

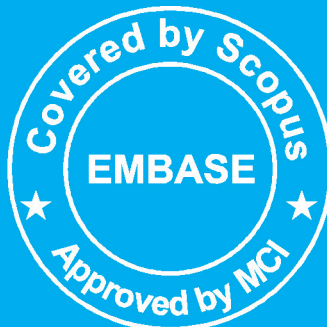
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An Autopsy Study of Cranio-Cerebral Injuries Due to Road Traffic Accidents

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Abstract

Cranio-cerebral injuries are a morbid state, resulting from gross structural changes to the scalp, skull and the contents of the cranium. In present scenario, accidents are now considered as one of major contributing factors of Non-Communicable Diseases which have become major health problems of developing countries like India. According to the national crime bureau statistics In India, over 1,46,133 people were killed in various road traffic accidents during 2015 and the count raised to 1,50,785 in 2016. Information on the contributing factors is mandatory to reduce this burden. A prospective study of all Road Traffic accidents coming for autopsy at Government Medical College, Anantapuram. Majority of victims were male in the age group between 31-40 years. Most of them had Linear fractures of the skull along with Sub dural haemorrhage. Two Wheeler riders were the most common victims. Most of the victims died due to Cranio-Cerebral Injury. Most of the times, it is the negligence, which results in an accident. The negligence may be on the part of the victim or may be there on the part of other person who occupied the second vehicle. Sometimes innocent pedestrians are also victimized to these deaths. An accident for all practical purposes is preventable, provided if it is anticipated and proper precaution and preventive measures are adopted.

Key words : Road traffic accidents, Intracranial Hemorrhage, Skull fractures, Pedestrian

Introduction

Road traffic accidents (RTA) can be defined as “ An accident that occurred on a way or street open to public traffic; resulted in one or more persons being killed or injured and at least one moving vehicle was involved. Thus RTA is collisions between vehicles, between vehicles and pedestrians; between vehicles and animals; or between vehicles and geographical or architectural obstacles^[1] .” Road Traffic Accidents (RTA) are increasing in alarming ways. Globally nearly 1.2 million people killed in RTA during the year 2002. Developing and underdeveloped countries accounted for 80% of these deaths and 21% of total injury projected

estimations reveals that fatalities due to RTA will be the 3rd leading cause of death by 2020 moving from its present 9th position ^[2] .Developing countries are very different from the industrialized countries with regard to the environment and mix of vehicles in the traffic stream ^[3] . Number of ‘Traffic Accidents’ in the country have been increased by 3.1% (from 4,81,805 in 2014 to 4,96,762 in 2015) during 2015 compared to 2014.^[4] Road Traffic Accidents (RTAs) are an important public health problem requiring urgent attention in developing countries such as India, which has the highest proportion of deaths due to RTAs in South East Asia. One of the main causes of death and disability is road traffic injuries, with an unequal number of incidences in developing countries.^[5] In 2000, RTA were the ninth leading cause of disability-adjusted life years lost and are projected to become third by 2020.^[6] Every year, more than 20 million people are injured or disabled and 1.17 million are killed because of RTAs.^[6] In developing countries, more than 85% of the deaths and nearly 90% of the

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disabilities are caused by RTAs globally.^[7] In India, of the mortality of 2,123.60 from all causes, 1,463 are caused by RTA. The World Health Organization (WHO) report on Global Status Report on Road Safety, which is the first of its type, states that, with more than 130,000 deaths annually, India has overtaken China and now has the worst RTA rate worldwide.^[8]

Materials and Method

All the post-mortem examinations conducted in Ananthapuram medical college mortuary on deaths due to road traffic accidents during 2016 year were analysed. The data regarding pattern of injuries leading to death, blood alcohol levels in the dead victims, age group affected, statistics of deaths among pedestrians and two wheeler drivers were collected for analysis. The study was conducted with the permission and help of medical records section and autopsy surgeons who have done post-mortem examination in various cases of deaths due to road traffic accidents. All cases of head injuries and injuries over other parts of the body due to RTAs are taken for the study. Decomposed bodies are not included in the present study. A total number of 234 cases were studied during the year 2016. This study included detailed history regarding the incident and complete clinical history including operative procedures, if any and detailed external and internal examination of the body.

Observation and Results

The current study conducted on 234 deaths due to road traffic accidents for which autopsy done in mortuary of Anantapuram government medical college, Andhra Pradesh during the year of 2016.

Out of 234 deaths **majority victims were** males. Males accounted to 150 (64%) and females were 84 (36%). As per age wise observation 73 deaths(males 45, females 28) occurred in the age group of 31-40 years. In the age group of 41 to 50 years the number of deaths were 58 (males 37, females 22). Next age group is 21 to 30 years in which 40 deaths (males 25, females 15) occurred; in the age group of 51 to 60 years

25 deaths(males 15, females 10) occurred; in the age group of 10 to 20 years 19 deaths (males 16, females 3) occurred; 14 people (males 8, females 6)more than 61 years are also died. Whereas 4 children (males 4 and no females) less than 10 years also died. If we take up the graph the peak is rising towards 31 to 40 years age group both in males and females.

During study of distribution of injuries to other body parts, Maximum number of victims had injuries associated with other body parts (159 cases) followed by head injuries(75 cases).

In our study different types of extra cranial injuries either alone are in combination were found. Among those abrasion was found in (134) followed by contusion (94), laceration(83), fractures(31), crushing injury (8) incised(6), penetrated(4) injuries respectively.

Out of 234 cases studied, 18 were intact without any fracture of the skull. 216 cases had skull fractures. Among them linear/fissure fractures topped the list of skull fractures (112), followed by , Communitated fractures (58), Depressed (20), combined (15), sutural separation (9), crush injuries (expressed fractures) (9) and the least being the ring fractures (2) and no gutter fractures seen and these fractures found either individually or in combination with each other

After opening the skull cavity the different kinds of intra cranial haemorrhages were observed in the study group. The type of intracranial haemorrhages found either individually or in combination with each other. Among these, Subdural haemorrhage either singly or in combination with others was found in 103 head injury cases. Next comes subarachnoid haemorrhage and it was found in 93cases, followed by intra cerebral haemorrhage(14), Extra dural haemorrhage(12) intra ventricular haemorrhage(5), Pontine haemorrhage (5) Cerebellar haemorrhage(2).

It was observed in current study the cranio cerebral injury was the leading cause of death in most of the victims that is in173deaths. Followed by haemorrhagic shock in 47 victims then neurogenic shock.

Table: 1. Age and Sex wise distribution cases of fatal RTAs

S.No	Age	Male		Female		Total	
		No of cases	%	No of cases	%	No of cases	%
1	<10	4	1.71	0	0	4	1.71
2	11-20	16	6.84	3	1.28	19	8.12
3	21-30	25	10.68	15	6.41	40	17.09
4	31-40	45	19.23	28	11.97	73	31.20
5	41-50	37	15.81	22	9.40	59	25.21
6	51-60	15	6.41	10	4.27	25	10.68
7	>60	8	3.41	6	2.56	14	5.97
	Total	150		84		234	100

Table:2. Head injury association with other body part injury

S.no	Item	No Of Cases	Percentage
1	Head injury with other body parts injuries	159	67.95
2	Only head injury	75	32.05
3	Total	234	100

Table:3. Types of extra cranial injuries

s.no	Type of injuries Associated with headinjuries.	Total	Percentage(%)
1	Abrasion	134	57.26
2	Contusion	94	40.17
3	Laceration	83	35.47
4	Incised injury	6	25.64
5	Penetrated injury	4	17.09
6	Crushing injury	8	34.19
7	Fractures	31	13.25

Table 4: Frequency of different types of fracture

s.no	Types of fracture	Total	Percentage(%)
1	Linear/ fissure	112	47.87
2	Communitied	58	24.78
3	Depressed	20	08.54
4	Gutter	0	0
5	Ring	2	0.86
6	Sutural separation	9	3.84
7	Combined	15	6.42
8	No fracture	18	7.69
9	Total	234	100

Table:5. Distribution of the Intracranial haemorrhages with respect to site in cases of fatal RTA

s.no	Type of Hemorrhage	Number of cases	Percentage (%)
1	Extra Dural Hemorrhage (EDH)	12	5.13
2	Sub Arachnoid hemorrhage(SAH)	93	39.74
3	Sub Dural hemorrhage(SDH)	103	44.02
4	Pontine hemorrhage	5	2.13
5	Intra cerebral hemorrhage(ICH)	14	5.98
6	Cerebellar hemorrhage	2	0.85
7	Intraventricular Hemorrhage(IVH)	5	2.14

Table:6. Different causes of Death in cases of fatal RTA

s.no	Cause of death	Number of cases	Percentage(%)
1	Cranio cerebral Injury(CCI)	173	73.93
2	Neurogenic Shock(NS)	9	38.46
3	Hemorrhagic Shock(HS)	47	20.09
4	Septic Shock(SS)	5	2.14
5	Total	234	100

Discussion

Head Injuries are more prone in road traffic accidents. These are due to the exchange of force between the body parts which are moving and the stationary hard objects present on and around the road. Or the human body may be stationary and the moving object come and hit the person wherein there is an exchange of force which results in the deformity of the body parts and the result is the injuries spread over the body surface or internal organs of the body.

The results of our study on the cranio cerebral injury due to RTA were analyzed and compared with other studies conducted at various places in India and abroad.

Table:1 in our present study maximum number of head injury victims were males in the age group of 31-40 years. The reason could be that the males of in this age group are prime earners of the family and remain outdoors during most of the day, risk taking behavior, Male dominance is explained by the fact that, males are more exposed to hazards of road. Similar results were observed in the various studies [9,10,11] while study by shamim monga et al^[12] contrasts our finding where the common age group was between 21-30 years.

Table:2 In our study injuries to other body parts also has happened along with head injury, similar finding found in study by Shobhna et al⁽¹³⁾. As most of the victims are from two wheeler accidents and pedestrians, victims had involvement of other body parts after hitting was more common.

Table:3 In present study grazed abrasion was most common associated injury either single or in combination with other injuries. Similar findings were observed in study conducted by Oberoi et al^[14]. However study conducted by Shobhna et al^[13] laceration was most common associated injury. Whenever there is a road traffic accident there is blunt force acting on the victim so it causes injuries like abrasion, contusion, lacerations.

Table:4 In regards to fracture of skull bone, we found that linear fracture was most common, similar findings were observed in studies conducted by Wankhede et al^[15], Menon et al^[16], Shobhna et al^[13]. Type of fracture occurring after vehicular accident depends on various factors e.g. speed, safety measures used, ground over which fall occurs. In severe accidents combination of fractures is observed. In another study which was carried out by kuchewar et al^[17], almost 79.87% of victims

were with skull fracture. Fracture of the vault of skull was more common than the base of the skull and most common type of fracture was linear. These results are similar to the results of our study.

Table:5 In current study, most common type of haemorrhage was subdural (either alone or with combination) which is similar to study conducted by Ravikumar et al⁽¹⁸⁾ and Arvind kumar et al⁽¹⁹⁾ while study by Wankhede et al^[15] contrasts our finding where Sub Arachnoid Haemorrhage was most common.

Table:6 in our study the commonest cause of death was Cranio Cerebral Injury, it is consistent with the study conducted by B. Srinu Naik et al.^[20]

The findings in the present study most of the vulnerable group road users are, two wheeler riders, and pedestrians. Similar findings observed in the study by Gururaj et al.^[10]. These groups of road users form the major bulk on Indian roads, and hence, their exposure is higher. Unlike occupants in cars and other heavy vehicles, these road users are directly exposed to the traffic environment,

Summary and Conclusion

The present study can be summarized and concluded as, head injury deaths due to road traffic accidents are occurring in significant number in day to day medicolegal autopsies. Among Highest number of deaths belonged to age group of 31 to 40 years with male preponderance. Majority Of Head injuries are associated with other body parts injuries and abrasion being the commonest. Linear fracture was most common type of skull fracture, and the Sub Dural Haemorrhage was the leading type of intracranial haemorrhage. Cranio cerebral injury being the commonest cause of death and two wheeler riders being the most vulnerable group of affected road users.

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Ethical Clearance: Ethical clearance from the institutional ethical committee obtained for the study.

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Age Estimation from Radiological Evaluation of Epiphyseal Union of Related Bones Around Elbow Joint: A Cross Sectional Study from Central India (Chhattisgarh)

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Abstract

Radiological evaluation of the skeletal age represents an important tool for the estimation of the chronological age in the living. The aim of our study was to evaluate the relationship between the chronological age and degree of epiphyseal fusion around elbow joint in population of Chhattisgarh (Central India) and to compare our results with the results of similar studies. The study was carried out in 100 healthy subjects (40 girls and 60 boys) aging from 13 to 20 years. The obtained results from the radiographs revealed that the complete fusion of epiphysis of elbow joint is seen at 16-20 years. Females were consistently developing epiphyseal union at a younger age than their male counterparts. Results also suggest that the age of epiphyseal union is found to vary greatly all over the world indicating the need for separate standards of age of epiphyseal union for separate regions.

Key Words: epiphyseal union, elbow joint, distal end of humerus.

Introduction

Accurate age estimation of living persons provides an authentic official document to prove their chronological age, important for humanitarian, administrative & legal purposes. Radiographic evaluation of the skeletal age is one of the most reliable methods of the four pillars for age estimation. Nevertheless this method is only an estimate, having an inherent degree of error due to variation in human skeletal development. The aim of our study was to evaluate the relationship between the chronological age and the degree of epiphyseal fusion around elbow joint in population of Chhattisgarh (Central India) and to compare our results with the results of similar studies. Present study has been undertaken in an indigenous population of Chhattisgarh from ossification around elbow joint radiographically.

Aims & Objectives

5. To evaluate age specific difference in epiphyseal union at elbow joint.
6. To estimate age from epiphyseal union at elbow joint.
7. To compare bisexual difference in epiphyseal union at elbow joint.
8. To compare the findings in the epiphyseal union at elbow joint in Central Indian population with other parts of India on the basis of previous studies.

Material & Method

The present study was carried out in the Department of Forensic Medicine & Department of Radiology, SSIMS, Bhilai, Chhattisgarh (Central India). A total of 100 individuals participated in this study. The subjects included were students of 13-20 years of age from schools & colleges from Bhilai city. They are born to parents living in Central India and have lived here since birth. The subjects do not have any disease/deformity pertaining to bones or chronic disease affecting the general health. An informed consent was taken from all subjects prior to each investigation.

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Procedure of Radiography: After taking written consent, thorough physical examination & radiological evaluation was done. X-Rays of right elbow joint were taken with the help of X-Ray machine in the Department of Radiology. Minimum shots were taken to expose the joints involved in study. Minimum & appropriate voltage settings of X-Ray machine were applied so as to avoid unnecessary radiation exposure of the subjects. All the radiological procedure was undertaken according to the

prescribed standards. Skeletal maturity was evaluated according to the Jit & Kulkarni's¹⁷ classification of four stages: Appearance, Non fusion, Partial fusion & Complete fusion ("A", "NF", "PF", "CF" respectively). The master chart was prepared and tabulated as per code given above. It was classified, analysed and compared with known standards. At the end conclusions were drawn, which were compared with available results of various previous studies.

Results

TABLE 1: Age and gender wise distribution of subjects.

Age in years	Males		Females	
	No	%	No	%
13-14	6	10	4	10
14-15	7	11.67	4	10
15-16	9	15	8	20
16-17	10	16.67	7	17.5
17-18	12	20	7	17.5
18-19	8	13.33	5	12.5
19-20	8	13.33	5	12.5
Total	60	100	40	100

Table 2: Epiphyseal Fusion of the Composite epiphysis (Capitulum and Lateral region of Trochlea, Medial region of Trochlea, Lateral Epicondyle) with shaft of humerus:

Age (years)	Males			Females		
	NF	PF	CF	NF	PF	CF
13-14	2 (3.33%)	4 (6.67%)	0 (0%)	0 (0%)	2 (5%)	2 (5%)
14-15	0 (0%)	2 (3.33%)	5 (8.33%)	0 (0%)	1 (2.5%)	3 (7.5%)
15-16	0 (0%)	2 (3.33%)	7 (11.67%)	0 (0%)	0 (0%)	8 (20%)
16-17	0 (0%)	0 (0%)	10 (16.67%)	0 (0%)	0 (0%)	7 (17.5%)
17-18	0 (0%)	0 (0%)	12 (20%)	0 (0%)	0 (0%)	7 (17.5%)
18-19	0 (0%)	0 (0%)	8 (13.33%)	0 (0%)	0 (0%)	5 (12.5%)
19-20	0 (0%)	0 (0%)	8 (13.33%)	0 (0%)	0 (0%)	5 (12.5%)
Total	60 (100%)			40 (100%)		

In males, composite epiphysis shows: non fusion in 2 (3.33%) cases in age group of 13-14 years, partial fusion in 8 (13.33%) cases in age group of 13-16 years

& complete fusion in 50 (83.33%) cases in age group of 14-20 years. Complete fusion is seen in all the subjects

in age group of 16-20 years.

In females, composite epiphysis shows: partial fusion in 3 (7.5%) cases in age group of 13-15 years & complete fusion in 37 (92.5%) cases in age group of 13-20 years. Complete fusion is seen in all the subjects in age group of 15-20 years.

Table 3: Epiphyseal fusion of Medial Epicondyle with shaft of humerus:

Males				Females		
Age (years)	NF	PF	CF	NF	PF	CF
13-14	1 (1.67%)	5 (8.33%)	0 (0%)	1 (2.5%)	3 (7.5%)	0 (0%)
14-15	0 (0%)	5 (8.33%)	2 (3.33%)	0 (0%)	2 (5%)	2 (5%)
15-16	0 (0%)	2 (3.33%)	7 (11.67%)	0 (0%)	1 (2.5%)	7 (17.5%)
16-17	0 (0%)	0 (0%)	10 (16.67%)	0 (0%)	0 (0%)	7 (17.5%)
17-18	0 (0%)	0 (0%)	12 (20%)	0 (0%)	0 (0%)	7 (17.5%)
18-19	0 (0%)	0 (0%)	8 (13.33%)	0 (0%)	0 (0%)	5 (12.5%)
19-20	0 (0%)	0 (0%)	8 (13.33%)	0 (0%)	0 (0%)	5 (12.5%)
Total	60 (100%)			40 (100%)		

In males, Medial Epicondyle shows: non fusion in 1 (1.67%) cases in age group of 13-14 years, partial fusion in 12 (20%) cases in age group of 13-16 years & complete fusion in 47 (78.33%) cases in age group of 14-20 years. Complete fusion is seen in all the subjects in age group of 16-20 years.

In females, Medial Epicondyle shows: non fusion in 1 (2.5%) cases in age group of 13-14 years, partial fusion in 6 (15%) cases in age group of 13-16 years & complete fusion in 33 (82.5%) cases in age group of 14-20 years. Complete fusion is seen in all the subjects in age group of 16-20 years.

Table 4: Epiphyseal fusion of Head of Radius:

Males				Females		
Age (years)	NF	PF	CF	NF	PF	CF
13-14	3 (5%)	3 (5%)	0 (0%)	1 (2.5%)	3 (7.5%)	0 (0%)
14-15	1 (1.67%)	6 (10%)	0 (0%)	0 (0%)	2 (5%)	2 (5%)
15-16	0 (0%)	3 (5%)	6 (10%)	0 (0%)	0 (0%)	8 (20%)
16-17	0 (0%)	0 (0%)	10 (16.67%)	0 (0%)	0 (0%)	7 (17.5%)
17-18	0 (0%)	0 (0%)	12 (20%)	0 (0%)	0 (0%)	7 (17.5%)
18-19	0 (0%)	0 (0%)	8 (13.33%)	0 (0%)	0 (0%)	5 (12.5%)
19-20	0 (0%)	0 (0%)	8 (13.33%)	0 (0%)	0 (0%)	5 (12.5%)
Total	60 (100%)			40 (100%)		

In males, Head of Radius shows: non fusion in 4 (6.67%) cases in age group of 13-15 years, partial fusion in 12 (20%) cases in age group of 13-16 years & complete fusion in 44 (73.33%) cases in age group of 15-20 years. Complete fusion is seen in all the subjects in age group of 16-20 years.

In females, Head of Radius shows: non fusion in 1 (2.5%) cases in age group of 13-14 years, partial fusion in 5 (12.5%) cases in age group of 13-15 years & complete fusion in 34 (85%) cases in age group of 14-20 years. Complete fusion is seen in all the subjects in age group of 15-20 years.

Table 5: Epiphyseal fusion of olecranon process of ulna:

Males				Females		
Age (years)	NF	PF	CF	NF	PF	CF
13-14	2 (3.33%)	4 (6.67%)	0 (0%)	2 (5%)	2 (5%)	0 (0%)
14-15	1 (1.67%)	6 (10%)	0 (0%)	0 (0%)	2 (5%)	2 (5%)
15-16	0 (0%)	3 (5%)	6 (10%)	0 (0%)	0 (0%)	8 (20%)
16-17	0 (0%)	0 (0%)	10 (16.67%)	0 (0%)	0 (0%)	7 (17.5%)
17-18	0 (0%)	0 (0%)	12 (20%)	0 (0%)	0 (0%)	7 (17.5%)
18-19	0 (0%)	0 (0%)	8 (13.33%)	0 (0%)	0 (0%)	5 (12.5%)
19-20	0 (0%)	0 (0%)	8 (13.33%)	0 (0%)	0 (0%)	5 (12.5%)
Total	60 (100%)			40 (100%)		

In males, olecranon process shows: non fusion in 3 (5%) cases in age group of 13-15 years, partial fusion in 13 (21.67%) cases in age group of 13-16 years & complete fusion in 38 (63.33%) cases in age group of 15-20 years. Complete fusion is seen in all the subjects in age group of 16-20 years.

In females, olecranon process shows: non fusion in 2 (5%) cases in age group of 13-14 years, partial fusion in 4 (10%) cases in age group of 13-15 years & complete fusion in 34 (85%) cases in age group of 14-20 years. Complete fusion is seen in all the subjects in age group of 15-20 years.

Discussion

Table 6: Showing comparison of ages (years) of union of epiphyses around Elbow joint given by various workers with findings of present study:

Researcher	Composite epiphysis		Medial epicondyle		Radial head		Ulnar Olecranon	
	Male	Female	Male	Female	Male	Female	Male	Female
Lal & Nat (1934) (U.P.)1	17	-	-	-	17	-	-	-
MJS Pillai (1936) (South India)2	14	14	17	17	17	17	-	-
Galstaun (1937) (Bengal)3	16	14	16	14	16-17	14-15	16	15
Basu & Basu (1938) (Bengal)4	-	13-14	-	13 ½ -14	-	13 ½ -14	-	13 -14
Lal & Townsend (1939) (U.P.)5	-	15	-	-	-	16	-	-
Gupta et al (1974) (U.P.)6	-	-	18-19	17-18	16-17	17-18	-	-
Sahni & Jit (1995) (Punjab)7	-	-	-	16	-	16	-	-
Nemade K et al (2007) (Vidarbha)8	16-17	14-15	17-18	15-16	17-18	15-16	-	-
Sidhom & Derry (1931) (Egyptian)9	17-18	20-21	-	-	19-20	-	-	-
Ledger & Wasson (1941) (Pakistan)10	14-15	14-15	17-18	14-15	17-18	14-15	-	-
Frazer (1958) (European)11	17	14	18	15	16-17	14-15	-	-
Gray (1995) (European)12	16	14	20	20	17	14	-	-
Present study	16-17	15-16	16-17	16-17	16-17	15-16	16-17	15-16

Composite epiphysis: The observations of present study for males, matches with works of Lal & Nat (1934)¹ in Uttar Pradesh, Nemade K et al (2007)⁸ in Vidarbha, Sidhom & Derry (1931)⁹ in Egyptians & Frazer (1958)¹¹ in Europeans. For females, the observations match with the findings of MJS Pillai (1936)² in South Indians, Galstaun (1937)³ in Bengalis, Basu & Basu (1938)⁴ in Bengalis, Lal & Townsend (1939)⁵ in Uttar Pradesh, Nemade K et al (2007)⁸ in Vidarbha & Ledger & Wasson (1941)¹⁰ in Pakistani population.

Medial epicondyle: The observations of present study for males, matches with work of MJS Pillai (1936)² in South Indians, Galstaun (1937)³ in Bengalis, Nemade K et al (2007)⁸ in Vidarbha & Ledger & Wasson (1941)¹⁰ in Pakistani population. For females, the observations match with the findings of MJS Pillai (1936)² in South Indians, Gupta et al (1974)⁶ in Uttar Pradesh, Sahni & Jit (1995)⁷ in Punjabis, Nemade K et al (2007)⁸ in Vidarbha & Ledger & Wasson (1941)¹⁰ in Pakistani population.

Radial head: The observations of present study for males, matches with work of Lal & Nat (1934)¹ in Uttar Pradesh, MJS Pillai (1936)² in South Indians, Galstaun (1937)³ in Bengalis, Gupta et al (1974)⁶ in Uttar Pradesh, Nemade K et al (2007)⁸ in Vidarbha, Ledger & Wasson (1941)¹⁰ in Pakistani population, Frazer (1958)¹¹ in Europeans & Gray (1995)¹² in Europeans. For females, the observations match with the findings of Galstaun (1937)³ in Bengalis, Lal & Townsend (1939)⁵ in Uttar Pradesh, Sahni & Jit (1995)⁷ in Punjabis, Nemade K et al (2007)⁸ in Vidarbha, Ledger & Wasson (1941)¹⁰ in Pakistani population & Frazer (1958)¹¹ in Europeans.

Ulnar Olecranon: The observations of present study for both males & female, matches with work of Galstaun (1937)³ in Bengalis.

Summary and Conclusions

9. This study was conducted exclusively on the young indigenous population of Chhattisgarh region.

10. The epiphyseal union of bones at right elbow joint in males is completed in all instances (100%) at the age of 16-20 years.

11. The epiphyseal union of bones at right elbow joint in females is completed in all instances (100%) at the age of 15-20 years.

12. As the sample size is limited, further studies are necessary. Region wise studies should be conducted for

better correlation and comparison.

13. Due to changing lifestyle pattern, dietary, climatic, behavioral factors, age of ossification is changing as mentioned in the available literature. So as to evaluate these changes, studies are recommended in every region of India at regular time period for academic and judicial interest.

14. The opinion about age should be given always in the range. From this study it can be concluded that the opinion about age can be given in a range having margin of error of 1-2 years.

15. Radiological interpretations are observer dependent so the set standards should be considered under expert guidance to arrive at conclusion in such radiological studies.

16. For estimation of age, relevant joints should be radiologically examined for different centres and opinion should be arrived considering the status of multiple centres.

Ethical Clearance- Taken from institutional ethical committee.

Source of Funding- Self.

Conflict of Interest- Nil.

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Manufacturers' and Endorsers' Liability : 'Shifting the Onus' Approach

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Abstract

Endorsement being seen as a platform for presentation of traits and performances of a product, it draws an analogy with 'invitation to offer' with the product or service voicing their presence via celebrity personalities attracting attention. Though the case of Donoghue v. Stevenson remains the original precedent on manufacturer's negligence and absence of any contractual obligations to the consumer making him responsible towards the ultimate beneficiary, the ratio and obiter should be analysed in sharing a look-alike obligation on endorsers for injury ensuing from use of such product or service. Since the debate of Nestles' Maggi brand, there has been a look out at the existing liability regime for the celebrity endorsers of such products. In the wake of flooding consumables in the free competitive market, falsification of critical data, misleading and non-obvious statements and superficial promising results often prejudice consumers' choice as well as preference, thereby affecting their rights to claim for healthy, consumer friendly products and income justified and habit of consumerism. Moreover, being a 'ideal' 'God like' and 'larger than life' figure to common man, personalities from entertainment, sports and other popular industry invite a stricter interpretation on their 'responsibility quotient' because of the edge over other professional advertisements in terms of greater credibility and trust.

Keywords: Endorsement, Misleading advertisements, Due diligence, Consumerism, Customers, Celebrities.

Introduction

Endorsers bridge the gap between manufactures and the consumers and often create a strong and relatable emotional bond with consumers with their earned likeability, and ways of work and life and become arbiter of quality, taste and performance of products or services. With the growing effect of the social media in the purchase journey of every individual the companies too are evolving new manners of effective saleability and one of the effective methods adopted is through endorsement through different channels. And many big celebrities are associated with the giant companies to vouch for their products and brands. But where

brands are taking advantage of celebrities, by rampantly using the social median to reach the stakeholders and customers buying behaviours dependent on celebrity endorsement, the endorser possess some responsibility and have liability against their misleading products. Because the customer places a higher value on products endorsed by celebrities and it is as if they are receiving a short of advice from a brand regarding that product when the customer is a fan of the celebrity.

So the endorsers in a way increase awareness trust and familiarity of the products they are vouching for. People also believe that the products promoted by the celebrities will make them or allow them to get the traits of the particular celebrity. So the customer in a way shows greater recall of product those are endorsed by celebrities. And thus, through the endorsement of brands by celebrities and endorser, companies are taking undue advantage.

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Justification in favour of liability:

1. There is an undue influence on the “freedom to choose” of consumers.
2. A joint or vicarious liability on the celebrity is a justified step for any for any ensuing immediate damage or harm from the use of product or services by the consumers.
3. There is a shared malicious interest of the endorsers with manufacturers in money making.

Justification against Liability:

1. Endorsers are not the approval authority or testing authority and certainly lack the technical expertise on the same.
2. It is understood that the primary safety test has been done by the authority as because it has been stamped to be market ready.
3. Endorser being a mere medium of transmission of information should not be made a scapegoat.
4. There is an express and implied ‘Indemnity clause’ in the Contract between the manufacturers and endorsers justifying a compensatory
5. The age old revolutionary concept of ‘Caveat Emptor’ puts a responsibility on consumers’ shoulder to be informative.

Liability of the celebrities for the claims made by them in advertisements: The question of liability of the celeb-endorser for the lapses of a manufacturer is long been debated ever since Nestles Maggie brand of instant noodle had quality issues and the product falling the foul of food testing authorities was banned by the Food Safety and Standards Authority of India.¹

An extremely important legal debate has been raised concerning the liability of endorsers. Various legal experts opine that even if the celeb-endorsers are made liable under certain provisions of existing legal provisions, it becomes difficult to prove the presence of clear intent to harm anyone via the endorsements they are making in respect of the deficient product. The rights and obligations of the endorsers are very well looked after by the contract between the endorser and the company. But in cases where a particular endorser is engaged not directly by the company but by any advertising agency, the terms and conditions of the

contract in such cases would be different. Moreover, in some cases, there might be non- existence of any contractual relationship between endorser and company. In absence of any contract, how far a brand ambassador is liable for deficient products is a big question.

Civil Liability Regime in India: Endorsers cover up allegations of misleading promotion under their plea as mere expression of opinion and a freedom of speech guaranteed under Article 19 of the Constitution of India But that too comes certain exceptions with a reasonable restriction being imposed in the interests of general public. Health of citizens is thus, matter of paramount consideration and no person may be allowed to trade at the cost of public health.

False and misguided claims range from overrated results of fairness products (‘fair skin in four weeks’)², food supplements guarantying ‘taller stronger and sharper children, Easy Slim Tea, use of Yantras and Stone/Topaz for male child to magical cure of ailments (Dettol TVC’s super ‘protects from 100 Germs’, Patanjali’s Chawanprash’s³ claim on ‘51 herbs’) and many more making advertisements void of any rational logic or ethics.

a) Tortuous Liability

Under the Law of Torts, duty of care and negligence could be clubbed against the endorser with a burden of proof on consumer to prove ‘malice’ on the part of endorser which is difficult to prove. Moreover, the endorsers in a manner are acting as agents of the company and thus invite no liability under the tort law.

b) The Sales of Goods Act, 1930

Implied condition of merchantability befitting the description and ‘conditions and warranties’ clause under the law is a major safeguard for consumers’ interests. Also, occasionally making buyer rely on the skills and judgment of seller and informing seller of his ‘particular purpose’ makes the seller contractually responsible.

c) Consumer Protection Act, 1986

Of all the legislations dealing with misleading advertisements and liability parameters of endorsers, the Consumer Protection Act, 1986 evolves to be most efficacious whose sole purpose is to safeguard consumers’ interests and settlement of disputes. Under section 2(1)(r) the ‘Unfair Trade Practices’ include the misleading advertisements which falsely represent

that goods are of particular standard, quality or grade along with the representation that certain goods have performance, characteristics uses or benefits which such goods actually don't have.

The Consumer Protection Councils under the Act, thus, play a vital role in deciding the extent of liability of the celebrities in case of misleading advertisements but only if the role of celebs in endorsing the products of certain brands and attracting liability in case of misleading advertisements specifically provided in the Act as the existing Act does not provide clear guidelines around rights and liabilities of celeb-endorsers. Considering the impact of celebrity endorsement on the consumer choices and behaviour, situation is more damaging in case of misleading advertisements of various products and unrealistic claims. Also the intent behind the advertisements and promotional activities is not only in a view to put forth an artistic expression but to have a better impact of their product in a very short span of time so that a whole new bunch of consumers just extend their wish to buy it because a particular celebrity uses the same.

Keeping in view the current scenario of celeb endorsement and celeb behaviour, the Consumer Protection Bill, 2018 which was introduced in the Lok Sabha for the first time on January 5, 2018, seeks to replace the existing Consumer Protection Act of 1986 in order to address the emerging consumer vulnerabilities. Till now in India, no celebrity endorser has ever been prosecuted for a misleading and exaggerated claim in an advertisement. But once the proposed bill is passed, the responsibility of celeb endorsers to our society could be enforced by a legal backing and also the trend of celebrity endorsement will become more guarded.

Moreover, the Bill is obviously a welcome move towards taking the issue of misleading advertisement but there are certain loopholes in the said bill which has been attracting criticism over and over again since the bill was introduced in the Parliament for the first time in the year 2015.

a) The proposed Bill though seems to have attempted some modification in ensuring professional and ethical liability on the endorsers; it certainly tried to limit the consumer's freedom to enforce its sanctioning rights via some compromising clauses.⁴

b) Defence of Due Diligence:⁵ On the question of liability for "false or misleading endorsement prejudicial

to the interest of any consumers", endorsers have been given an opportunity to negate malice and prove their fair intention in not knowing about the veracity of the product by pleading "due diligence" and precaution.

c) No vicarious liability too could be ensued on the endorsers.

d) Empanelled Mediator: Filing of complaint through an executive agency who is an officer belonging to the Central Consumer Protection Authority and who is being duly authorised by the Chief Commissioner is violative of a person's 'right to sue' by limiting it through an unaffected intermediary.

e) Compounding of Offence: Compounding of offence by the brand ambassador for first offence is an easy escape with the brand ambassador or endorser shelling out monetary damages at the cost of consumer's physical and mental health.

Criminal Liability Regime in India:

a) Indian Penal Code:

Any person selling or offering for sale noxious or unfit food can be prosecuted according to the provisions of the "Indian Penal Code" if that person does the same knowingly. In the case involving the instant noodle Maggie, a case under Section 270 which incriminates the malignant act that is likely to spread infection of diseases that are dangerous to the life of the persons was filed against the endorsers. Also the criminal liability cases involving Section 273 dealing with the "sale of noxious drinks", Section 276 involving the "selling of drugs as a different drug or preparation" and Section 420 involving "cheating and dishonesty" was reportedly being filed against the celebrity endorsers.

But the liability cases made under Section 420 and Section 376 dealing with cheating with regard to property and the sale of different drugs or preparations respectively are falling apart as it was not the clear case here. On the other hand, in Sections 270 and Section 273 there is a specific requirement of the involvement of the accused directly with a clear intent which is missing in some cases and difficult to prove in some other.

b) Other Special Statutes:

The Food Safety and Standards Act, 2006 under Section 24, puts a restriction on advertisements that are misleading. The Act says "no person shall be allowed

to engage in misleading representation concerning the standard ‘quality, quantity, grade and composition’, and ‘need for, or the usefulness of a food product’. Moreover, it also restricts the endorser from making such statements that gives any guarantee to the consumers as to the efficacy of the product.

The penalty for false advertisement is provided under Section 53 of the said Act which can extend up to 10 lakhs (it is believed by some legal experts that the amount of penalties in such cases are typically picked up in the contractual indemnities provided by the manufacturers or the brand owners).

Regulatory Framework in India: “Advertising Standards Council of India”, (ASCI) is a non-statutory Tribunal established in the year 1985 also deals in regulating the mechanism for ensuring just and ethical advertisement practices and takes up complaints against any perceived misrepresentation in an advertisement.⁶

It has power to give direction for modification and withdrawal of any advertisements hereby assuring truthful representations of the product. ASCI works on its code of Advertising Practice and is applicable to advertisements read heard or viewed in India irrespective of their origin. According to Gowree Gokhale, a senior partner of an International Law Firm Nishith Desai Associates, basing on the principles of “decency, fairness, honesty and responsibility”⁷ the advertisements are evaluated by the ASCI. Although the orders of the ASCI’s are generally void of enforceability, the Ministry of Indo and Broadcasting has made the violation of “Advertising Code” a penalty restricting the Cable service providers and TV channels to promote.

International Norms: In the United States, the Federal Trade Commission has certain guidelines for endorsement by celebrities. The FTC made amendments in the year 2009 giving the consumers the liberty to even hold celebrities liable in cases of misleading advertisements. It has prescribed standards for the liability of endorsers. Advertisement are evaluated on the principle of “*good reason to believe that*” in order to examine whereas the endorser has sufficient reasons to believe that the said feature of a particular commodity he is endorsing and thus guidelines make the celebrities responsible enough to investigate products first and also requiring celebrity to be a *bona fide* user.⁸

In Europe, there is voluntary self-imposed code to be followed by the celebrities whereby they are refrained

from endorsing “medicines, medical treatments, tobacco and alcohol” which have harmful effect over the health of the people.

In China, there is equal and joint responsibility with food producers if food causes harm with an option to file claim either against enterprise manufacturer or celebrity recommending the same. Misleading testimonials too have same fate. The Food Safety law of China talks about endorsers’ liability in case of misleading testimonials and recommendations. In an endorsement of a shampoo, Jackie Chan faced a legal battle for the shampoo brand he was endorsing which was alleged to be containing cancer causing ingredients whereas the advertisement showed it chemical free. But the suit against the endorser failed on the ground of non-existence of any legal relationship between the endorser and the company. China does not have any procedure for determining liability of the celeb endorsers such as “false and misleading test” and is yet to evolve laws regarding celebrities by fixing joint responsibilities in all spheres of trade.⁹

Korea, on the other hand, has a “self- regulatory institution” responsible for issuing guidelines with respect to endorsements which also has the power to decide which products are to be expressly advertised and which are not, thereby making false advertisements a rarity. It can thus, be said that Korea has comparatively more stringent mechanism in controlling misleading advertisements.

Conclusion

In lights of the expanding economic horizons of the country, it is the need of the hour to establish an economy where none is taking advantage of and none is left bereft of resources. Endorsers certainly are creating target base and building markets for big multinational companies through their perceived influence on consumers’ mind, interpreting ‘innocent misrepresentation’ and ‘negligent misrepresentation’ would be a guidance for lawmaker to see through a better and sound enforceability and plea of privity of contract or defences against strict liability falling short of their rationality when endorsements involve recklessness and whimsical professional ethics. Before acting as a spokesperson to the brand’s voice or being a mere carrier of information there is certainly a ‘line of commitment’ to morality and ethics. Thus, while it is time to ensure strict regulations against people who sacrifice their integrity for money, celeb-endorsers and advertisers take joint responsibility to marketing and

promoting ‘truth’ and ‘veracity’ in products and services.

Ethical Clearance: Not required as the researcher has just referred to some published works. The research is doctrinally undertaken, completely by the researcher herself.

Source of Funding: Self

Conflict of Interest: Nil

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Crossword Puzzle: An Innovative Assessment Tool to Improve Learning of Students in Forensic Medicine

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Abstract

Background: As per Medical Council of India (MCI) for setting teaching learning standards according to need of society, now has focus shift from traditional teaching methods to adopting teaching learning method that is been termed as competency-based learning. Faculty training programme by MCI are also providing the right platform for learning the new methodology in medical education.

Objectives: To prepare an interesting and effective tool in assessing the knowledge of Forensic medicine among the medical undergraduate students to produce competent and confident Indian Medical Undergraduates.

Methodology: Crossword puzzle exercise was given to 2nd year students, who were in 5th semester. 38 students participated in this study. A questionnaire was given to the participants to evaluate the response consisting of 15 questions; responses were obtained on Likert scale 5 to 0.

Results: Out of 38 students 92% of students found the puzzle interesting. 76.4% students found this puzzle as a useful tool to learn forensic medicine. 73% students agreed it to be a useful tool for the assessment of their knowledge. 81% students were in favour to use such puzzle in competitive exams. In terms of retaining the knowledge of topics, 84 % students found this puzzle useful.

Conclusion: Crossword puzzle improves memory power, performance and critical thinking of students with fun. This can be tried as a question in periodic internal examination for internal assessment as well as well as for the purpose of structured viva examination in university examination.

Key words: MCI, traditional teaching, medical undergraduate, cross word, assessment

Introduction

Teaching and learning are mutual procedures that influence each other, and assessment determines both students and teacher's effort¹. The purpose of assessment is to impart quality education to students, to give feedback to the educational managers about the curriculum, and to categories the students according to their talent and to monitor their own learning. Assessment also provides

a high degree of fairness and objectivity in testing and produces data to enable continuous quality improvement². The welfare and indeed the future health of people depend on the quality of medical graduates which in turn depends on quality of medical education. Educationists believe that simply by changing the assessment style for the learners can affect the way students engage with the subject contents³. Assessment drives learning and learning drives practices. By changing the format of assessment or examination, can lead the students to engage their study more thoughtfully; their focus can be shifted to clinical rather than theoretical issues⁴.

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The crossword puzzle is a century old game and was first used in ancient Egypt. In 1913, Kathryne

created a modern crossword puzzle⁵. In recent years, it has become an interesting game and we come across it in many newspapers, magazines, books, and journals. Some magazines even offer prizes for solving it as an incentive for the participants. Recently educationists have started using these puzzles as an educational tool especially in medical education and nursing courses.⁶⁻¹² Crossword puzzle can also be used as an innovative tool for assessment of undergraduate medical students.

This exercise helps them to remember the forensic medicine terms easily, understand the concept and helps the teachers to evaluate the students' knowledge and understanding. It can detect the misconceptions and help to clarify the concepts of the medical student.^{13,14} The benefits of such active learning are that it promotes the communication ability, memory, cooperation among learners and their critical thinking power.¹⁵

Such games are important in acquiring skill and psychomotor knowledge, brain functions like understanding, thinking, remembering and analyzing the facts.^{16,17} The crossword puzzles are in various forms including cryptic form, symmetrical form.

Since medical education has changed dramatically in last few decades, the assessment of knowledge of medical students also needs to be changed and it needs to be effective as well as interesting. Crossword puzzle will prove as an effective tool for assessment in terms of recall and analysis of knowledge. Forensic medicine is a very important subject for the medical student for their career, and for the medico-legal system to have more experts. The crossword short answer question (SAQ) stimulates the cognitive function. Due to previous experience in crossword puzzles¹¹, the author got an idea to use his puzzle in the examination as short question answer.

The literature search did not show any crossword puzzle tool in form of short question-answer assessing the knowledge of the forensic medicine in medical students. This is an innovative tool for the above purpose and hence this study was planned. We tried to evaluate the crossword puzzle tool for assessment of their knowledge and also analyzed their feedback for the crossword exercise given to them.

Materials & Method

The present study was a prospective cross-sectional analysis of feedback questionnaire. This study was

carried out in the Department of Forensic Medicine, MAMC Agroha after approval from institutional ethics committee. The crossword puzzle exercise was formulated with the terms and words from taught syllabus of Forensic Medicine was formed. This puzzle had varying degrees of difficulty which were evenly distributed; key related to each question was prepared, including facts, hints or statement related to the question. This puzzle was distributed to faculty of forensic medicine for validation. Suitable changes after validation were incorporated. A feedback questionnaire was prepared by the authors consisting of 15 questions evaluating student's perception on the given crossword puzzle, its impact on retaining and recalling the knowledge and further utilization of such puzzle in different disciplines of Under graduate curriculum. The questionnaire was also given to senior faculty of the various streams of medical undergraduate subjects for validation. The validated feedback questionnaire was used for responses. All the feedback responses were graded on Likert scale from 5 to 0 in which grade 5 was awarded to those who strongly agreed, 4 to those who agreed, 3 to those who moderately agreed, 2 to those who least agreed, 1 to those who strongly disagreed and those who did not respond were given grade 0. A total of 38 students of 5th semester participated voluntarily after briefing them about the method and purpose of this crossword puzzle and feedback questionnaire. Each question was awarded score 1 (for correct) or 0 (for incorrect), with no negative marking. All the participants were given a crossword puzzle sheet, a paper for keys, and a questionnaire. Participants were instructed not to use internet, mobile or any books. They were allotted 45 minutes to solve the puzzle. The puzzle had 9 horizontal and 8 vertical words to fill with the help of 17 key statements (Figure 1 and Figure 2). After completion of 45 minutes, a questionnaire for feedback was given to the participants and 15 minutes to read the questions carefully and to answer. The crossword entries were checked and each participant was marked out of 17. Marks scored by students and response to feedback were analyzed with suitable analytic tests.

Results

Out of total 38 students; 11 students secured 16-17 marks, 17 students obtained marks between 13-15 and 5 students obtained 10-13 marks. Of the total, 47.23% did not agree that it was a wastage of time. 81.6% students felt this method less time consuming as compare to traditional examination methods. 65.8% students also

agreed to take part in preparing cross word puzzles by their own. Other responses of the feedback are depicted in figures 1 to 3.

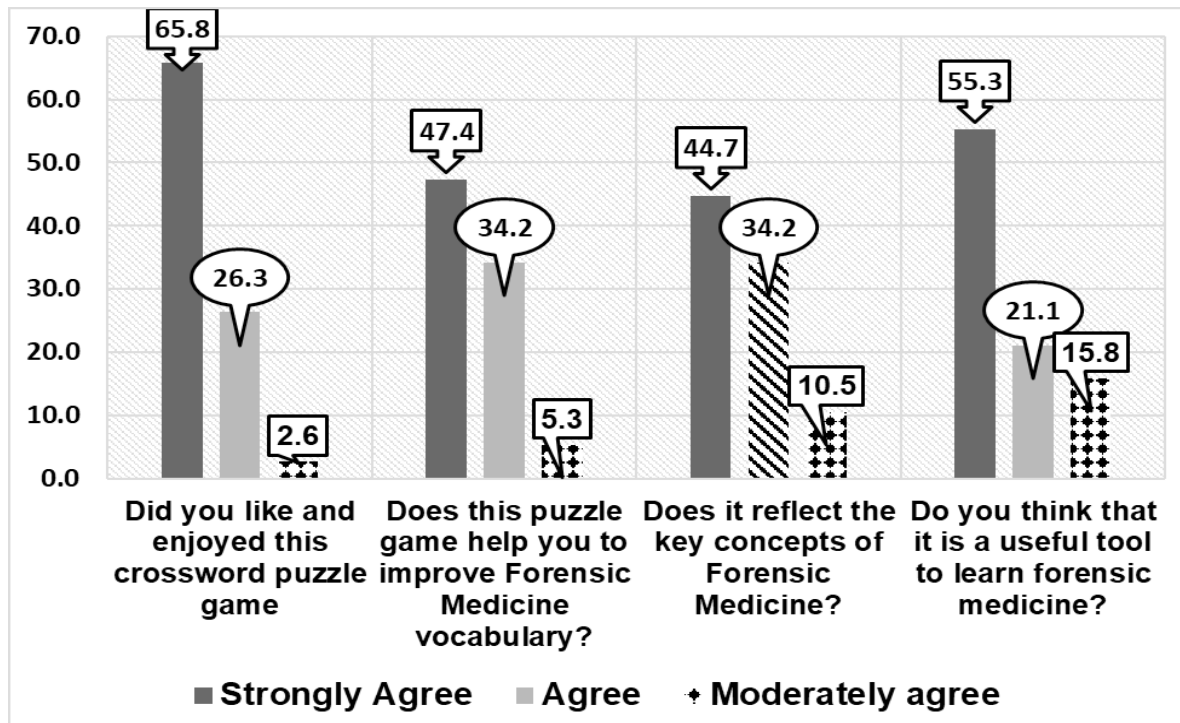


Figure 1: Students perception on cross word puzzle in Forensic Medicine

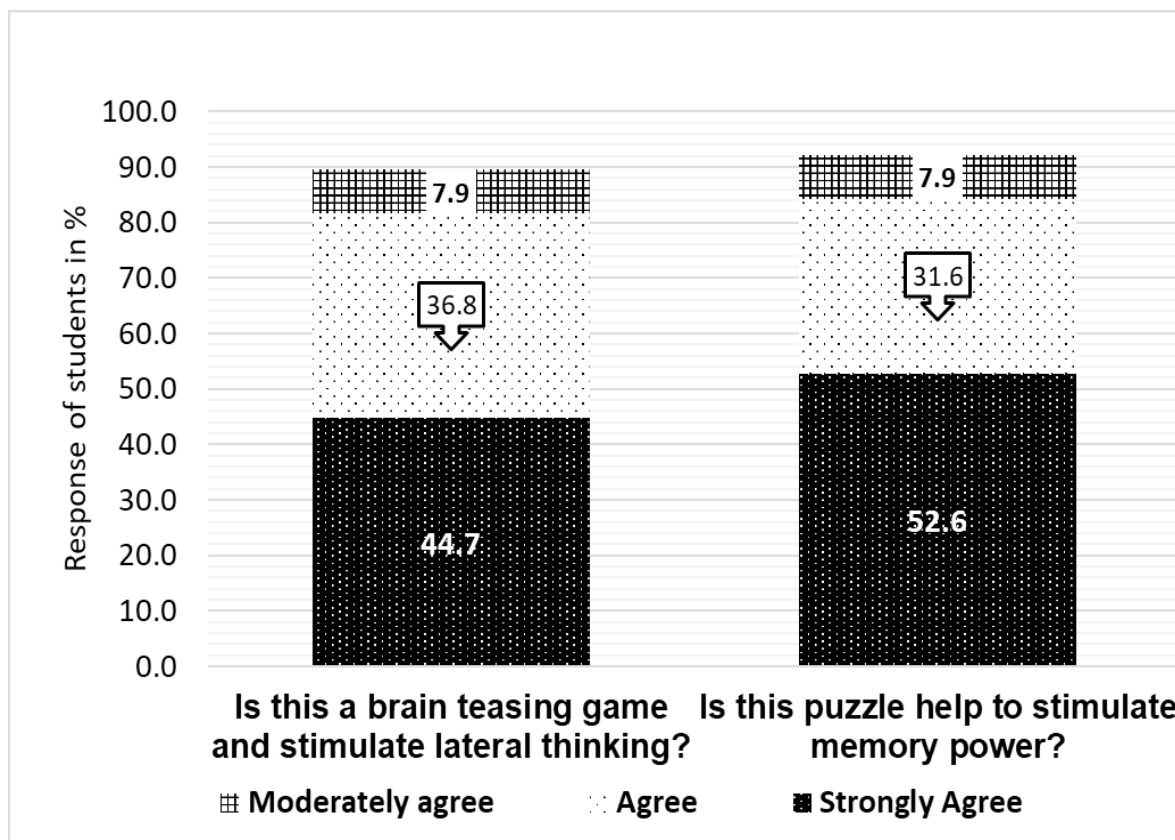


Figure 2: Students' perception on recalling the information by cross word puzzle

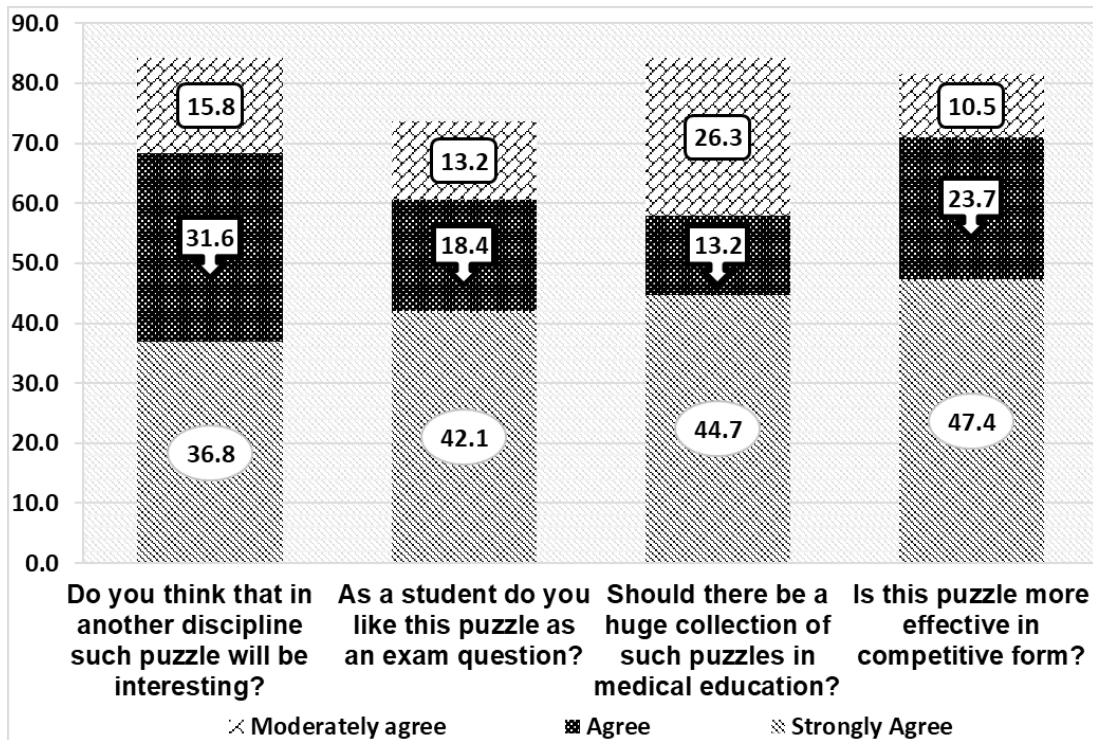


Figure 3: Students’ feedback on implementing such crossword puzzle in other disciplines

Discussion

The crossword puzzle is a very interesting word game and many people enjoy this game. Crossword puzzle as a teaching tool is very beneficial in remembering the words and terms with the help of keys. The key consists of facts, hints or statements in the form of a word, facts, terms or incidences and when a student reads the key, he recalls the answers easily. As we know that memorizing any fact needs its correlation and memorization of other related facts¹². Once he remembers the related words, he has to fit the answer in the crossword by counting the number of alphabets mentioned in the key. This is how it stimulates thinking and improves the memory. This same mechanism of recalling is useful in an examination which will automatically improve the performance in an examination too¹³.

We did this survey to study the individual performance of an undergraduate medical student without any help or without the cooperation of groups. So, it becomes easy to know the performance of a single student, because in a group usually, one or two students are active, and others are passive and so the assessment is not for all¹³.

Bailey et al used four types of games like crossword puzzles, words scramble, word search and hidden

message puzzles, in gastrointestinal physiology teaching. According to them, in the crossword puzzle, inability to identify the word indicates the weakness and that can be corrected by proper teaching.¹⁰

Htwe et al did the study on crossword as a teaching tool on the group of students and revealed that is an excellent tool for teaching pathology with fun.¹¹ Saxena et al. also did the same study on groups of students and they concluded that students liked the crossword puzzle as a teaching tool.¹²

We believe that for teaching and learning purpose this survey can be used on a group of students, but for the assessment of the students, the student must solve the crossword puzzle individually. In our study, the main aim was to study the crossword puzzle as a tool to assess the students in an examination, so we did not make the groups of students. Playing with such puzzles, psychomotor skill and knowledge both are increased.¹² We did this study for the subject of forensic medicine which is a brain teasing discipline where the student must churn the thought process for the complicated case scenario with various medico-legal aspects, like a detective. Nowadays many of the medical schools and colleges emphasize on student oriented medical education where the active involvement and participation of every

student is necessary, especially in small group teaching, for better and detailed understanding of concepts in medical science. The students are encouraged to solve the problems by themselves.^{18,19}

Crossword puzzle improves cognitive function as per clinical trial done by Wolinsky et al.²⁰ They used computerized crossword puzzle in a clinical trial on middle aged and old people to study the cognitive processing speed and concluded that crossword puzzle delays the decline in the cognitive process and improves the speed of the cognition.

Conclusions

Majority of participants liked the crossword puzzle as an examination question. It improves memory power, performance and critical thinking of students with fun. This can be tried as an examination question in periodic internal examination for internal assessment and can be used for the purpose of structured viva examination in university examination in other disciplines of medical undergraduate curriculum paving the way for creating more competent medical graduates, the need of the society at present time.

Ethical Clearance: Taken by Institutional ethical committee

Source of Funding: Self

Conflict of Interest: Nil

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A Study to Assess the Patients Compliance to Medications among Hypertension Patients at Selected Areas in Kanchipuram District Tamilnadu

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Abstract

Hypertension is the most prevalent cause for cardio vascular disease, affecting at least 600 million people worldwide and is an important contribute to cardiovascular mortality and mortality. Compliance to antihypertensive medication has been found to be a major concern³

The study was conducted to assess the patient's compliance to medications among hypertension patients at selected areas in Kanchipuram district Tamilnadu. The objectives of the study were to assess the patient's compliance to medications among hypertensive patients and to associate patient's compliance to medications with selected demographic variables.

The research design selected for the study were Descriptive research design. The sampling technique used for the study were purposive sampling with the sample size of 60. Data collection was done by identifying the demographic variables and by using Morisky Medication Adherence scale, the patient's compliance to hypertension medications was assessed.

The results revealed that assessing patients compliance to medications, the study shows that 48(80%) of hypertensive patients are following medium compliance of hypertension medication and 12(20%), of the patients are having low compliance and none of the patients 0% are following high compliance to medication. Regarding association with demographic variables, factors like sex and blood pressure are highly associated with compliance to medications and there is no significant association with the demographic variables like age, educational status, types of family, religion, socio economic status

Hence community education is needed to improve the patient's ability to cope up of medications and make informed decision regarding hypertensive medications and to motive the community people to introduce changes in diet and life style modification.

Keywords: Patients, Hypertension, Medications, Compliance

Introduction

Hypertension is the most common cardiovascular disease, emerging as a major public health problem in

developing as well as developed countries. The WHO report that the prevalence of any disease, hypertension ranks four in the world. Pooled epidemiological studies show the average prevalence of hypertension in India is 25 % in urban and 10 % in rural population. Hypertension is a significant public health problem in urban and rural areas of India. It is directly responsible for 57 % of all stroke deaths and 42% of coronary heart disease deaths in India. It is also leading cause of blindness, renal failure and congestive heart failure³

Successful control of blood pressure is of para amount importance in the reduction of morbidity and

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mortality rates and many studies have demonstrated the impact of antihypertensive agents on improving clinical outcomes. However, the achieved by optimal compliance to prescribed medications according to healthcare provider's instructions⁴

In developing countries, the degree of non-compliance is assumed to be higher particularly due to shortage of health resource and difficulties in access to health care professional is necessary. patient's education is a process that improves patient's ability to cope up and make informed decision regarding their disease medication and motivate the patients to introduce changes in diet and lifestyle modifications.⁶

Materials & Method

The methodology of research indicates the general patterns of organizing the procedure for getting valid and reliable data for investigation. Research approach for the present study was a descriptive research approach. The descriptive research design seems to be the most appropriate design for this study. The study was conducted in the selected area in Pooncheri villages, Kanchipuram district, Tamilnadu. All the hypertensive patient residing in the selected villages and who fulfilled the sampling criteria was included in the study.

Sampling Criteria

Inclusion Criteria

- Patients who are diagnosed as Hypertension
- Hypertensive patients who are under single hypertensive drug

Exclusion Criteria

- Hypertensive patients who are having other chronic diseases.
- Hypertensive patients who cannot speak and understand Tamil/English

By using purposive sampling technique 60 samples were selected. The tool used for the study consists of the demographic variables like age, sex, educational status, types of family, religion and socio economic status and blood pressure. To assess the Compliance to medications, Morisky Medication Adherence scale was used.

Study Findings:- Regarding demographic variables

- Maximum no of hypertensive patients were in the age group of 51 years and above 41 (68%)
- Maximum female 32 (53%) are hypertensive patients
- Majority of educational status was Non formal education 24 (40%)
- Majority of family of hypertensive patients are single family 40 (66.66%)
- Majority of religion of hypertensive patients are Hindu 41 (68.33%)
- Majority of taking hypertensive medications regularly 42 (70%)

- Majority of person from which a they are getting medication for hypertension are 38 (63.33%)

- Majority of blood pressure are 46 (76.66%)

- Regarding assessing patients compliance to medications, the study shows that 48(80%) of hypertensive patients are following medium compliance of hypertension medication and 12(20%), of the patients are having low compliance and none of the patients 0% are following high compliance to medication. Regarding association with demographic variables, factors like sex and blood pressure are highly associated with compliance to medications and there is no significant association with the demographic variables like age, educational status, types of family, religion, socio economic status.

Discussion

Hypertension is the most prevalent cause for cardio vascular disease, affecting at least 600 million people worldwide and is an important contribute to cardiovascular mortality and mortality. Compliance to antihypertensive medication has been found to be a major concern.

The mean proportion of control hypertension among all hypertension patients being only 13% because of poor medication compliance and is one of the leading causes of failure to achieve blood pressure control.

Conclusion

The study reveals that health care facilities should concentrate on continuous treatment for non communicable diseases, health education to the public

on regular medications can able to prevent complications from cardiovascular diseases and other complications.``

Efforts to be made enhance the capabilities of doctors, village health nurses and other paramedical through pre-services and in-service training programme to enhance not only prescribing medications and follow up of medications is essential.

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Restrictions Imposed by Human Biology in Achievement of Gender Justice as Human Rights

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Abstract

In contemporary times with frequency as high as that of everyday, we are witnessing debates on implementation of gender justice. Be it college forums, news channels or for that matter parliament everywhere and everyone at both conscious and sub-conscious levels are aware of the problems resulting because of imbalance in power equations between the genders. The focus area of this research paper will be India and legislation of India which has made many laws, bye-laws and rules to bring feminine and masculine gender on the same footing but yet there are gaps through which gender justice is getting hit hard despite the Criminal Amendment Act of 2013 and 2018. Complication by the NALSA judgment have occurred as a result of which the definition of gender justice needs over-hauling but the Indian society is unwilling for it. Through this research paper, researchers trace out the problem is actually lying in the very meaning of sex, sexuality and gender as understood by the society of India and the solution is lying in being neutral towards sex and gender.

Keywords: - Sex, Gender, Sexuality, Gender Justice

Introduction

From the history of human to present, there are ample evidences which are leaving no doubt on the fact that there is some sort of interconnection between working of the human society irrespective of the fact that in which ethnicity and time zone that society is working in. There are certain rules of a society of course unwritten in majority of the human civilizations which are based on the sex of a person. For example, as to how the property is to be distributed, which jobs particular sex and gender can do or cannot do, even the “public places” like parks, circus, theaters, malls etc.. are being restricted by sex and gender of a person.

Nomenclature of Sex And Gender

This research paper is focusing on the how the

concept of gender justice has been developed over a period of time. Before that there are certain concepts which shall be understood before focusing on the research problem of this research paper. And they are:-

a) Sex

As known commonly, it is a natural phenomenon which distinguishes between body of man and woman. It is also known as sexual activity which results in progeny. Medilexicon¹⁰ defines Sex as a character biological in nature based on their gonads, chromosomes, hormones, primary and secondary characteristics and identifies human bodies as male and female. Sex is also a psychological progression of a person which triggers the behaviour automatically for the purpose of sexual contentment. Wharton¹¹ in her work defines sex as a characteristic which is biological relying on hormones, chromosomes, gonads etc..and if clearly distinguished then are termed as normal sex being male and female and if parameters are in divergence, the human body is labeled as Intersex.

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b) Gender

Gender is a role which males and females are expected to play in society for ensuring its smooth functioning. Tierney¹² defines Gender as social and civilizing expression which dictates the manner in which defined biological body is suppose to function.

Role of Sex and Gender

As the Indian society began to take shape, individualism vanished and a pattern developed wherein food production became the responsibility of the males, considering their physical potency while distribution went to females because of their biological capacity of giving birth, making womb, a resource to cash as the principle was to survive. These clashes for survival, highlighted the need of human biology where male sex attained preferences in working of the societies and accordingly roles named as gender were formulated for the sake of convenience. It was this convenience, roles in the form of gender began to define and since it meant survival, male and female began to enforce them on the younger generations and inculcated divine , morality and law to aid the compliance of these roles and penalized all acts of deviance.

As a matter of fact, in India the presence of third sex is known by its gender role which is to provide amusement and is labeled as Kinnars, Eunuchs, Hijras, Khwaja-sarah nd recently as Intersex, transgenders etc. They were in haraams of the kings and queens, in circus etc..but were in no way daughter-in-laws or sons-in-law of a “normal” family.

Effect of Gender on Sexuality

Sexual behaviour which aided in continuance was accepted as normal known as Heterosexual activity with a rider of reproduction classifying it to be moral sexuality. This termed penile-vaginal intercourse as normal and moral while rest any other sexual activity as immoral even between a heterosexual couple because that was not resulting in progeny.

Because of this moral weightage, sexuality began to give in and same sex relation modernly known as homosexuality were frowned upon and became sin. To ensure that homosexuality and all other non-productive heterosexual activities are discouraged, legal structure was roped in and sanctions as hard as burning alive, amputation , hanging , jail sentences and not to forget

fine and social detestation, were introduced to make sure that gender is abided within the four squares as laid down.

However, this control of gender on sexuality backfired and visible victims of this control were females who were then laiden with the expectation to remain chaste till their official union with a ‘man’ in form of marriage and procreate as many times possible. It denied them the access to medical sector without getting their gender role scrutinized first at the help-desk and then at doctor’s chamber. The other casualty were biological males who were sexually attracted towards males. Known as homosexuality, this behaviour was morally and legally penalized.

Last casualty of gender roles are Third sex/ Intersex, whose sexuality itself has no where been defined. The denial is so strong that no proper scientific research have been conducted to understand the sexuality of Intersex. Even the medical fraternity which is of course the members of normal society have concluded their many research attempts by stating that they are abnormal and in need of medical aid in terms of psychological corrections, hormonal and surgery procedures. The ambiguous genitalia is a medical emergency and sex reassignment is prescribed after consulting with parents of the child with the personal opinion of the doctor. Here most of the times the child is too young to understand the complexities of the procedure yet, a “normal” biological sex is assigned to the child with enforcement of parallel gender role. But what is forgotten that what is allotted will be in arms with what is felt internally. The end result is of a contradiction and conflict of soul and when the child defies the allotment the labels, who is then a transgender¹³.

Presence of Third Sex and Gender

It will not be incorrect to say that presence of third sex and gender openly have been felt in the society from last 40-50 years only before that they were open secret of human society which were denied any sort of identity / labeling by the normal society to maintain its self-proclaimed integrity. They have been awarded names from kinnars to hijras , Khawaja-sarachs to kathoeyes , sissys to muxes and have faced discrimination along with both physical and sexual violence.

It is only recently that the third sex and gender have been identified as Human and their rights have been advocated through various international conventions.

For instance, united nation resolution on human rights, sexual orientation and gender identity 2012¹⁴, wherein it was sketched that it is the State which is to protect the individuals irrespective of their LGBTQI sexual orientation and any violation will be treated as violation of Universal Declaration of Human Rights. Then there is international policy of United nations on Men having sex with Men 2006¹⁵, where in states are directed to take all the measures on the fact that homosexual men are not discriminated on basis of their sexuality and proper medical treatment is provided to them as needed. It has been further said that there shall be awareness programmes in local neighbourhood to make society aware that homosexuals shall not be discriminated just because of their sexuality. There is declaration of commitment on HIV/AIDS¹⁶ wherein it was for first time in the recorded history of international legal documents, stated that the transgender person are in need of State protection and medical aid as they are the ones who are being discriminated solely on the basis of their sexuality.

India also know acknowledges, the presence of the third sex and gender via NALSA¹⁷ judgment wherein an umbrella term “Transgender” was chosen to identify distinct sexuality of LGBTQIA. It was in NAZ judgment¹⁸ wherein Section 377 of IPC,1860 was declared as unconstitutional by Delhi High Court, but only till the consensual part. This was overturned in Suresh Kumar¹⁹ wherein the court opined, that it is the legislative decision and courts shall not interfere as they only interpret law. In 2018 came Navtej Singh Johar²⁰ wherein again Section 377 of IPC,1860 was declared unconstitutional till the consensual part giving a choice to make to members of LGBTQIA community.

The reason of such fluctuations in dictates of judiciary pertaining to the issues of LGBTQIA community is the fact that there are moral dilemmas of the society and judges are part of the society, so it is very normal that such dilemmas step in law making process. This conflict between legality and morality was first time recorded in Hart-Devlin debate wherein Wolfeden Committee in England clearly stated that legal dicta has nothing to do with same sex behaviour and hence the Buggery Act got evaporated from the legal text of Britain. This small statement caused uproar in British Society because it was disturbing the way a society works. This lead to debate²¹ between two wise heads namely HLA Hart and Lord Devlin where later opined that segregation of morality from legality will lead to confusion in for a person as there will be no internal, moral force which will make

him/ her to oblige with law. HLA Hart, who rejected the arguments made by the former and stated that Devlin is going by the principle of majority rules but the minority no matter how small cannot be overlooked and cannot be imposed on everyone.

In India, it was in 2018 only when the consensual homosexuality was acknowledged. Ideally, it is a great step taken by the judiciary in bestowing Article 21 and 19 on LGBTQIA community and gave them liberty of life and choice but the confusion on sex and sexuality can be seen in the dictum of apex court as well. The celebrated NALSA judgment which recognizes all non-heterosexual activities under the term of transgender and identifies kinnars, hijras etc.. as third gender, while in the interviews conducted by the researcher proves the fact that the judgment has failed them. They opine that their attempt was to identify themselves as women but labeling them as transgender have defeated their struggles. They are still outside the purview of society and hence justice is still a distant dream for them.

Gender Justice

Oxfam²² defines gender justice as a human right for women in order to grant life full of liberty, dignity and freedom to make choice. While generally, gender justice is taken as something which aims to bring equality between man and woman. Point to note here is that the concept of gender justice in itself is talking about two known biological sexes and genders only. It is correct that gender justice is talking about equality, justice, liberty etc.. all fantasized concepts to restore dignity of human life but they are all incomplete attempts as not all lives are taken into consideration. This results in biasness where the base of discrimination is lying in human genitals as a result of which implementation of gender justice around the world has failed miserably and no concrete results are yet been achieved even in India. For instance, legislation in an attempt to do gender justice formulated Article 14, 15 and 16 of constitution to open up work, education opportunities and public place for Indian women but the glaring question is are they still open?. In a recent survey²³, it was conveyed that more number of educated women are dragging themselves out of work force, to be home-makers as there is no one to look after young ones. So, what sort of gender justice are we as a society advocating?. Answer to this situation is lying in gender neutrality, which is relatively new concept but rather simple to understand and it means applying all the principles of justice and

equality without giving any preference to sex and gender of person.

Cambridge²⁴ dictionary defines gender neutrality as something which has nothing to do with men and women in particular. The definition in itself is confusing and hilarious, as it does not explain what it actually means. European Institute of Gender Equality²⁵ defines it as, policies which are not in particular effecting men or women. However it does not stop here and says further that these policies effect male and female sex uniformly. This definition on international forum clearly demonstrates the importance of normal sexes in the society and the confusion or rather unwillingness to give acceptance to third sex and gender as a human body.

Even the concept of justice, in form of gender justice is under challenge. However before that we need to have a basic understanding of what is gender justice? United Nations defines it as a concept wherein an end is brought to the inequality among biological males and females be it in home, office or societal norms itself.

Here the problem is that years of usage feminine gender is allotted the role of victim and it is the male biology who is a offender. In India, the legal acceptance of homosexuality and all other non-heterosexuality has highlighted the fact that even the biological male can be victim of gender discrimination and the biological female a hardened offender. Now this very notion has jolted the concept of gender, which is finding difficult to accept that masculinity can be a victim and femininity an offender. "Normal/ mainstream" Society is still finding it difficult to accept that in heterosexuality which is still the normal and moral conduct for the society, a man can be victim and a women an offender, as it questions the very role the society had created for them.

Elevation to Gender Neutrality

The question which arises before us is now that what can be done to solve the confusion which the pre-conceived notions of sex, gender, gender justice have on the society. And the answer to this problem is lying in extension of gender justice and moving towards the understanding and accepting of "Gender Neutrality" which means being neutral to one's gender without giving any preference to biological and sociological sex.

This concept is focusing on bringing formal equality wherein the concept will be applied as whole and focus will be on human body and its rights rather than on his

or her rights where substantive equality executes itself. This execution of substantive equality is so unaware of the concept of intersex and LGBTQIA that there are no roles defined for them in the society. Let alone be the roles, no name are also allotted for intersex and transgenders unlike the designations of Mr., Mrs., Miss, His or Her, He or She for 'normal' male and female sexes. The names if any available to intersex and transgenders are like abnormal, kinaar, hijras, she-male, he-female and all sorts of slangs and derogatory words which are being used to taunt rather than name them.

Conclusion

To brief up this piece, it seems that this newly found species / variation of human body in India has shook up the strings of society on the basis of which its execution has been drafted. Until now the very concept of human rights to accomplish itself was literally looking below the belt of a human body and if it was able to trace the distinguish genitalia of a male and a female only then that body classified itself to be a human and having any human rights. Even the black and white text of Indian laws including the constitution of India which sculpts the principle of equality from Article 14 to 16 but give it a shape of male and female only. The very concept of human also known as person in law in itself needs a change. Both law and society has to understand the genitalia, testosterone, estrogen and heterosexuality are not the only criteria to identify someone as humanoids. There are feelings of love and respect in the heart, value of life honour and dignity and that certainly cannot be based on sex and sexuality of a person.

Conflict of Interest:-NIL

Source of funding:-Self

Ethical Clearance :- In this self funded research paper, researchers have care of ethics required in research and have duly credited the respective authors at appropriate places and since it is a self funded work, no permission from any committee was required.

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Knowledge & Perception of Medical Students Towards The LGBT (Lesbian, Gay, Bisexual & Transgender) Patients & Their Rights: A Cross Sectional Study

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Abstract

Diversity is a part of our everyday lives. Having good attitudes towards LGBT (lesbian, gay, bisexual & transgender) individuals is one of the ways of accepting and respecting human diversity. In this way, the quality of offered services will be same for all the people. Attitudes of medical professionals towards homosexuals can influence their willingness to provide these individuals with medical help. The study evaluates the medical students' knowledge about homosexuality and their attitudes towards it. The sample consisted of 200 participants (104 from second year & 96 from first year) who anonymously completed the preformed questionnaire. The study showed that the second year students have more knowledge than the first year students. Degree of knowledge had significant predictive effect on attitudes in the analyzed predictive model & is important tool in shaping the attitudes towards LGBT patients and reducing stigmatization.

Keywords: Lesbians, Gays, Bisexuals, Transgenders, attitude.

Introduction

A person's sexual orientation affects the attitudes of others toward him or her. In today's world, heterosexuality is the norm and most minority groups like LGBT people are subjected to stereotypes. Their population ranges from 4 to 17%¹. Homosexuality is thought to be "against the nature" by most of the religions in the world & has been a debatable issue since the ancient time. Perceptions toward LGBT people are various according to types of societies, cultural and moral development or political situation. According to Harry (1989)², homosexuality is not rare or unusual for people who have that kind of sexual orientation, but they often face the prejudice from multiple sources such as at home, school and work. Weinberg (1972)³

gives the first definition of homophobia that indicated it as irrational negative attitude towards people with homosexual orientation. Studies use different terms to indicate hostility, antipathy or discriminatory behaviour directed towards LGBT people. Homonegativity includes negative attitudes, values and beliefs of the heterosexual majority towards same-sex couples, along with the negative reactions towards them⁴. These negative feelings have been investigated more deeply & distinguished into variety of terms such as biphobia, transphobia etc⁵ each one depicting differences and the special problems that follow. Perception and knowledge towards LGBT patients in health care is an important but infrequently assessed issue in India. So an effort is made with our study to know the same in medical students at a medical college.

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Aim: To know the knowledge & perception of medical students towards the LGBT patients.

Objectives: To assess:

1. Awareness of medical students regarding LGBT people & discrimination faced by them.

2. Acceptance Level of medical students regarding LGBT people & ways to address the problem of discrimination.

3. Awareness of medical students regarding recent Supreme Court judgment regarding S. 377 IPC & its social impact.

4. Attitudes of medical students towards LGBT people.

Materials & Method

Participants: The study includes 200 randomly selected medical undergraduate students with gender distribution of 61.5% (N=123) females and 38.5% (N=77) males. 96 (48%) of the participants were from first year and 104 (52%) were from second year. The participants' ages ranged from 19 to 23 years. Majority of the participants (89.5%) were from urban setup.

Design and settings: Between April & June 2018, 200 medical undergraduates attending their first & second year were asked to participate in the survey to assess their knowledge, attitudes & perception pertaining to LGBT people & their healthcare.

Ethical issues: Permission from Institutional ethical committee was taken. All participants received verbal and written information on the study. Their participation was anonymous and voluntary, and their responses were confidential.

Data collection: We collected data from the students by using preformed anonymous questionnaire having six sections. It was designed by the authors to obtain information that was supposed to have effects on the scores of Knowledge, Attitudes and Perception towards LGBT patients in clinical practice. The survey took place in a large classroom with enough space per student to allow for privacy and it took approximately 30 minutes to complete in presence of authors.

Results

Table 1: Demographics of the Respondent:

Demographic parameter	First year	Second year	Total
Gender			
Male	42	35	77 (38.5%)
Female	54	69	123 (61.5%)
Age			
19	21	4	25 (12.5%)
20	51	16	67 (33.5%)
21	12	40	52 (26%)
22	12	29	41 (20.5%)
23	0	15	15 (7.5%)
Domicile			
Rural	6	15	21 (10.5%)
Urban	90	89	179 (89.5%)

The study includes 200 randomly selected medical undergraduate students with the gender distribution of 61.5% (N=123) females and 38.5% (N=77) males. 96 (48%) of the participants were from first year and 104 (52%) were from second year. The participants' ages

ranged from 19 to 23 years with majority (33.5%) are of 20 years of age. Majority of the participants (89.5%) were from urban setup.

Table 2: Awareness:

Awareness parameter	First year		Second year		Total (200)
	Yes	No	Yes	No	
Are you aware of the acronym LGBT & LGBT movement?	96	0	104	0	100%
Knowledge & understanding regarding following terms:					
Lesbian	96	0	104	0	100%
Gay	96	0	104	0	100%
Bisexual	96	0	104	0	100%
Transgender	70 (35%)	26 (13%)	104 (52%)	0 (0%)	100%
Queer	40 (20%)	56 (28%)	90 (45%)	14 (7%)	100%
Homosexual	96	0	104	0	100%
Heterosexual	96	0	104	0	100%
Homophobia	75 (37.5%)	21 (10.5%)	95 (47.5%)	9 (4.5%)	100%
Are LGBT people more likely to be infected with or carry sexually transmitted diseases (STDs)?	52 (26%)	44 (22%)	90 (45%)	14 (7%)	100%
Are LGBT people more likely to be involved in substance abuse?	50 (25%)	46 (23%)	76 (38%)	28 (14%)	100%
Are you aware of the Section 377 IPC & recent judgment regarding it by the Supreme Court of India?	36 (18%)	60 (30%)	102 (51%)	02 (1%)	100%
What is the principle source of information on LGBT?	Peers, Internet, Electronic media		Lectures, Peers, Internet, Electronic media, Print media.		

All the participants were aware of the acronym LGBT & regarding LGBT movement. All students were having knowledge & understanding regarding terms: lesbian, gay, bisexual, homosexual & heterosexual. 13% students (all from first year) were unaware of the term transgender. 42% students mostly from first year were unaware of the term queer. 30% students mostly from first year were unaware of the term homophobia. 71% students say that LGBT people are more likely to be infected with or carry STDs like AIDS, Gonorrhoea, Syphilis etc.

63% students say that LGBT people are more likely to be involved in substance abuse like alcohol, tobacco, cocaine, solvent abuse etc. 69% students mostly of second year were aware of the Section 377 IPC & recent judgment regarding it by the Supreme Court of India. Among the different sources of information regarding LGBT, lectures were principle source for second year students whereas peers were principle source for first year students. Internet, electronic media & print media are the other important sources of information.

Table 3: Acceptance Level: Will you accept or not accept the following situations?

Situations	Acceptable	Neutral	Unacceptable	Don't know/ no comment
Your family member is from LGBT group	108 (54%)	41 (20.5%)	38 (19%)	13 (6.5%)
Your friend is from LGBT group	138 (69%)	37 (18.5%)	22 (11%)	3 (1.5%)
Your neighbour at hostel is from LGBT group	157 (78.5%)	33 (16.5%)	5 (2.5%)	5 (2.5%)
Your teacher is from LGBT group	161 (80.5%)	25 (12.5%)	9 (4.5%)	5 (2.5%)
A LGBT person holds a senior position/ position of authority in the organization you work for.	151 (75.5%)	30 (15%)	10 (5%)	9 (4.5%)
You encounter LGBT patient during clinics	185 (92.5%)	9 (4.5%)	4 (2%)	2 (1%)
Your routine patient turns out to be from LGBT	168 (84%)	24 (12%)	2 (1%)	6 (3%)
Same sex marriages	117 (58.5%)	42 (21%)	34 (17%)	7 (3.5%)

While evaluating acceptance level, most of the students were acceptable to the LGBT person as a friend (69%), neighbor (78.5%), teacher (80.5%), senior/ authoritarian (75.5%) & patient (92.5%). But the acceptance level drops (54%) when this LGBT person is a family member & also same sex marriages are unacceptable to 41.5% students.

Table 4: Discrimination Faced: Following are some possible situations faced by LGBT people:

Situations	Serious	Average	No problem at all	Don't know/ no comment
A doctor discriminates LGBT patients & they receive lower quality care	183 (91.5%)	7 (3.5%)	2 (1%)	8 (4%)
An institute refuses to employ a doctor qualified for the job due to his/her sexual orientation	176 (88%)	19 (9.5%)	1 (0.5%)	4 (2%)
A medical club/ association/ organization refuses to accept him/ her as its member	158 (79%)	32 (16%)	6 (3%)	4 (2%)
A warden/ landlord refuses accommodation	124 (62%)	66 (33%)	0 (0%)	10 (5%)
A student is discriminated against at school/ college	179 (89.5%)	21 (10.5%)	0 (0%)	0 (0%)
Verbal/ physical/ cyber bullying of LGBT person at school/ college	177 (88.5%)	19 (9.5%)	0 (0%)	4 (2%)
Comparatively they have higher chances of developing anxiety & depression	149 (74.5%)	33 (16.5%)	9 (4.5%)	9 (4.5%)

Most of the participants find discrimination faced by LGBT people as serious issue in various situations like at medical practice (91.5%), employment (88%), clubs/ associations (79%), accommodation (62%), school/ college (89.5%), bullying (88.5%) & resulting anxiety & depression (74.5%).

Table 5: Ways to address the problem of discrimination faced by LGBT people:

Ways	Agree	Neutral	Disagree	Don't know/ no comment
Society should ensure equal opportunities	192 (96%)	6 (3%)	0 (0%)	2 (1%)
Public education	187 (93.5%)	10 (5%)	1 (0.5%)	2 (1%)
Teaching scientific facts about LGBT as a part of sexuality education in schools	182 (91%)	16 (8%)	2 (1%)	0 (0%)
The government should introduce separate legislation to outlaw discrimination on the ground of sexual orientation (admission/ employment/ promotion/ public facilities etc)	132 (66%)	35 (17.5%)	33 (16.5%)	0 (0%)
There should be separate reservation for LGBT people in education & jobs	14 (7%)	37 (18.5%)	144 (72%)	5 (2.5%)

Most of the students are in agreement that equal opportunities (96%), public education (93.5%) & teaching scientific facts about LGBT as a part of sexuality education in schools (91%) are effective ways to address the problem of discrimination. 66% think that there should be separate legislation to outlaw discrimination on the ground of sexual orientation. But maximum students (72%) are against separate reservation for LGBT people in education & jobs.

Table 6: Attitudes towards LGBT people:

Attitudes	Agree	Neutral	Disagree	Don't know/ no comment
Work ability is not directly related to sexual orientation	183 (91.5%)	7 (3.5%)	6 (3%)	4 (2%)
Promiscuity is not directly related to sexual orientation	115 (57.5%)	30 (15%)	19 (9.5%)	36 (18%)
LGBT are psychologically normal people	148 (74%)	28 (14%)	14 (7%)	10 (5%)
Sexual intercourse between them is against order of nature	53 (26.5%)	46 (23%)	82 (41%)	19 (9.5%)
Violence/ discrimination based on sexual orientation	17 (8.5%)	24 (12%)	147 (73.5%)	12 (6%)
Homophobia contributes to discrimination/ violence	98 (49%)	26 (13%)	35 (17.5%)	41 (20.5%)

91.5% participants think that LGBT people are equally competent at work. 74% think that LGBT people are having normal psychology. 57.5% students think that there is no relationship between sexual orientation & sexual promiscuity. 41% students think that sexual intercourse between two LGBT people is with the order of nature. Most of the students (73.5%) are against the violence or discrimination based on sexual orientation. Nearly half of the participants (49%) think that homophobia contributes to discrimination & violence.

Discussion

Supreme Court of India verdict (2018)⁶: Consensual adult gay sex is not a crime and article 14 (right to equality) & 21 (right to life & personal liberty) of Indian Constitution contradict the present view of Section 377. There is lack of Indian literature⁷ that has systematically investigated issues related to LGBT people & patients in medical practice and this is an effort to study the knowledge and attitude of medical students

towards the same in an Indian set up. Knowledge about homosexuality emerged as the strongest predictor of a positive attitude towards them. The Association of American Medical Colleges has recommended that “medical school curricula ensure that students master the knowledge, skills and attitudes necessary to provide excellent, comprehensive care for LGBT patients” by including “comprehensive content addressing the specific healthcare needs of LGBT patients” and “training in communication skills with patients and colleagues regarding issues of sexual orientation and gender identity.”⁸

First year students (10% - 28%) were unaware of the terms like transgender, queer & homophobia. 30% students (first year) were unaware of the Section 377 IPC & recent judgment regarding it by the Supreme Court of India. That’s the reason why 24% to 46% of the participants remained neutral when asked regarding social impact of recent Supreme Court judgment regarding Section 377 IPC. From the pattern of responses, our study proves beyond doubt that degree of knowledge had significant predictive effect on attitudes in the analyzed predictive model & is important tool in shaping the attitudes towards LGBT patients and reducing stigmatization.

Conclusion

Through this study the researcher found the following findings:

- The study showed that the second year students have more knowledge than the first year students. Degree of knowledge had significant predictive effect on attitudes.

- Academic lectures play vital role in understanding the different related terminologies, problems (medical, psychological & social) faced by LGBT people & different ways to address such problems.

- Most of the students were acceptable to LGBT person as a friend, neighbor, and teacher, senior / authoritarian & patient. But this acceptance level drops (54%) when this LGBT person is a family member.

- Most of the participants find discrimination faced by LGBT people as serious issue & 66% think that there should be separate legislation to outlaw discrimination on the ground of sexual orientation.

- Most of the participants think that LGBT people

are psychologically normal & their work ability is not directly related to their sexual orientation.

- Most of the participants also support the LGBT rights movement.

Recommendations:

- Public education
- Teaching scientific facts about LGBT as a part of sexuality education in schools.

- The government should introduce separate legislation to outlaw discrimination & Violence.

- Counsellors & counselling centres in medical colleges & schools.

- Accessibility to appropriate and accurate information regarding sexual orientation at early stages through library and Internet resources as well as workshops and forums.

- To change societal attitude media has to play a responsible role by reporting on LGBT issues and promoting a culture of tolerance and freedom for minorities.

- Legal funds need to be created that can take on Public Interest Litigation on LGBT issues.

- Training needs to be conducted for health professionals to increase their understanding of LGBT identity as potential risk factor for self-harm, suicidal behavior and depression.

- Respective authorities should ensure that health, mental health and social care services are provided in a way that is accessible and appropriate to LGBT people.

- National & state government should develop initiatives to support employers in making workplace and workplace culture more supportive and inclusive of LGBT people.

- Police force needs to be sensitized on LGBT issues and general principles of fundamental human rights.

- Stigmatizing or pathologizing language regarding LGBT persons should be avoided.

- Local authorities, policy makers, schools and families need more education on gender identity equally,

applying policies and programs in friendly manner

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Causes and Factors in Road Traffic Accidents at a Tertiary Care Center of Western Uttar Pradesh

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Abstract

Road Traffic Accidents are one of the leading causes of morbidity and mortality in the world. The etiological factors may be classified into human and environmental out of which human factors are much more responsible for number of accidents. This study was carried out on Road Traffic Accidents cases reported to casualty department of Muzaffarnagar Medical College, Muzaffarnagar (U.P) from 1st July 2016 to 30th June 2017. The main objectives of the study were to know the causes and factors responsible for the accidents. Data were collected and analyzed. A Total of 416 cases were included in the study. Human error is responsible for accidents in 78% of cases in which drivers were at fault in 57.0% of cases followed by the pedestrians and passengers of vehicles who were responsible for 18% and 3.0% cases respectively. Faults in vehicles and poor weather accounted for accidents 8.0% & 7.8% of total cases respectively. Bad roads were responsible for accidents in 4.0% of total cases. None of the driver or passengers of the vehicles was wearing helmets or seat belts which are a very alarming trend. The important human factors responsible for accidents were over speeding, rash driving, violation of traffic rules, carelessness, wrong crossing, playing on roads, alcohol intake, fatigue or sleepiness.

Keywords: - Road traffic accidents, Causes, Risk factors, Human error, Drivers.

Introduction

Road Traffic Accidents are one of the leading causes of morbidity and mortality in the World. WHO data show that in 2016 nearly 1.35 million people died worldwide as a result of Road Traffic Injuries. However, the rate of death relative to the size of the world's population has remained constant.¹ In 2002, Road Traffic Injuries were the ninth leading cause of disability-adjusted life years (DALYs) lost, accounting for over 38 million (DALYs) lost, or 2.6% of the global burden of disease. Low and middle income countries account for 91.8% of the DALYs lost to road traffic injuries worldwide. According to WHO data for 2002, Road Traffic Injuries accounted for 2.1% of all global deaths and ranked as

the 11th leading cause of death. These road traffic deaths accounted for 23% of all injury deaths worldwide. Road traffic injuries constitute a major public health and development crisis and are predicted to increase if road safety is not addressed adequately.² A total of 4,64,674 road accident cases were reported during 2015. Road accident cases in the country have increased by 3.1% (4,64,674 in 2015 from 4,50,898 in 2014) during 2015 compared to 2014. The fatalities in road accidents have increased by 5.1% (from 1,41,526 in 2014 to 1,48,707 in 2015) during 2015 over 2014. It is observed that rate of deaths per thousand vehicles has decreased marginally from 1.0 in 2011 to 0.8 in 2015, although the number of vehicles in the country have increased by 28.6% (from 1,41,866 in 2011 to 1,82,445 in 2013) and the quantum of road accidents has increased by 5.6% during same period.⁴ 64,674 road accidents caused 1,48,707 deaths and injuries to 4,82,389 person during 2015. Generally road accidents have caused more injuries than deaths but in Punjab and Uttar Pradesh road accidents caused more death compared to persons injured.³ Accidents constitute a complex phenomenon of multiple causation.

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The etiological factors may be classified into two broad categories human and environmental.⁴ The present study was conducted to explore the various causes and factors responsible for RTAs for better prevention and management of Road traffic accidents.

Material & Method

The present study was conducted in the department of Forensic Medicine at Muzaffarnagar Medical College, Muzaffarnagar a tertiary care teaching hospital from 1/7/2016 to 30/6/2017. During this period a total of 416 cases of Road traffic accidents were reported to casualty department. This study was a prospective study. The relevant data was collected from casualty medical officer, treating doctor, police, relative accompanying the patients and from case files. In few cases adequate information was not obtained and such cases were put under unknown group. A detailed Performa was prepared for filling the observations on the present study. The information thus collected was statistically analyzed.

Observation and Result

During our study period 416 cases were admitted to the hospital with diagnosis of Road Traffic Accidents. The causes of accidents were analyzed in detail. In our study human error was responsible for accidents in 78% cases out of these drivers were at fault in 57% cases followed by pedestrians and passengers responsible for accidents 18% and 3% cases respectively. Present study showed that vehicle and weather were responsible in 8% and 7.8% cases respectively. Poor and defective roads lead to 4% of fatal accidents and in 2.2% cases the cause was unknown. (Table-1) In this study the common fault of drivers responsible for fatal accidents were due to over speeding (49.8%), rash driving (30.8%),

loss of control (6.8%), violation of traffic rules (5.5%), alcohol intoxication (4.2%), fatigue or sleepiness (2.9%). (Table-2) In present study out of 75 pedestrians responsible for accidents, 58.8% were careless in crossing roads, 20% were crossing from wrong side, and 16% of children were playing on roads and 5.2% were vulnerable due to old age and diseases. (Table-3) Out of 12 passengers responsible for fatal accidents, 50% were catching or getting down of running buses, 33.4% were travelling on foot board of buses, 8.3% were catching the buses from wrong side of the road and 8.3% of passengers were projecting outside the body of the vehicle when they fell out. (Table-4) In this study out of total 34 cases of accidents attributed to faults of vehicles, 29.8% of vehicles were overloaded or overcrowded, 26.7% of passengers ejected out of open jeeps during collision. These open jeeps are used to ferry passengers illegally. Wrongly parked vehicle on roads leading to accidents at night accounts for 17.8% cases. In this study 14.2% of vehicle has failure of brakes or steering, 8.5% had a tire burst at high speed leading to accidents due to overturning or collision with vehicles or trees. In 3% of cases, projecting loads from rear of trucks accounted for the accidents. (Table-5) Regarding the effect of the poor weather, 46.7% cases occurred at night due to poor vision and fog or mist account for 44.2% cases and 9.1% of cases due to heavy rain or storms in this study. Our study showed that out of 17 cases of accidents due to poor road condition, 34.4% occurred due to stray animals on road and 29.5% due to potholes and damaged roads. In 23.5% cases merging of rural roads directly to a highway with high speed traffic were responsible for accidents. 6.3% cases each occurred due to diversion or construction material on the road and illegal speed breakers, respectively. (Table-6)

Causes and Factors in Road Traffic Accidents at a Tertiary Care Center of Western Uttar Pradesh

Table - 1 Causes of fatal Road Accidents

Causes	Cases	Percentage (%)
Human Error	324	78.0
1. Fault of Drivers	237	57.0
2. Fault of Pedestrians	75	18.0
3. Fault of Passengers	12	3.0
Role of vehicles	34	8.0
Role of Weather	32	7.8
Role of Roads	17	4.0
Unknown	09	2.2
Total (n = 416)	416	100

Table – 2 Faults of Drivers

Faults	Cases	Percentage (%)
Over Speeding	118	49.8
Rash Driving	73	30.8
Loss of Control	16	6.8
Violation of Traffic Rules	13	5.5
Alcohol Intoxication	10	4.2
Fatigue/Sleepiness	07	2.9
Total (n = 237)	237	100

Table – 3 Faults of Pedestrians

Faults	Cases	Percentage (%)
Carelessness	44	58.8
Wrong crossing	15	20.0
Playing of Roads	12	16.0
Disease	04	5.2
Total (n = 75)	75	100

Table – 4 Faults of Passengers

Faults	Cases	Percentage (%)
Catching / alighting Running Bus	6	50.0
Travelling on foot Boards	4	33.4
Catching / alighting from wrong side	1	8.3
Projecting outside the Vehicle	1	8.3
Total (n = 12)	12	100

Table – 5 Faults of Vehicles

Faults	Cases	Percentage (%)
Overcrowding / over loading	10	29.8
Ejected out of open jeeps	09	26.7
Wrongly Parked on Road	06	17.8
Failure of Brakes / Steering	05	14.2
Tire Burst	03	8.5
Projecting loads	01	3.0
Total (n = 34)	34	100

Table 6 – Factors related to Roads

Faults	Cases	Percentage (%)
Stray Animals on Road	6	34.4
Potholes / Damaged Road	5	29.5
Merging of Rural Road with Highway	4	23.5
Diversions / Material on Road	1	06.3
Illegal Speed Breakers	1	06.3
Total (n = 17)	17	100

- **Conflict of interest:** Nil.
- **Source of Funding:** Self-funded.
- **Ethical Permission:** Institutional ethical committee.

Discussion

Road Traffic Accidents are mainly caused by the rapid increase in vehicles on roads, personalized modes of transport, lack of road discipline and improper roadway features. India accounts for about 10% of road accidents fatalities world wide and 85% of all road accidents occurred in the developing countries.² In the present study road traffic accidents accounted for 416 cases. The factor of human error is found to be most significant (78%) as compared to defects in vehicles, roads or weather conditions similar to other study.^{6-9,13} The drivers were at fault in 57% of cases & were responsible

for over speeding in 49.8% cases, rash driving in 30.8% cases. Violation of traffic rules, alcohol intake, fatigue or sleepiness were other causes.^{7,8} Pedestrian comprising of elderly & children are most commonly affected group of road accident victims. Majority of them are themselves responsible for accidents due to carelessness (58.8%), Wrong crossing (20%), children usually playing on roads (16%) and diseases in elders (5.4%).^{8,9,13} The common faults of passengers were catching running bus (50%), travelling on foot boards (33.4%), catching from wrong side (8.3%) and projecting outside the vehicle (8.3%).^{7,8,13} In the cases of accidents attributed to faults of vehicles, 29.8% of vehicles were overcrowded or over loaded, in 26.7% of cases victim ejected out of open jeeps at the time of collision. A small number of vehicles had mechanical failure in form of steering or brake failure (14.2%) or tire burst (8.5%) at high speed.^{6,7,13} Poor weather condition like night or poor vision (46.7%), fog or mist (44.2%), heavy rain or storm (9.1%) responsible for accidents which is consistent with other studies.^{7,13,14} Factors related to roads like stray animals on road (34.4%), potholes or damaged road (29.5%), merging of rural road with highway (23.5%) and diversions or material on road (6.3%), illegal speed breakers (6.3%) were responsible for accidents. Findings are consistent with other studies.^{7,14} The most disturbing finding in the present study was that none of the drivers and passengers of motor bikes or four wheelers were wearing helmets or seat belts leading to fatal injuries.¹⁰⁻¹³

Conclusion

The tragedy of Road Traffic Accidents is that they particularly involve young, perhaps the young and adventurous ones more. Human error is the most common cause of road accidents out of which drivers are at fault in many cases, followed by faults of pedestrians and passengers. The defects in vehicles, poor road infrastructure and poor weather accounts for a smaller number of cases. Fatal accidents represent not only tragic family loss but also a serious economic loss to the community as their education and training have been wasted. Such incidences can be prevented by giving proper education, awareness, training of safety standards by administrators and law enforcement agencies. There should be road safety programmes regularly in which all the cities of our country must be ranked and sensitized on the basis of various criteria like standards of roads, functioning of traffic signals, obeying of traffic rules by the citizen etc.

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Toxicological Trends of Poisoning in a Tertiary Care Center of Western Uttar Pradesh

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Abstract

Poisoning is a significant global public health problem which leads to nearly a million deaths per year. Incidence of poisoning is high in India. This study was carried out on poisoning cases reported to casualty department of Muzaffarnagar Medical College, Muzaffarnagar from 1st January 2016 to 31st December 2016. The main objectives of the study were to analyze pattern and demographic variables of poisoning cases. Data were collected and analyzed. A total of 72 cases (male: 46, female: 26) were included in the study. Maximum cases were of age group 21-30 years (30.5%). More cases from rural area (75%) were reported. Summer months saw maximum number of cases (37.5%). Poisoning by Organophosphorus was seen in maximum cases (31.9%) followed by Aluminium phosphide (29.1%) and in maximum cases reason for poisoning was Intentional (52.7%) and route of exposure was by oral ingestion (84.7%). The study concludes that the burden of poisoning demands strategies for identification, prevention and its rational management.

Key Words: Poisoning, Organophosphorus, Aluminium phosphide, Casualty

Introduction

Poisoning is a major problem all over the world, though the type of poison and the associated morbidity and mortality varies from place to place and changes over a period of time. Worldwide, an estimated three million cases of pesticide poisoning occurs every year, resulting in an excess of 250000 deaths. Of these 90% of fatal poisonings occurs in developing countries particularly amongst agriculture workers.¹ An estimated total of 877000 people committed suicide worldwide in 2002 and around 28% of these cases are from South East Asia Region.² The exact incidence of this problem in India remains uncertain but, it is reported that 1 to 1.5 million cases of poisoning occurs every year, of which nearly 50,000 dies.³ The last quarter of century has seen tremendous advances in the fields of agriculture,

industrial technology and medical pharmacology. These advances have been paralleled with remarkable changes in trends of acute poisoning in developing countries, including India.⁴ The commonest cause of poisoning in India is pesticide due to easy availability, agriculture based economy and poverty. In developing countries like India occupational poisoning is common due to illiteracy, unsafe practices like storing the pesticides at home and handling them without safety gear.⁵ Intentional and unintentional pesticide poisoning has been acknowledged as a serious health problem in many agriculture communities of low and middle income countries. WHO and other humanitarian organizations are coercing the authorities of different countries to ban the highly toxic pesticide and imposing restrictions to their access. Controlling access to pesticide is not only critical in reducing self-directed violence, it is a key to preventing unintentional poisoning. Studies indicate, the ban must be accompanied by evaluation of agriculture needs and replacement with low risk alternative for pest control.⁶ The paucity of information on risk population, circumstances and toxics is a hurdle to effective poisoning prevention and targeted intervention programs. So the study is sought to characterize poisoning with regard to

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demographic factors and common toxic agents in our region.

Material & Method

The present study was conducted in Muzaffarnagar Medical College, Muzaffarnagar, a tertiary care teaching hospital from 1st January 2016 to 31st December 2016. During this period a total of 72 cases of poisoning were reported to casualty department. This study was a prospective study. The relevant data was collected from casualty medical officer, treating doctors and from case file. Data related to name, age, sex, religion, marital status, economic status, type of poison ingested, mode of ingestion, rural & urban distribution of cases, occupation was collected in standardized proforma & analyzed. Brought dead cases were not included in this study.

Observations & Results

During our study period seventy two cases were admitted to the hospital with diagnosis of acute poisoning. Males were more prone to poisoning (63.9%) as compared to females (36.1%). (Table 1) The incidence of poisoning according to age revealed that there was an

increasing trend of poisoning with increase in the age up to 30 years with a peak incidence in the age group 21-30 years which represented 22 (30.5%) cases in this study and then declined. (Table 2) Among the 72 cases admitted to the hospital with diagnosis of acute poisoning 46 (63.9%) cases were married followed by unmarried 25 (34.7%). Incidences are more with rural areas 54 (75%) then urban areas 17 (23.6%). Out of 72 cases incidences was more in middle class 47 (65.3%) followed by lower cases 24 (33.3%). In present study incidence of poisoning was more in farmers 26 (36.1%) and laborers 15 (20.8%) (Table 3) Intentional poisoning was more common 38 (52.7%) followed by accidental 30 (41.7%). (Table 4) Out of all cases reported, oral ingestion was the most common route of exposure 61 (84.7%) followed by inhalation 10 (13.9%). (Table 5) Poisoning was more during summer season 27 (37.5%) followed by winter 24 (33.3%) and monsoon 21 (29.2%). The poisons used were organophosphorus (31.9%), Aluminium phosphide (29.1%), Alcohol (13.9%), rat poison (6.9%), Kerosin (2.8%). Among these Organophosphorus poisons are the most commonly abused poison followed by Aluminiumphosphide. (Table 6)

Toxicological Trends of Poisoning in a Tertiary Care Center of Western Uttar Pradesh

Table 1: Sex wise Distribution of Cases (N=72)

Sex	No. of Cases	Percentage (%)
Male	46	63.9
Female	26	36.1
Total	72	100

Table 2: Age wise Distribution of Cases (N=72)

Age (Years)	No. of cases	Percentage (%)
0-10	2	2.7
11-20	19	26.4
21-30	22	30.5
31-40	12	16.6
41-50	7	9.8
51-60	3	4.2
>60	6	8.4
Unknown	1	1.4
Total	72	100

Table 3: Distribution of Cases According to Occupation (N=72)

Occupation	No. of Cases	Percentage (%)
Farmers	26	36.1
Laborers	15	20.8
House Wife	10	13.9
Students	9	12.5
Unemployed	6	8.3
Service	5	7.0
Unknown	1	1.4
Total	72	100

Table 4: Distribution of Cases According to Reason for Poisoning (N=72)

Reason	No. of Cases	Percentage (%)
Intentional	38	52.7
Accidental	30	41.7
Unknown	4	5.6
Total	72	100

Table 5: Distribution of Cases According to Route for Poisoning (N=72)

Route	No. of Cases	Percentage (%)
Oral Ingestion	61	84.7
Inhalational	10	13.9
Bite/Sting	1	1.4
Total	72	100

Table 6: Distribution of Cases According to Type of Poisoning (N=72)

Poison	No. of Cases	Percentage (%)
Organo Phosphorus	23	31.9
Aluminum Phosphide	21	29.1
Alcohol	10	13.9
Rat Poison	5	6.9
Mosquito Repellant	4	5.6
Benzodiazepine	3	4.2
Kerosene	2	2.8
Cannabis	1	1.4
Corrosives	1	1.4
Insect bite	1	1.4
Unknown	1	1.4
Total	72	100

Discussion

Poisoning cases, pesticide poisoning in particular impose a huge burden on the economy in developing countries. According to a study from India it is found that around 27% of pesticide poisoning cases require ventilation for varying periods which causes an unusual burden on already stretched health care system like India.⁷ It is known that the pesticides that cause most deaths in rural Asia and in the world, are WHO class I and II organophosphorus pesticides, causing an estimated 2,00,000 deaths.⁸⁻¹⁰ The present study shows that most of the cases belong to the age between 21 to 30 years which constitute 30.5% of the total cases. This observation is consistent with the other studies.^{6,11} In this study it has been observed that there is decreasing trend of poisoning cases after the peak of 21-30 years and it is least in extremes of life. Further it has been observed that most of the cases are due to organophosphorous and other insecticide poisoning. This is in accordance with the other studies. (5,6,8-10) Out of total 72 cases studied 46 (63.9%) were male & 26 (36.1%) were female which is consistent with other studies.¹¹ In the present study 46 (63.9%) cases were married & around 25 (34.7%) were unmarried. This is consistent with other studies.¹¹ Rapid increase of indebtedness by farmers and failure to reimburse due to natural calamities like draught is the reason behind the increase in poisoning during summer season.^{11,12} India being an agriculture nation, handling of pesticides is a routine practice by farmers and their family members. House hold and agricultural agents were associated with most poisoning due to easy availability of these agents & inadequate knowledge to support their safe residential use. Studies have shown pesticides is the most common toxic agent involved in poisoning.¹¹⁻¹⁴ In the present study intentional poisoning is more common which is consistent with other studies. (Mentioned above) In the present study it has been observed that incidences are more among rural population (75%) than urban population (23.6%) which is consistent with other studies.¹¹⁻¹⁴ It is worth noting that incidences of poisoning is more in middle class 47 (65.3%) followed by lower class 24 (33.35) which is consistent with other studies.¹¹ In the present study it has been observed that oral ingestion is the most common route of exposure 61 (84.7%) followed by inhalation 10 (13.9%).¹²⁻¹⁴

Conclusion

Increased Intentional Poisoning in adults emphasizes

on importance of Counseling & awareness about depression and stress affecting the major strata of the Society which increases suicidal tendencies. As in India, two third of populations economy is based on agriculture, of which majority lives in rural area. The reason of intentional poisoning by farmers is indebtedness, which may be due to natural calamities like- draught, Flood, etc. Authentic data on poisoning was not available not only from India but from entire SEAR (South East Asia Region). WHO States that many cases go unnoticed and mortality may actually be higher. Involvement in poisoning young male group which is most active and productive, puts huge burden on economy and social loss to the country. Pesticides again are clear culprit in most of the cases. In one sentence it may be stated that self harm pesticide poisoning is most common type of poisoning which is more common in rural areas and most of the cases are from age group 21-30 years.

Conflict of Interest: Nil

Source of Funding: Self-funded.

Ethical Permission: Institutional ethical committee.

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A Study on the Cause of Death Due to Burn Cases and Histopathological Changes in North Indian Setting-A Cross Sectional Study

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Abstract

Background: Fatal burns and related injuries are major cause of death and disability. There are certain pathological changes such as lungs shows necrotizing pneumonia, congestion of alveolar walls, capillary proliferation, intra alveolar oedema, giant epithelial cells

Objective: To study on the cause of death due to burn cases and histopathological changes in north Indian setting.

Method: This was a cross-sectional study. All autopsies with history of burn injury were studied to find out the significant histopathological change in lung. Cases was thoroughly studied using specially designed proforma that included demographic profile of deceased, history from relatives, police & hospital records, autopsy findings.

Results: The most common cause of death due to burn injury was found to be Sepsis (48.2%) and neurogenic shock (29.5%). On histopathological examination, Congestion in trachea was present in majority 434 (78.9%) cases while Tracheal soot particles were present in only 40 (7.3%) cases. Specimens of 375 cases were available for histopathology out of which 52 (13.9%) specimens were autolyzed. Changes suggestive of Pneumonia (50.1%), Congestion (83.7%), alveolar and interstitial haemorrhage (63.2%) were present in majority of the cases while changes suggestive of alveolar interstitial edema (64.3%), alveolar wall disruption (66.1%), inflammatory cells (55.5%), hyaline membrane (79.7%) and Fibrin strands (79.7) were absent in majority of cases. Capillary dilatation was present in 39.2%.

Conclusion: In the present study, an important observation in burn deaths is the Sepsis and Neurogenic shock. Congestion in trachea was most common on histopathological change.

Key words: Fatal burns, Cause of death, Histopathological change

Introduction

A severe burn injury is the most devastating injury a person can sustain and yet hope to survive. Every year

more than 2 million people sustained burns in India. Around 5 lakh people were treated as outdoor patients. About 2 lakh people admitted in hospital, of which 5000 people die each year¹. Thermal burns are more common incidents, which stands next to road traffic accidents in India. On an average, 1/4th of the deaths constitute death due to burns among all postmortem examinations conducted. Mortality rate due to burns in India is much more than any other developed countries². Histopathological changes in various organs are noted

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in burn deaths. Lungs are usually congested and show marked edema³. Necrosis of alveolar epithelium and necrotic debris is present as a membrane in cases of shock lung. Gastric ulcers may occur within a day of burning. Curling's ulcers are produced in the duodenum in less than 10% of cases on 10th day in extensive burns. These ulcers are sharply punched out mucosal defects which may be superficial or deep. The liver shows cloudy swelling. The kidney shows cloudy swelling, capillary thrombosis and infarction. Presence of haem casts in medullary tubules is common. Renal obstruction leads to microcirculatory insufficiency and renal ischemia⁴. There is lack of information on the cause of death due to burns and histopathological changes from north Indian setting, hence this study was planned to study on the cause of death due to burn cases and histopathological changes in north Indian setting in a cross sectional study design.

Material and Method

This was a cross-sectional study conducted in the Department of Forensic Medicine and Toxicology in collaboration with Department of Pathology in a tertiary care hospital in north India over a period of one year.

All autopsies with history of burn injury were studied to find out the significant histopathological change in lung. The cases with time since death more than 24 hours were not to be included, as lungs undergo decomposition after 24 hour period of death were excluded from the study. Cases with previous history of lung diseases, anatomically distorted lungs were excluded were also excluded.

Cases was thoroughly studied using specially designed proforma that included demographic profile of deceased, history from relatives, police & hospital records, autopsy findings. Before taking the lung sample, proper consent was taken from the relatives after explaining the purpose of the study. After gross examination sections from different lobe were taken. These sections were sent to Department of Pathology

for microscopic examination through a multi-step process. Routine Hematoxylin & Eosin stains done. The histopathological changes were seen under microscope.

Results

The most common cause of death due to burn injury was found to be Sepsis (48.2%), followed by Neurogenic shock (29.5%), Hypovolemic shock (14.0%), Asphyxia (3.1%), Multi-organ failure (2.7%) and Cardio-respiratory failure (2.2%). Other causes contributed to death in 0.4% burn victims only (Table-1).

Table-1: Distribution of Burn Cases according to Cause of Death (N=550)

Cause of death	No. of cases	Percentage
Sepsis	265	48.2
Neurogenic Shock	162	29.5
Hypovolemic Shock	77	14.0
Asphyxia	17	3.1
Multi-organ Failure	15	2.7
Cardio-respiratory failure	12	2.2
Others	2	0.4
Total	550	100.00

On histopathological examination, Congestion in trachea was present in majority 434 (78.9%) cases while Tracheal soot particles were present in only 40 (7.3%) cases. Specimens of 375 cases were available for histopathology out of which 52 (13.9%) specimens were autolyzed. Changes suggestive of Pneumonia (50.1%), Congestion (83.7%), alveolar and interstitial haemorrhage (63.2%) were present in majority of the cases while changes suggestive of alveolar interstitial edema (64.3%), alveolar wall disruption (66.1%), inflammatory cells (55.5%), hyaline membrane (79.7%) and Fibrin strands (79.7) were absent in majority of cases. Capillary dilatation was present in 39.2% (Table-2).

Table-2: Histopathological Changes in Trachea and Lungs

Variables	Total	Absent		Present		Autolyzed	
		No.	%	No.	%	No.	%
Traches							
Congestion	550	116	21.1	434	78.9	0	0.0
Soot particle	550	510	92.7	40	7.3	0	0.0
Lung							
Pneumonia	375	135	36.0	188	50.1	52	13.9
Congestion	375	9	2.4	314	83.7	52	13.9
Capillary dilatation	375	176	46.9	147	39.2	52	13.9
Alveolar and interstitial edema	375	241	64.3	82	21.9	52	13.9
Alveolar and interstitial hemorrhage	375	86	22.9	237	63.2	52	13.9
Alveolar wall disruption	375	248	66.1	75	20.0	52	13.9
Inflammatory cells	375	208	55.5	115	30.7	52	13.9
Hyaline membrane	375	299	79.7	24	6.4	52	13.9
Fibrin strands	375	299	79.7	24	6.4	52	13.9

Discussion

Burn injuries are one of the most devastating injuries and constitute a major global public health hazard. Burns are the fourth most common type of injury worldwide after road traffic accidents, falls and interpersonal violence⁵ (World Health Organisation, 2018). Extensive development and growth of Information technology has made vast changes in recent years in medical education system in India at both the teaching level as well as research level⁶ (Tayade and Kulkarni, 2011).

There are numerous cases in which there was no soot in the larynx or trachea, yet analysis of blood for carbon monoxide revealed lethal levels⁷ (DiMaio, 2001). Introduction of soot into the trachea, either during incision on the charred neck at autopsy or by disintegration from burning, gives the false impression of smoke inhalation⁸ (Shkrum et al, 2007).

In this study, the most common cause of death due to burn injury was found to be Sepsis (48.2%), followed by Neurogenic shock (29.5%), Hypovolemic shock (14.0%), Asphyxia (3.1%), Multi-organ failure (2.7%) and Cardio-respiratory failure (2.2%).

Burn injury affects kidney by creating hypovolemic and intense pro-inflammatory states in the earlier phases of survival whereas in the later days systemic sepsis takes the upper hand for the development of the organ dysfunction. Congestion in trachea was present in majority 434 (78.9%) cases while Tracheal soot particles were present in only 40 (7.3%) cases. Specimens of 375 cases were available for histopathology out of which 52 (13.9%) specimens were autolyzed. Changes suggestive of Pneumonia (50.1%), Congestion (83.7%), alveolar and interstitial haemorrhage (63.2%) were present in majority of the cases while changes suggestive of alveolar interstitial edema (64.3%), alveolar wall disruption

(66.1%), inflammatory cells (55.5%), hyaline membrane (79.7%) and Fibrin strands (79.7) were absent in majority of cases. Capillary dilatation was present in 39.2% are the histopathological findings in the present study that is close to the studies of Sevitt (1956), Argamaso (1967), Rathod et al (2014) and Schrier et al (2004), 9,10,11,12. Naik et al (1998) in their study did not find soot in naked eye examination in any case of sustaining less than 60% total body surface area (TBSA) of burn¹³. Gupta and Srivastava (1988) found soot particles in trachea in total 38 cases (21.11%)¹⁴.

The emerging techniques, development of study of histopathological techniques plays a vital role in autopsy. Burn deaths are an important public health & social problem in India. There should be urgent need to implement burn prevention programme in India which should aim at attending the incidence of burn injuries and mortality among young generation, especially in females. Burn has been reported to be the second most common cause of death in all medicolegal cases.

Conclusion

In the present study, an important observation in burn deaths is the Sepsis and Neurogenic shock. Congestion in trachea was most common on histopathological change.

Conflict of Interest: There is no conflict of interest.

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Client Satisfaction and Preferences Towards Nonverbal Communication(NVC) of Health Care Providers in a Therapeutic Setting, Mangaluru

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Abstract

Non verbal communication refers to the communication and interpretation of information by any means other than language. Non verbal communication is used to express and communicate thoughts, feelings and emotions to establish and maintain relationships and to influence others. In health care setting it is very important to maintain a healthy provider- client relationship. The present study studies the non verbal behaviors between doctors and nurses and ranks the client preference during interaction. The results revealed that there is no significant difference in the non verbal behaviours used by doctors and nurses. Henry Garret ranking was used to rank the preferences rated by Clients. Hence it is concluded that NVC are very much essential in health care.

Key words: Non Verbal communication, Therapeutic settings, Health care provider, Client

Introduction

Establishing good communication, either verbal or nonverbal, with patient is an essential and important component to develop a good health professional-patient relation. Numerous studies have explored the mechanisms and importance of nonverbal communications.¹ Face-to-face interaction (including facial expressions and eye contact), expressive touch, body language, paralinguistic's (vocal communication which is discrete from actual language), interpersonal proximity, physical appearance, and eloquent gestures all make verbal conversation more expressive and meaningful.² Evidence shows that health professionals (doctors and nurses) nonverbal behavior leads to higher patient satisfaction, but this is affected by a number of factors, including gender of the health personnel as well as of the patient. A study, from Switzerland, showed both male and female doctors should display different set of nonverbal behavior to maximize patients satisfaction.³ Nonverbal communication has been shown to be important in dealing with pediatric age groups and with those recovering from disabilities.⁴

A good health care provider begins to care for the patient as soon as he/she looks at him. In a study

conducted 86.1% of the patients eagerly wanted the doctor's attention through his/her eye contact. Even a simple gesture of frowning can have a positive impact on the patient's satisfaction.³ Eye contact and physical touch are commonly used as effective tools in nonverbal communication.^{1,5} Touch can be perceived as comforting and healing.⁶ Health care providers may feel reluctant to use touch other than procedural touch, because of the fear of misinterpretation of such behavior. However, many patients believe that, particularly in distressing situations, expressive touch is acceptable.⁷ Eye contact is another important nonverbal behavior and is especially essential for building good rapport with elderly individuals.³ It is mostly taken as a sign of respect, care, and attention from a care provider.¹ However, if eye contact is coupled with active listening it inclines the interaction towards more patient-centered communication.³ Nowadays, the use of computers and especially the electronic health records (HER), is a big obstacle in using eye contact as an effective way to communicate.⁸ The Present study objectives are: To assess the level of client satisfaction towards NVC of the health care providers during the assessment, consultation and while providing care, to determine the preferences of the clients, To find the association between client satisfaction towards NVC of health care providers and selected demographic variables, To compare the satisfaction level of clients

towards NVC among doctors and nurses

Materials and Method

A Descriptive Survey was conducted among 200 Clients who were admitted to selected Hospital at Mangaluru. Eligibility criteria was clients with simple medical and surgical problems admitted after the initial assessment performed by the licensed doctor and a registered nurse. Samples were selected by convenient sampling. Information was collected by administering the rating scale to check the client satisfaction and a semi structured questionnaire. Apart from this demographic data is collected by giving a questionnaire. The tools after validation and pre-testing were administered to 10 clients admitted with minor medical and surgical problems to test the reliability. The satisfaction rating scale was checked for reliability using Cronbach's Alpha with $r=0.982$. Permission to conduct the study was obtained from Institutional Ethics Committee and from the Hospital Administrator

Section 5: Comparison on satisfaction between Doctors and Nurses NVC

Section I

Table 1: Client Satisfaction towards Doctors NVC

n=200

Satisfaction Score	Satisfaction Score %	Grading	Doctors		Nurses	
			f	%	f	%
101-125	≥80%	Highly satisfied	91	45.5	94	47.0
76-100	61-79%	Moderately Satisfied	70	35	81	40.5
25-75	≤60%	Not satisfied	39	19.5	25	12.5

Maximum score: 125

The above table interprets that 45.5% and 47.0% of the clients were highly satisfied with the NVC shown by the doctors and nurses .

Table 2: Area Wise Mean, Standard Deviation and Mean Percentage of Client Satisfaction towards Doctors Non Verbal Communication

n=200

Area	Item	Max. score	Doctors			Nurses		
			Mean ± SD	Mean satisfaction %	Level of Satisfaction	Mean ± SD	Mean satisfaction %	Level of Satisfaction
Gestures and interpersonal proximity	16	80	61.80±13.07	77.25%	Moderately Satisfied	63.54±11.50	79.42%	Moderately Satisfied
Facial expression, eye contact, touch, body language, appearance	9	45	35.41±7.32	78.68%	Moderately Satisfied	36.41±6.64	80.91%	Highly satisfied
Total	25	125	97.22±20.06	77.77%	Moderately Satisfied	99.95±17.85	79.96%	Highly satisfied

Findings

Master data sheet is prepared and the coded data was entered. SPSS-16 version was used to analyze coded data. Frequency and percentages of baseline variables were analyzed. Chi-Square test was used to find the association. Henry Garrets Ranking is used to interpret the client preferences for NVC

The data collected were organized under the following headings

Section 1: Client Satisfaction towards Doctors NVC

Section 2: Association of Doctors and nurses Satisfaction with baseline variables

Section 3: Client Preferences towards NVC

Section 4: Henry Garrett Ranking for priority in Preferences for NVC

From the above table it is clear that there is large deviation from the mean value in the satisfaction level of clients.

Section: II

Table 3: Association of Client Satisfaction of Doctors NVC with baseline variables n=200

Sl.No	Variables	< Median	≥ Median	p Value
1	Age			0.000*
	≤40	66	45	
	>40	21	68	
2	Education			0.006*
	≤ 12th std	30	61	
	Graduation and above	57	52	
3	Occupation			0.000*
	unemployed	50	37	
	employed	37	76	
4	Marital status			0.000*
	Married	24	79	
	others	63	34	
5	Living with			0.273
	Nuclear/alone	64	75	
	others	23	38	
6	Type of personality			0.350
	Optimistic	66	79	
	Pessimistic/dont know	21	34	
7	Gender			0.034*
	Male	25	49	
	Female	62	64	
8	Place of residence			0.78
	Rural	33	57	
	Urban	54	56	

p<0.05

* significant

* significant

Data in table 6 shows that p value computed between clients Satisfaction of Doctors Non Verbal Communication and age (0.000), Education (0.006), Occupation (0.006), Marital Status (0.000), Gender (0.034) is < 0.05, at 0.05 level of significance. Hence null hypothesis was accepted only in case of age, education, occupation, marital status and gender.

Table 4: Association of Client Satisfaction of Nurses NVC with baseline variables n=200

Sl.No	Variables	< Median	≥ Median	p Value
1	Age			0.037*
	≤40	51	60	
	>40	28	61	
2	Education			0.784
	≤ 12th std	35	56	
	Graduation and above	44	65	

Cont... Table 4: Association of Client Satisfaction of Nurses NVC with baseline variables n=200

3	Occupation unemployed employed	47 32	40 81	0.000*
4	Marital status Married others	29 50	74 47	0.001*
5	Living with Nuclear/alone others	60 19	79 42	0.109
6	Type of personality Optimistic Pessimistic/don't know	56 23	89 32	0.680
7	Gender Male Female	25 62	49 64	0.034*
8	Place of residence Rural Urban	33 46	57 64	0.458

p<0.05

* significant

* significant

Data in table 7 shows that p value computed between clients Satisfaction of Nurses Non Verbal Communication and age (0.037), Occupation (0.0001), Marital Status (0.001), Gender (0.034) is < 0.05, at 0.05 level of significance. Hence null hypothesis was accepted only for those areas.

Section: III

Client Preferences towards Health care providers Non Verbal Communication

The analysed data reveals that majority, 177(88.5%) showed approval of physical touching of their body by the health care provider during Interaction. More than half, 118(59%) consider the touch of health care provider as therapeutic. Most, 125(62.5%) consider hand and

105(52.5%) consider shoulder as the comfortable part to be touched during the interaction. Most of them 178 (89%) wants their health care provider to maintain eye contact during interaction. 161(80.5%) feel comfortable when health care provider of opposite gender maintains eye contact. Almost all clients 189(94.5%) expect their health care provider to acknowledge with a pleasant smile. 167(83.5%) prefer their health care provider to wear apron and ID card during interaction/consultation. 106(53%) expect the health care provider to make them comfortable before starting the interaction and 107(53.5%) wants their health care providers to build confidence. Majority 176(88%) expect family member to be present during consultation/interaction. More than half 108(58%) prefer senior health care provider during consultation.

Section: IV

Table 5: Henry Garrett ranking for Preferences of Clients towards health care providers NVC

n=200

Factor No.	Factors	Rank
1.	Greeting with a smile	1
2.	Making comfortable	2
3.	Asking problems	3
4.	Nodding head	4
5.	Maintaining physical distance	5
6.	Allow a family member to accompany during interaction	7
7.	Give complete instructions regarding treatment	8
8.	Give time to discuss your problem with the health care provider	6

Section: V

Table 6: Comparison on satisfaction between Doctors and Nurses NVC (Independent Samples Test)

F		Levene's Test for Equality of Variances		t-test for Equality of Means						
		Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
T test	Equal variances assumed	3.838	.051	1.440	398	.151	2.73500	1.89904	-.99840	6.46840
	Equal variances not assumed			1.440	392.702	.151	2.73500	1.89904	-.99856	6.46856

There is no statistically significant difference between the satisfaction of doctors and nurses towards non verbal communication (p>0.05).

Conclusion

The present study attempted to determine the client satisfaction towards non verbal communication of doctors and nurses in a therapeutic setting at Mangaluru. The following conclusions were made based on the findings of the study:

- Clients were moderately satisfied with the health services provided by doctors and nurses

- There was significant association was found with few of the selected demographic variables with the satisfaction level

- There is no difference observed between client satisfaction towards non verbal communication among doctors and nurses.

The study concludes by interpreting that periodic training sessions on communication, soft skills

development, making the availability of sign boards and discussion of feedback obtained by the clients helps in improving the quality care.

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Ethical Clearance: obtained from Institutional Ethics Committee

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Querying the Dataset from the Developed Ontology for Swineflu Disease

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Abstract

Ontology design and querying the data set to obtain accurate results has been a topic of research. The aim of the paper is to represent ontological knowledge in the field of Medical Information Systems to store the knowledge about Swine flu disease and thereby querying the data and formalize the knowledge base development. The developed knowledge from RDF is converted to rules and then querying is done through different methods and performance analysis has been done on the retrieved query. The results predicted determine the suitability of the method where querying gives the accurate result for swine flu disease ontology.

Keywords: Querying; Ontology; Swine-flu; Protégé; SPARQL;

Introduction

Semantic Web a layer of existing web enables machines to operate better and share meaningful knowledge. Semantic Web provides technology stack where key part is standardized information exchange. As part of Semantic Web, Computers should have access to structured collection of documents and sets of inference rules so that they conduct automated reasoning. Semantic web can otherwise be referred as Linked Data. Aristotle defined the term Ontology^[1,8,9] in his Metaphysics. In 1998, Studer et al.^[2] defined the term Ontology as : “An ontology is a formal, explicit specification of a shared conceptualization.” Conceptualization denotes abstract model being representing some phenomenon identifying Knowledge in detail with individual relationships. In our paper , We present our application for searching on appropriate semantic information on Swine flu in respiratory disease ontology which is a domain ontology .This we have done using Classes and Objects and the inter individual relationships which gives the information to patient or any person searching the Web such as what drug is suitable for a patient given his symptoms. Explicit states that type, constraint and their use is explicitly stated. Shared echoes the perception that Ontology represents consensual knowledge refers to some group and not individual. Features are described by Classes and attributes are represented by data properties. Instances are represented by individual

classes and querying to retrieve semantic information is done with the help of SPARQL. The main purpose of the paper is to communicate information retrieval ,querying through SPARQL and make an analysis of performance of web based applications to predict the query evaluation that gives accurate results when queried. The remaining part of the paper is organized as follows .Section 2 describes about the different tools used for Semantic Web and Section3 describes about the framework for the development of swine flu ontology and section4 presents analysis of NASA TLX INDEX^[3,4] on applying SPARQL^[5], Ontograf^[6], SWRL^[7] Queries on the ontology that is retrieved and the evaluation is presented in the form of graph and Section 5 concludes our work.

Tools used for Semantic Web in our Case Study

Respiratory diseases are the diseases caused due to the disorder of the air and lungs that affect the human respiratory system. These respiratory diseases may cause damage to the organs and the other internal structures that deal with the breathing, and may include nasal cavities, the throat, the bronchitis and many other organs present. Identification of these respiratory diseases and taking the correct predicate is a difficult task for a normal individual affected. Respiratory diseases cause the malfunction of the internal organs that block and cause damage to the lungs which may cause severe health issue. There are many diseases which are caused on the respiratory

system. Some of them namely, Asthma, Pneumonia, Upper respiratory tract infection, Infant respiratory distress syndrome, Cystic fibrosis, Shortness of breath, Obstructive lung disease, Bronchitis, Obstructive sleep apnea, Influenza-like illness, Acute severe asthma. These diseases may affect the human structures and organs directly. Knowledge of these diseases to the individuals is very much less rather than the experts in that domain. To get the knowledge about the diseases is very much difficult and that may happen only when the expertise help is provided to the user. To get the preventive measurements for a user without expertise help may end up in the wrong cause. To understand the content and to provide the better knowledge about the diseases ontologies provide an accurate representation to the user without the help of the expertise in that domain.

There may be various characteristics and different issues related to the diseases. Each of them are classified into the specific categories in the domain those are affecting different organs or the structures. Sufficient knowledge about the diseases and the corresponding precautions or about the diseases through the ontologies can help in removal of unnecessary damage and less spread of the wrong information through the web. Technologies that help to build a content oriented system is possible using semantic web^[10,11]. By using semantic web which provide information using the ontology help to show the related issues in the respiratory diseases, how it is caused and how it can be prevented. Much of the related information can be seen on the web rather than having the misguided information.

Methodology

Tools for Ontology Development

Protégé^[12,13] - Protégé is developed by Stanford University as a tool for Semantic Web and it is a framework for building Intelligent Web Systems. It can be adapted to build both simple and complex ontological applications where the concepts used are classes, objects and the inter individual relationships established among them. Protégé provides us meta modeling an the best part

is that there is no syntax involved and domain ontologies can be developed easily with this.

Jena – Apache Jena is open source framework based on Java. It provides framework to extract data from and write to RDF and graph which is represented as abstract model. Data can also be populated from databases, Files, URLs and also it has the API for creating and accessing RDF data.

RDF – A Resource Description Framework, is used as model for interchange of data on the Web. URIS are assigned to data objects and then RDF is used to create statements about them. RDF is used for serializing triples and RDF consists of Subject-Predicate-Object triple. This makes data easier to store and interchange.

SPARQL – An Acronym for SPARQL Protocol and RDF Query Language is used for querying, retrieving and manipulating data stored in RDF format. It allows us to search the Web and discover relationships among the classes and individual objects. SPAQRL takes text in the form of queries and return the results. SPARQL consists of SELECT queries which are similar to SQL thereby it is easy for the user to write if he has knowledge on the SQL queries. SPARQL produces results in three formats XML,JSON and CSV formats.

Ontograf – Ontograf provides support for navigating relationships of OWL ontologies. The various relationships that can be supported are subclass, individual, domain/range object properties, and equivalence. It provides zooming, spring layout, searchable relationship filters, configurable tooltips, pinning tooltips, OWL Imports View for better enhancement of views.

SWRL – SWRL rules can be executed through a tab in protégé SWRL Tab. It supports interoperating with other rule engines and there are other user-defined libraries and various built-in libraries are also provided mathematical, temporal and string operators. This language provide a powerful means extracting OWL Ontologies.

Framework For Swine Flu Disease Ontology

A framework for Swine Flu disease ontology is developed where ontology is created with the help of Protégé. Protégé helped in modelling of ontology classes. Classes used for development of Swine Flu disease are demonstrated in Fig1 .

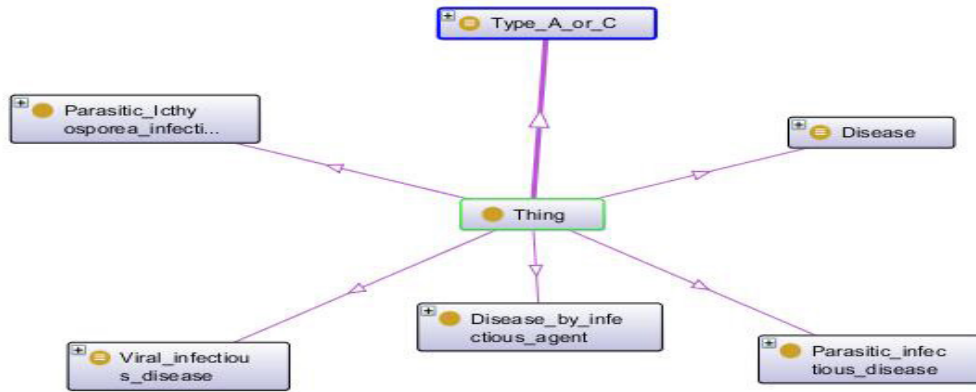


Fig1 : Display of Term Candidates in an Unstructured List

Classes used are highest occurrence of Disease and its diagnosis, Symptoms of individuals, Causes of disease, Its prevention and Vaccines, Etiology. Relationships used are Named_Disease, Caused_By, Used_to_diagnose, Types, Has_severity, Managed_To, Disease_Name, Managed_by, Used_to_cure, Inter individual relationships are represented in the following Fig2.

diseases.

After SwineFlu disease ontology is developed, the next step is we evaluated our ontology using a Fact++ Reasoner which verified the ontology by executing each class and their properties.

Results & Discussion

Performance Evaluation

Our paper deals with SwineFlu ontology to disseminate knowledge to the user regarding SwineFlu the symptoms risk factors vaccines drugs Type_A/ Type_c. we conducted one experiment to gather information regarding SwineFlu on two sets of users. One set of users has awareness on SwineFlu and the other does not have any awareness on SwineFlu. Taxonomy on SwineFlu ontology was shown in fig 1 where it comprised of classes, objects and instances. Various queries are posed on ontology and performance was evaluated as such which query gives the better performance. The type of queries used here are SPARQL Ontograf and SWRL.

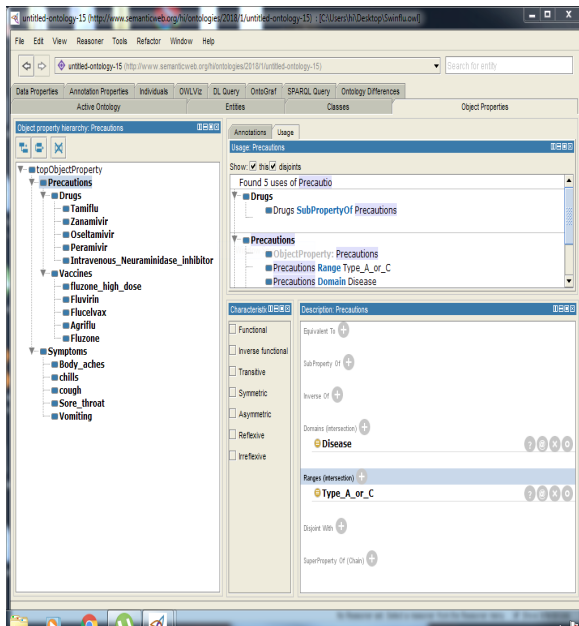


Fig 2: Snapshot of inter individual relations in swine flu

1. User is asked to find the term “Fever” from Disease ontology

```
SPARQL query:
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX ab: <http://semanticweb.org/chandana/ontologies/2018/2/untitled-ontology-54#>
PREFIX ns: <http://semanticweb.org/chandana/ontologies/2018/2/untitled-ontology-54/swineflu#>
SELECT ?subject
WHERE {
?subject ?predicate ?object FILTER
regex(str(?subject), "Fever", "i")
} order by ?subject
```

Fig 3: Query 1

Fig 3: Query 1

2. User is given the SwineFlu details and is asked to find the drug which is used to cure “Cough”.

```
SPARQL query:
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX ab: <http://semanticweb.org/chandana/ontologies/2018/2/untitled-ontology-54#>
PREFIX ns: <http://semanticweb.org/chandana/ontologies/2018/2/untitled-ontology-54/swineflu#>
SELECT DISTINCT ?object
WHERE {
?subject ?predicate ?object
FILTER regex(str(?predicate), "curedBy", "i")
FILTER regex(str(?subject), "Cough", "i")
} order by ?subject
```

Fig 4: Query 2

3. Query for the user about the year of attack of disease like “In which year particular patient affected with swineflu disease”.

```
SPARQL query:
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX ab: <http://semanticweb.org/chandana/ontologies/2018/2/untitled-ontology-54#>
PREFIX ns: <http://semanticweb.org/chandana/ontologies/2018/2/untitled-ontology-54/swineflu#>
SELECT DISTINCT*
WHERE {
?subject ab:PatientID=50.
?subject ?predicate ns:hasSymptom swineflu
}
```

Fig 5: Query 4

Different users tried to find out the information regarding swineflu disease on the basis of results retrieved by SPARQL, Ontograf, SWRL. There after NASA TLX(Task Load Index) As been used for query analysis and time need to perform execution.

A comparative study on the results obtained by using different queries is done from this study. The SPARQL query has given higher efficiency and performance in retrieving the results when compared to other tools like ontograf, SWAL Query. This comparison states that SPARQL is far better suited than other tools in giving optimal results.

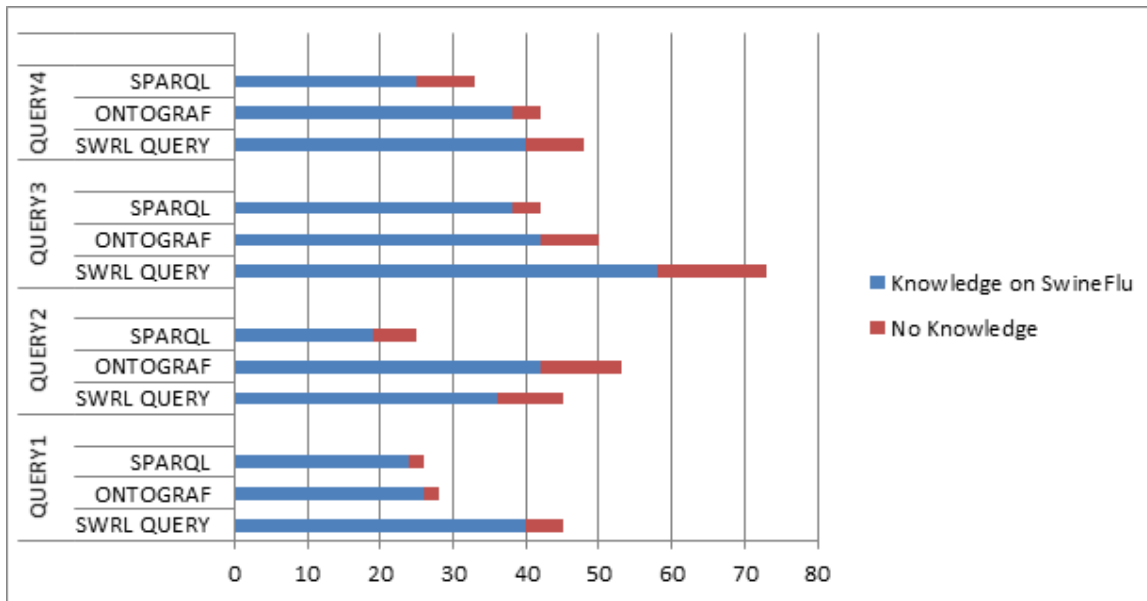


Fig 6. SPARQL, Ontograp, SWRL Query TLX and Time Comparison.

Conclusion

This paper gives knowledge on the creation of domain ontology for SwineFlu Disease and the queries are done using SPARQL. This gives performance analysis on ontological evaluation based on ontological tools. The analysis results state that SPARQL method is efficient method and it outperforms the other querying methods. Semantic web being intelligent web is used for developing ontology for swineflu that is useful for medical information systems that provides a linked data for the benefit of health care systems. This can be extended with machine learning to train the patterns so that ontology for other respiratory diseases can be developed in future.

Ethical Clearance- This research was approved by the Research and Ethics Committee of the ESI Hospital, Pulmonology center, Chest Diseases, ESI, Hyderabad,India.

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Conflict of Interest - None declared

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Constitutionality of Attempt to Commit Suicide- Unlocking The Controversy

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Abstract

A person is born free but he does not have this freedom to choose his death. Suicide is a deliberate act of killing of oneself. Suicide as such is not a crime but when an attempt is taken it can be considered as one under Section 309 of Indian Penal Code. The debate round the corner is whether attempt to commit suicide should be punished or not. A person was aware of the outcome of committing suicide, still knowingly takes an attempt. Suicide as a problem is the mixture of social, psychological, philosophical, moral, ethical and legal reasons behind it. An act of suicide requires grave awareness because there is nothing an ordinary prudent man fears more than his death, and that fear in the huge majority of cases, is as logical as it is inevitable. This paper has drawn the attention towards the ongoing debate of retaining or deleting Section 309 by testing its validity on the ground of Article 21 of the constitution of India which provides right to life as a fundamental right.

Key words- *Suicide, attempt, crime, right, life, death*

Introduction-

“To be, or not to be-that is the question:

Whether it is nobler in the mind to suffer,

The slings and arrows of outrageous fortune,

Or to take arms against a sea of troubles,

And by opposing end them.”

- Shakespeare, Hamlet, III, i.

The right to take one's own life has become much discussed topic throughout the world. A person who succeeds in taking away his life escapes all worldly miseries as well as legal action whereas one whose attempt fails is drawn into the dragnet of criminal courts. A person when enters into the stage of life finds only one entrance to go inside but with several exit doors to come out of which suicide is one such exit door. Several

researches are being made throughout the globe to find out the causes and outcomes of suicide. The World Health Organisation in 1968 while carrying on one such research found out suicidal act to be 'the injury with varying degree of lethal intent'. The Organisation further differentiated between suicidal acts with fatal outcome and non fatal outcome as- the former being coined as suicide and the later as attempted suicide. For whatever reason it might be caused, but suicide is never being appreciated as an act to be commended. Mythological treatises like the Holy Quran and Bible expressly prohibit the act of suicide. Hindu Dharma too believes that a person committing suicide will be devoid of attaining 'Moksha', i.e. free from the cycle of rebirth due to good fortune and that his soul will roam around with severe pain.¹

Suicide is a more of a concept related to moral, religious or psychological qualities of the person or the existing socio-economic, cultural circumstances of the society. Section 309 of the Penal Code deserves to be eradicated from the statute book to improve our penal laws. It is inhumane and illogical provision, and it may effect in punishing an individual all over again who has undergone pain and would be undertaking humiliation as of his unsuccessful attempt to commit

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suicide. For coming to a conclusion that Section 309 of the Indian Penal Code is obsolete, unreasonable and unkind the court appears to have closely relied upon 42nd Law Commission report which had in early 70's itself suggested the removal of the offence of attempt to commit suicide from the Penal Code.²

The question whether the crime of attempted killing oneself is punishable or not has been a topic of moral and legal debate over a long time. Right to life is a natural right embodied in Article 21 but suicide is an unnatural termination or extinction of life and therefore, incompatible and inconsistent with the concept of right to life; is not like other Fundamental Right such as the right to form associations and speech which are positive rights. Right to speech includes the right not to speak, the right to form associations, includes the right to form associations. But the right to life does not include the right not to live.³

The act of attempted suicide is always given more importance than the act of committed suicide as because in case of the later the culprit is no more alive to get punishment, but in the former case the culprit is still alive to get some deterrent punishment so as not to repeat the same offence in future. Section 309 of the Indian Penal Code categorically makes attempt to commit suicide punishable, but time and again there arose several debates on the necessity of retaining or deleting this section from the statute book. The judiciary too perceived the criminalization of suicide with contrasting views. While Article 21, the life-line of all fundamental rights under the Indian Constitution guaranteeing right to life and personal liberty, sometimes interpreted to be including right to die under its wrap, in some other cases it is bluntly denied of having any such interpretation. Considering the legislative intent behind insertion of penal provision for attempt to commit suicide in the 1860 statute, it could be very well understood the amount of importance given to the dignity of human life in that statute considering human life is precious not only for the person concerned holding it but also for the State which cannot stand blind-folded by allowing the person attempting to commit suicide set free without any punishment. Something deterrent would make the offender aware of the value of his life for himself as well as for others. The persons criticizing this view are of the opinion that the insertion of Section 309 under the Penal Code is altogether a wrong provision as it punishes the distressed person doubly who had tried to end his life due to deep depression. Instead of having sympathetic

approach towards the victim, if further punishment would be inflicted upon him it would be simply ruthless act. The supporters of this view also opine that why the State remain as a silent spectator in thousands of cases when saints due to their faith and belief went on fast for indefinite period without being punished under section 309? ⁴

If a person succeeds in committing suicide, he is saved from being convicted but if he survives he may face legal consequences. The logic is obvious Article 21 of the Constitution which is its backbone and the people who advocates the theory of deletion of Section 309 of IPC on the basis of Article 21 of the Constitution. Article 21 of the Constitution provides that "No person shall be deprived of his life and personal liberty except according to procedure established by law" So, it the duty of the State constitutionally that it should protect a citizen's life howsoever his condition is miserable.⁵

The problem of suicide is of controversial nature, The Constitution of India provides religious freedom from Article 25 to 28. However, no religion allows suicide, whether it is Hinduism, Christianity or Islam. Christianity prohibits suicide considering it as a sin which leads to a felony. In Hinduism it is considered that there is a process of rebirth, i.e. life after death. Still it appears that Hindu law does not permit Suicide. In Islamic law, it is believed that Allah has given the life to serve the society and it will be disrespect to Allah if someone takes his own life.⁶

Objective-

The purpose of research in this topic are-

1. To know whether the fundamental right to life includes right to die.
2. To know whether attempt to commit suicide under Section 309 of Indian Penal Code violates Article 21 of Indian Constitution.
3. To know how the Indian Judiciary is tackling these types of cases relating to attempt to commit suicide.

Constitutionality of Sec. 309 IPC with Reference to Fundamental Rights-

What is an attempt of commit suicide? An attempt implies at least an act towards the commission of suicide, such as drowning or poisoning or shooting oneself. If a person throws himself into a well with a view to

drowning himself, and if rescued, he is guilty of such an attempt as is punishable under this Section 309 IPC.

In *Emperor v. Mst. Dhirajia* [AIR 1940 All. 486] a twenty year old lady ran away from her husband's house after serious confrontation between the two with her six-month old child. The husband followed them and found them crossing the railway line. The lady apprehending him coming closure to them, got frightened and jumped into a nearby well with the baby in hand. This caused the death of the baby, but the lady was rescued with slight injury. The lady was subsequently charged with two offences- one for murdering her child and the other for attempting to commit suicide. The court, however, discharged her from the charge of murder of her baby considering absence of mens rea in the act as it was caused out of fear without any guilty intention. Regarding the second charge for punishing the lady under sec.309, the court was of the view that the word 'attempt' used under the provision speaks for some conscious effort made on the part of the offender to constitute the act, which was lacking in the instant case as the lady jumped into the well being frightened and without having the consciousness of the act she was committing.⁷

Regarding the Constitutionality of Sec. 309 of IPC, lots of diversifying views have come to the fore by the Hon'ble Apex Court time and again. For the first time the question was raised in the Delhi High Court in 1985 in the case of *State v. Sanjay Kumar Bhatia* [1985 CrL.J. 931] where the Division Bench headed by Sachar, J. Held the view that continuation of sec.309 in the Indian Penal Code would be an anachronism disgraceful for the Indian society. The court, however, not gave any comment on the constitutional validity of the provision.

In *Maruti Sripati Dubal v. State of Maharashtra* [1987 CrL. L.J. 743] the Division Bench of Bombay High Court presided by P.B. Sawant, J. Was of the view that Sec. 309 of IPC is violative of Art. 14 of the Constitution for being discriminatory in nature and for violating arbitrarily the equality guaranteed to the persons. The provision was further held to be violative of Art. 21 as right to life include the right to terminate one's own life also.

In *Chenna Jagadeshwar v. State of Andhra Pradesh* [1988 CrL. L.J. 549] the Division Bench of Andhra Pradesh High Court, however, rejected the above contention made by the Bombay High Court and held that Sec. 309 IPC is not violative of Article 14 and

Article 21 of the Constitution

The decision of the Bombay High Court in *Maruti Sripati Dubal's* Case is however, gained much momentum by the Supreme Court in *P. Rathinam v. Union of India* [1994 AIR 1844] where a Division Bench of the Court presided by B.L. Hansaria, J. held that right to life under Art. 21 of the Constitution doesn't speak for a right to live a forced life to one's own disadvantage. The court further reasoned out that Art. 21 ensures the right to live with dignity which in no way can include to live with continuous drudgery. To justify the point, the Court expressed its view in the following lines:

"One may refuse to live, if the living be not according to the person concerned worth living or if the richness and fullness of life were not to demand living further. One may rightly think that having achieved all worldly pleasure and happiness, he has something to achieve beyond this life. This desire to communion with God may very rightly; lead even a very healthy mind to think that he would forgo his right to live and would rather choose not to live. In any case, a person cannot be forced to enjoy right to life to his detriment, disadvantage or disliking".

While categorically declaring Sec. 309 IPC unconstitutional, the Court further reiterated that "attempt to commit suicide is in realty a cry for help and not for punishment" and that right to life includes right to die also. Considering the point from a humanitarian approach, the Court held that when a person due to his various sufferings from life problems attempts to kill oneself, but becomes unsuccessful, if will be penalized for his act, it would be completely inhuman. Rather efforts are to be made to mitigate his problems by using separate methods.⁸

The Bombay High Court's decision in *Maruti Sripati Dubal's* Case to include right to die within right to life is, however, not declared absolute to be exercised under all circumstances, rather it was applicable only under certain situations satisfying the act. It entails in the absence of sufficient reasons for the court to rely upon for the attempted suicide, the act would be considered as an offence being punishable under the law.

The *Rathinam* verdict created large hue and cry throughout the country and within few months only again the Apex Court came to review the ruling through a full bench Court in *Gian Kaur v. State of Punjab* [1996 AIR 946]. The important point raised before the court

against the previous judgment was that after the principal offence of attempt to commit suicide is declared void being violative of right to life under Art.21, how the abetment for the same can be made punishable under Sec. 306 of IPC? It was contended that right to die being a part of Art.21 after declaration of unconstitutionality of sec. 309, anybody abetting another to commit suicide be not punished as abettor, rather he be considered to be assisting the victim to put into effect his fundamental right under Art. Considering the far-reaching adverse consequence of the Rathinam verdict and to put an end to the much debated controversy, the Court overruled the decision and held that 'right to life and personal liberty' as enshrined under Art.21 of the Constitution by no stretch of imagination can be extended to include 'right to die'. Clarifying the point further the Court held that "Right to life' is a natural right embodied in Article 21 but suicide is an unnatural termination or extinction of life and, therefore, incompatible and inconsistent with the concept of right to life". The Court also differentiated between 'Euthanasia' and attempt to commit suicide by saying the former may come within the purview of right to live with dignity up to the end of natural life and thus may include the right of a dying man to desire to die with dignity when his life is ebbing out, but the later in no way be equated with it to allow a person to die an unnatural death reducing natural duration of life.

No Constitution can ignore the rights of individuals living in the country to lead a life with dignity, failing which the fundamental rights available to the citizens will be meaningless. Keeping the judicial analysis made above in view, it can be asserted that right to life by no implication be stretched to include right to die as it may lead to social disorder. If sec. 309 be declared as ultra vires, punitive actions cannot be taken against those adopting the practice of attempting to commit suicide with the plea that they have right to do so. It is true that in most of such cases the victims attempt such acts due to heavy mental stress, for which instead of punishing, some reformatory actions be taken against them. The very essence of sec. 309 also doesn't mandate for punishment in every case, rather it only sets the higher limit of such punishment. The courts are endowed with enormous power to ensure that unnecessary harsh dealing or injustice is not caused to the victims who are under severe mental stress.⁹

Conclusion

Attempt to commit suicide from an offence to

no offence to an offence and now in verge of again happening to be a No Offence. However, declaration of unconstitutionality to sec. 309 IPC would adversely affect the continuance of the provision under sec. 306. Ours is a male dominated society, women in some areas being still illiterate and bound by blind traditions. They very often fall victims to the cruel and inhuman treatments by their male counterparts and in-laws. Under such circumstances if any woman commits suicide, the persons responsible for active assistance and inducement to commit suicide may leave scot-free. It is quite pertinent that a society being unresponsive to social causes have no right to punish the distressed. At the same time it is also not possible for the State to adopt the principle that those not able to lead a dignified life are allowed to depart it.

Ethical Clearance: Not required, as the article is based on aspects which are doctrinally taken.

Source of Funding : Self

Conflict of Interest : Nil

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Perspective on the Immorality of Honor Killings – A Review Article

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Abstract

The killing of a family member, when the offenders believe that the victim's activities have resulted in immense dishonor to the family or community is called honor killing or shame killing. The absence of systematic data collection in most countries has resulted in lack of clarity on the judicial approach and its consequences, with many of the killings being reported falsely as suicides or accidental deaths by the families. Honor killings are prevalent all over the world, with the majority of them happening in the Asian countries, closely followed by the Middle East and South Asia regions. This review article attempts to analyze the present legal status of honor killing in the country of India, predominantly in the southern states. The sensational killing of a Dalit youth, Gokulraj in 2015 found in the company of a girl belonging to the Gounder community at a temple in Tiruchengode, sent shock waves across the state. Another prominent case occurred in the state of Tamil Nadu, where the marriage of Ilavarasan – a Dalit youth from Dharmapuri to a Vanniyar girl from Sellangottai, evoked deep conflicts in 2013, that led to the former's body lying on a railway track. With the ideals of 'honor' and 'disgrace' being deeply rooted in the Indian mindset, the laws alone will not suffice to curb such forms of violence and it has to be addressed as a sociological issue.

Key Words: Honor Killing, Khap Panchayat, Dalit, Vanniyar

Introduction

About The Crime

The killing of a family member, when the offenders believe that the victim's activities have resulted in immense dishonor to the family or community is called honor killing or shame killing. The reasons for this usually include events such as inter-caste marriages involving a caste hierarchy, refusing an arranged marriage, illicit relationships, separation from spouse, etc. These offences, are considered to be as misdeeds

or insults against the family, their traditions and social customs.

The victim's family members, most commonly men who believe they have been disgraced, are generally the perpetrators of honor violence. However in certain cases the men could also be victims of honor killings. Honor killings need not always be carried out by the family alone but may also be ordered by the community leaders or tribal councils.

The perpetrators justify the act on the basis that it was an act to uphold the honor of the family which was otherwise tainted by the behavior of the victim. It stems from strong religious and cultural principles that the perpetrators are taught by the elders in their family.

Although they bear a resemblance to domestic violence in terms of the most common perpetrator and victim, honor killings are culturally deep-seated. [1]

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Global Scenario

The absence of systematic data collection in most countries has resulted in lack of clarity on the judicial approach and its consequences, with many of the killings being reported falsely as suicides or accidental deaths by the families. Honor killings are prevalent all over the world, with the majority of them happening in the Asian countries, closely followed by the Middle East and South Asia regions. According to an estimation done by the United Nations in the year 2000, an estimated 5,000 women are honor killed each year. [2]

Honor Killings In India

India is renowned for its high incidence of honor killings. The extent of the gruesome crime varies from state to state, with it being more common in the states of Punjab, Delhi, Rajasthan, and Bihar, largely due to the presence of 'Khap Panchayats' or 'Caste panchayats'. Tamil Nadu has become another epicenter of these crimes with increasing occurrence over the years.

Being a multicultural society, with variegated beliefs and faith forming the crux of every domain, honor crimes cut across all boundaries of caste, creed, class, religion, wealth and nationality.

Aim

To analyze the present legal status of honour killing in the country of India, predominantly in the southern states

Materials and Method

Primary sources – Cases in which post mortem was performed by the authors.

Secondary Sources – An extensive search was conducted from databases of valid studies to

explore the incidence, causes and approaches to honor crimes and a detailed analysis of the same has been made in order to reach conclusive results and emphasize on the necessity for a proper legal framework.

Causes and Method

There is no one specific cause for honor killing to occur and there are numerous, that interact with one another which include the following. Refusing an arranged marriage or marrying by own choice puts the family at the risk of "disgrace" such as in the case of a

21 year old girl in Delhi, who was strangled to death in November 2014, for an inter-caste marriage, by her parents, in whose eyes, the act had destroyed the family's prestige. [3]

1. Divorce: The woman is shamed for public display of her marital problems through attempting to obtain a divorce from her husband, especially when the marriage is arranged and involves dowry

2. Fear of Ostracization and isolation of a family by the society when allegations and rumors are set afloat about a female member.

3. Immodest dressing, which is beyond the norms of the society

4. Victim of Sexual offences: They are often considered impure and are believed to have brought upon dishonor to the family, especially if the victim gets pregnant. [4] Central to it is the misconception associated with the virginity of a woman where it is considered to be a property of her father gifted to her husband.

5. Heterosexual acts and non-sexual relationships out of marriage are perceived in the same light.

6. Homosexuality is another major factor thought to have brought dishonor to the family. This is considered to be more a crime when it is between two women. There is evidence to show that homosexuality is perceived to be ground for honor killing as seen with the killing of the Homosexual Turkish student Ahmet Yildiz in 2008.

Why Is Honor Killing Prevalent?

1. Patriarchal Society :

Every action of a woman is linked to the honour of her family which are hence controlled largely by the male members. Lack of respect for the choices and individuality of a woman is a contributory factor.

2. Caste System:

India is a country which is diverse not only in its culture but also in the number of castes that exists. The superior or inferior status of an individual is decided by the caste that one belongs to. Hence marrying someone outside of the caste is considered to be a big crime and a dishonour to the family. [5]

In connection with this there has been a Supreme court observation in the Latha Singh v. State of Uttar

Pradesh (2006) 5 SCC 475, which says that honor killings are basically cold blooded murder and that there is no honor in such acts. It also observed that in order to strengthen the social fabric, more of inter-caste and inter-religious marriages should be encouraged.

3. Khap Panchayats:

A community especially found in villages and in Northern India is the Khap Panchayats which is seen to exert a social influence within the community. These people take law in their own hands and mollycoddle in activities that are not only offensive, but that, which could endanger the personal lives of persons marrying according to their free will.

Courts have provided a number of judicial decisions against the wrong doings of the Khap Panchayats. One such decision was provided in the landmark case of Smt Laxmi Kachhwaha v. the State of Rajasthan (1999). A Public Interest Litigation was filed against the illegal functioning of Khap Panchayat in the Rajasthan High Court citing the reason to be violation of an individual's basic rights. The Court ordered State authorities to restrict the functioning of such Panchayat and also see to it that members of the said Panchayat be arrested and punished. In another case of Arumugam Servai v. State of Tamil Nadu (2011), the Apex Court was of the opinion that once a person becomes a major, it is his/her will to decide about the person they want to marry.^[6]

4. Inadequate education and lack of awareness leading to lack of sensitisation against the problem

5. Absence of stringent enforcement of laws :

Despite the increasing incidence and public outrages over the crimes, there exists no legal recognition, no protection offered to self-choice couples, no measures for the prevention and control of such barbaric acts and no punishment. Currently the crime is only reported as – Murder (section 302 of Indian Penal Code) and Culpable Homicide (Section 304 IPC). In 2015 there were 251 honour killing cases registered in the country a huge increase from what it was in 2014 of 28 cases.^[7]

LEGAL ASPECTS:

EFFECT ON CONSTITUTIONAL PROVISIONS:

This heinous crime is known to violate multiple provisions of the Constitution and basic human rights. Rights that are violated included those under Article

14(Right to Equality), Article 15(1) and (3) (prohibition of discrimination on grounds of religion, race, caste, sex or place of birth), Article 17(Abolition of Untouchability), Article 19(1) (freedom to speech and expression) and Article 21(right to life and personal liberty).

Considering Article 39(a) of The Directive Principle of State Policy (DPSP) , which makes it imperative for the State to secure the livelihood of all citizens, honor killings seem to deprive the victims of their very lives. Many young couples are put in a dangerous environment and exploited of their lives.

Legislations:

1. Indian Majority Act, 1859: According to by Article 21 -Right to marry is a constitutional right. A person, who is the citizen of India attains age of majority after completion of 18 years under Section 3 of Indian Majority Act, 1857. Once majority is attained the individual can decide to marry the person of their choice. The laws do not prohibit inter- caste, inter-community or inter-religious marriages which are common triggers for honor crimes.^[8]

2. Special Marriage Act, 1954: According to this act, any citizen of India including those living outside of India can marry irrespective of religion, caste or faith of the parties. The act aims to provide a special form of marriage for this purpose.

3. Protection of Human Rights (Amendment) Act, 2006: This act guarantees access to legitimate legal and fundamental rights.

4. Domestic Violence Act, 2005: Preventing a woman from marrying a person of her choice amounts to emotional abuse.^[9]

5. **The scheduled castes and scheduled tribes (Prevention of Atrocities) Act, 1989** - Most honor killings occur in relation to the Scheduled castes as they are considered to be one of the lower most castes in the hierarchy of castes. Any dishonorable acts against individuals of these castes are punishable under this act.

International Laws and their Applications:

Honor killing is prevalent not only in India but also places outside of it. The crime encroaches upon the Universal Declaration of Human Rights, 1948.^[10] According to the Article 1 & 2 of the Convention, “all human beings are born free and equal in dignity and

rights.” Article 3 states that” everyone has right to life, liberty and security”. Article 16 of the declaration gives all individuals who have attained majority , the freedom to choose the person to marry without any restraint due to religion, race or nationality.^[11]

India, being a signatory to the United Nations Convention on Elimination of all forms of Discrimination against Women (CEDAW 1979), is legally bound to enact policies and laws to alleviate all forms of honor killings and abolish gender based violence on women.^[12]

Judicial Approach

The approach to meeting out justice in the case of honor crimes has undergone a gradual change as reflected by the judgements and judicial trends with punishments being targeted at violation of the Constitution.

The Karnal District Court meted out justice to the deceased victims of the cruel act, Manoj and Babli, that eloped and married in June 2007. Five perpetrators were executed and the Local “Khap” (Caste based Council) head was given a life sentence.^[13]

The Supreme Court, in yet another judgement, described honor killings as threats or acts of harassment that are wholly illegal and attract severe punishment. The Division Bench expressed its concern over the consequences of inter-caste marriages, in the famous *Lata Singh vs State of U.P. and Anr* case, wherein it stated that

“Once a person becomes a major he or she can marry whosoever he/she likes. If the parents of the boy or girl do not approve of such inter-caste or inter-religious marriage the maximum they can do is that they can cut off social relations with the son or the daughter, but they cannot give threats or commit or instigate acts of violence and cannot harass the person who undergoes such inter-caste or inter-religious marriage.”^[14]

A parallel can be drawn to the case of *Jyoti Alias Jannat and Anr vs State of UP and others*, where the importance of the Indian Majority Act was reinstated.^[15]

The sensational killing of a Dalit youth, Gokulraj found in the company of a girl belonging to the Gounder community at a temple in Tiruchengode , by the President of the Dheeran Chinnamalai Peravai, a Kongu- Vellalar

caste-based outfit in 2015 sent shock waves across the state when Tiruchengode DSP Vishnupriya was found dead. Post mortem examination of the victim by one of the authors of this article revealed that the possibility of a homicide could not be ruled out.

Another prominent case occurred in the state of Tamil Nadu, where the marriage of Ilavarasan – a Dalit youth from Dharmapuri to a Vanniyar girl from Sellangottai, evoked deep conflicts in 2013, that led to the former’s body lying on a railway track. Though an author of this article who performed autopsy in this case gave evidence for a homicide, it is still undergoing a series of trials.

Conclusion

The alleviation of social evils such as honor killings is a multi-step process requiring equal gender relations to be established. A state’s asset is its citizens and safeguarding the same by preventing the violation of human rights, offering them protection and the necessary opportunities for the oppressed to seek support and aid, is hence its prime responsibility.

An efficient legal framework, stringent actions and effective enforcement alone cannot accomplish the task. Instead, every realm– social, economic, cultural and political will have to be sensitized to the ill-effects of the gory act to tackle the problem at hand by analyzing from all angles.

With the ideals of ‘honor’ and ‘disgrace’ being deeply rooted in the Indian mindset, the laws alone will not suffice to curb such forms of violence and it has to be addressed as a sociological issue.

The CEDAW convention believes in enforcing stringent laws against such heinous crimes. Due to certain loopholes in the law, some perpetrators escape even though most of them are punished.

Recommendations:

1. Systematic data collection
2. Improving service provisions for men due to the neglect of male victims.
3. Stringent laws with an effective framework should be enforced immediately deal exclusively with honor killings.
4. Change has to be brought in the mind set of

the people and for this awareness should be created. Stress should be given on the fact that honor killing is a punishable offence and those committing it should be punished severely.

5. Propaganda about the caste systems should be reduced

6. Khap panchayats should be abolished completely as they do not have any legal recognition

7. Education plays a pivotal role in preventing deaths caused by a lack of awareness amongst people belonging to the poorer socio-economic strata.

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International Humanitarian Approach on ‘Identity Crisis’ of LGBTQ: A Global Perspective

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Abstract

Unlawful attacks on sexuality perpetuated by intolerance of the binary sex poses a serious concern on the honour and reputation of a transgender person being an ‘individual’ making the minority vulnerable with poor physical and mental health. Being a person with diverse sexual expression is no limitation to enjoy basic inalienable rights being a ‘human’ suppressing sexual orientation and identity is an arbitrary denial of right to love with dignity. Streets taking up ‘pride parade’ movements confronting the Governments demanding progressive laws against discrimination, harassment and degrading treatment, recognition of their constitutional fundamental and basic human rights still remain far from reality. International commitments drafted at Conventions remain non-functional because most of the legal systems defend a stigmatised religious attitude and intolerance of culture. However, regardless of variation in customs, culture or societal norm, it is obligated on countries to secure freedom of expression of LGBTQ for an inclusive society. Homosexualities in sports and athletes have shown apologetic and disheartening incidents of voyeurism, trauma and humiliation. The alleged sex controversy of 2012 involving the Asian Games gold winner Pinki Pramanik (Indian Athlete) raised disturbing questions on a person’s anatomical features, right to privacy of body, standards of morality when she was mistreated and lodged in a male prison on accusations of raping her live-in-partner. This paper is an attempt to bring out the perspective of world community on personhood and human rights of the LGBTQ/transgender community.

Key Words: LGBTQ, Identity, Equality, Gender, Discrimination.

Introduction

Over the centuries they have endured cruel forms of physical assault, forced prostitution, hate crimes even honour killings. The prevailing social-political scenario and existing legal framework appear to be indifferent and negligent to the agony of the community who for no fault of their own suffer grave injustice at the hands of its fellow beings and the State. Thus, the paper intends to offer an insight into the state of affairs of the Government, the Judiciary in working out a humane approach towards the LGBTQ community or ‘third gender’ and looks ahead with some suggestions that will hopefully ensure equity and justice in true sense. United

Nations Declaration on Human Rights (1948) has put an umbrella cover against all form of discrimination under Article 2, wherein, every individual has been granted rights and freedoms set forth in the UN’s Declaration irrespective of any distinction of any kind. While Article 1 safeguards for all an equality before the law and equal protection of the law, Article 12 protects right to privacy from arbitrary interference, any target upon honour and reputation of individuals. The Committee on the Rights of the Child (CRC), too stress that discrimination against vulnerable or marginalized groups of children (including children who are lesbian, gay, transgender or transsexual) must be addressed by the States parties.

Socio-Legal Perspective: Degrading treatment towards LGBTQ is often coupled with other parameters of superiority norms e.g. race, religion, disability, or economic, social or other status. Trans people across different countries face complex human rights issues often questioning their ‘gender identity’ unlike the self

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acclaimed superior genders of ‘male’ and ‘female’ who are perceived normal and without any chromosomal deficiency or discomfort in biological body. Apart from the instances of abuse, ostracization, and hate crimes, the following concerns need to be empathetically addressed across the globe under domestic laws and welfare policy measures justifying standard norm of ‘equality’ and ‘freedom’ meaningful irrespective of gender in whatsoever diversity ;

1. Invasion on right to privacy
2. Criminalisation of homosexuality
3. Restricted access to health services
4. Limited access to public places and institutions
5. Exclusion from employment and livelihood opportunities
6. Forced labour, slavery and sexual exploitation
7. Discriminatory treatment in access to education
8. Freedom of free speech, assembly and association
9. Citizenship rights and freedom to participate in all civic body elections
10. Legalising right to marriage, parenthood, adoption

International Scenario: Though the countries have ratified commitments under the International law to safeguard individuals from cruel inhuman and degrading treatment, they have failed to realise the same. However, the last few decades have seen some visible movements, protests by the LGBTQ community leading to formal, intergovernmental meetings at the United Nations and other fora, demanding right to self identity, a life of dignity and mainstreaming into the society. At this juncture, the Yogyakarta Principles of 2006 comes as relief to ensure that States ensure and implement the obligations ratified under various International covenants, treaties or protocols. Keeping in view the growing concern on raising violations of human rights on account of orientation and identity, the Yogyakarta Principles plus 10 (adopted on 10 November 2017) to complement the Yogyakarta Principle on additional provisions of State

in respect of application of the International Human Rights Laws as to Gender Expression, Gender Identity, Sex Characteristic and Sexual Orientation.²

The International Covenant as to the Civil and Political Rights, 1966 has a vital responsibility of upholding and protecting the human rights of people without any discrimination. Various provisions relevant to the mandate of such protection include Article 2(1) which emphasizes on the State parties to ensure to all individuals irrespective of distinction of any kind all the rights recognized by the Covenant. Article 26 on the other hand emphasizes on ‘equality before law’ thereby entitling every person protection of law without any discrimination.³

Rights of Transgender: A Global Context

Australia: The Australian Parliament passed same sex marriage laws in December 2017 with questions concerning adequate protection of ‘freedom’. Other legislation such as Family Law Act, Migration Act, Sex Discrimination Act etc. has to be amended so as to adapt the legislations consistent to the requirement of new law making the definition of ‘marriage’ which is being changed from a ‘union of man and woman’ to ‘union of two people’ in the Marriage Act, 1961.⁴

Bangladesh: The Human Rights Watch, a non-governmental human rights organisation has time and again asked the Bangladesh Government to develop legal mechanisms to better protect the human rights of the transgender, but in vain⁵. In 2017, few transgender persons from different parts of Bangladesh were interviewed by the Human Rights Watch and almost all of them allegedly spoke about being bullied at schools. They also expressed the difficulty in accessing health care, harassment in private and public places, barriers to employment etc. On the top of this, they were also attacked by religious extremist and targeted for their gender identity⁶.

Amidst all the issues faced by transgender in Bangladesh, though some small steps has been taken by the Government in the recent years, but declaration of legal recognition and policy implementation still remains a distant dream in Bangladesh with government rejecting

recommendation of the United Nations Human Rights Commission (UNHRC) to repeal the old draconian law forbidding same sex conduct.

China: Homosexuality was decriminalised in China way back in 1997 but same sex partnerships are yet to be recognised. Also, laws for protection of people from discrimination on basis of gender identity and sexual orientation are yet to be reformed. Moreover, the attitude of the Government towards homosexuality and transgender is quite paradoxical with instances of Chinese Authorities shutting down popular dating Application (App) for Lesbian online video programmes on abnormal sexual lifestyles. In addition to that, transgender communities are forced to cancel events and 'Speak Out' conferences. Also, instance of 'conversion therapy' continues in the country including electro shock therapy questioning the protection measures of the Government⁷.

Europe: The European Union was one of the first international organisations to recognise sexual orientations explicitly. The protection of LGBT was first included in the Amsterdam Treaty of 1997. In 2000, in the Charter for Fundamental Rights, the directive for Equal treatment (in respect of trade and job prospects) of LGBT community was established in order to protect against discrimination. Also, the EU has got protection for the UK citizens on same sex partnership or marriage (who have registered their partnership or married in UK) when they work, live and travel within the EU continue having their relationship recognised and all legal rights protection intact⁸.

In the year 2013, guidelines in supporting LGBT human rights were adopted by EU which is being used by the staff and embassy of the EU countries all over the world. Recently, in the year 2017, Council of Europe Secretary General T. Jagland highlighted the need of effective and strong anti-discrimination laws and following the same the ECtHR ruled that it is grave violation of human rights to force the transgender to undergo sterilisation operation to have their gender recognised. Later in March 2018 a resolution was passed by the European Parliament condemning the Conversion therapy and the EU member states were thereby urged to ban the practice⁹.

United States: The LGBT rights have significantly progressed over the period of time but the rights vary by

jurisdiction. In Mississippi, until April 2016 when the govt enacted laws for LGBT community, discrimination based on religious and moral bias as to same sex marriage and recognition of transgender identity was permitted. In Michigan, the State funded adoption and foster care agencies are at a liberty to refuse to place children with LGBT parents on grounds of moral and religious objections. In some States, due to their religious exemptions, LGBT people fear mistreatment in public places and from seeking services. Almost hundred Bills promoting LGBT rights were introduced by legislators in several States in 2017¹⁰.

Rights of Transgender in Indian Context:

Transgender constitute an integral part of every cultural diversity across the globe, subjected to similar prejudices owing to their sexuality and gender with denial of basic human rights and restrictive definitions of 'freedom' negating and affecting recognition, realization of rights on the same footing as secured under international law. They comprise a diversity including lesbian, gay, and bisexuals, cross dressers. In India, however, it has assumed distinct and separate class/category which may encompass various visible regional and trans-regional communities like hijras/kinnars, kothis, aravanis, jogtas, and shiv-shaktis¹¹. From guaranteeing right to dignified life (Article 21), securing primary right to 'freedom of expression' (Article 19), 'equality before law' (Article 14), safeguarding from discrimination on any ground be it race, caste, religion, sex and place of birth (Article 15) and equal opportunity of employment (Article 16) to protecting against human trafficking and forced labour (Article 23), the Constitution of India promises to gift a dignified way of life.

Dilemma of Identity: Gender identity and sexual orientation has been the key criteria for ascribing various rights under the NALSA judgement establishing identity with the gender is person's right to self-identification either as binary sex or transgender or other category where one's orientation indicates to individual's enduring physical attributes, or an emotional attraction towards other identities. The two-judge bench judgment though made assertive directives for the third gender and transgender, but the confusion over the word 'transgender' still hangs open for some vague interpretation. While, Justice Sikri, has given a restrictive definition to the term based on essentialist criteria,¹² Radhakrishnan J.

exhaustively interprets ‘transgender’ as an open ended umbrella clause embracing a variety of expressions and experiences including any surgically operative (pre or post) trans sexual people.

Dilemma of Special Status: India being a welfare State has made special provisions for its minority and marginalised groups considering their vulnerability, special condition and justifiable requirements (subject to criteria of ‘reasonable classification’) as permitted within the ambit of the Constitution. However, the newly coined status of ‘*socially and educationally backward classes*’ given to the transgender has raised some criticism. The question often raised is whether it is justified to categorise a minority community (transgender) within another minority class (SEBC) of citizens to give access to welfare measures under various schemes. Again there is a likelihood of confusion of associating the third gender under “Other Backward Classes” or the leaving wide ambiguous interpretations.

Though, the third directive under the NALSA judgement secures the transgender a status of ‘SEBC’ of citizens with all kinds of reservation(Quotas) in cases of admission in educational Institutions and public appointments, making Article 15(4) bring meaning to their long drawn plight in getting access to such public space.

The approach to categorise ‘TGs’ as a whole under SEBC replaces the axis of gender in the place of caste, however ignoring the fact that ‘minority community’ may span an array of class and caste positions. In the growing concerns and debate at State and national level on inclusion of third gender into a class based category or gender based reservation, the NALSA judgment is yet to yield some success in meaningful terms.

Conclusion

Transgender and people of LGBTQ community have been the worst victims of harassment and exploitation due to statelessness and no compartmentalised identity and also being deprived of access to basic education, employment opportunities within the society. Though safeguards are being made mandatory through national implementation of laws, very few objectives are being observed and realised in real sense. In India, while the ramifications and impact of landmark NALSA judgment are yet to stand the test of time in meeting the aspirations of minority community of ‘transgender’ against social stigma, existing binary laws and evolving legislations

seeking to protect their socio-economic rights, instances of societal rejection, marginalisation and discrimination seem to be on the rise.

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Direction of Environmental Virtue an Epilogue: A Critical Analysis of 19th Century Case Laws

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Abstract

In this race the Indian legislature, fortunately, has not lagged far behind and has shown great concern for degradation of environment” and made specific legislative attempts to control different environmental pollution in particular. On the other hand, the second limb of the state, the executive, has been moving at a snail’s pace or what Justice Krishna Iyer says, the bureaucratic machinery, which difunctionally, has passion for files, not for the people.” Whereas, the judiciary is trying its best to balance the environment and development. In view of the degrading environment which poses a problem for the very survival of living things, the environmental law academics lately started paying attention to this underdeveloped field. Out of the three components of the state, the academics in India have generally confined their discussions to the approach of the legislature. The executive approach in environment has yet to attract serious attention of the law academics’ writings. However, the judicial approach finds some place in the law writings. The present paper makes an attempt to take further the discussion on Indian judicial approach in the field of environment. Such academic exercise is all the more necessary in the present time because Indian judiciary since 1980 is taking special cognizance of the pollution explosion and there is a substantial increase in the case law in environment. Is not the time ripe to take stock of the direction of environmental legality in India? The present paper makes a humble attempt in this direction. It confines discussion to the cases of 1987 decided by the Supreme Court of India and the High Courts. This specific year has been selected because the graph of case law in environment from the year 1950 to 1990 shows its highest peak in 1987.

Key Words: *environmental pollution, environmental degradation, balanced approach, environmental legality, industrial activities*

Introduction

The life of human beings depends upon the ecological balance and environmental protection. If the human beings protect the environment and promote the ecological development automatically an environment free from pollution may be developed and with that development of the living conditions of human beings and living organisms will be developed. The environmental damage will be caused not only in the nation where it occurs but at the global level in general. All public institutions, including the judiciary, need

to make collective effort to fight against this universal peril. Human activities sometimes tend to submerge concepts such as respect for nature, trusteeship of earth resources and community interests in common amenities, present in the traditions of many developing countries. These traditions can be a rich source of inspiration for the environmental law of the future, where relevant attention is drawn to them. Environmental problems stem from two main categories of human activities. First, the use of resources at unsustainable levels and contamination of the environment through pollution and secondly discharge of the wastes at levels beyond the capacity of the earth and environment to absorb them or render them harmless results in ecological damage and environmental degradation. Environmental damage around the world includes: biodiversity loss, pollution of water and consequent health problems, air pollution resulting increase in respiratory diseases, causing

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deterioration of buildings and monuments, loss of soil fertility, desertification, increase in skin cancers and eye diseases in certain areas due to ozone depletion, and more widespread diseases. Environmental hazards are created by the excess consumption propensities of rich people, while the weight of environmental degradation is primarily borne by the poor people.

The year 1987 saw many judgments handed down by the Supreme Court of India while few cases were decided by the High Courts.¹³As regards the Supreme Court cases, many cases were decided by the Division Bench consisting of two judges and some cases by three judges. All the judgments were unanimous except the Sachidanand Pandey case where Justice Khalid, “fully agreeing” with the conclusion of Chinnappa Reddy “added few lines” to “delineate the parameters of public interest litigation.” And also, in the M.C. Mehta case, Justice K.N. Singh, “agreeing with every word” of Venkataramiah J. “added few words.” In the above two cases the individual judges, delivering separate opinions, did not deviate from the unanimous approach. Justice Ranganath Misra participated in the maximum number of environmental law cases followed by Justices P.N. Bhagwati and G. L. Oza. It was Justice Misra who wrote the maximum number of judgments. In the cases of 1987 during the Chief Justiceship of Justice Bhagwati, one finds that the Bench had invariably at least one judge who was already there deciding environmental law matters. As regards the High Court case law, the environmental law matter was handled mainly by three High Courts: Allahabad, Andhra Pradesh and Karnataka. The judgment of the Allahabad High Court was a decision of the Division Bench consisting of two judges, whereas, in the other cases it was a single judge opinion. But the Damodar Rao case makes history in the field of environmental law where Justice Choudary, under the influence of Maneka Gandhi’s wavelength tried to bring right to the enjoyment of a pollution free life under Article 21 of the Indian Constitution.

Now coming to the subject matter, the question of balancing ecology attracted maximum litigation. In most of the cases the petitioners pleaded for protection of environment. The pollutants which attracted the most attention included, industrial activities, mining technology, deforestation and building construction, with industrial pollution alone attracting ten case law. In this paper some cases the government or other authorities were defendants and in other cases the writ

petitions were filed against private parties. It is very clear in such cases that administration of environmental justice received a sympathetic consideration when the legal battle was fought by the social organization or social activist.

There are criticisms against the administration of environmental justice. An attempt is made in the present paper to find out how far it is true to label the Indian judiciary as not possessing the pool of skills, the fund of experience or being “not innovative and ill-equipped to deal with complex legal issues,”¹⁴The present study also examines different dimensions of environmental justice in India.

Industrial activities

The most dangerous pollutions caused by industry include air, water and noise. The problem of gradual deterioration in the environment of the present case law industries which attracted litigation included fertilizer, slaughterhouse and mining activities. In many cases, the Supreme Court adopted a balanced approach and allowed industrial activities to continue with Certain riders. It is interesting to note that the balanced approach orders or judgments were delivered by judges like Bhagwati, Ranganath Misra and Oza JJ. who were mostly on more than one Bench handling environmental cases. But this should not be taken to indicate that these judges learned in favour of balancing the competing interests.

Food and fertilizer industry

The multi-dimensional issues relating to environmental pollution were raised in M.C. Mehta v. Union of India, A.I.R. 1987 S.C. 965 case where the sole question was whether Shriram should be allowed to restart the caustic chlorine plant. The flashback of this case was that, there was a major leakage of oleum gas from one of the units of Sriram affecting a large number of persons, both amongst workmen and public, and it was alleged that an advocate practicing at the Tis Hazari Court died due to the leakage and within two days there was another minor oleum gas leakage. In view of these incidents, the inspector and assistant commissioner of factories issued orders prohibiting Sriram from operating their plants.

The aftermath of the Bhopal tragedy, opened the eyes of the Government of India and it started examining the question whether industries employing hazardous

technology and producing dangerous commodities, were equipped with proper and people living around them. There were committees after committees of accidental release of hazardous gas could endanger life of the people living in the vicinity of the caustic chlorine plant. Further, they were all unanimous that there was considerable negligence on the part of the management of Sriram in the maintenance and operation of the said plant.

The Supreme Court in this case was confronted with the problem of how to balance the pollution hazard of the chlorine gas over the (i) safety arrangements made by Sriram, (ii) interests of workmen, (iii) scarcity of chlorine, and also (iv) a task and with considerable hesitation, bordering almost on trepidation. While balancing development and environment, it tilted the scale in favour of development. It further stated that such an approach was essential for economic development and advancement of well-being of the people.

Some of the “stringent conditions” which the court imposed so as, “to almost reduce to nil” the hazard or risk, included:

First, the installation of effluent treatment plants.

Second, operator of the safety device and head of the chlorine plant would be held personally responsible if the expert committee or factory inspector found that the safety measures were not properly functioning.

Third, chief inspector of the factory or any senior inspector nominated by him or deputed by the Central Board would inspect the caustic chlorine plant at least once a week by paying a surprise visit

Fourth, the Chairman and Managing Director of the Delhi Cloth Mills Ltd., which was the owner of various units of Sriram, would give an undertaking that they would be held personally responsible for payment of compensation for any death or injury. It may be mentioned that section 16(1) and (2) of the Environment (Protection) Act 1986 specifically imposes personal responsibility on the above officers of the company. In view of the statutory strict liability the undertaking had no meaning.

Fifth, the condition provided that there would be a Committee of Workmen’s Union to look after the safety arrangements in the caustic chlorine plant.

Sixth, there were also conditions for protection of the workmen including training of workers in regard to functioning of the plant, warning and safety devices. The introduction of environmental education is one of the basic needs for protection and improvement of the environment.

Finally, Sriram was required to deposit Rs. 20 lakhs and bank guarantee for Rs. 15 lakhs had to be furnished within two weeks from the date of the present judgment for payment of compensation claims of the victims of oleum gas.

Slaughterhouse

An abattoir, having its plant in the agricultural area, was not permitted to further run its business. It was alleged that the abattoir was likely to pollute the rivet water used by human beings and animals and in no circumstances should it be permitted to run the plant. The Supreme Court¹⁵ upheld the order of cancellation of permission in the public interest. In this case, unfortunately, no light is thrown on the ecological problem, whereas the aspects of environmental problem involved were, first use of agricultural land for non-agricultural purposes; and second, pollution which could be caused by a large meat export industry.

Mining activities

Mining activity is a source of environmental pollution. In Rural Litigation and Entitlement Kendra,¹⁶ the main question before the Supreme Court was whether the mine lessees could be allowed to mine quarrying operations. The court was confronted with the difficult task either to protect the ecology and environment or to make available to the country, high grade lime stone deposits. The court in the present case shifted its responsibility and preferred a decision by the bureaucrats over the judicial finding.

At the same time, the court insisted that the natural resources have got to be tapped for the purpose of social development but this should be done with requisite attention and care so that ecology and environment was not affected in any serious way. Use of the word ‘serious’ in this judgment implied the court’s inclination towards the development process. Further, how far the government will seriously balance the competing



interests is a doubtful question.¹⁷

Direction of environmental justice an epilogue

The Judiciary maintained a distinction between an established industry and an industry to be established. To prevent the environmental pollution, the judiciary turned down the rigid control mechanism on the industrial process. The private industries at times did not give cooperation to the judiciary in observing the minimum standards. In such cases the court came down with iron hands to that the inactive capitalists could be forced to rise to the occasion and fulfil their constitutional duty relating to environment.

Whatever was the wavelength in balancing environmental justice in the present case law, one bright side was that the case law brought to light the pollutants and polluters who would have otherwise remained in the dark. And here comes the need of social action organisations to publicize their anti-pollution role so that a mass movement could be developed against those who commit offences not just against the present generation, but the generations to come.

Conclusion

The environment cases of 1987 saw new directions of environmental education, protection of public and workers' health and the economics of pollution. The discussions of fundamental right, fundamental duty and the directive principles relating to environment had also some place in a few cases. The important judicial innovation in this field was recognition of the fundamental right to live in a clean environment, which has yet to find a place in other environmental jurisprudence. This development imposes a constitutional duty on the state and other authorities to provide all the people of India a loveable environment.

The environmental justice is a developing branch where Indian judiciary has made new innovations in the administration of justice. These include, for example, the forging of new remedies, principle of absolute liability, Indian jurisprudence of judicial process, foregoing the hyper-technicalities, speedy and cheap environmental justice, adjusting the scale of justice with changing time and situation, environment court, neutral environment experts, pollution insurance, etc. At times, the Indian judiciary, while administering environmental justice, laced difficulty in balancing the environment and

development, but it did not shirk its responsibility. The court tried its best to see that, on the one hand the environment was least interfered with, and on the other, the development process for a developing country, like India, was permitted within a reasonable dimension. In view of the above developments and innovations, in the Indian environmental jurisprudence, the environmental justice is still in a nascent stage and this tender plant has yet to reach deep into the Indian soil. So, our Indian judiciary is "very progressive" and "super-innovative".

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A Study on Pattern of Intracranial Injuries in Cases of Fatal Head Injury

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Abstract

Head injuries are the most common cause of death in trauma patients throughout the world. These injuries occur due to many causes most common of them being road traffic accidents, followed by fall, assault, etc. The dissection technique of scalp, skull and dura was in accordance with the procedures suggested by Gresham GA and Turner AF and the brain dissection as suggested by Ludwig J. Among the 42 cases, highest number of cases was between the age of 51-60 years with 12 cases (28.6%) and the lowest < 20 years with 4 cases (9.5%). The highest number of cases were seen among the upper middle class with 19(45.2%). There were 30 (71.4%) cases of road traffic accidents and the remaining 12 (28.6%) were case of fall (fall from height, fall of objects etc). Among the cases with skull fracture 23.8% (10) had linear fractures, 11.9% (5) had comminuted fracture, 2.4% (1) had diastatic fracture and others (61.9%) had no fractures. Among the cases with skull fracture 23.8% (10) had linear fractures, 11.9% (5) had comminuted fracture, 2.4% (1) had diastatic fracture and others (61.9%) had no fractures. Subdural hemorrhage was the commonest (n=34) intracranial injury observed. Highest number of fractures were present in the middle cranial fossa (n=16) among them 11 was linear fractures and 5 were comminuted fractures.

Key Words: head injury, road traffic accident, fall, fractures, parenchymal injuries.

Introduction

Among all regional injuries, injuries to the head and neck are the most common and important in Forensic Medicine. ^[1] Head injuries are the most common cause of death in trauma patients throughout the world. As the head accommodates the most vital organ of our body 'brain', so such injuries cause death of victim in most of cases due to brain damage. ^[2] These injuries occur due to many causes most common of them being road traffic accidents, followed by fall, assault, etc. Road traffic injuries are the leading cause (60%) of fatal head injuries followed by fall from height (20%-25%) and violence (10%). Road traffic accidents are a human tragedy. Road traffic accidents take major portion of magnitude of

mortality in developing and developed countries, also the major concern of disability and pose itself as a major epidemiological and legal problem universally. However the other causes viz. fall from height, assault etc. also adds up to the toll. The extent of injuries sustained vary depending on the falling height, the composition of the impact surface, rate of deceleration, intermediate objects encountered during the process of fall, the position of the body when landing and individual factors such as age, body weight, pre-existing disease, and type of the person (child, adult, elderly). In India, fall from height is one of the common causes of severe blunt trauma. Fall from high places are frequently encountered in accidents, suicides & sometimes rarely in homicides. ^[2]

Aims and Objectives

To ascertain pattern of head injury due to varying etiology

Materials and Method

This cross-sectional study was conducted at the

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Department of Forensic Medicine and Toxicology of Sri Ramachandra Medical College and Research Institute, Porur, Chennai between June 2017 and May 2018. The sample size was 42 that were found eligible and taken up however the cases with advanced stage of decomposition where interpretation of injuries were not possible were excluded from the study.

The dissection of scalp, skull and dura matter was done after which the brain dissection was done. The brain was subjected for 1cm thick coronal sections. Each slice was examined before the new slice was made. The brain-stem and cerebellum were sectioned in a horizontal plane.

The demographic data as regards to age, sex, socio economic status (based on modified Kuppusamy classification), manner of injury, and Post mortem findings with respect to Skull fractures types and sites, brain parenchymal injuries.

Data collected were analyzed using Statistical Package for Social Sciences version 15.0 software. The output of the Data was in frequencies and percentage. Then Charts and Tables were prepared based on the output data.

Results

Among the 42 cases, highest number of cases was between the age of 51-60 years with 12 cases (28.6%) and the lowest < 20 years with 4 cases (9.5%). The youngest victim was 18yrs old and the oldest was 80 years of age. On adding up total of 19 cases (45.3%) were present in the productive age group between 20yrs-50yrs (Ref Table 1). Mean age is 45.45years. In the study there were 39 (92.9%) male cases enlisted and female were 3 (7.1%) (Chart – 1).

The socio-economic status of the total cases were classified based on modified Kuppusamy classification with data collected on education, occupation and monthly income of a person. Based on this the highest number of cases were seen among the upper middle class with 19(45.2%) and the least was among the upper 1 (2.4%) and lower 1 (2.4%) economic category. Two cases were left behind as, one was a student and the other was a old female with no necessary credentials required (Chart – 2).

As per the history obtained from the relatives and through the Police Inquest, out of the total 42 cases,

there were 30 (71.4%) cases of road traffic accidents and the remaining 12 (28.6%) were case of fall (fall from height, fall of objects etc) (Table – 2).

Among the cases with skull fracture 23.8% (10) had linear fractures, 11.9% (5) had comminuted fracture, 2.4% (1) had diastatic fracture and others (61.9%) had no fractures (Chart – 3). Subdural hemorrhage was the commonest (n=34) intracranial injury observed among the total 42 cases of fatal head injuries next with subarachnoid hemorrhage in 28 cases closely followed by subscalpal hematoma in 28 cases, Ventricular hemorrhages were present in 9 cases, contusions present in 7 cases and epidural hemorrhage was elicited in 6 cases (Table – 3). Highest number of fractures were present in the middle cranial fossa (n=16) among them 11 was linear fractures and 5 were comminuted fractures, Posterior cranial fossa had 10 fractures of which linear and comminuted fractures were equally observed and 6 fractures were present in the anterior cranial fossa were linear and comminuted fractures are equal in number (Chart – 4).

Table 1: Age Distribution

Age (range)	Frequency (n)	Percent (%)
<20yrs	4	9.5
21-30yrs	6	14.3
31-40yrs	6	14.3
41-50yrs	7	16.7
51-60yrs	12	28.6
>60yrs	7	16.7
Total	42	100.0

Table 2 : Incidence

Type	Frequency (n)	Percent (%)
RTA	30	71.4
FALL	12	28.6
Total	42	100.0

Table 3: Types of Injury / hemorrhage in head injury

Types of Injury / Hemorrhage	No.of cases
Sub-Scalpal Hematoma	28
Epidural Hemorrhage	6
Sub-Dural Hemorrhage	34
Sub-Arachnoid Hemorrhage	29
Ventricular Hemorrhage	9
Contusion	7

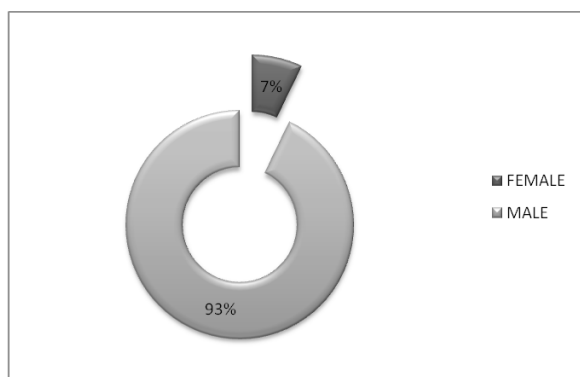


Chart 1 : Gender Distribution

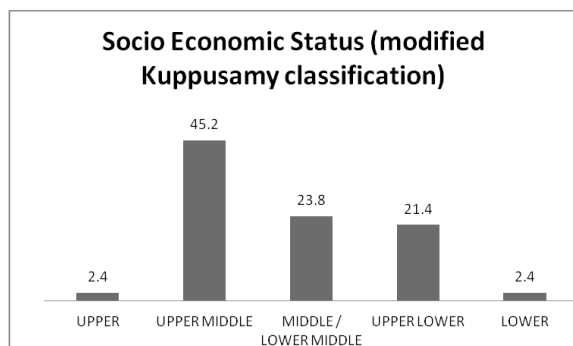


Chart 2: Socio Economic Status (modified Kuppusamy classification)

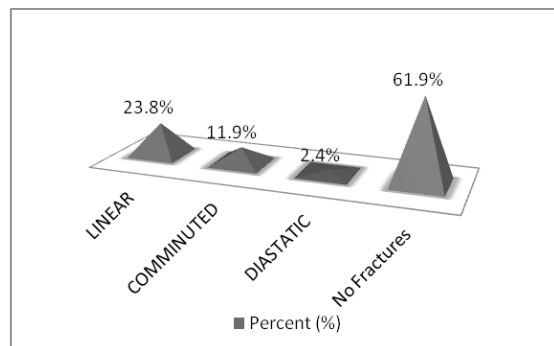


Chart 3 : Incidence of skull fractures

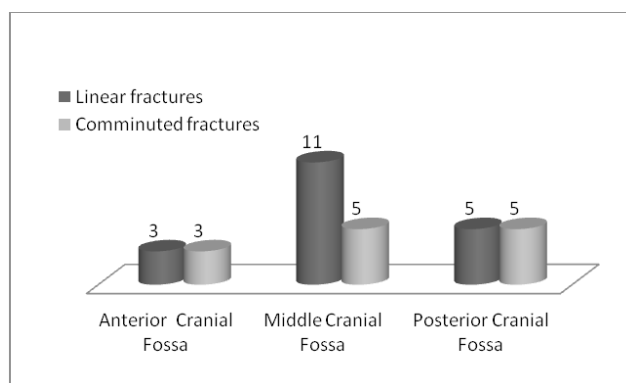


Chart 4 : Pattern of Base of Skull Fractures

Discussion

A total of 42 cases were taken up, for the study in which the highest incidence of fatal head injury cases was observed in the age groups 51-60years followed by the group between 41-50years and the mean age of the subjects was 45.45years. Dr. Priyadarshi et al’s study on pattern of fatal RTA found the vulnerable age group of fatal head injuries were among those in 40-59 yrs (54.3%) [3] which is the most productive age group in the community.

The data show male victims were more common than the female is in coherence to study by Selvaraj.T et al, in the southern city of Madurai in Tamilnadu with 84.9% of male and 15.1% of female victims of road traffic accidents. [4] Arvind Kumar et.al study was with highest male victims (88.22%) in his study on relating the fatal road traffic accidents and head injury. [5] The finding of the study that majority of victims of head injury fell in the category of upper middle class as per Modified Kupussamy classification of Socio-Economic Status, is almost referring the study by Dr. Priyadarshi et.al where the middle category (20%) was the highest involved group in fatal road traffic accidents followed by the upper middle category. [3]

The incidence of road traffic accident (71.4%) followed with fall (28.6) were found in study is similar to the observation of Prasanthi Puvanachandra in Asia in which majority of cases of traumatic brain injuries were of road traffic accidents (60%) followed by fall (20-30%) and the least violence (10%) [6], another study by Dr. Mukesh Kr Goyal et.al also shows similarity with cases of road traffic accidents (62.1%) followed by fall (30.7%) [7].

Linear fracture composed of 23.8% of the skull

fractures and next was the comminuted fracture. In a study on head injury by blunt force by Raja Rupani et al, fissure/diastatic fracture was seen in 50% followed by 30% of depressed fracture and 20% comminuted fracture^[10] showing a wide difference in the results. Manish K et al observes that a linear fracture (38.8%) was the commonest among the victims of road traffic accidents.^[9]

As found in the study it was the subdural hemorrhage predominating among all types of intracranial injuries followed by subarachnoid hemorrhage. These results were in coherence with the 5 years (2008-2012) retrospective study by Shivaramu MG et al; states that subdural hemorrhage (130) was the commonest intracranial injury, followed by Sub-Arachnoid hemorrhage (126) among a total of 310 fatal cases of road traffic accidents.^[10] Yet another similar study by Anand Menon et al also state that Sub-Dural hemorrhage was present among 52.63% of cases, followed by 27.27% cases with subarachnoid hemorrhage.^[11] Study of Arvind Kumar et al also gives subdural hemorrhage (89.11 %) as the commonest of the intracranial hemorrhages.^[7]

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A Post-mortem Observational Study of Suspicious Deaths in Married Females Aged 30 Years or Less

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Abstract

Introduction – Suspicious death in married female is always a sensitive case and needs our full attention. So, current study was undertaken at S.S.G. Hospital, Vadodara for a period of 1 year.

Material & Method –Of all cases coming for the postmortem examination, cases in which the victim is female and below 30 years of age were taken for the study when there was suspicion regarding the cause of death.

Results – Out of all the medico-legal autopsies 5.7 % autopsies were Unnatural deaths of married females less than 30 years old. Maximum number (40 %) of deaths were observed in the age group of 21-25 years. (86.65 %) of female deaths occurred within 0-7 years of marriage. 75.55 % of deaths were suicidal in nature followed by accidental (18.88 %).

Statistical Analysis –The data collected was analyzed using MS Excel worksheets for averages and percentage.

Conclusion – Many of the findings of current study were correlated with earlier studies, while others were found contradictory. Further detailed study with larger sample size is required.

Key-words –*Suspicious death, married female*

Introduction

In an autopsy whenever there is a case of married female for post-mortem examination, there is always suspicion raised by the family of the female. So, in every case of married female death we have to be extra cautious. And also, the chance of maternal death also should be kept in mind in married females. So, to identify profiles and patterns in suspicious deaths in married females, current study was designed. The current study was undertaken at P.M. room of S.S.G. Hospital, Vadodara

to study the profiles and patterns in suspicious deaths in married females of below 30 years age group. Out of total cases coming from post-mortem examination total 90 cases were selected based on inclusion, exclusion criteria.

Material & Method

An autopsy study of suspicious deaths in married females of below 30 years age was carried out in this Medical College from 1st August 2017 to 31st July 2018. A total 90 autopsy cases of unnatural deaths in married females with age less than 30 years were studied during the study period.

Inclusion Criteria:

The material for the present study consists of the cases of suspicious deaths of married female with age less than 30 years which have been brought for medico-legal autopsy.

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Exclusion Criteria:

1. Deaths due to mass casualties or road traffic accidents.
2. Deaths due to natural disease.
3. Unidentified and Decomposed female dead bodies.

Before performing autopsy, all these cases were studied in details from indoor case records, hospital records (where applicable), history obtained from relatives of deceased and police inquest. A standard proforma was used to collect information regarding age of deceased, duration since marriage, educational background of deceased and husband and types of

family. A careful and complete autopsy was performed in each case. The viscera and necessary samples were preserved in required cases. Statistical analysis of data was done and presented as result and observation in tabular form, graphs and charts.

Statistical Method

The data so collected was tabulated and required calculations were done using MS Excel 2010. No other statistical method was required.

Results

Out of total 1925 autopsies performed in 1-year study period, 90 cases were selected as per inclusion, exclusion criteria. The results are as per tables below.

Table No.1: Distribution of cases according to age.

No.	Age of Deceased	No. of Cases	Percentage
1.	Less or equal to 20	24	26.67 %
2.	21-25 years	36	40.00 %
3.	26-30 years	30	33.33 %
Total		90	100 %

Maximum number (40 %) of deaths were observed in the age group of 21-25 years followed by 26-30 years (33.33 %).

Table No.2: Distribution of cases according to religion

Sr. No.	Religion of Deceased	No. of Cases	Percentage
1.	Hindu	83	92.22 %
2.	Muslim	4	4.44 %
3.	Sikh	3	3.33 %
4.	Other	0	0 %
Total		90	100 %

Most of the deaths (92.22 %) were observed in Hindu religion followed by Muslims (4.44 %) followed by Sikh (3.33 %).

Table No.3: Distribution of cases according to duration of marriage

Sr. No.	Duration since Marriage	No. of Cases	Percentage	
1.	Below 1 year	20	22.22 %	86.65 %
2.	Between 1 to 3 years	33	36.66 %	
3.	Between 4 to 7 years	25	27.77 %	
4.	Above 7 years	12	13.35 %	
Total		90	100 %	

It was observed that significant number (86.65 %) of female deaths occurred within 0-7 years of marriage.

Table No. 4: Number of cases having children

No.	Deceased having children	No. of Cases	Percentage
1.	Yes	49	54.45 %
2.	No	41	45.55 %
Total			100 %

It was observed that 54.45 % of female victims had children while 45.55 % female victims had no child.

Table No. 5: Distribution of cases according to cause and manner of Death

No.	Cause of Death	Manner of death			No. of Cases
		Accidental	Suicidal	Homicidal	
1.	Burns & its complications	10 (11.11 %)	16 (17.77 %)	0 (0 %)	26 (28.88 %)
2.	Hanging	0 (0 %)	18 (20.00 %)	0 (0 %)	18 (20.00 %)
3.	Poisoning	2 (2.22 %)	30 (33.33 %)	0 (0 %)	32 (35.55 %)
4.	Drowning	1 (1.11 %)	4 (4.44 %)	0 (0 %)	5 (5.55 %)
5.	Physical Assault	0 (0 %)	0 (0 %)	5 (5.55 %)	5 (5.55 %)
6.	Electrocution	2 (2.22 %)	0 (0 %)	0 (0 %)	2 (2.22 %)
7.	Snake bite	2 (2.22 %)	0 (0 %)	0 (0 %)	2 (2.22 %)
Total		17 (18.88 %)	68 (75.55 %)	5 (5.55 %)	90 (100 %)

It was observed that 75.55% of deaths were suicidal in nature followed by accidental (18.88 %) and homicidal deaths (5.55%). Total 17.77 % of deaths were burns suicidal in nature, 11.11 % of deaths were accidental burns.

Discussion

An autopsy study of suspicious deaths in married females of below 30 years age was carried out in this Medical College from 1st August 2017 to 31st July 2018. During this one-year period a total of 1925 medico-legal autopsies were conducted, out of that 138 cases (7.16 %) were all age females with suspicious deaths. Out of which 90 cases (5.7%) were suspicious deaths of married female with age less than 30 years. Which is comparable to what was reported by Darji J.A.¹ et al (9.25%), Verma R.K.² et al (7.74%) and similar to Shrivastava A.K.³ et al (4.95%).

In the present study (Table No 1), it was observed that Maximum number (40 %) of deaths were observed in the age group of 21-25 years followed by 26-30 years (33.33 %) and less than 20 years 26.67 %. The findings in the present study are consistent with the study carried out by Zine K.U.⁴ et al (41.30%), Buchade D.⁵ et al (40.93%). Sharma B. R.⁶ et al noted that higher incidence (53.37%) of unnatural female deaths were in the age group of 21-23 years. The study conducted by Dere R.C.⁷ et al most common age group of unnatural death in females was 21-30 years (46.45%). This may be due to the fact that the common age of marriage in our region and many regions all over India is 18 to 23 years and deaths due to torture and mental harassment by husband and in-law's in relation to dowry in newly married females occurs in initial few years of married life. Also, this is the most active period of life where the females are expected to perform work related to cooking and allied work hence are more prone to accidents during kitchen related activities.

In the present study (Table No.2), it was observed that Most of the deaths (92.22 %) were observed in Hindu religion followed by Muslims (4.44 %) followed by Sikh (3.33 %). The study carried out by Darji J. A.¹ et al (94.18%), Pankaj Prajapati⁸ et al (92.04%) showed similar findings where most of the female victims were Hindu by religion. The Majority of the population from this region belongs to Hindu religion and dowry system is prevalent in this region resulting in a greater number of deaths in newly married females. The present

study also revealed that 4.35 % deceased females were Muslims and 2.90 % were Sikhs. These communities are comparatively in minority in this region hence death rate might be less in these communities.

From Table No.3, it was observed that 58.88 % of deaths of married females were within initial 3 years of their marriage which is highly significant followed by 4-7 years of marriage (27.77 %) It was observed that significant number (86.65 %) of female deaths occurred within 0-7 years of marriage. Similar findings were noted by Jaswinder Singh⁹ et al (44.97%), Darji J.A.¹ et al (57.28%), Verma R.K.² et al (57.47%), Praveen Arora¹⁰ et al (60.13%). This might be due to dowry demand, harassment, and physical / mental torture resulting in suicide or homicide of newly married females occurring more commonly in initial few years of married life.

In present study (Table No.4), It was observed that 54.45 % of female victims had children while 45.55 % female victims had no child. This might be due to after marriage there is a family and social pressure on the new couple for begetting child and one of the purposes of marriage is continuing the legacy of family.

From table No.5 it was observed that in accidental deaths in married female accidental burns was most common cause of death (58.82 %, 10 out of 17 accidental death cases). Quite similar findings were noted by Buchade D.⁵ et al (62.02%) and Chavan K.D.¹¹ et al (64.28%). Accidental burns can be explained by females spending most of the time in kitchen and thereby coming in contact with fire following inadequate precautions while cooking on cooking gas, kerosene stove and open unguarded chulha. Also, in rural areas kerosene lamp is still used during electricity failure which is very common. Wearing highly inflammable synthetic clothes, loose clothes like sari of the victims are highly susceptible to catch fire suddenly while cooking causing kitchen accidents. Also, the relatives of females might give the false history suggesting the incident to be accidental in nature for the settlement of property. In suicidal deaths, poisoning (44.11% - 30 out of 68 suicide cases) was most common followed by hanging (26.47 % - 18 out of 68 suicide cases) followed by burns (23.52 % - 16 out of 68 suicide cases) followed by Drowning (5.88 %). Similar findings were observed by Pankaj Prajapati¹² et al in his study on pattern of suicidal deaths in females (35.51% deaths by poisoning, 31.16% by hanging). Easy availability of household and pesticidal poisons in rural population might be cause for these preferences.

Likewise, easy availability of sari or dupatta, kerosene and matchstick might be responsible for such trends in suicidal deaths by hanging and burns.

Abbreviations -NIL

Statement of Conflict of Interest – NONE

Statement of Informed consent – Informed consent of relatives taken

Statement of Human and animal ethics – No ethical issues involved.

Source of Funding - Self

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Study of Various Osteometric Parameters of Human Mandible in Adult and Elderly Age Groups

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Abstract

The cardinal points of identity establishment can be met out with the help of mandibular anthropometry, when the bone is available for examination. A number of metric and non- metric parameters help in estimating the age from the mandible; which accurately differentiates various stages of life cycle

The main aim of this study is to study the various osteometric parameters of human mandible in adult and elderly age groups; and to determine their significance and utility for the purpose of identification in forensic sample.

For the purpose, 200 mandibles were measured anthropometrically. The data was collected in master chart and statistically analysed.

Height of the mandibular body, thickness of the mandibular body and maximum ramus height were found to be statistically significant parameters. Hence, these parameters could be used for allocation of a mandible to adult or elderly age group. It is also recommended to include other morphometric parameters of mandibles in the study to increase the accuracy and precision.

Key words: *osteometric, statistically significant, maximum ramus height*

Introduction

Estimation of age is extremely important in the identification of human remains. Chronological age assessment is an important part of medico- legal practice. The procedures for age estimation are complex and require the consideration of many factors. Bones undergo a series of changes from pre- natal to post- natal life; and changes in their composition and structure continue into old age and even after death. Hence, these form

a reliable source of information regarding growth and growth changes. Mandible is the largest and strongest bone of the face. Presence of a dense layer of compact bone makes it very durable and hence, remains well preserved than many other bones. In this study, age at the time of death was considered for study on mandible.

Mandibular dentition can help in estimating the age of an individual depending upon the eruption of mandibular teeth. This coupled with various subjective and morpho- metric parameters, help in arriving at the closest and accurate age range of the available forensic sample. A number of metric and non- metric parameters help in estimating the age from the mandible; which accurately differentiates various stages of life cycle

The main aim of this study is to study the various osteometric parameters of human mandible in adult and elderly age groups; and to determine their significance

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and utility for the purpose of identification in forensic sample.

Material and Method

This prospective study was carried out on 200 mandible specimens in the Department of Forensic Medicine and Toxicology, Gandhi Medical College Bhopal. All the pathological, deformed and fractured mandibles were excluded from the study.

The criteria to decide the age of group of mandible were:

1. Dental examination and number of sockets present on the alveolar margin as it is known that age of eruption of third molar is 17 – 25 years.
2. Body – It is thick and elongated in adults and shallow and big in elderly.
3. Ramus – stunted and acute angled in adult and long and oblique in elderly.
4. Condylod process- open midway between the upper and lower border of body in adult and in elderly placed at near/ upper border of body.
5. Mental foramen – present midway between alveolar margin and inferior border of corpus of the body in adult and present near alveolar margin in elderly.

Mandibles were allocated to adult and elderly age group by forensic medicine experts and forensic anthropologists of the institute.

Osteometric parameters measured were as follows:

1. Height of the mandibular body was the direct distance from the alveolar process between 1st and 2nd molar to the inferior border of the mandible perpendicular to the base; measured with the help of sliding caliper.
2. Thickness of the mandibular body was measured at the level of 2nd molar perpendicular to the vertical axis of the body, using sliding caliper.
3. Maximum ramus height was measured between ^condyion superior and *gonion by Sliding caliper/mandibulometer.
4. Length of the mandibular body was the distance between #gnathion and gonion, measured using mandibulometer,

Landmarks

^Condylion superior-The most superior point of the mandibular angle.

***Gonion**-The most lateral and external point at the junction of the horizontal end of rami of the lower jaw.

#Gnathion-The middle point of the lower border of the mandible in the sagittal plane.



Fig-I: Measurement of height of mandibular body using sliding caliper

The data was collected in pre designed proforma and statistically analyzed using t test to find out the level of significance.

Findings

On statistical analysis, the results obtained were as follows:

LHEIGHT OF THE MANDIBULAR BODY:

Table – 1 Depicts mean and standard deviation of height of the mandibular body in male mandibles on both right and left side

Male			
Right		Left	
Adult	Elderly	Adult	Elderly
*90	*40	*90	*40
#29.9964	#24.9277	#29.9662	#24.9277
^4.07456	^3.1980	^4.07341	^3.16610

P<0.001

Table-2 Depicts mean and standard deviation of height of the mandibular body in female mandibles on both right and left side

Female			
Right		Left	
Adult	Elderly	Adult	Elderly
*52	*18	*52	*18
#30.9096	#21.7656	#30.9100	#21.7667
^3.41612	^2.61973	^3.41510	^2.62007

$P < 0.01$

Corici et al (2009)³ in his study carried out on 80 mandibles, also found this parameter to be significant.

Also, in a study conducted on OPGs of 113 edentulous patients aged 55-76 years, by Balwant Rai² in the year 2007, when the means +_ SDs are compared for each age groups in male and female subjects, the difference is not found to be significant.

II. THICKNESS OF THE MANDIBULAR BODY:

Table-3 depicts mean and standard deviation of thickness of the mandibular body in male mandibles on both right and left side

Male			
Right		Left	
Adult	Elderly	Adult	Elderly
*90	*40	*90	*40
#25.8613	#20.2702	#25.8617	#20.2697
^4.8944	^3.2912	^4.8939	^3.2915

$P < 0.001$

Table-4 depicts mean and standard deviation of thickness of the mandibular body in female mandibles on both right and left side

Female			
Right		Left	
Adult	Elderly	Adult	Elderly
*52	*18	*52	*18
#24.7462	#15.6033	#24.7463	#15.6033
^1.6973	^1.0915	^1.0915	^1.0909

$P < 0.001$

This parameter was not very widely studied by the past investigators

III. Maximum Ramus Height:

Table-5 Depicts mean and standard deviation of maximum ramus height in male mandibles on both right and left side

Male			
Right		Left	
Adult	Elderly	Adult	Elderly
*90	*40	*90	*40
#65.6632	#60.9537	#65.6644	#60.9545
^5.3636	^6.5116	^5.3645	^6.5123

P<0.001

Table-6 Depicts mean and standard deviation of maximum ramus height in female mandibles on both right and left side

Female			
Right		Left	
Adult	Elderly	Adult	Elderly
*52	*18	*52	*18
#67.7635	#64.6039	#67.7646	#64.6056
^3.8160	^8.5498	^3.8160	^8.5494

P<0.05

NOTE- Index for tables 1-6

*n= no of specimens

#M= mean

^ SD= standard deviation

Ionescu et al⁵ in his study in the year 2007 also described maximum ramus height as statistically significant. Dayal et al 2008⁴ found mandibular ramus height to be best parameter with an accuracy of 75.8 %. Similarly, Badiu et al (2010)¹ in their study found this parameter to be statistically significant (*p*< 0.05) . Saini et al⁸ in their study in the year 2011 on mandibular ramus flexure also found this parameter to have probability level of *p*< 0.001 and thus statistically significant.

IV. Length of the Mandibular Body

For this parameter, the mean +_ standard deviation for male on right side is 92.4818 +_5.6516 in adults &

92.2720 +_ 3.6925 in elderly and ; on left side, 91.4936+_ 5.4349 and 92.2738+_ 3.6928 for adult and elderly age group respectively; *P*=0.59 which is statistically insignificant. For females, on right side, the mean is 90.1219 with a standard deviation of 4.5758 for adult & for elderly it is 91.0450 with a SD of 3.6896 ; on left side, the mean and standard deviation are 90.1238and 4.5763 respectively for adult & for elderly, the mean is 90.6022 with a SD of 3.2550; *P*=0.85 making it statistically insignificant.

Comparison of means and standard deviations of elderly and adult samples is found to be statistically significant in case of height of the mandibular body, thickness of the mandibular body and maximum ramus height. Mandibular length was found to be statistically insignificant in this study.

Conclusion

In the study conducted on 142 adult and 58 elderly

mandible specimens, the level of significance was found to be high, in case of height of the mandibular body, thickness of the mandibular body and maximum ramus height. Hence, these parameters can be used for allocation of a mandible to adult or elderly age group.

Similar finding was obtained by Mohite et al⁶ in their study in the year 2011. They stated that, “A reduction in the height of the body of the mandible was observed with increase in age.” and ‘The width of cortex at the mental region (MI) and antegonial region (AI) shows a decrease in values with increasing age’; also, an increase in the size of the gonial angle was observed in this study.

Rai et al (2008)⁷ in his study on 120 lateral cephalograms found the maximum ramus height to be a significant parameter ($p < 0.05$) for this purpose.

It is recommended to evaluate the utility of other morphometric parameters of mandibles for the purpose of age estimation to increase the accuracy and precision.

Conflict of Interest – Nil

Source of Funding- self with assistance from institute.

Ethical Clearance – The study protocol was approved by Institutional Ethics Committee of Gandhi Medical College, Bhopal.

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Estimation of Stature from Footprint Length

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Abstract

The human foot is studied for various reasons in forensic departments, by anthropologists, anatomists etc. Footprints are of immense value in a crime scene in establishing the personal identity and in a potential link between the perpetrator and the scene of crime. Identification of a person is of prime and foremost importance in both civil and criminal cases. Time is a critical factor in crime scene investigation, so rapid identification of suspect is very important. Here, in our study, the aim is to estimate the stature of individuals based on their footprint lengths among the students (Both male and female students between the age group 18 to 22 years) 50 male and 50 female students, studying in Rajarajeswari Medical College and Hospital, Bengaluru.that the footprint length help us in estimating the stature of an unknown individual which will be helpful in investigation of various crimes. Also not much difference is statistically noted in the stature estimated by right and left footprint length in both the sexes.

Keywords: Stature; Foot print length; Identification.

Introduction

To establish the identity of a person if alive or expired is called identification of a person. The Latin word, 'idem' known as "the same"¹ is from which the word identification has its origination. Determination of identity of a person in case of emergency disasters like bomb blast, hurricane, train wreck, flight fall, earthquake etc. will not be an easy task for an autopsy surgeon to rectify the clarification of identity of a person from an amputated body part.² stature, in the pharmacological aspect is also important for to determine the nutritional range and for the estimation of pharmacokinetic measures of a person. The identification of a male or a female is made easier if the stature of a person is determined in any sort of investigation to determine the identity of a person.³

Aims and objectives of the study

To estimate the stature of individuals based on their footprint lengths

Material and methods

Materials used are as follows:

1. Printers black ink,
2. Non- breakable glass plate,
3. White sheets,
4. Roller,
5. Pencil,
6. Measuring scale,
7. Measuring tape,
6. Calculator and
7. Proforma.

Collection of Footprints

Both male and female students those who are

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studying in Rajarajeswari Medical College and Hospital, Bengaluru -560074, between the age group 18 to 22 years will be included in the study. The consent of those students will be obtained in a pre-designed and pre-tested pro-forma consisting the objectives of the students after explaining them the aim and objective of the study.

A glass plate of 24x24 inches cleaned and smeared uniformly with painters ink will be kept on the floor.

The students after washing and drying their feet will be asked to stand on the smeared glass plate first and then, on two separate white sheets so that prints of right foot and left foot will be transferred on these white sheets separately. In this way footprints of all the individuals will be recorded. The footprint length will be measured from the heel to the tip of extension of longest toe.

Then all the students will be asked to stand bare foot and erect on the floor with their heel and occiput attached to the wall where markings for measuring height are already made. The students will be asked not to move the head. A thin plate is kept horizontally at the vertex of the head. Then the height will be measured from heel to the horizontal thin plate. Height of the individual will be measured in cm to the nearest mm.

The data collected is analyzed statistically by using descriptive statistics, namely percentage and standard deviation. The results will be predicted using SPSS version 20, if required, using linear regression equation for stature estimation and to assess the co-relation

between the footprint length and stature, Pearson’s correlation coefficient method will be adopted.

Place of Study: Rajarajeswari Medical College and Hospital, Bengaluru-560074.

Duration of Study: 1 year and one month.

Sample Size: 100 students (50 males and 50 females)

Inclusion Criteria

1. Both male and female students who are studying in Raja Rajeswari Medical College and Hospital, Bengaluru-560074 between the age group 18 and 22 years.
2. Students of both sexes.
3. Age group between 18 years to 22 years.

Exclusion Criteria:

1. Students other than the age group 18 to 22 years.
2. Students with any abnormality of foot/lower limb.
3. Students with any spinal abnormality.
4. Students with any endocrinal disorders.

Sampling Method:

Convenient sampling method.

Results

Table-1: Correlation between Right Foot Print Length, Left Foot Print Length and Stature in Male Students

Variable	N	Mean ± SD	Range	Cor. Coeff. r-value	Reg. Coeff. b-value	Reg. Equation
RFPL Actual Ht	50 50	24.7±1.25 173.5 ± 6.64	22.3–28.0 156 – 196	+ 0.659	3.49	Ht = 86.89+ 3.49 (RFPL)
LFPL Actual Ht	50 50	24.8±1.29 173.5±6.64	21.6–28.6 156 – 196	+ 0.0652	3.34	Ht =90.15 + 3.34 (LFPL)

RFPL = Right Footprint Length LFPL = Left Footprint Length

Ht = Height Comparing Right Footprint Length and Left Footprint Length P - 0.0

Table no.1 represents the height of 50 male students and the co-relation between the right and left foot print length.

The average of the right footprint is slightly larger than the left.

A relevant co-relation between the right footprint with stature ($r = 0.659$) and the left footprint length with stature ($r = 0.0652$). The difference in co-relation coefficient is statistically significant ($p < 0.000$). To determine the stature based on any given right or left

footprint length can be made with this significant co-relation.

When one such right footprint length is given, the stature can be estimated by the regression equation.

$$Ht = 86.89 + 3.49 (RFPL)$$

When one such left footprint length is given, the stature can be estimated by the regression equation.

$$Ht = 90.15 + 3.34 (LFPL)$$

Table-2: Correlation between Right Foot Print Length, Left Foot Print Length and Stature in Female Students

Variable	n	Mean ± SD	Range	Cor. Coeff. r-value	Reg. Coeff. b-value	Reg. Equation
RFPL	50	22.3±1.125	19.8-24.9	+0.761	4.426	Ht = 58.93+4.42 (RFPL)
Actual Ht	50	157.78±6.65	144-172			
LFPL	50	22.2±1.1	19.8-25	+0.747	4.438	Ht = 59.08+4.43 (LFPL)
Actual Ht	50	157.78±6.65	144-172			

RFPL = Right Footprint Length LFPL = Left Footprint Length

Ht = Height

Comparing Right Footprint Length and Left Footprint Length $P < 0.00$

Table no.6 represents the height of 50 female students and the co-relation between the right and left foot print length.

The average of the right footprint is slightly larger than the left.

A relevant co-relation between the right footprint with stature ($r = 0.761$) and the left footprint length with stature ($r = 0.747$). The difference in co-relation coefficient is statistically significant ($p < 0.000$). To determine the stature based on any given right or left footprint length can be made with this significant co-relation.

When one such right footprint length is given, the stature can be estimated by the regression equation.

$$Ht = 58.93 + 4.42 (RFPL)$$

When one such left footprint length is given, the stature can be estimated by the regression equation.

$$Ht = 59.08 + 4.43 (LFPL)$$



Figure-1: Method of recording footprint



Figure 2. Right footprint of a student



Figure 03. Measuring height of a student

Discussion

Stature can be estimated from many parameters of the body parts, also the researches were made on them by many researchers. But very few researchers estimated stature from footprint length. Researchers did their work for foot length in both sexes but for the footprint length is rare. Our study is on both sexes of both right and left footprint length to estimate stature from it.

But in the study done by Devesh VO (2006)⁴, Danborn B (2008)⁵ and Vidya CS⁶, the footprint is lengthier in men than the women which is of same results as our study.

In our study, the footprints of both the foot in both sexes gives the height of an individual approximately for each foot and this is also seen the study made by Theodoros B Grivas⁷ (2008).

Our study gives the regression equations for both the footprint length by which the height can be determined whereas the stature from the known foot length only can be determined by a regression formula in the study made by Abraham Philip⁸.

In our study, only the length of the longest toe to the tip of the sole is taken to give the height of the student whereas in the work done by JaydeepSen (2008)⁹

The girls are less in height and they have length of their foot also little short than the boys. Also he stated that there is a good relationship which is significant between the height and the length and the breadth of the individuals foot. ($P < 0.01$).

Separate regressions equations were developed for both the footprints of both the genders in our study similarly, a study which was done only on males which had significance in the foot length and height with a $P < 0.001$ by Raju M¹⁰ (2009)

Also a similar research results were noted among the individuals of Uttarakhand region by Deopa Deep¹¹ (2010)

Ethical Clearance - taken and I have attached the ethical clearance certificate as a pdf sir..

Source of Funding – Self

Conflict of Interest - Nil

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Assessment of Knowledge and Attitude of Adolescents Regarding Blood and Organ Donation in Selected Rural Areas of Shimla, Himachal Pradesh, India

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Abstract

Objectives: The life force in all human beings, regardless of colour, race or belief, flows through their arteries and veins; it is red liquid which –depends on whether they are well or ill – bears good and bad tidings. Its various components form a highly developed defence and transport system which gives and saves life.

Method: The present study was aimed to assess the knowledge and attitude regarding blood and organ donation among adolescents in selected rural areas of Shimla, Himachal Pradesh, with a view to prepare a self instructional module. The research design used for this study was Non experimental descriptive design. Non probability purposive Sampling was used to select 100 samples for the study. The tool used for the study was structured interview schedule

Result: The findings of the study includes 33% of adolescents had inadequate knowledge and 77% of adolescents had favourable attitude regarding blood and organ donation. The study revealed that there was positive correlation ($r=0.268$) between the knowledge and attitude scores of blood and organ donation.

Conclusion: Distributing SIM regarding blood and organ donation helps the adolescents to have adequate knowledge, awareness and positive attitude regarding blood and organ donation.

Key words: *Knowledge, Attitude, Organ Donation, Adolescents*

Introduction

Blood is a whole world in itself, each component having a specific job – red blood cells transport oxygen throughout the body; plasma transport proteins, including antibodies and clotting factors, and nutrients like glucose for energy around the body; white blood cells constitute defence mechanism against disease, and platelets ensure that bleeding stops. Blood also carries waste products from all the organs to be evacuated from the body.¹ Eligibility criteria for blood donation are donor should be between 18 –55 years of age with a weight of 50 kg or above with normal pulse rate, normal body temperature and normal blood pressure. Both man and women can donate blood. There are only few conditions in which donors are permanently excluded. The donor with history of epilepsy, psychotic disorders, abnormal bleeding tendencies, severe asthma, cardiovascular

disorders, and malignancy is permanently unfit for blood donation. People who have undergone surgery may safely donate Blood after 6 – 12 months. For woman donors who are pregnant or lactating, blood is not taken as their iron reserves are already on the lower side.²

Method

In view of the nature of the problem under study and to accomplish the objectives of the study descriptive approach was found to be appropriate to assess the knowledge and attitude regarding Blood and organ donation among the adolescents In view of the nature of the problem under study and to accomplish the objectives, Non experimental descriptive survey design was adopted to assess the knowledge and attitude of adolescents regarding blood and organ donation.

The study was conducted in selected rural areas under Surathkal PHC. In the present study, the target population consists of adolescents residing in a selected rural area at Shimla, and accessible population consists of adolescents in the age group of 12-21 years residing in a selected rural area at Shimla.

The sample for the study consists of 100 Adolescents who met the inclusion criteria and are residing in a selected rural area at Shimla. Non probability purposive sampling was used to select the samples.

This study received ethical approval from the Institutional Review Board of the parent institution. Individual Informed consent was taken from the sample before the data collection.

Results

SECTION A: Description of demographic Variables.

While assessing the demographic data it showed that the majority of the adolescents 72 (72%) belonged to the age group of 18 – 21 years and about 71 (71) % were Males and 29 (29 %) were females. The data also showed that the highest number 87 (87%) of adolescents belonged to Hindu religion from nuclear families.

The majority of the adolescents 61 (61%) had health information from television programs, 8 (8%) of the adolescents had health information from radio programs, 31 (31%) of adolescents had health information from newspaper and magazines. The data also showed that most 93 (93%) of the adolescents were not registered, very few 7 (7%) of the adolescents were registered for blood & organ donation.

SECTION B: Frequency and percentage of knowledge scores of adolescents regarding blood and organ donation.

Table 1: Frequency and percentage of knowledge scores of adolescents regarding blood and organ donation

n=100

S.No	Level Of Knowledge	Frequency(F)	Percentage (%)
1.	Adequate Knowledge	10	10
2.	Moderately Adequate knowledge	57	57
3.	Inadequate Knowledge	33	33
	Total	100	100

Table 1 showed that 33 (33%) had inadequate knowledge 57 (57%) had moderately adequate knowledge and 10(10%) of adolescents had adequate knowledge regarding blood and organ donation.

SECTION-C Frequency and Percentage of Attitude

Table 2: Frequency and percentage of attitude scores regarding blood and organ donation among adolescents.

n=100

S.No	Level of Attitude	Frequency(F)	Percentage (%)
1.	Favourable attitude	77	77
2.	Moderately favourable attitude	23	23
3.	Unfavourable attitude	-	-
	Total	100	100

Table: 2 showed that 77 (77%) had favourable attitude, 23(23%) had moderately favourable attitude and 0(0%) had unfavourable regarding blood and organ donation.

SECTION – D Correlation of Knowledge Scores With attitude Scores Regarding Blood and organ Donation among Adolescents.

a) Table 3: Mean and standard deviation of adolescents regarding `blood and organ donation among adolescents.

n=100

S.No	Variable	Mean	Standard Deviation
1	Knowledge	17.81	5.69
2	Attitude	54.56	5.77

Table 3 Showed that mean score of knowledge and attitude regarding, blood and organ donation were 17.81(SD+ 5.69) and 54.56(SD+5.77) respectively.

b) Table 4: Correlation of knowledge and attitude scores among Adolescents regarding blood organ donation.

n=100

S.No	Variable	Mean	Co Efficient of	Table
1	Knowledge	17.81	0.268	0.195
2	Attitude	54.56		

(df: 98) (P< 0.05=0.195)

Table 4 showed that there was positive correlation (r = 0.268) of knowledge and attitude regarding blood and organ donation among adolescents at 0.05 level

($\chi^2=3.52$).

SECTION –E Association of knowledge scores regarding blood and organ donation among adolescents with their selected demographic variables.

When the Association of knowledge scores regarding blood and organ donation among adolescents with their selected demographic variables were assessed it showed that Chi Square values were calculated to find out the association between knowledge scores of adolescents with their demographic variables regarding blood and organ donation reveals that there is association between knowledge scores when compared to age ($\chi^2=13.58$) and there is no-association between knowledge scores when compared to sex ($\chi^2=1.43$), Religion ($\chi^2=2.067$), family type($\chi^2=0.056$), Education ($\chi^2=6.63$), Health Resources ($\chi^2=5.74$) and Registration

SECTION –F Association of attitude scores regarding blood and organ donation among adolescents with their selected demographic variables.

When the Association of attitude scores regarding blood and organ donation with with their selected demographic variable were assessed it showed that the Chi Square values were calculated to find out the association (table 7) between the attitude scores adolescents with their demographic variables regarding blood and organ donation reveals that there is association between attitude scores when compared to sex ($\chi^2=5.98$), Religion ($\chi^2=7.89$) and there is no association between attitude scores when compared to age ($\chi^2=3.55$), family type ($\chi^2=0.12$), Education ($\chi^2=2.26$), sources of Information ($\chi^2=0.02$) and Registration ($\chi^2=0.32$).

Discussion

First Objective: Assess the knowledge regarding blood and organ donation among adolescents.

The data analysis showed that, the assessment of knowledge regarding blood and organ donation among 100 adolescents revealed 33% had inadequate knowledge, 57% had moderately adequate knowledge and 10% had adequate knowledge. Area wise analysis shows that mean score of physiology of blood is 2.48(SD \pm 1.2), blood donation criteria 3.83(SD \pm 1.47), care following blood donation 0.83(SD \pm 0.67), safe blood donation 1.43(\pm SD0.53%), meaning of organ donation 1.37(SD \pm 0.70) type of organ donation 0.85(SD \pm 0.71), criteria for organ donation 4.97(SD \pm 2.21) ,timing for organ donation 1.92(SD \pm 1.6)and contraindications for organ donation 0.11(SD \pm 0.3). The overall mean knowledge scores of blood and organ donation among adolescents was 17.79(SD \pm 9.39). It revealed that there was a need for creating awareness regarding blood and organ donation. This finding is consistent with the study findings of Androulakiz et. al., (2005)³ where 53.2% had inadequate knowledge about blood donation, and also it is consistent with the study finding of Gallagher,B. (2000)⁴ where 67.9% had lack of awareness regarding organ donation.

Second Objective: Assess the attitude regarding blood and organ donation among adolescents.

The data analysis showed that in assessing the attitude regarding blood and organ donation among 100 adolescents 77% had favourable attitude, 23% had moderately favourable attitude.

This finding was supported by the study conducted by Suárez I, et al. (2004)⁵ on public attitudes regarding the blood donation and storage of specimens. The study results revealed 42% had favourable attitude regarding blood donation. Chernenko,S.M. et. al. (2005),⁶ conducted a study in Hong Kong to study attitudes of local medical students with regard to organ donation. A majority (85%) had a positive attitude but only a (23%) had signed the organ donation card.

Third Objective: Find the relationship between knowledge and attitude regarding blood & organ donation among adolescents.

The data analysis revealed that the relationship between knowledge and attitude score of blood & organ donation among adolescents showed that there

is a positive correlation ($r=0.268$) between knowledge score and attitude score of adolescents regarding blood & organ donation. Hence the research H1=There will be significant relationship between knowledge score and attitude score regarding blood and organ donation among adolescents was accepted.

This finding is consistent with the study findings of Singh, P. et. al. (2002)⁷ where the results revealed medical students had highly positive attitude towards organ donation (mean score 4.34, +0.46). This may be because the medical students had adequate knowledge regarding organ donation.

Fourth Objective: Find the association between the level of knowledge regarding blood and organ donation with their selected demographic variables.

The study showed that there was statistically significant association between the level of knowledge with age ($\chi^2=13.58$) at $p<0.05$ level. Therefore the research H2= There will be significant association between knowledge score regarding blood and organ donation among adolescents with their selected demographic variables was accepted except for sex , religion, family type ,education, health resources, registration.

This finding is consistent with the findings of Lowe, K. C. et. al. (2003)⁸ where the results revealed the study samples from different culture and language groups (German, French & Italian) showed difference in the knowledge related to organ donation.

Fifth Objective: Find the association between the level of attitudes regarding blood & organ donation with their selected demographic variables.

The study showed that there was statistically significant association between the level of Attitude with sex ($\chi^2=5.98$) and religion ($\chi^2=7.89$) at $P<0.05$ level. Therefore the research H3 = There will be significant association between attitude score regarding blood and organ donation among adolescents with their demographic variables was accepted except for age, type of family, education, health resources, registration.

This finding is consistent with the findings of Gillespie, T.W. et. al. (2002)⁹ where the study findings revealed the main reason for not agreeing organ donation was belief of inappropriateness related to religion (25.7%), and there was no significant difference based on gender.

Conclusion

This study finding concluded that the adolescents in the community had less knowledge regarding blood and organ donation. The SIM will play an important role in improving the knowledge and positive attitude of adolescents regarding blood and organ donation.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Taken from the college of nursing ethical committee.

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Non-Invasive Method of Measuring Blood Sugar in the Early Stage and Diagnose the Result Using Discrete Wavelet Transform

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Abstract

Monitoring of blood glucose levels is clinically crucial in managing diseases affecting insulin secretion and resistance, most notably diabetes mellitus and cystic fibrosis. Blood glucose is used to monitor the amount of glucose in the blood, especially patients with symptoms with the abnormality of high or low blood glucose levels. Most recently, they enable diabetic patients to administer appropriate insulin doses to human health. The availability of in-house glucometers, as opposed to clinical-use equipment, has dramatically improved the quality of life of diabetic's patient. However, such monitors require a blood draw through finger pricks for each test, which causes pain and inconvenience. Each test also needs a new test-strip, contributing to the recurring cost of such a device. Typically the blood glucose monitoring is the non-invasive technique which may cause distress and discomfort, particularly in the pediatric patient. We introduce an architecture that uses Near Infrared (NIR) spectroscopy to determine blood glucose levels based on transmittance spectroscopy on the nose lobe. The Measurement of glucose in the respiratory fluid by a collection of exhaled breath in condensate and therefore, a potentially clinically useful method of estimating blood glucose levels identified and therefore it is the excellent agreement between these diabetics blood glucose level.

Keyword: *Insulin secretion, Diabetes mellitus Glucometer, Near-infrared spectroscopy, Diabetes mellitus.*

Introduction

Diabetes mellitus is a disease resulting from insufficiency of insulin in the body causing elevated blood-glucose levels known as hyperglycemia, or reduced glucose concentrations, known as hypoglycemia [1]. Insulin is the hormone secreted from the pancreas to mediate metabolic reactions from glucose level into the body. Initiates have taken to decrease blood glucose level in the body, and hence reduce the human risk to live a long life. Diabetes is associated with many medical conditions such as celiac disease, cystic fibrosis, tuberculosis and heart disease for all groups of peoples [2]. Such conditions result in retinopathy which leads to blindness, nephropathy rise to renal failure, and peripheral nerve affected with increased in the human risk of foot ulcer, cardiovascular diseases or final stage of cancer which leads to death. Diabetes mellitus is the manageable disorder in which the of blood glucose is monitored daily so that diabetics affected person won't get afraid because every time the affected person

feels the blood glucose level will rise faster, it leads to significant risk [3]. The diagnosis and monitoring of blood glucose in the human body currently used in medical studies such as pre-diabetes patients involves the use of blood tests before and after fasting in real time situation. Blood glucose level is done by drawing the blood samples from the patient using a typical glucometer to measure the reading in digital form. This glucometer measurement involves pricking a drop of blood from the human body and placing the drop of blood on a sensitive area of the strip which is inserted in an electronic reading instrument in digital form [4]. This method is very painful, invasive and it is unsafe for diabetic's patient. Therefore, it will not suit all people, especially where the patient wants several samples of a blood test each day. The emerging technique built on the advancement measurement technologies provides a non-invasive method for diabetic's disease and diagnosis of the disease in the early stage itself [5]. The application of acetone detection has potential attention which

rapidly distinguishes between healthy and unhealthy diabetic patients. These remarkable results are achieved to improve analytical techniques performed in the last ten years [6]. This method uses the single instrument and skilled operators for testing the blood glucose level both in fasting and after fasting with the duration of minimum two hours [7]. Furthermore, the technique includes low cost with high accuracy of result for all type of diabetics' patient, i.e., TYPES I, TYPE II diabetics [8]. The next section will briefly summaries about the materials and methods and findings which are used to identify the earlier stage of diabetics.

Material and Method

Envoy Kirchsteiger, Luca Zachariah, Eric Reynard, Luigi del has proposed the issue of online adjustment and recalibration for nonstop checking the blood glucose level to severe diabetics in the beginning time [9]. Two distinctive parametric relations among interstitial and blood glucose are examined, and valuable calculations to adaptively appraise the parameters inside those relations are proposed [10]. One trademark is the clear thought of estimation vulnerability of the gadget used to gather the alignment estimations. Another component is the programmer discovery of finger stick estimations that are not appropriate to be utilised for alignment. Since the techniques depend on the arrangement of straight grid imbalances bringing about arched improvement issues, the calculations are of moderate computational multifaceted nature and could be actualized on a CGM gadget. The strategies were surveyed on clinical information from 17 diabetic patients, and the enhancements as for the present best in class appear [11]. Yang Jin; Hong Wang, Hayman Cal, Zhenjiang Lv, Shiyuan Yang, Hayman Cai, Jun Feng Jiang and Tsinghua has proposed the electrochemical techniques which have been generally utilised in the concoction and pharmaceutical ventures, which require exact fixation estimations, substance response location and examination for people with diabetes quiet. The electrochemical potentiostat, the central component in electrochemical instruments, have been examined as an exciting issue tending to the trouble of applying high-accuracy consistent voltage and Pico ampere current estimations [12]. Then, dependable potentiometer is very favourite for convoluted mechanical situations with commotions just as prerequisites of remote screens. This paper portrays a potentiostat for automatic glucose estimation that isn't only exact yet also blame tolerant to ensure consistently high quality in modern conditions.

They showed adaptable pH sensor and glucose biosensor altered by attractive dabs and graphene was proposed. The ruthenium dioxide detecting films were kept by radio recurrence sputtering framework, and the screen printed system was utilised to build the silver directing wires and a protective layer of the cathodes. To improve execution of the pH sensor and glucose biosensor, the smaller scale fluidic gadget had been used and created [13]. In the estimation forms, the different pH and glucose arrangements were researched in different stream rates. As indicated by the test results, the natural affectability of the pH sensor was improved, and the natural affectability of the 2/grapheme/attractive dot GOx-Nafion glucose biosensor was upgraded from 10.628 to 13.541 mV/mm. Concerning the remote detecting estimations, the remote detecting framework which agreed the ZigBee standard was utilised to transmit the signs of the pH or glucose estimations in this examination. Xbee gadget, Arduino Mega 2560, a readout circuit, pH or glucose biosensor and PC. Without diabetes, your body tracks glucose levels throughout the day and night to guarantee the appropriate measure of insulin is discharged at the correct time with hazard free appraisal. To effectively oversee diabetes, an observing framework is expected to check your glucose levels in the body reliably. The breathing sensors incorporate transducers connected to the human body. For instance, customarily utilised strategy utilises two versatile groups implanted with sensors around the ribcage and stomach area to screen their developments. Data on the different movements of the ribcage and midriff give data about breath exertion. Albeit worthy for shorter timeframes, this strategy is inadmissible for long haul checking or observing of dozing patients. A fasting blood glucose test is the favoured strategy to analyse diabetes and guideline out different conditions. This test is done after an individual has had nothing to eat or drink except water for somewhere around 8 hours. It is for the most part begun medium-term so the test should be possible in the first part of the day. A self-observing test or blood glucose checking by finger prick is a quick and straightforward technique for distinguishing issues with glucose levels. The average blood glucose levels fluctuate contingent upon which test was performed, regardless of whether an individual was fasting before the test, and whether any exceptional dietary or glucose substances were given amid testing. Expanded dimensions of blood glucose, a condition known as hyperglycemia, might be brought about by the accompanying blood glucose level in a reasonable state.

Findings

The figure 1 shows the hardware circuit and to implemented to the patient for monitoring the blood glucose level with fast fasting. The net results can be achieved in digital a value which is the accurate measurement and it can vary from +20 to -20 variations in the blood sugar level. The figure 2 shows the hardware circuit and to implement to the patient health monitoring the blood glucose level without fasting. The

net results can be achieved in digital a value which is the accurate measurement and it can vary from +20 to -20 variations in the blood sugar level. Both the hardware circuit implemented for patient health monitoring is the non invasive method of testing the blood glucose level. The figure 3 and 4 shows the output interns of dyadic wavelet transformation and the time domain factor and probability distribution of signal analyzed with respect to discrete wavelet transform.

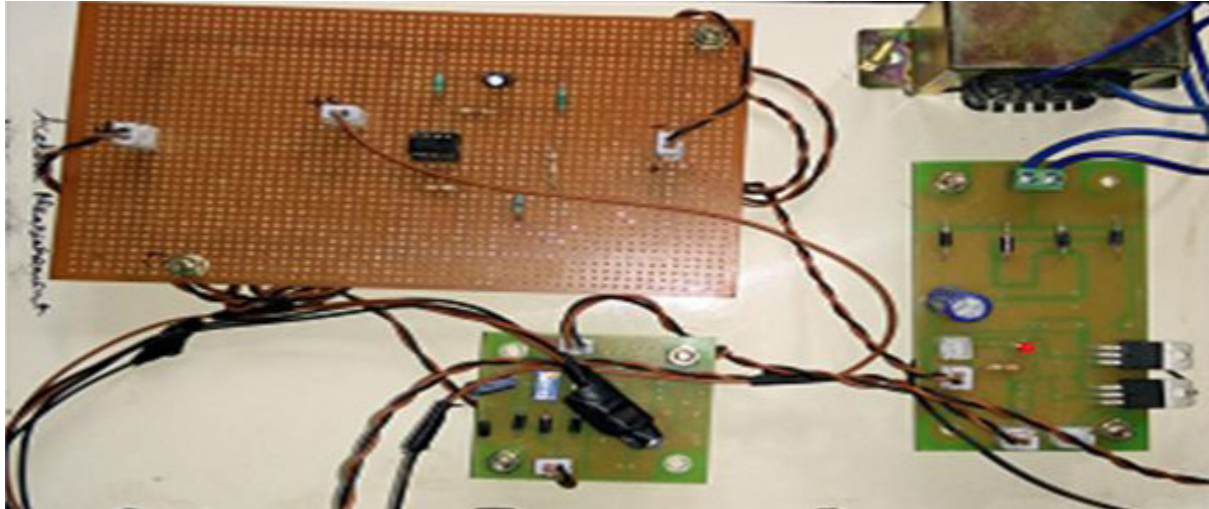


Figure 1 Before Fasting

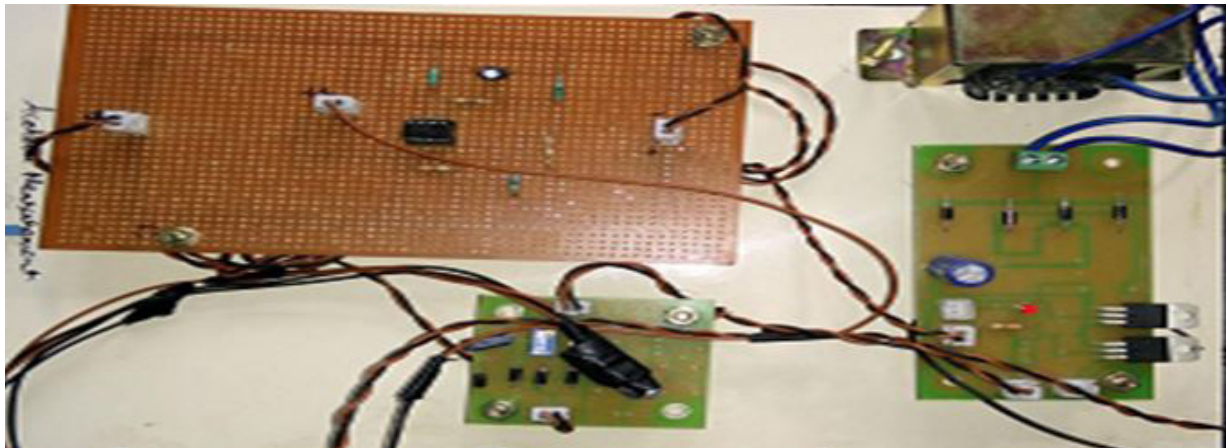


Figure 2: After fasting

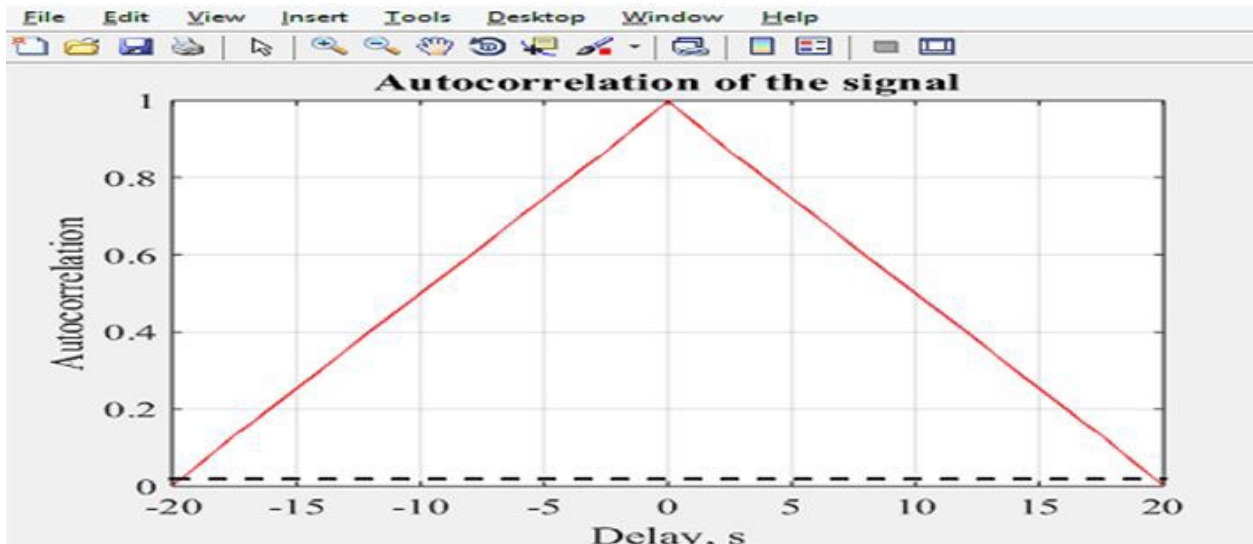


Figure 3: Simulated Output

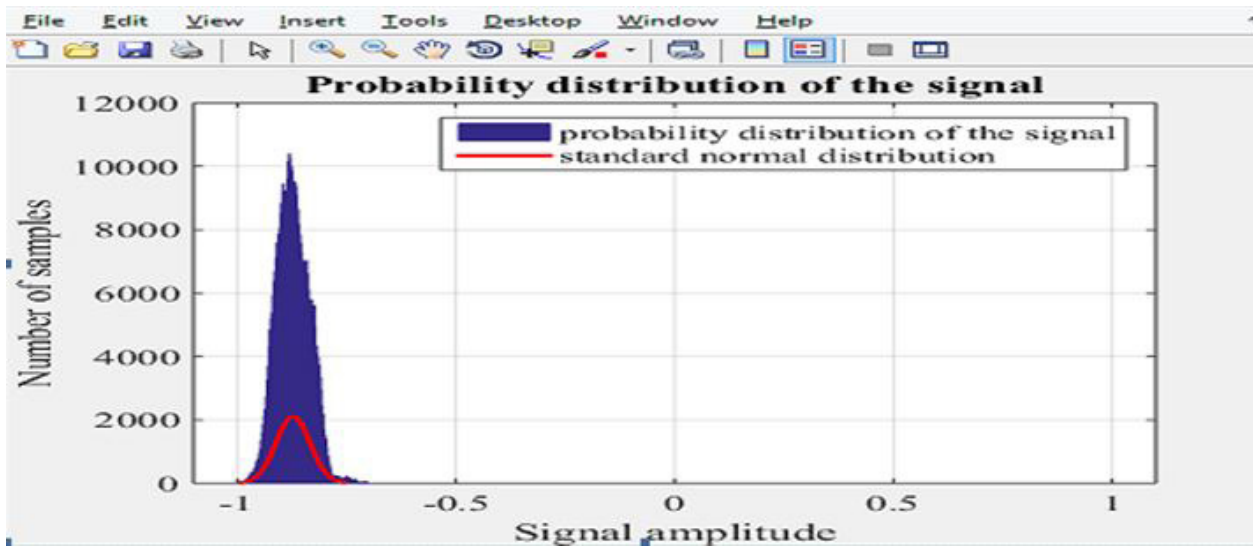


Figure4: Probability distribution of a signal

Conclusion

There have been continuous advances in the field of glucose monitoring during the last four decades, which have led to the development of highly evolved blood glucose meters, non-invasive glucose monitoring (NGM) devices and continuous glucose monitoring systems (CGMS).Glucose monitoring is an integral part of diabetes management, and the maintenance of physiological blood glucose concentration is the only way for a diabetic to avoid life-threatening diabetic complications. This technique is highly useful for random test in the blood glucose level for monitoring the health condition in the early stage and probably when diagnosis is identified in the early stage the condition to

maintain blood sugar in Normal Mode.

Future Developments:

In future, the glucose level can be measured by using sweat, saliva and tears. Monitoring of blood glucose level can be measured by using noninvasive techniques. Noninvasive techniques are used than invasive technique which can create distress and discomfort such as finger prick method. Glucose monitoring is an integral part of diabetes management, and the maintenance of physiological blood glucose concentration is the only way for a diabetic to avoid life-threatening diabetic complications.

Conflict of Interest: There is no conflict of interest regarding this research paper

Source of Funding: Self

Ethical Clearance: The research work proves in novelty of the proposed work

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Knowledge about Legal Aspects of Medical Negligence in India among Dentists– A Questionnaire Survey

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Abstract

Introduction: Medical negligence is the breach of legal duty to care which includes the damages, and establishing causation. Awareness towards medical negligence is increasing day by day among patients. Recent court rulings have also been in favour of the complainants where there is proven case of negligence which has encouraged others to take up their grievances. There is no special subject where dentists learn about legal aspects of medical negligence. Hence this study was done to assess their knowledge on legal aspects of medical negligence.

Materials and Method: An online questionnaire with 15 questions regarding legal aspects of medical negligence was sent to 100 dentists of a well reputed dental college. The completed forms were evaluated. The results were calculated as percentage and tabulated as graphs.

Result: The awareness was less among dentists for most of the questions. Majority of them knew the term medical negligence but terms least known were *res ipsa loquitur*, *bolam's test* and *Bolitho case*. The other questions had less than an average response.

Conclusion : The survey results showed that the knowledge of dentists regarding the legal aspects of medical negligence was poor. This survey assessed the knowledge of the dentists and also enlightened the respondents with answers pertaining to the questions. More awareness must be created so that doctors are more careful and hence patients benefitted.

Keywords: Medical negligence, law, knowledge.

Introduction

Medical negligence is the breach of legal duty to care which includes the damages, and establishing causation⁽¹⁾. After the Consumer Protection Act, 1986, numerous cases are reported against doctors due to

public awareness which is growing now in India. A breach of this duty gives a patient the right to initiate action against negligence⁽²⁾. Recent court rulings in favour of the complainants where there is proven case of negligence has encouraged others to take up their grievances⁽³⁾. Medical error is the third leading cause of death in the US, accounting for 2.5 lakh deaths every year. But no such data is available in India. Patients often allege that doctors try to save each other even when the case is re-referred to medical boards for investigation⁽³⁾. Cases of medical negligence are also heard of in the field of dentistry but no data is available on the percentage per year. Recently, in December 2018, there was a case which involved a private dental clinic in Ambattur, Chennai, where the court asked the dentist to pay back the patient the treatment cost along with a sum of Rs.15,000 for

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mental agony caused during the process due to medical negligence. This study is important because there is no special subject where the dentists are exposed to law and medical negligence in their curriculum, hence assessing their knowledge and creating awareness will make the dentists more responsible towards their patients.

Materials and Method

An online questionnaire consisting of 15 questions regarding knowledge on legal aspects of medical negligence was sent to 100 dentists of a well reputed dental college in Chennai, South India. The survey was conducted between October 2018 to January 2019. The details regarding the age, gender and years of experience in dentistry was collected with each form. The respondents had to choose between options 'know' and 'don't know'. If the respondent knew the answer, he/she had to check it with the answers that were provided after the questionnaire section and then choose the option 'know' if it correlated or the option 'don't know,

if the answer was wrong or did not correlate with the right answers. The scores were given as good, fair and poor if the number of known responses were between 60-100%, 30-59% and 1-29% respectively.

Results

81% of the respondents were between 20-30 years of age, 75% were females and 60% had experience less than 5 years. The age distribution, gender and years of experience are represented in Fig 1-3. Among the 15 questions regarding law and medical negligence in India, knowledge was good regarding the terms and questions on medical negligence, consumer protection act, arrest of the doctor and punishment for medical negligence, knowledge was fair regarding the terms Burden of proof, Civil negligence, Criminal negligence, punishment for free services and the Standard to judge the negligence of the doctor and knowledge was poor for terms like Implied undertaking, *res Ipsa loquitur*, Bolam's test, Bolitho case and Vicarious liability. The results of the survey are tabulated in Table 1.

Table 1: The responses(in %)for the medicolegal terms and questions

S.No	Knowledge on	% Who knew	% Who didn't know
1	Medical negligence	91	9
2	The Standard to judge the negligence of the doctor	45	55
3	Implied undertaking	29	71
4	Res Ipsa loquitur	2	98
5	Bolam's test	2	98
6	Bolitho case	3	97
7	Civil negligence	51	49
8	Criminal negligence	60	40
9	Punishment for medical negligence	66	34
10	When can a doctor be arrested?	40	60
11	Are you punishable for free services?	39	61
12	When is the dr not punishable?	47	53
13	Vicarious liability	14	86
14	Burden of proof	24	76
15	Consumer protection act	69	31

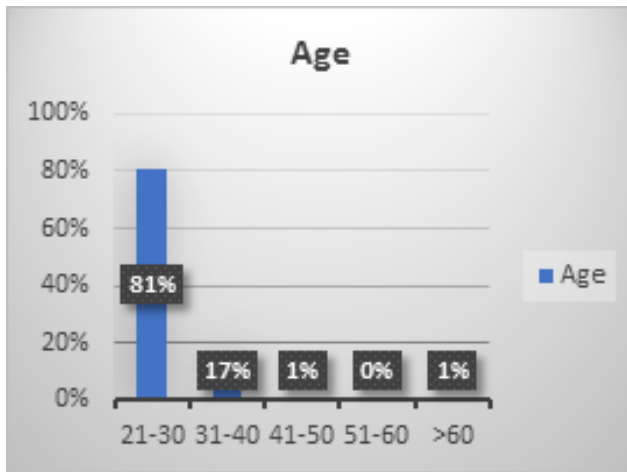


Figure 1: Graph depicting age distribution

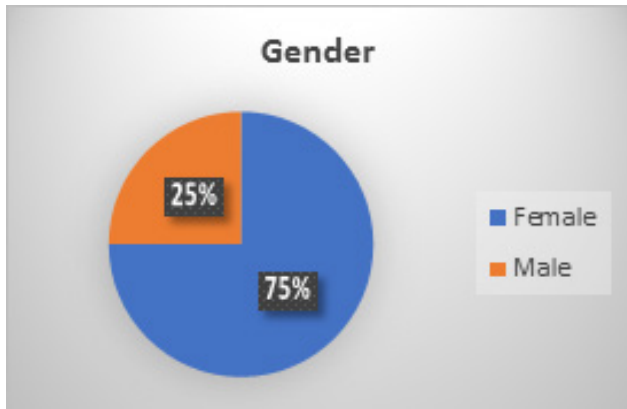


Figure 2: Graph depicting gender distribution

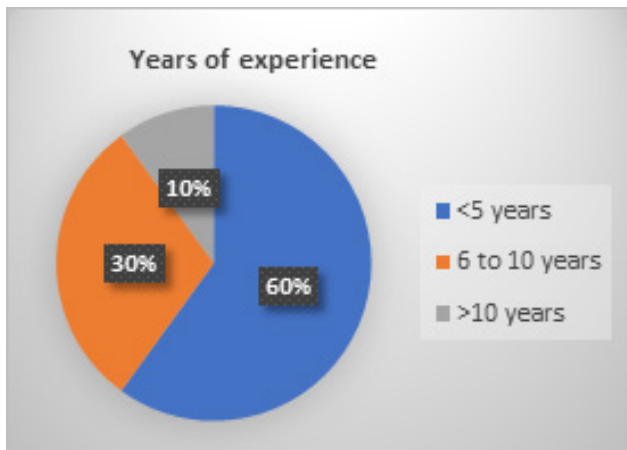


Figure 3: Graph depicting years of experience

Discussion

Doctors are expected to deliver good service at all times. But if there is a breach in the duty due to an act of commission or omission then they are said to be medically negligent. The consequences that follow when a patient takes this legally is of great importance to the doctor. Knowing the laws that govern medical negligence will help the doctors serve patients better and more cautiously .

A study by AIIMS forensic department has revealed wrong treatment is the most common reason for people to complain about medical negligence, followed by lack of care, no treatment and forced discharge⁽³⁾.

People are more educated now than before. They are aware of their rights. In the medical field, the public can procure their rights through Consumer protection act. 69% of them knew the term consumer protection act. Consumer protection act came out in 1986 which means any fault, imperfection, shortcoming, or inadequacy in the quality, nature, or manner of performance that is required to be maintained by or under any law for being in force at that given time⁽²⁾. This term has also been used for other services consumed including medical services.

Doctors must exercise an ordinary degree of skill ⁽⁴⁾. No doctor can give a warranty of the perfection of their skill or a guarantee of cure. If the doctor has adopted the right choice of treatment, if she/ he is skilled and has worked with a method best suited to the patient, she/ he cannot be blamed for negligence if the patient is not totally cured ⁽⁵⁾. Dr Abhishek Yadav, who led the study in AIIMS , told that allegations were found to be more in common in groups of children and adolescents (50%) with a declining trend with increase in age⁽³⁾.

Better characterizing these events can educate providers with the goal of improving patient care⁽¹⁾.

Among all the questions medical negligence which is breach of the said duty; and consequential damage that follows was the term maximum known. This may be due to frequency of hearing more than the other terms.

Its understood that any professional in their field (law, medical, engineering) acquires and has the skill that profession needs after graduating. A doctor need not possess the highest expert skill. The standard of the accused doctor is adjudged with an ordinary doctor of the same profession with ordinary skills⁽⁶⁾.

Majority of them did not know the term Implied undertaking which means that any person who offers medical advice and treatment implicitly state that they have the skill and knowledge to do so, that they have the skill to decide whether to take a case, to decide the treatment, and to administer that treatment⁽⁷⁾. Doctors said lack of communication between the doctors and patient is a major cause of discontent. “Doctors should refrain from making vague promises of complete recovery and should always explain the complication

or unforeseen danger associated with the treatment procedure,” said a doctor at AIIMS ⁽³⁾.

The questions with the least responses were Res ipsa loquitor, Bolam’s test and Bolitho case. The principle of res ipsa loquitor is ‘thing speaks for itself’. For e.g. prescription with the wrong medicine or a cotton swab/ instrument inside the lesion during surgery. With nearly 5,000,000 Indians dying due to medical negligence every year, experts claim that a specialised course for doctors and hospital staff focusing on how a critically ill or injured patient should be handled could bring down the figure by almost 50 per cent⁽⁸⁾. There are examples of few cases in Tamil Nadu recently which got medical negligence to limelight like 1) a case where HIV infected blood was transfused to a 8 month pregnant lady ,2) an accusation against a gynaecologist for leaving a sanitary napkin behind during the C-section.3) A lady was misdiagnosed as pregnancy positive but had a tumour instead. This is mainly due to medical negligence. In certain circumstances no proof of negligence is required beyond the accident itself⁽⁹⁾.

2)According to Bolam’s test, a doctor, who acts by a practice accepted as proper by a responsible body of medical men, is not negligent mainly because there is a body of opinion that takes a logical reasonable view. The typical rule for assessing the appropriate standard of reasonable care in negligence cases involving skilled professionals. The law imposes a duty of care between a doctor and his patient, but the standard of that care must be in accordance with the responsible body of opinion (medical board), then he is not considered negligent. This is known as Bolam test propounded by McNair J in Bolam v. Friern Hospital Management Committee (1957) 2 All ER 118 in the UK. It has been approved and followed by the courts in India⁽¹⁰⁾.

3)Bolitho case is causation must be proved to bring a claim in negligence and whether the doctor acted by a practice accepted as proper by an ordinarily competent doctor. In his opinion delivered in the Bolitho case, Lord Browne-Wilkinson indicated that experts should direct their minds to the question of comparative risks and benefits in order to reach a defensible conclusion on the matter in question. A clinical conclusion which does not have risk analysis at its heart is not likely to be deemed a responsible conclusion⁽¹¹⁾. Over time, the Bolam test evolved in the English courts and was made stricter by the Bolitho case. But the Indian courts still follow the

Bolam test.

More than half knew the term civil negligence which means the professional shows negligence but does not cause death of the patient. Less than half knew the term criminal negligence but the punishment given was known by greater number of them. Section 304A[10] of the Indian Penal Code of 1860 states that “ whoever causes the death of a person by a rash or negligent act not amounting to culpable homicide. The doctor shall be punished with imprisonment for a period of two years, or with a fine or with both. ” but this is used to deal with both cases of accidents caused due to rash and negligent motor vehicle driving and also medical negligence leading to the death of a patient.

Sections 80 and 88 of the IPC(Indian Penal Code) contain defences for doctors accused of criminal liability. Nothing is an offence that is done by accident or misfortune and without any criminal intention under Section 80. A private complaint of rashness or negligence against a doctor may not be entertained without prima facie evidence in the form of a credible opinion of another competent .In addition, an independent opinion should be received from an investigating officer, preferably of a government doctor. A doctor may be arrested only if the investigating officer believes that she/ he would not be available for prosecution unless arrested which was known by majority of them⁽¹²⁾. Negligence cannot be attributed to a doctor merely because the doctor chooses one procedure over other, he won’t be liable when done with proper care and caution.

Before, doctors were not liable for their services individually or vicariously if they do not charge fees. Now under the torts law or civil law, they can be punished even if the doctor provides free services. Less than a quarter knew that many a time the doctor will also be responsible vicariously, meaning thereby if his employee/servant rashly causes the death of a patient. In that case, the employee as well the doctor will be liable due to the principle of ‘Vicarious Liability’ under Tort law⁽¹³⁾.

Burden of proof is on the one who complains. Patient has to try and prove the doctor’s fault. If a patient alleges malpractice in medical field, the law will require a higher standard of evidence to support it. The best evidence available in medical science presented with expert opinion is required by the complainant to prove negligence by the doctor. It was held that negligence has

to be established and cannot be presumed⁽¹⁴⁾ and it must be proved by the onus as in *Kanhaiya Kumar Singh vs Park Medicare & Research Centre*. Informed consent, full details of the patient, details of investigations and the treatment provided must be maintained by the hospital as precautionary measures.

Conclusion

This survey is the first of its kind to assess the knowledge of dentists and make them familiar with terms regarding legal aspects of medical negligence in India. The survey results have shown that there is less awareness among dentists regarding law and medical negligence. Limitations of this study would be choosing the sample in a single institution. In future, research should be carried out on a larger sample to assess the knowledge of dentists, conduct education programmes for evolved dentists, and a subject on the basics of medical law which would include legal aspects of medical negligence must be added to the dental curriculum for evolving dentists since knowledge regarding this is important for both the doctors and patients since both their rights and dignity have to be maintained.

Competing Interests: Nil.

Funding support: Nil.

Ethical Clearance: Obtained from the ethical committee of Saveetha Dental College and Hospitals, Chennai.

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Nasal Height as a Parameter for Stature Estimation & Sex Differentiation in Dehradun Region

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Abstract

Introduction: Stature is one of the most important parameters in the identification of an individual, living or dead. In intact bodies, stature estimation does not pose any problem but when dismembered human body parts are involved, it is of a challenge for the forensic pathologist as these parameters are highly sex, race and age dependent.

Materials & Method: The study was conducted in Shridev Suman Subharti Medical College, Dehradun among a total of 158 healthy subjects (17-25 years), comprising 79 males and 79 females. Those with cranio-facial defects were excluded from the study. Mean stature and nasal height were obtained by direct measurement; co-relation co-efficient were obtained and regression equation formulated for estimating stature.

Observations & Result: The study showed that in males mean values are significantly higher than females for both stature as well as nasal height; stature (males, 172.3435 ± 6.48442 ; females, 158.9430 ± 5.64269), nasal height (males, $5.0341 \pm .37075$; females, $4.6770 \pm .30431$). Nasal height in total subjects and individually in males is significantly ($p < 0.05$) and positively correlated with stature. However, in females it is found to be statistically insignificant. These values can be employed in estimation of stature using the linear regression equation $Y = 155.251 + 3.395$ (nasal height of Males), $Y = 151.170 + 1.662$ (nasal height of females). Also, accuracy in predicting sex when mean nasal height is taken as independent variable is more in females as compared to males (F=77.2%, M= 68.4%).

Conclusion: Nasal height can be used as a reliable tool in estimating stature, particularly in the males and in females it can be used for determination of sex with accuracy.

Keywords: Nasal height, stature, identification,

Introduction

The branch of physical anthropology that deals with measurements of different body parts is known as Anthropometry.¹ Various bones of the human skeleton have been employed for reconstruction of stature and

prediction of sex by many scientists with varying degree of accuracy.^{2,3,4,5} Although a wide variety of long bones have been employed for stature estimation, only few studies have utilized the cranio-facial dimensions in this regard.³ Hence, establishment of alternative methodologies for estimation of stature still requires elaborate studies.

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In archaeological procedures or in forensic examinations after mass disaster, estimation of height is done from rudiments or fragments of bones for the purpose of identification.² The body segments exhibit consistent ratios among themselves and also relative

to the total body height.⁶ Thus, in addition to the limb measurements, various cephalo-facial indices such as head circumference, facial length, facial width, nasal height, nasal width etc are amongst some of the clinical anthropometrical parameters that can be used for estimation of stature.³

Although, many formulae for stature estimation have been proposed, there is no universally applicable formulae as the ratios of the body segments and stature are dependent on age, sex and race.^{6,7} This study aims to estimate stature of the study population in Dehradun region using nasal height by regression equation and to predict reliability of nasal height in sex differentiation.

Materials & Method

The study was conducted in Shridev Suman Medical College, Dehradun among healthy students of the Institute, subjects varying in age from 17 to 22 years. A total of one hundred and fifty eight (158) subjects

were involved which comprised of 79 males and 79 females. Those having any cephalo-facial defects or spinal deformity (kyphosis, scoliosis) were excluded from the study. A written informed consent was duly obtained from all the willing participants; procedure and purpose of study was explained in detail. The stature was measured using an anthropometer as the vertical distance between vertex and heel touching the floor or ground surface, with the person standing erect and head in a Frankfort plane. A vernier calliper was used for measuring nasal height; the distance between nasion to nasopinale of the nose i.e from the point in midline where the frontonasal suture and the median plane intersect, taken on the frontal, to the lowest point at the start of the nasal floor. It was taken on both sides; to minimise subjective errors, all these measurements were taken twice and an average was duly noted. Mean of the stature and nasal height was obtained for both sexes, correlation co-efficient calculated and a regression equation was formulated using statistical software SPSS version 20.

Observations & Result

Parameter		Mean	Std. Deviation	Correlation value [r]	R2	P value
Total subjects (n= 158)	Mean stature	165.6433	9.04919	.437	.191	.000
	Mean Nasal Height	4.8555	.38259			
Females (n= 79)	Mean stature	158.9430	5.64269	.090	.008	.216
	Mean Nasal Height	4.6770	.30431			
Males (n= 79)	Mean stature	172.3435	6.48442	.194	.038	.043
	Mean Nasal Height	5.0341	.37075			

In the study, it was observed that mean stature and mean nasal height was significantly higher in males as compared to females i.e in Males stature was 172.34 ± 6.48 while in females it was 158.94 ± 5.64 ; nasal height in males was 5.03 ± 0.37 and in females it was 4.68 ± 0.30 . Also, in total subjects as well as individually in males and females, a weak positive co-relation was obtained with stature. Since P value is ≤ 0.05 in total subjects and in males, which means it is found to be statistically significant. However, in females, P value is found to be statistically insignificant. [Table 1]

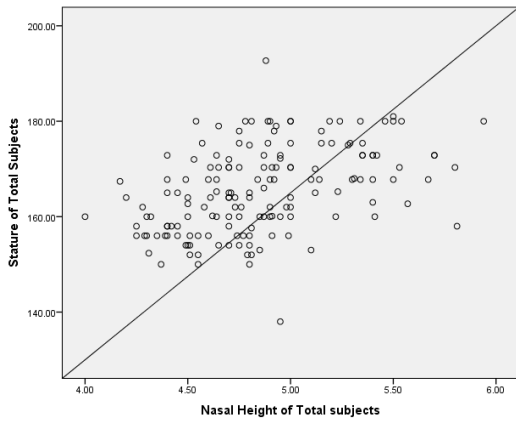


Fig 1: correlation between stature and nasal height of total subjects

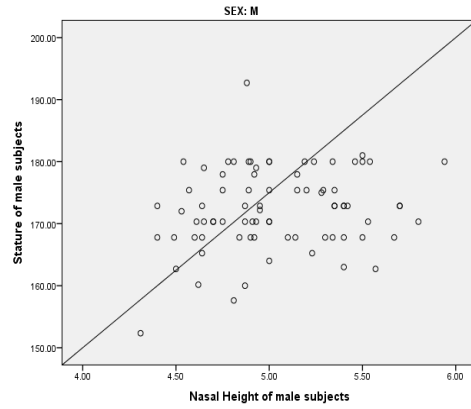


Fig 3: Correlation between stature and nasal height in males.

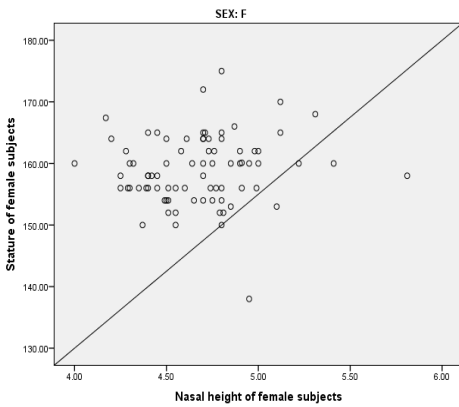


Fig 2: Correlation between stature and nasal height in females

Regression equation was formulated for total subjects as well as individually for males and females which can be used for calculating the estimated stature of that particular person once nasal height is known. [Table 2]

Table 2: Regression analysis for predicting stature (dependable variable) considering nasal height as independent variable	
Parameter	Regression equation for stature
Total subjects (n= 158)	$Y = 115.480 + 10.331 (\text{nasal height of subjects})$
Females (n= 79)	$Y = 151.170 + 1.662 (\text{nasal height of females})$
Males (n= 79)	$Y = 155.251 + 3.395 (\text{nasal height of Males})$

Considering nasal height of the subjects alone as an independent variable, sex can be differentiated as P value is ≤ 0.005 , which is statistically highly significant. This shows that statistically, sexual dimorphism exists

among the study population having a percentage of 8.5%. It was also observed that the findings are more accurate in females as compared to males i.e 77.2% and 68.4 % in females and males respectively [Table 3 & 4]

Table 3: Independent t test: for sex differentiation from Nasal Height						
Parameter	Sex	Mean ± SD	T value	P value	Significance level	% of sexual dimorphism
Nasal Height	M	172.3435 ± 6.48442	6.617	0.000	Statistically Highly significance	$\frac{X_m - X_f}{X_f} \times 100 = 8.5 \%$
	F	158.9430 ± 5.64269				
Xm = mean of male nasal heights, Xf = mean of female nasal height						

Table 4: % age accuracy to predict sex from nasal height using differential functional analysis	
Parameter	% age Accuracy
Total subjects	72.8%
Females	77.2%
Males	68.4%

Discussion

Various authors have estimated stature from cephalo-facial dimensions and found that it had partial positive correlation with total facial height, considering facial height as a better parameter.^{8,3,9,10,11} In this study, nasal height was used as a single parameter for estimation of stature. Except Shrestha RN et al¹² which has used solely, most of the authors^{13,14,15,16,17,18,19,20} have used nasal height in conjunction with other cephalo-facial parameters and similar findings of a positive correlation consistent with the present study have been obtained; the values being higher in males as compared to females. Though, few of the authors^{18,19,20} found nasal height to be un-reliable in stature estimation.

It is known that stature can be estimated either by multiplying the parameter with the derived multiplication factor or can be measured by employing regression equation, but most of the researchers considered that regression analysis is the best for stature estimation.^{3,13,14,21} However, in this study, the value of regression analysis is not found to be statistically significant in females but in males as well as when all the subjects are considered together, the value is significant. This disparity could be due to lesser number of subjects being studied and thereby research needs to be extended to a larger population.

In a study by Sagar S and Nath S²² nasal height is not considered to be a reliable parameter for sex differentiation but findings by E O Ewunonu²³ is consistent with the present study. The accuracy in predicting sex when mean nasal height is taken as independent variable is more in females as compared to males (F=77.2%,M= 68.4%) with percentage of sexual dimorphism being 8.5%; no author has commented in this regard.

Since, this study was conducted with intact soft tissue over the face, it is possible that the parameters may have insignificant correlation with bare bone measurements. These results can be of significance only in mutilated body with presence of some intact tissue or when isolated facial structure is brought for forensic examination. The regression equation thus obtained could prove to be beneficial in mass disasters as individuals that fall outside those limits can be easily excluded.

Conclusion

In circumstances where decomposed or mutilated body is brought for medico-legal examination, identification can be established by estimating stature by means of regression equation using nasal height. This produces a height range and individuals that fall outside

those limits can be subsequently excluded. Prediction of sex is also possible to a greater extent which can be used as an identification tool. This method is not only reliable, relatively easy and quick to apply without involvement of any sophisticated techniques but also the anatomical landmarks measured are standard, much easier to locate and does not require difficult instrumentation.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Obtained from the Institutional Ethical Committee of Shridev Suman Subharti Medical College

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Study of Suspicious Deaths in Middle Aged Married Females

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Abstract

Introduction – Female deaths, especially young married females always arouse suspicions, but later age females who have crossed 30 years of age are not the cases which draws our attention. So, we conducted an observational study for a period of 1 year in autopsy of SSG Hospital, Baroda.

Material & Method – Of all cases coming for the postmortem examination, cases in which the victim is married female and above 30 years of age were taken for the study when there was suspicion regarding the cause of death.

Results – Victims having Illiterates (16.66 %), primary (45.83 %), secondary (33.33 %) school education were total 95.82 % of cases. It was observed that 72.91 % of deaths were suicidal in nature followed by accidental (22.91 %) and homicidal deaths (4.16 %).

Statistical analysis –The data collected was analyzed using MS Excel worksheets for averages and percentage.

Conclusion – Education holds a very pivotal role in the prevention of unnatural deaths in females.

Key-words – *Married females, suspicious death*

Introduction

In an autopsy whenever there is a case of married female for post-mortem examination, there is always suspicion raised by the family of the female. So, in every case of married female death we work extra cautious. Specifically, if the married female is young. But married females who are more than 30 years in age, these cases do not attract our great attention. So, to identify profiles and patterns in suspicious deaths in married females who are more than 30 years in age, current study was designed. The current study was undertaken at P.M. room of S.S.G. Hospital, Vadodara to study the profiles and patterns in suspicious deaths in married females of more than 30 years age group. Out of total cases coming from post-mortem examination total 48 cases were

selected based on inclusion, exclusion criteria.

Material & Method

An autopsy study of suspicious deaths in married females of above 30 years age was carried out in this Medical College from 1st August 2017 to 31st July 2018. A total 48 autopsy cases of unnatural deaths in married females with age more than 30 years were studied during the study period.

Inclusion Criteria:

The material for the present study consists of the cases of suspicious deaths of married female with age more than 30 years which have been brought for medico-legal autopsy.

Exclusion Criteria:

4. Deaths due to mass casualties or road traffic accidents.
5. Deaths due to natural disease.
6. Unidentified and Decomposed female dead

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bodies.

Before performing autopsy, all these cases were studied in details from indoor case records, hospital records (where applicable), history obtained from relatives of deceased and police inquest. A standard proforma was used to collect information regarding age of deceased, duration since marriage, educational background of deceased and husband and types of family. A careful and complete autopsy was performed in each case. The viscera and necessary samples were preserved in required cases. Statistical analysis of data was done and presented as result and observation in tabular form, graphs and charts.

Statistical Method

The data so collected was tabulated and required calculations were done using MS Excel 2010. No other statistical method was required.

Results

Out of total 1925 autopsies performed in 1-year study period, 138 were females of all ages with suspicious deaths. From them 48 cases with age more than 30 years were selected as per inclusion, exclusion criteria. The results are as per tables below.

Table No.1: Distribution of cases according to age.

No.	Age of Deceased	No. of Cases	Percentage
1.	31-40 years	32	66.66 %
2.	40-50 years	12	25.00 %
3.	>50 years	4	8.33 %
Total		48	100 %

Maximum number (66.66 %) of deaths were observed in the age group of 31-40 years followed by 40-50 years (25 %).

Table No.2: Number of cases having children

No.	Deceased having children	No. of Cases	Percentage
1.	Yes	44	91.66 %
2.	No	4	8.33 %
Total		48	100 %

It was observed that 91.66 % of female victims had children while 8.33% female victims had no child.

Table No 3: Distribution of cases according to education of victim

No.	Education of Deceased	No. of Cases	Percentage
1.	Illiterate	8	16.66 %
2.	Primary	22	45.83 %
3.	Secondary	16	33.33 %
4.	Graduation	2	4.16 %
5.	Post-graduation	0	0 %
Total		48	100 %

Maximum number of married female deaths cases 45.83 % were observed in females having just primary or less education. Victims having Illiterates (16.66 %), primary (45.83 %), secondary (33.33 %) school education were total 95.82 % of cases.

Table No. 4: Distribution of cases according education of their husband

No.	Education of Husband	No. of Cases	Percentage
1.	Illiterate	10	20.83 %
2.	Primary	16	33.33 %
3.	Secondary	12	25 %
4.	Graduation	10	20.83 %
5.	Post-graduation	0	0 %
Total		48	100 %

Maximum number of suspicious deaths (79.83 %) in married females occurred where their husbands were poorly educated which include Illiterate (20.83%), primary (33.33 %), secondary (25 %).

Table No. 5: Distribution of cases according to cause and manner of Death

No.	Cause of Death	Manner of death			No. of Cases
		Accidental	Suicidal	Homicidal	
1.	Burns & its complications	6 (12.50 %)	10 (20.83 %)	0 (0 %)	16 (33.33 %)
2.	Hanging	0 (0 %)	10 (20.83 %)	0 (0 %)	10 (20.83 %)
3.	Poisoning	2 (4.16 %)	14 (29.17 %)	0 (0 %)	16 (33.33 %)
4.	Drowning	1 (2.08 %)	1 (2.08 %)	0 (0 %)	2 (4.16 %)
5.	Physical Assault	0 (0 %)	0 (0 %)	2 (4.16 %)	2 (4.16 %)
6.	Electrocution	1 (2.08 %)	0 (0 %)	0 (0 %)	1 (2.08 %)
7.	Snake bite	1 (2.08 %)	0 (0 %)	0 (0 %)	1 (2.08 %)
Total		11 (22.92 %)	35 (72.92 %)	2 (4.16 %)	48 (100 %)

It was observed that 72.92% of deaths were suicidal in nature followed by accidental (22.92%) and homicidal deaths (4.16 %). Total 20.83 % of deaths from burns were suicidal in nature, 12.50 % of burns were accidental.

Discussion –

An autopsy study of suspicious deaths in married females of above 30 years age was carried out in this Medical College from 1st August 2017 to 31st July 2018. A total 48 autopsy cases of unnatural deaths in married females with age more than 30 years were studied during the study period. During this one-year period a total of 1925 medico-legal autopsies were conducted, out of that 138 cases (7.16 %) were all age females with suspicious deaths. Which is comparable to what was reported by Shrivastava A.K.¹, Darji J.A.² et al (9.25%), Verma R.K.³ et al (7.74%) and similar to et al (4.95%). Out of which 48 cases (2.49%) were suspicious deaths of married female with age more than 30 years.

In the present study (Table No 1), Maximum number (66.66 %) of deaths were observed in the age group of 31-40 years followed by 40-50 years (25 %). The study conducted by Dere R.C.⁴ et al most common age group of unnatural death in females was 21-30 years (46.45%). Sharma B. R.⁵ et al noted that higher incidence (53.37%) of unnatural female deaths were in the age group of 21-23 years. The findings in the present study are consistent with the study carried out by Zine K.U.⁶ et al (41.30%). This may be due to the fact that the common age of marriage in our region and many regions all over India is 18 to 23 years and deaths due to torture and mental harassment by husband and in-law's in relation to dowry in newly married females occurs in initial few years of married life. Also, this is the most active period of life where the females are expected to perform work related to cooking and allied work hence are more prone to accidents during kitchen related activities.

In present study (Table No.2), It was observed that 91.66 % of female victims had children while 8.33% female victims had no child. As this study was in more than 30 years females & this might be due to after marriage there is a family and social pressure on the new couple for begetting child and one of the purposes of marriage is continuing the legacy of family.

In present study, (Table no. 3) Maximum number of married female deaths cases (45.83 %) were observed in females having just primary or less education. Victims having Illiterates (16.66 %), primary (45.83 %), secondary (33.33 %) school education were total 95.82 % of cases. It was clearly observed that as educational status rises in females, the death rate decreases. Present study is almost similar to Pankaj Prajapati⁷ et al Parmar V.N.⁸ et al, Zine K.U.⁶ et al and Darji J. A.² et al. This

might be due to the fact that female's professional is not dependent economically on their family members are less affected by violence and dowry death as compared to less educated females who are usually dependent on their family. Shrivastava A.K.¹ et al (37.76%) found that most of the females were educated up to primary school. Kulshreshtha P.¹ et al (50.42%) and Darji J.A.² et al (61.16%) found that most of the females were illiterate. This might due to change in lifestyle, socio-economic condition and population affected in that region and national capital. According to Zine K.U.⁶ et al. 72.3% victims were educated less than matriculation, reason for which may be dependence of less educated women on husbands and or in-laws and hence becoming victims.

In present study, (Table no. 4) Maximum number of suspicious deaths (79.83 %) in married females occurred where their husbands were poorly educated which include Illiterate (20.83 %), primary (33.33 %), secondary (25 %). It was observed that if the husband is educated then the deaths of married female deaths are less. The education of husband up to graduation level increases the chances of him becoming skilled worker and thereby increased chances of job opportunity. Also because of education, the person will be in position of taking proper decision with thinking rationally when conflict between family members arises.

From table No.5 it was observed that in accidental deaths in married female accidental burns was most common cause of death (37.50 %, 6 out of 16 accidental death cases). Quite different were noted by Buchade D.⁹ et al (62.02%). Accidental burns can be explained by females spending most of the time in kitchen and thereby coming in contact with fire following inadequate precautions while cooking on cooking gas, kerosene stove and open unguarded chulha. Wearing highly inflammable synthetic clothes, loose clothes like sari of the victims are highly susceptible to catch fire suddenly while cooking causing kitchen accidents. Also, the relatives of females might give the false history. In suicidal deaths, poisoning (40% - 14 out of 35 suicide cases) was most common followed by hanging (28.57 % - 10 out of 35 suicide cases) followed by burns (28.57 % - 10 out of 35 suicide cases) followed by Drowning (2.86 %). Similar findings were observed by Pankaj Prajapati¹⁰ et al in his study on pattern of suicidal deaths in females (35.51% deaths by poisoning, 31.16% by hanging). Easy availability of household and pesticidal poisons in rural population might be cause for these preferences. Likewise, easy availability of sari or dupatta, kerosene

and matchstick might be responsible for such trends in suicidal deaths by hanging and burns.

Abbreviations -NIL

Statement of Conflict of Interest – NONE

Statement of Informed consent – Informed consent of relatives taken

Statement of Human and animal ethics – No ethical issues involved.

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Quality of Life among Patients with Hypertension at Selected Tertiary Hospital In Kelambakkam, Kanchipuram District, Tamil Nadu, India

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Abstract

A descriptive study to assess the quality of life among patients with hypertension in a selected tertiary hospital at kelambakkam, kanchipuram District, Tamilnadu. The objectives were to assess the quality of life among patients with hypertension and to associate the quality of life of patients with hypertension and the selected demographic variables. 75 samples were participated in the study by using purposive sampling technique. WHO QOL - BREF tool was used to assess the quality of life among patients with hypertension. The study findings revealed that (52) 69.33% of the samples had low quality of life, (22) 29.33% of them had moderate quality of life and (1) 1.33% only had good quality of life. The results revealed that there is a statistical significance found between the Quality of life and selected demographic variables respectively age ($\chi^2=10.69$), weight ($\chi^2=4.34$), duration of hypertension ($\chi^2=3.79$) co-morbid condition ($\chi^2=0$). There is no statistical significant association found quality of life among patients with hypertension .

Keywords: *Quality of life, patients with hypertension.*

Introduction

Hypertension is a global public health issue and a leading cause of cardiovascular disease¹. Hypertension (HTN) exerts a substantial public health burden on cardiovascular health status and health care systems in India². HTN is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India³. One in three adults worldwide, according to the report, has raised blood pressure – a condition that causes around half of all deaths from stroke and heart disease⁴.

Global health report showed the prevalence of hypertension as 22% in the year 2014⁵. American Society of Hypertension and International Society of Hypertension 2013 reported that about 1/3 rd of

adults have hypertension in developed and developing countries⁶.

Quality of life (QOL) is the subjectively determined personal satisfaction with daily life, as influenced by the individual's evaluation of his/her physical, psychological, social, and spiritual wellbeing⁷. World Health Organization defines QOL as “an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns”^{8,9}

In different studies conducted to assess the relation between QOL and hypertension, most of the studies reported lower scores in most dimensions as physical capacity, social functioning, mental health, psychological functioning, vitality as compared to general population^{10,11}.

From the above statistics it indicates that hypertension is an burning issue, for chronic diseases like hypertension assessing the quality of life can help in evaluating physical and psychosocial impact of the

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disease on affected individuals.

Materials and Method

A Quantitative approach with descriptive design was used in the study. The study was conducted in medical ward in a selected Hospitals. A purposive sampling technique was used to select 75 samples with the following inclusion criteria viz. Patients with hypertension who are willing to participate in the study, who all are available during the time of the study and patients who can understand Tamil or English language.

Patients who are critically ill. Patients who have pregnancy induced hypertension were excluded from the study. Self-structured administered questionnaire was used to elicit the demographic variables and WHO-QOL BREF tool was used to assess the quality of life among

patients with hypertension and the score was interpreted as follows 0 - 50 - Low quality of life, 51 - 75 - Moderate quality life, 76 - 100 - Good quality of life.

Findings and Discussion

Frequency and percentage distribution of demographic variables of patients with hypertension.

Majority 42 (56%) were in the age group of 30 – 40 years, 39(52%) were females, 60(80%) of them were married, 26(34.66%) were having high school education, 27(36%) were moderate workers, 30(40%) were having normal weight, 39(52%) of them having hypertension since 1 – 3 years, 45(60%) were having co morbidities and 36(48%) were taking 1- 2 antihypertensive drugs to control hypertension .

Table.1 - Assessment of quality of life among patients with hypertension

Domains	Low quality of life		Moderate quality of life		Good quality of life	
	No	%	No	%	No	%
Domain – I physical	42	56	33	44	0	0
Domain – II psychological	43	57.33	32	42.66	0	0
Domain – III social relationship	53	70.6	19	25.33	3	4
Domain – IV environmental	48	64	27	36	0	0
Overall quality of life score	52	69.33	22	29.33	1	1.33

The above table reveals that, majority of the patients 52(69.33%) had low quality of life, 22 (29.33%) of them had moderate quality of life, 1 (1.33%) of them had good quality of life.

Table.2 - Mean and Standard deviation of quality of life of patients with hypertension.χ

S.No	Level of Quality of life	Frequency	Percentage	Mean	Standard Deviation
1.	Good quality of life	01	1.33%	44	10.67
2.	Moderate quality of life	22	29.33%		
3.	Low quality of life	52	69.33%		

Association of quality of life of patients with hypertension with demographic variables.

The Chi-square association revealed there was significant association between quality of life with selected demographic variables like Age ($\chi^2 = 10.69$), Weight ($\chi^2 = 04.34$), Duration of hypertension ($\chi^2 = 03.79$) and Co-morbidities ($\chi^2 = 0.7949$). Considering the other demographic variables like Gender ($\chi^2 = 33.08$), Marital status ($\chi^2 = 50.25$), Education ($\chi^2 = 15.23$), Occupation ($\chi^2 = 25.23$) and Number of anti hypertensive drugs ($\chi^2 = 13.32$) doesn't show any significant association.

Conclusion

Quality of life is important to everyone. The results of the study confirmed that the quality of life of patients with hypertension is impaired by assessing the four domains (Physical, Psychological, Social relationship, Environmental). So the health care professionals can create awareness regarding health promotion among hypertensive patients to prevent further cardiac diseases in patients with hypertension. Further studies can focus on the intervention that will improve the QOL of hypertensive patients.

Ethical Clearance - Ethical clearance was Obtained from Institutional Human Ethical Committee Chettinad Academy of Research and Education. Formal written permission obtained from the hospital authorities. Consent was obtained from each participants after explaining the procedure.

Conflict of Interest - Nil

Source of Funding - Self

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Effectiveness of Information Booklet on Knowledge, Practices and Willingness Regarding Recycling of Solid Household Waste Management among Residents

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Abstract

Background: Pune is the 8th largest city in India and the 2nd largest in the state of Maharashtra. Population is about 4 million and the households are nearly 1 million.

Objective: To assess the effectiveness of information booklet on knowledge, practice and willingness of residents regarding recycling of household waste management.

Methodology: The research design was quasi experimental: pre-test post-test research design with the sample size 100 and used systematic random sampling technique. The structured questionnaire was administered. In order to establish the reliability of the tool inter rater method was used. The scores were calculated and reliability was established by Kappa method which was 0.80. The phases of data collection were informed consent was taken followed by the pretest and distribution of information booklet on recycling of solid household waste management to the residents and posttest was administered after 15 to 20 days of pretest and processed the data for analysis.

Results: t-test was used to check the effectiveness of the informational booklet on knowledge regarding recycling of solid household waste management among residents. t-value for this test was 27.4 with 99 degrees of freedom, corresponding p-value was of the order of 0.000, which is small (less than 0.05), the null hypothesis is rejected.

Conclusion: It was concluded that, the intervention which was provided to the residents was very effective in improving their knowledge, attitude and willingness towards the good practices of waste management at home.

Keywords: *information booklet, knowledge, practices, willingness, recycling, solid household waste management*

Introduction

The importance of cleanliness in our lives cannot be denied. A bad environment is solely responsible for spoiling the health of the people in the community around. Commonly used techniques of waste management are dumping, sanitary landfill, incineration, recycling, and composting etc.

Recycling is a process serves to transform the wastes into products of their own genre through industrial processing. Paper glass, aluminum, and plastics are commonly recycled. It is environmentally friendly to reuse the wastes instead of adding them to nature.

Waste is any substance that is considered not useful in the environment and can be harmful to human health .We have two types of waste which are solid and liquid waste, the solid waste consist of used plastic bags, damage home appliance, etc. whiles liquid waste consist of used water from bath, washing, decompose fecal matter and oil ¹

Pune is the 8th largest city in India and the 2nd largest in the state of Maharashtra with population about 4 million and the households are nearly 1 million. The area of Pune city is 250 sq. kms. There are 4 zones, 15 administrative ward offices and 76 Prabhags. Pune

generates about 1600 tons of solid waste per day. 160 trucks collect the waste door-to-door, collecting an average of 198 tons per day. 847 containers and 116 compactor buckets dispersed around the Pune. ²

Solid waste management plans by Authorities are Expansion of door step collection and sources segregation to entire city and for different waste streams, strengthen transport system (feeder, community, bin pick), create visible improvement in street cleanliness levels, ensure timely commissioning of waste processing and recovery capacity, stock holder participation and communication and establish robust complaint tracking and resolution system. ³

Working Nature of PMC Swachmodel a follows,

- A pair services door-to-door waste collections for 300-400 households.
- Segregated wastes expected but not always received from generators.
- Waste pickers further segregate waste and sell recyclables.
- Non-recyclables waste delivered to feeder point.
- Also provide compost services. ⁴

Besides the excellent services and efforts made by the PMC, many residents of our setting do not have adequate knowledge and practices of recycling of waste at the home. For instance, the PMC has given two dust bins to collect the dry and wet waste, but they are not used for waste collection by many residents, they are using them to keep provisions in the kitchen and residents were given muck to convert the household waste in manure for plants but there was no proper demonstration. It was surveyed in our previous descriptive studies. Now the investigators decided to educate the residents of our setting of the study in regard to recycling and waste management at home. ⁵

Title of the study

Effectiveness of information booklet on knowledge, practices and willingness regarding recycling of solid household waste management among residents

Objectives of the study

- To assess the knowledge, practice and

willingness of residents regarding recycling of household waste management

- To assess the effectiveness of information booklet on knowledge, practice and willingness of residents regarding recycling of household waste management

Methodology

In the present study, quantitative and evaluative approach was used. Research design was quasi experimental: pre-test post-test research design. Study was conducted in urban areas of Pune district. The sample size was 100 and systematic random sampling technique was used. The data was collected from the participants who were willing to participate in the study, and who were able to understand the English and Marathi. The structured questionnaire was administered. Questionnaire had four sections; Section I had demographic data of the residents with 5 items, Section II had assessment of knowledge regarding solid household waste management with 10 items, Section III had assessment of practice on solid household waste management with 19 items and section IV had, assessment of willingness of residents regarding solid household waste management with 10 items. In order to establish the reliability of the tool inter rater method was used. The score were then calculated and reliability was established by Kappa method which was 0.80. 11 experts in the field of specialty did validation of the tool. The data was collected in two months duration. The phases of data collection were, informed consent was taken from participants followed by the pretest and distribution of information booklet on solid waste management to the residents and posttest was administered after 15 to 20 days pre test and processed the data for analysis.

Results

Distribution participants based on demographic variables:

23% of the citizens had age 21-30 years, 41% of them had age 31-40 years, 21% of them had age 41-50 years and 15% of them had age 51-60 years. 54% of them were females and 46% of them were males. 46% of them were illiterate, 36% of them had primary education, 5% of them were graduates and 13% of them were post-graduates. 37% of them were employed, 33% of them were not employed, 13% of them were student and 17% of them were retired. 22% of them had income

less than Rs. 5000, 28% of them had income Rs. 5001-10000, 30% of them had income Rs. 10001-15000 and 20% of them had income more than Rs. 15000.

Table No 1: Effectiveness of the informational booklet on knowledge regarding recycling of solid household waste management

N=100

Knowledge	Pretest		Posttest	
	Freq	%	Freq	%
Poor (score 0-3)	53	53%	0	0%
Average (score 4-6)	34	34%	0	0%
Good (score 7-10)	13	13%	100	100%

In pretest, 53% of the citizens had poor knowledge (score 0-3), 34% of them had average knowledge (score 4-6) and 13% of them had good knowledge (score 7-10) regarding recycling of solid household waste management. In posttest, all of them had good knowledge (score 7-10) regarding recycling of solid

household waste management. This indicates that the knowledge of the citizens regarding recycling of solid household waste management improved remarkably after information booklet.

Table No 2: Paired t-test for the effectiveness of the informational booklet on knowledge regarding recycling of solid household waste management among residents N=100

	Mean	SD	t	Df	p-value
Pretest	3.8	1.9	27.4	99	0.000
Posttest	9.0	0.2			

Researcher applied paired t-test for the effectiveness of the informational booklet on knowledge regarding recycling of solid household waste management among residents. Average pretest knowledge score was 3.8 which increased to 9 in posttest. T-value for this test was 27.4 with 99 degrees of freedom, corresponding p-value was of the order of 0.000, which is small (less than 0.05), the null hypothesis is rejected. Knowledge of the citizens regarding recycling of solid household waste management improved significantly after information booklet.

Table No 3 : Effectiveness of the informational booklet on practices regarding recycling of solid household waste management among residents n=100

Practice item		Pretest	Posttest
Do you compost	Yes	41	35
	No	59	65
How many bags do you compost at home on your land with no cost to municipality	None	29	5
	1 bag per week	30	26
	2 bags per week	25	21
	3 bags or more per week	16	43
How do you manage dry waste? (Paper, plastic, etc.)	Burning	26	7
	Open ground	15	10
	Scraping	19	16
	Burn	40	19
How do you manage wet waste? (Food waste)	Drainage	21	4
	Dust bin	42	19
	Feed Animals	12	13
	Burn	25	42
How do you dispose sanitary waste	Burning	26	19
	Dustbin	74	81

Cont... Table No 3 : Effectiveness of the informational booklet on practices regarding recycling of solid household waste management among residents n=100

How do you dispose Electronic waste or E- waste	Dustbin	26	4
	Re-use	31	19
	Scarp	12	15
	Open	31	59
Which method do you use to segregate your waste	Dustbin	38	21
	Plastic bags	62	79
How often do you wash your dustbins	Daily	38	53
	Twice a week	34	20
	Thrice a week	21	10
	Weekly	7	17
Do you use recycling service	Yes	45	32
	No	55	68
If yes, how often do you use the services of recycling	Never	27	61
	Weekly	20	14
	Once a month	34	14
	Twice a month	19	11

Discussion

In the 2016, the researchers have conducted a similar study and it was discovered that due to lack of knowledge regarding house hold waste management, about 95.3% household waste was not collected systematically and reused it, which has developed to cause the insects and household infections, such as cholera ,pest bite infection, diarrhea, etc . It is also evident that some of this waste was dumped on the streets, gutters, holes and in nearby bushes causing environmental pollution.⁶

Even in our study, it was noticed that 53% of residents had poor knowledge regarding household waste management and after the intervention, their knowledge levels had been increased to an extent. It was also noticed that, the collection of the waste at home reduced about 45 % , which has proved that , the intervention which was provided to the residents was very effective in improving their knowledge, attitude and willingness towards the good practices of waste management at home.

Conclusion

Waste management activity is crucial to keep the environment clean and people healthy. As per the study results, it is provethe residents of urban community rated

PMC's waste collection and disposal services as good. The waste management technique adapted by PMC is commendable. It was noted that in urban community, waste lifters insisted on waste separation. The descriptive analysis also pointed out that the residents of urban community were satisfied with services of PMC. However, with the application of sustainable environmental education greater success ratio can be achieved.

Ethical Clearance: This study was approved from ethical committee of Symbiosis College of Nursing, Pune

Conflict of interest: Nil

Source of Funding: Self

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A Study “To Assess the Level of Knowledge on Swine Flu Among Adults in Selected Area at Poonchery, Kanchipuram District, Tamilnadu

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Abstract

The swine flu is a viral disease that is transmitted to humans, the swine flu is also known as pork flu virus belonging to the family Orthomyxoviridae which is endemic in population of pigs. A study to assess the knowledge on swine flu among adults in Poonchery, Kanchipuram District, Tamilnadu, India. The study was conducted with the aim to assess the knowledge on swine flu among the adults and to associate knowledge on swine flu with selected demographic variables between the age group of (18 years to 60 years). A study was conducted and the sample was consisted of a total of 50 adults. The tool used for this study was structured questionnaire. It results that 52% of them having Inadequate knowledge, 30% of them having moderate knowledge and 18% of them having Inadequate knowledge. The chi square value is 20.9862 ($P > 0.05$) S*, There is significant association between demographic variables. We have found that there is inadequate knowledge of adult population.

Key words : Assess ,knowledge, swine flu, adult.

Introduction

The current influenza outbreak of swine flu is a result of an influenza virus species that infected pigs, then re-assort (swap genes) and the new virus emerging. Currently there are four main influenza type A virus sub types, but the most recent influenza virus from pigs causing the outbreak have been H1N1 viruses. This new virus that has emerged is a mixture of swine, human and avian influenza viruses.¹

The swine flu is a viral disease that is transmitted to humans, the swine flu is also known as pork flu (any) virus belonging to the family Orthomyxoviridae which is endemic in population of pigs². These strain of viruses are known as swine influenza virus of SIV (the acronym in English of swine influenza virus have been classified into influenza virus C or are the subtypes of the genus influenza virus A (being the best known strain H1N1 isolated in Japan and Europe). Such genetic restructuring occurs regularly in nature and, at times, provides the virus with the capability of causing widespread disease in immunologic-ally populations. The virus can move swiftly across geographical borders to cause pandemics¹.

Statement of the Problem:

A study to assess the level of knowledge on swine flu among adults in selected areas at Poonchery, Kanchipuram District, Tamilnadu.

Objective of the Study:

1. To assess the knowledge on swine flu among the adults.
2. To associate knowledge on swine flu with selected demographic variables.

Research Methodology

- **Research Approach** : Non experimental approach.
- **Research Design** : Descriptive research design
- **Research Setting** : The study was conducted in the selected Community area Poonchery at Kanchipuram District, Tamilnadu

- **Population** : The population for this study in all adults who are residing at Poonchery village at Kanchipuram District.
- **Sample Size** : 50 adults.
- **Sampling Technique** : Simple Random Technique.

Results

SECTION-A: Frequency and percentage distribution of demographic variables of adults in assess the level of knowledge on swine flu among adults in Poonchery.

Age(years)in which majority (38%) were belongs to the age between 39-48 years.(18%) were in the age group of 49-60years.

Sex, in which majority (60%) of the samples were female and (40%) of samples were Male

Marital status, in which majority (58%) of the samples were unmarried.(3%) samples were divorced.

Educational status, in which majority(34%) of the samples belongs to the high school (10%)were in the graduate

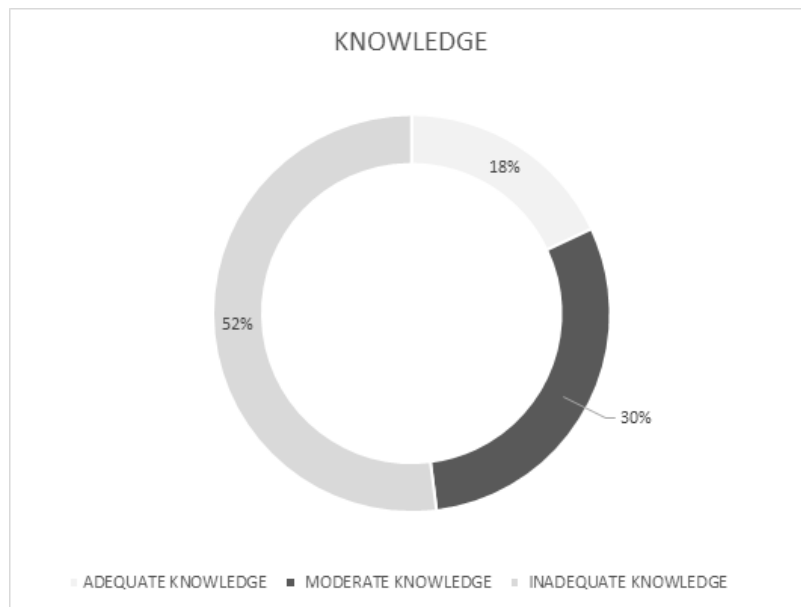
Income, in which majority(60%) of the samples were Rs.5,000-10,000l (2%)were in the >15,000rupees

Types of family, in which majority(54%) of the samples werejoint family(46%)were in the nuclear family

Source of Information in which majority (36) of the samples belongs to the sources of knowledge from media. (14%)were in the television.

SECTION-B: Distribution of knowledge on the Swine Flu among adults in selected Village Poonchery.

The study finding revealed that the frequency distribution in the study shows that majority 52% of them having Inadequate knowledge,30% of them having moderate knowledge and 18% of them having Adequate knowledge on Swine Flu among adults.



SECTION-C: Association on knowledge on Swine Flu among adults with demographic variables:

Regarding association there is significant association of factors influencing knowledge on Swine Flu among adults with demographic variables like age, Sex,Marital Status,Education status,Income,Type of family and sources of information.

Summary

The finding of the study indicated that the knowledge plays an important role in the health of the community. It is a suitable method of instruction for the community health nurses for disseminating health information regarding swine flu, management and prevention of the pandemic swine flu. Educational interventions are

necessary to improve the knowledge. An improvement in the knowledge will lead to better practices, early identification of danger sign, initiation of appropriate treatment and prevention of the pandemic swine flu.

Source of Funding : Nil

Ethical Consideration: Chettinad Academy of Research and Education, Institution Human Ethics Committee

Conflict of Interest : Nil

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The Effectiveness of Video Assisted Teaching on Fire Safety among School Children at Selected School, Kanchipuram District, Tamilnadu

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Abstract

“A Quasi Experimental study to assess the effectiveness of video assisted teaching on fire safety among school children at selected school”. The objectives of the study were to determine the effectiveness of video assisted teaching on fire safety among school children at selected school and to find out the association between post-test knowledge score and selected demographic variables like Gender of students, Educational qualification of family, occupation, monthly income of family. The sampling technique used was simple random sampling technique with the samples of 100 school children. A validated questionnaire was used to assess the knowledge of the samples before and after administration of video assisted teaching programme on fire safety. An extensive review of literature with the guidance of experts formed the foundation to the development of questionnaires. The investigators used demographic variable Performa. The data collection tool was validated and reliability was established, the collected data was tabulated and analyzed. Descriptive and inferential statistics were used. The posttest mean value is 16.43 and the standard deviation 3.1 showed that the school children with adequate knowledge were 33%, with moderate knowledge 58% and with inadequate knowledge 9%. Hence health education for the school children was implemented to improve the children’s knowledge.

Key words: video assisted teaching, fire safety, fire safety among school children.

Introduction

Fire safety is a set of practices intended to reduce the destruction caused by fire. Fire safety measures include those that are intended to prevent ignition of an uncontrolled fire, and those that are used to limit the development and the effects of a fire after it^[1].

Fire safety measures include those that are planned during the construction of a building or implanted in structures that are already standing, and those that are taught to occupants of the building.

Threats to fire safety are commonly referred to as fire hazards. A fire hazard may include a situation that increases the likelihood of a fire or may impede escape in the event a fire occurs. Fire safety is often a component a building safety ^[2].

Those who inspect buildings for violations of the fire code and going to schools to educate children fire safety topics are fire department members known as fire prevention officers ^[3].

The chief fire prevention officer or chief or fire prevention will normally train new comers to the fire prevention division and may also conduct inspections or make presentations^[4]. Fire safety in schools is often a neglected element in many Indian schools and there are no rules that are set in place for checking this aspect.

The government does not enforce fire safety and most of the schools still function without even the basic safety amenities ^[5]. This has come to light recently in the fire disaster that was happened in Tamil Nadu.

Objective of the Study

To assess the pre-test and post-test knowledge level on fire safety among school children.

To find out the association between post-test knowledge score and selected demographic variables like gender of student, educational qualification of family, occupation, monthly income of family.

Hypothesis:

H1: There will be a significant difference between pre test score and post –test score knowledge secure prevention of fire safety.

H2: There will be a significant association between post-test knowledge of women regarding fire safety and selected demographic variables like gender of student, educational qualification of family, occupation, monthly income of family.

Research Methodology:

- Research approach: Quasi experimental research approach
- Research Design: Quasi-Experimental-Interventional research design
- Population: The Accessible Population of the present study is School children from 6thstd to 12thstd at selected schools at Kanchipuram District.
- The Sample size of 100 school children will be selected
- Research setting: The study will be collected in the Selected Schools at Kanchipuram District, Tamilnadu.
- Sampling Technique: Simple random sampling

Data Collection Procedure:

Permission to conduct the study was obtained from UG and ETHICAL committee.

Prior permission from the institution was obtained.

Informed consent was obtained from each sample.

The samples were given a questionnaire before administering the video assisted teaching programme

Video assisted teaching programme was conducted for 8 minutes

Post test knowledge level was assessed by readministering the questionnaire.

Results

The finding of the study was discussed under the following.

1. Assess the pre test of knowledge on practice of fire safety among school children.

The study result shows the level of knowledge of school children regarding fire safety that was assessed by structured questionnaire, analyzed using descriptive statics. It indicates that mean pre test knowledge score was 14.51 and standard deviation was 2.87.

2. Evaluate the video assisted teaching knowledge on practice of fire safety among

School children.

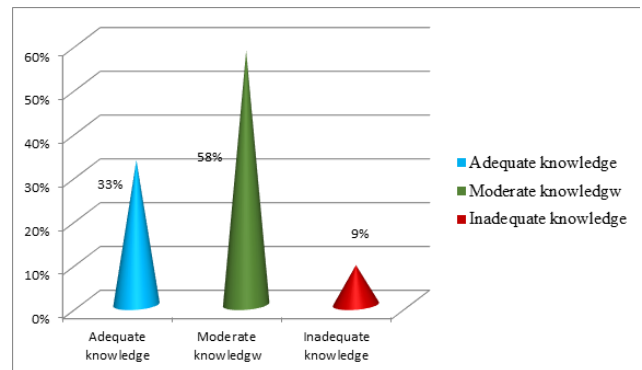


Figure:1 Distribution of post-test knowledge of video assisted teaching on fire safety.

Figure 1: shows the post test knowledge were having adequate knowledge 33%, moderate knowledge 58%, inadequate knowledge 9%, regarding the practice on fire safety.

3. Association of the post test level of knowledge on fire safety among school children with selected demographic variable.

As there was no significance association of post test knowledge score with selected demographic variable such as gender of student and occupation. In conclusion, the discussion of the study finding obtained by the researcher shows that there was a significant difference in the knowledge level on practice of fire safety after administration of video assisted teaching among school children.

Conclusion

This result from this study shows that the level of knowledge on practice of fire safety among school

children was moderate and adequate. This has to be taken into consideration. There may be some justifiable reasons for inadequate knowledge on fire safety among school children which can be improved upon.

Video assisted teaching is one of the effective methods in increasing the knowledge regarding practice of fire safety among school children. The findings of the shows a significantly increased post test level of knowledge scores after administration of video assisted teaching.

Ethical Clearance: Chettinad Academy of Research & Education- Institution Human Ethics Committee

Source of Funding: Self

Conflict of Interest: Nil

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Lilliputian Neglected Happenings Call For Snafu: “Theory of Broken Windows”

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Abstract

This article named “Lilliputian neglected happenings call for snafu” is a work focusing on the small things that are usually neglected and avoided during policing which further leads to hampering of peace and harmony in the neglected society or community thus giving a chance to the delinquents and offenders to foul up and create a chaotic situation. This work is inspired from the “Theory of Broken Windows” which was introduced by James Q Wilson and George L. Kelling in March 1982 in an article named “Broken Windows: The Police & neighborhood safety” in The Atlantic, retrieved 2007-09-03. This article first starts explaining the definition and origin of theory in general then how it reached its targeted audience and got popularized. The influencing power of the theory has been elaborately discussed, its theoretical tendency to revamp the policing methods have been stated and then the practical adoption of the theory by the New York police department and the consequences of the same have been enunciated. Finally the observation after through research works whether the theory is practically persistent or not has been deduced along with the concluding remarks.

Key words: *crime rate, social disorder, petty offences, environmental attitude, offenders*

Introduction

According to William J. Bratton, the former Police Chief of Los Angeles and New York City said that “If you take care of the little things, then you can prevent a lot of the big things.” In March 1982 James Q Wilson and George L. Kelling came up with the “Broken Windows Theory” in their article titled “Broken Windows” in the Atlantic Monthly.^[1] This theory dealt with the secret of persistent good management and maintenance through immediate replacement of the broken windows or other signs of disorder in order to prevent the criminals from assuming those signs as signs of weak social control, thus preventing omnishambles or a chaotic situation.

The theory was majorly targeted towards the policing trends and it tried to incorporate the methods

of immediate peeling of the onion, disposal hydra-headed instruments and other problems that usually goes unattended in a given environment and affects the peoples attitude towards the environment and leads to further aggravation of the matter but as a corollary to this theory if the problems are well tended as soon as they arise and swiped out from the roots using successful policing strategies thus restoring order in the society and reducing crime in our communities because April showers bring the May flowers .

However it is majorly a criminological theory that states the eye catchy signs of civil disorderliness, anti-social behavior or other criminal activities that gives scope to further create disorders including serious crimes.

Reaching the Targeted Audience and Getting Popularised:

Being one of the most cited articles the Broken Windows theory creates records in the history of Criminology. Since huge number of cities throughout the world has used Wilson and Kellings ideas under the

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broken windows theory of policing as motivation for zero balance therefore it is also referred to as the Bible of policing wherein even the pettiest crimes are severely punished for.^[2]

Influencing Power of the Theory:

The broken windows theory has influenced the creation of Ontario's Safe Streets Act^[3] generated legal response to panhandlers, noisy neighbors and other forms of anti social behavior. Even By laws have been enacted through this act in order to curb the social and physical disorders. This theory of broken windows and its influence on policy and policing needs to be reformed due to the contentious approach that it has created and incorporated within marginalized neighborhoods. If it tries to strictly focus on solving the problems by engaging directly in dialogue with the communities then this broken windows theory would prove to be more effective on policies and policing.

Adoption of the Theory by The New York Police Department:

Closely following the Wilson and Kellings 1982 model^[4] the agencies first applied the broken windows theory of policing in several ways. However the most prominent way of adoption of this theory occurred in the New York City as an approach to crime and disorder. New York Mayor Rudolph Giuliani in 1990s enacted a policy whereby small crimes were targeted aggressively by the police and this message was channelized properly due to which a strong social signal was spread that "Crime isn't acceptable", thus, resulting in a significant fall of crime across the city.

Measuring The Broken Windows Treatment:

The best indicator of broken windows policing has been misdemeanor arrests since the data's are readily available and along with it the officers must also decide whether an arrest is appropriate or not. Therefore whether the New York Police Department was able to adopt this model successfully or not still remains open for discussion but it is very clear that its intervention is complex and evaluation would prove to be difficult. There has been much discussions on the impact of the adopted policing theory and the tactics on reducing crime and disorder. It has been stated by Eck & Maguire in 2000^[5] that the broken windows policing alone did not bring down the crime rates but it's also likely that police played some role.

Concequences of Applying The Theory:

Throughout the 1990s the broken window theory had an enormous impact on Policing and remained till the 21st century. It took a leap when the New York City applied the theory under the direction of William Bratton, police commissioner who believed in the theory and was convinced that the aggressive social order maintenance practices in the New York City Police Department were responsible for the drastic fall in the crime rates. William Bratton also translated the theory into practice as the Chief of New York City Police from 1990 -1992. Officers were assigned to catch hold of the social order breakers in squads wearing plainclothes without uniform which proved to decrease all kinds of crimes drastically.

Observational Deduction Whether the Theory is Persistent or Not? :

It is believed by most of the researchers on the broken windows theory that this theory has always worked better as an idea than as a description of the real world or when applied or adopted practically. The major problem in the theory is the inclusion of the perception that "disorders have more to do with the racial composition of a neighborhood than with the number of broken windows". Therefore we can deduce that it was persistent for a specific period only when it took a leap because of its practical adoption in New York City but when researches were made on the theory's practicability it was proved that it individually wasn't responsible for lowering the crime rates but along with it many factors worked simultaneously.

Indian Perspective:

Since the rate of petty offences is in diminishing order in India and the heinous crimes are increasing day by day so this theory won't be considered for practical application in India. Only when the situation demands for times when social disorder is at its peak and affecting the crime rate accordingly, necessary steps may be taken in order to apply the same theory if the rules, regulations and laws permit to do so. However the present situation demands stringent laws relating to heinous crimes in India and not the petty ones.

Conclusion

In brief the validity of the above theory is yet to be known, therefore it would be safe on my part to conclude that the broken windows theory even if valid does not state the explanation of all the components

that it involves. Further it is to be noted that it requires companion theories to explain the type of crimes and criminals that it would deal with. Unless more cities tend to adopt and experiment on the theory, the lacunas as well as the practicability cannot be precisely stated.

Ethical Clearance: Not required, as the research article is based on the relation between environmental attitude and petty offenders behavior. The research is doctrinally undertaken.

Source of Funding : Self

Conflict of Interest : Nil

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Self Determination and Indigenous People: The Fight For ‘Commons’

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Abstract

History has always seen the less-privileged as the one suffering the alienation of their rights, entitlements. It is equally true that these communities have fought back to claim what is rightfully theirs. The principle of Self determination or the right to decide how to be governed can be traced back to World War-1 and the principles laid down by Woodrow Wilson. This right to Self determination exists for each one of us. This becomes even more imminent when it belongs to a community which has its own preserved culture to protect, it has its own resources of which it is the foremost protector. Here the paper emphasizes how the tribals in India have now been reduced to a mere dependant and beggary. The paper traces the various changes of the Indian legal system governing the relationship between the ‘Commons’ and the Tribal Communities. But ‘the history of Forests is the history of conflicts’. The researcher has taken two case studies- the struggles of the Dongria-Kondhs of Odisha and the Sentinelese from Andaman, to show how these communities have in their own unparalleled ways protect their Commons from the never-ending appetite of the industrialization and human greed. Lastly, the researcher has analysed various provisions from the Corpus of Indian laws, to find out where is the State missing out. Along with it, the researcher has also suggested potential reforms to those laws, so as to guarantee the Tribals their “Right of Self Determination” in wholesome.

Keywords: *Commons, Self-Determination, Tribals, Indigenous People, Conflicts, Tribal Advisory Councils, Constitution.*

Introduction

“*A thing that we share and enjoy jointly*”(here after ‘Commons’), the significance of which has been taken from the way a mutual land was utilized among a commune in medieval Europe, i.e. ‘it was “held in common’.⁶ Absence of exclusive property rights except a right to enjoy the benefits out of it which is to be enjoyed by all in the community. This defies the conventional rules under the Transfer of Property Act, 1882 (Criteria for ownership is the mentioned Act which requires Right, Title and Interest over the property).

A community who is dependant on the forest resources, have a single forest shared by all. Also, the term ‘*khirkai/gaathan*’ brings forth the importance of this dependence⁷. The water bodies, resources (lac, resin, tendu patta), cremation grounds, connecting roads and other government created community assets are of utmost importance. The sharing and caring behaviour of such community people is important in the current times especially when the resources are depleting at an exponential rate, human beings are becoming greedier

day by day.

For the adivasis who make 8.6% of the total population” according to the “Census 2011 report”, secluded from the mainstream, consider these forests ‘safe haven’. Tribal communities have been enduring gradual disappearance of their original habitats and annihilation of their cultures through predatory involvement. Making them mere wage earners with uncertain and non-existent futures from self-sufficient owners of resources. There is one more dimension to it. A Senior Forest Officer of West Bengal mentioned in an interview that “the participation of the locals is one of the reasons for the increase in the forest cover.”⁸ It is important to highlight that the participation at the grass root level is essential for the environmental well-being and for the realization of tribal rights. The paper shall review the recent events which reflect how in the current times for the sake of economic growth the State has transformed itself protector has itself turned into ravisher of indigenous communities.

State's Rough-and-Tumble with Forest Community's 'Right To Exist' (Findings and Discussions)

Various propounders, starting from the great E.P Thompson⁹ to the Karl Marx¹⁰, have portrayed in their writings the hostility between the state players and the forest communities.

In India like most of its counterparts, the forest communities owned and shared their natural resources. 3rd of August 1865 brought an upheaval when the report of the then-in-charge of forests in Burma culled away rights of forest dwellers (tribal).¹¹ This initiated assertion of state monopoly rights over jungles. A law was enacted putting an end to the exclusive right of the indigenous people on the surrounding resources. Forests were now differentiated under The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 into: Reserved forests, protected forests. Baden Powell stressed here that "In olden days, native rulers used often to set aside considerable areas of forest land as hunting grounds." Colonial bureaucracy intentionally misused this practice from yesteryear turning those lands and its resources into the property of the Colonist through the rule of succession."¹²

The modern India carried forward its "British inheritance" by creating a department for Forests and keeping "The Indian forest act, 1927". The diminutive transition of such right from being an 'exclusive right' to mere concessions conferred by the 'state' has caused destructive displacement of unimaginable forest dwellers resulting in the destruction of the symbiotic relationship between nature and its people/protectors. The vices of getting benefited from the rich flora and fauna of the forest have substantially jeopardized the very existence of forest dwellers. They are in present deemed as trespassers to the forest and categorized as torch bearers of extremism. It is not a new concept but a hobby of the tyrannical government since time immemorial. Not only the centre, but the various state laws have been implementing amendments to antique laws constraining the rights of the tribals, in favour of industries and real-estates.¹³ The new law has widened the nature of the cultivable lands allowing use of land for suitable for the capitalists. Also by placing the said Law/s in the 9th Schedule of the Constitution, the Government has successfully tried to avoid judicial review.

In 2016, in a collusive bid between the Odisha Mining Corporation (hereafter, OMC) and the state

government (hereafter, Government), 1400 acres of forest area was to be diverted for iron ore mine.¹⁴ The state government successfully obtained a permission from the MoEF by including in the diversion proposition seven (exact) repetitive gram sabha resolutions. These proposals reflected a presumed free consent of the seven villages, and also expressing that they are not using the said lands for the purposes of agriculture, in-habitation, or any other sustenance. It was later found that all the seven proposals were actually so designed by a coterie of OMC and the Government.

DONGRIA KONDHS, ODISHA, INDIA

The Dongria Kondhs are one of the particularly vulnerable tribal groups of the State of Odisha. They consider the Niyama Hills as 'sanctum sanctorum', which defines their cultural, economic and social realities. These people proudly refer these hills as Niyam Raja as their God. "It is unthinkable to detach links between the tribes and forest"¹⁵. "The Government of Odisha agitated the lives of the indigenous people when it began to disport over 660 hectares of 'forest land' for mining by the a Mining Company in the districts which are one of the most resource enriched area of the State. What resulted next was nothing less than history. The battle was raised in forms of not-so-silent marches and rallies, the sounds of which reached from a tiny community in Kalahandi and Rayagada to the Wall Street and Madison Square. Their story was considered similar to that of the Na'vi Tribe of the Oscar winning movie Avatar. It is a matter of deep concern that the conventionally educated are still lagging behind to understand what Dongria Kondhs have realised and are much ahead in working on it by playing their own part in the larger scheme- Of saving biodiversity-rich forests of Niyamgiri. Thirty-eight water resources have their source-point from Niyamgiri hills and forests like this are a defence against climate change. No argument can be stronger when it is said that our Mother Nature is truly safer in the hands of the local people and that's the message they have sent out to the world. Dongrias are unaware about private ownership of resources because for them their community is everything. Here the Apex Court of India in the case of *Odisha Mining Corporation Limited v. Ministry of Environmental Forest Supreme Court of India, (Writ Petition (Civil) No. 180 of 2011)*, came upheld the customary and cultural rights of tribal community over Niyamgiri and right of self determination of the Indigenous People in accordance with the Forest Rights Act, Panchayat

(Extension to Scheduled Areas) Act, and provisions of the Constitution thus instilled the authority of the gram sabhas to protect customary habitats and cultural rights. The mining corporation has still built a refinery in the northern Part of the Niyamgiri hills. This has displaced a large number of indigenous. The land grants are limited to the people actually displaced. Not only this, the operation of the refinery has started affecting the surrounding. What would be very much welcome here is just and equitable rehabilitation package keeping in consideration the inflation indexed economic sustenance a land or house which must be market-price indexed. The Indian Law on Rehabilitation which is still in limbo could be brought into enforcement on a mission mode. Also, It is very much true that Maoist insurgency has established itself within the state of Odisha and the insurgents are looking for innocent residents of under developed areas for recruitment. So if State uses violence, then the tribal will not hesitate to retaliate.

Sentinelese, Andaman and Nicobar Islands, India

Best described as the world's last stone age tribe, the Sentinelese tribe of North Sentinel island of the Andaman and Nicobar Island, India. The country gained the recent limelight when an American national was killed when he tried to contact the said tribe. It has been alleged that he supposedly went with an object to preach the word of Jesus among the unapproachable part of the human community. The Sentinelese tribe, unlike its other counterparts, are devoid of any outside contact, except a few instances.¹⁶ "*The Andaman and Nicobar (Protection of Aboriginal Tribes) Regulation, 1956*" expressly "prohibits any kind of taking photograph/videos of aboriginal tribes; encroaching, hunting and poaching in reserve area and imposes an imprisonment of 3 years and fine". Any person who wants to enter into a reserved area can do so with a pass under the authority of the Chief Commissioner, following certain restrictions and conditions as provided under Section 7, The Andaman and Nicobar (Protection of Aboriginal Tribes) Regulation, 1956. This was brought in to force to maintain the pristine environment from the rapid pace of economic growth and the greed of the human race. The Andaman islands stands near to the world famous strait of Malacca which enjoys the distinction of being second busiest trade and tourism routes. This seemed to be a great opportunity for widening the tourism industry in the islands.

The government which has exercised the policy of non-intervention till 1991 by not even carrying the census survey, has now suddenly opened the closed doors of such a pristine tribe to the outsiders. Thus the Indian government removed the restrictions in 29 islands where the Restricted Area Permit mandatory under the Foreigners (Protected Areas) Order 1958.¹⁷ It is also important to stress here that the Indian citizens/tourist require no such permission. The Andaman Authorities have pursued to establish the direct sea path instead of reaching the islands through the Jarawa creek.¹⁸ The famous 'Jarawa creek' is a lonely planet in itself. It is the residing place of the primitive tribes, the population of whose have reduced to two-digit. Detached from rest of the planet, they are the marvel of the modern international. The Sentinelese have been categorized as one of the most untouched tribe, leading to their diminished immunity against external pathogen. The curiosity of few many so called new world inhabitants has led them to tread in to the dreadful. Not only the tribes, but the Island itself is so pristine surrounded by lucid waters, magnificent coral reefs and one of the most peculiar wetland of the world which is considered as a hot spot of wildlife inhabitants. It is essential to reiterate and stress upon the symbiotic relationship between the tribes and the environment in which they have sustained themselves.

The Stopping Point (Suggestions and Conclusion)

The current government has successfully ensured that the role of the adivasis are limited to tongueless stamps.

Hobbes in his book "*The Leviathan*" has explained that to escape from the harsh, brutish and unforgiving natural condition of the human beings, a central authority is imminent. It will aid the men to exist with other human beings in harmony as men by nature are war-mongering. But it should not be ignored that the Hobbes has missed out the wellfarist nature of the state, when he portrayed State only as a Brute Police Force. The state cannot limit its welfare policies to the dead-letters of Law. *The Panchayats (Extension to Scheduled Areas) Act 1996* entitles the people with a right of self rule, self determination. The principle of self rule was defied when the 'Restricted Area Permit' was removed with out any discussion or consultations with the inhabitants. It is also saddening enough to see that it was the State Government (the 'so-called protector') brought the plunderers (The Mining Corporation) to the

doorsteps of NiyamGiri Hills. Starting from Hobbes to the current day luminaries, all of them have stressed upon the idea of an individual bestowed with the control to decide any matter affecting him/her. This right being partially restricted under the Social Contract Theory (by Marsilius of Padua) does not devoid him of self determination. It is not arguable that the state believes in the concept of *Parens Patriae*. But the 'Parent' has to keep in consideration 'the best interests of the child' while taking any decision with respect to the child.

The Article 244 of the Constitution of India has instilled in the Governor and the Tribal advisory councils (TAC) with the duty to administer (control) the 5th Schedule areas. Now this may seem to be an epitome of a successful grass root level governance. But examining colonial acts of 1919 and 1935', the current provisions in Constitution are nothing but an old wine in a new steel (nearly unbreakable) bottle.¹⁹ The new law is more restrictive and control-centrist. The TACs are filled with systemic deficits: it is devoid of legislative or financial powers, 1/4th of the composition of the TAC are not characterized, a complete diminution of the role of the Governor from a constitutional authority to a mere annual-report writing body, plus the powers of the Governor are blurry. Here it is necessary to make these two bodies as strong and accountable in favour of the tribals. In the Memorandum to President Pranab Kumar Mukherjee, submitted by Adivasi Samanvay Manch, Bharat it was found that in most of the states, the Chief Minister's of the state are holding the chair of TACs and in many other areas, the Chairperson is a Non-ST. The decisions taken for the governance by these TACs and scheduled areas has to wait for the assent of the President, thus defeating the very objective of the grass root level governance. The Governor has to take decisions regarding the scheduled areas on the basis of the consultation with the TACs and not the Council of Ministers. Finally, the PESA Act, 1996, which granted autonomy in self governance to such areas, have been repeatedly non-implemented, and this has led to forceful implementation of the two-tier system of governance.

In light of the above whims and fancies of the Government, it is commendable to consider that the two tribes: the Dongria Kondhs and the Sentinelese, have in their own established incomparable ways have let the world know that they are not modern day colonies of the 'State', that they will do what they are required to do save their existence, their commons, their sanctorum. But at the end of the day, these groups do not fall on

the powerful side of the system. How long can they fight for their commons, with the limited resources they possess? The United Nation's 'Declaration on the Rights of Indigenous Peoples' stresses on the right of self determination, right of free, prior informed consent as a cardinal rule of Right to exist of the the Indigenous People. It is very essential to empower them, their agencies of governance by working in the following directions:

- i. Funding should be localized.
- ii. Giving clarity to the discretion of the Governors,.
- iii. The Governor of scheduled areas must rein their regulatory role and dispose it successfully in the favour of the deprived.
- iv. The TACs should have a better say and control on the funding and the implementation
- v. The Chairperson of the TACs must be a ST, who can better understand the problems of the tribals.
- vi. A strong political push to work out the enforcement in the favour of the communities on a mission mode

The indigenous are the essence of our motherland. We trace our culture, customs, existence from them. It is a matter of great shock that the fore-moving engine of growth and development is failing to carry on within it the greatest stakeholder. The Government, the civil society and the communities themselves have to come together to make this symbiotic functioning of governance, growth and successful human existence a reality.

Conflict of Interest- Nil

Source of Funding - Self

Ethical Clearance- The author has used a doctrinal method for research. All the information and discussion in the article in the paper is based on author's own analysis based on the data secured on Informed consent and available publicly.

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A Descriptive Study to Assess the Knowledge on Fast Food Eating among Adults in Selected Urban Community Kanchipuram District Tamil Nadu

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Abstract

The fast food industry had its beginning around the mid-twentieth centuries and it grew tremendously during the last three decades of the twentieth century. The fast-food eating cause heart disease high blood pressure and diabetes mellitus and high risk of health problem such as obesity. The objectives of the study is to assess the knowledge level on fast food eating among adults and to find out the association between the knowledge and demographic variables of adults. A purposive sampling technique is used to collect data from the sample. The samples size was 50 adults at selected urban community. The knowledge level was assisted by self structured questionnaire. The result shows 1(2%) of sample had inadequate knowledge, 18(36%) of sample had moderately adequate knowledge 31(62%) of sample had adequate knowledge regarding fast food eating. There was a significant association between the knowledge and age of adult and there is no significant association between the other demographic variables like gender, income, education, resident and number of times eating fast food per week.

Key Words: Assess, Knowledge, Fast food , Adult.

Introduction

Fast food has appeared in the world during ancient Rome age, Indian introduced dahi vad, vadapav, and panipuri. Fast food is which is easily processed food served in snack bars and restaurant as a quick meal or to be taken away. Fast food are characterized as quickly easily accessible and cheap alternatives to home cooked and meals they also tend to be in high in Saturated fat sugar salt and calories. Fast food outlets a number of which offers drive through service fulfill a need for today's often over-scheduled society. The fast food industry had its beginning around the mid-twentieth century, and it grew tremendously during the last three decades of the twentieth century.³

The fast food eating causes heart disease high blood pressure and diabetes mellitus. You elevate your risk of health problem such as obesity whenever you eat fast food meals according to a 2007 article in "The New York Time Health Guide "People find it convenient to eat such as food items which please the taste buds more than regular food. They contain no nutritional value and are extremely unhealthy but still fast food items are popular as people find fast food items are popular as people find it hassle free to prepare and consume. Adults and children nowadays eat fast food without its effects on the body and general health, therefore we shall realize the nutritional value of what we eat in order to understand whether we need it or not.⁴

About junk food discussing of its, reasons of rapid spread all around the world, its harmful effects, and the possible solution for that problem. There are many examples of junk food such as pizza, French Fries, Burgers, Hotdogs, Fried food, candy, ice cream, and soda pop. Others kinds of junk food are just like the imitation juice that you find nowadays in most of the markets, and so little of the pure natural juice.⁷

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Advantages of fast food is that it can save money, save time and when it comes to disadvantages he quality of fast food is low, more fattening. When fast food enters our body it will lead to fatigue, constipation, bloating, increase in obesity risk but you will be starving, and increase in cancer, heart and liver diseases risk, your memory and cognitive functions will decline, skin will start deteriorate, kidneys and stomach will suffer more, Teeth will start decaying, blood sugar and cholesterol increases, mental health may be affected. ⁶

Need for the Study

Fast food is an affordable and convenient way to fill stomach when on the urge. Although people won't feel guilty for an occasional indulgence, regularly eating fast food can seriously damage health. Coupled with low nutritional value, the high fat, calorie and sodium content of these foods can lead to a variety of health problems. With statistical associations to weight gain, obesity, diabetes, cardiovascular conditions and all-cause mortality.¹

A study was conducted in Srinagar, Jammu & Kashmir aimed to enhance the knowledge of adolescents regarding effects of junk foods on health and in turn to reduce the incidence of consumption of junk foods by adopting healthier eating habits. A pre-experimental study was conducted using one group pre-test post-test design. The findings of the study revealed that knowledge level of adolescents regarding effects of junk foods is inadequate and there is a great need to improve this knowledge. In pre-test knowledge score 47(59%), were having inadequate knowledge, 33(41%) were having moderately adequate knowledge and no one was reported to have highly adequate knowledge about effects of junk foods on health. ²

Women who are more fast food and less fresh fruits took longer to conceive. Fast food may affect fertility because of its high saturated fat content. Women who eat more fast food spend longer trying to get pregnant, while those who eat more fruit conceive more quickly, It's one more finding adding to evidence that a healthy diet can help make people more fertile.⁵

Methodology

Research Approach

Quantitative descriptive approach was used for the study. The present study was conducted to assess the

knowledge on fast food eating among adult at selected urban community, Kanchipuram District, Tamil Nadu .

Research Design

Non-experimental descriptive research design was used.

Research Setting

The study was conducted in a urban community, karapakkam

Population

The populations of the study to assess the knowledge on fast food eating among adults

25-50 years of age residing in selected community area, Kanchipuram district, Tamil Nadu

Sample Size

The sample size used was 50 adults residing at karapakkam.

Sampling Technique

Non randomized purposive sampling technique was used for the present study.

Sampling Criteria

A) Inclusion criteria

- o Adult age between 25-50 year of age
- o Adult who are present at the time of data collection
- o Adult who can understand Tamil or English

B) Exclusion criteria

Adult who are not present at the time of data collection

Development and Description of the Tool

The tool was developed by the researchers on reviewing literature and in consultations with medical and nursing experts in the field of community medicine and nursing.

Description of the Tool

The tool consist of two sections

Section-A: Demographic variables like age, gender, occupation, income, education, residence and number of times eating fast food.

Section-B: Modified questionnaire to assess the level of knowledge of fast food eating among adults

Tools consist of 15 questions with choices regarding fast food eating where correct answer is given 1 score and the others are given 0 score

Method of Data Collection:

The data was collected by using self-structured questionnaire a method.

Statistical Analysis

The descriptive statistics mean, percentage is used to assess the knowledge on fast food eating among adults. Chi square was used to find out the association between the adults knowledge and demographic variables.

Results and Discussion

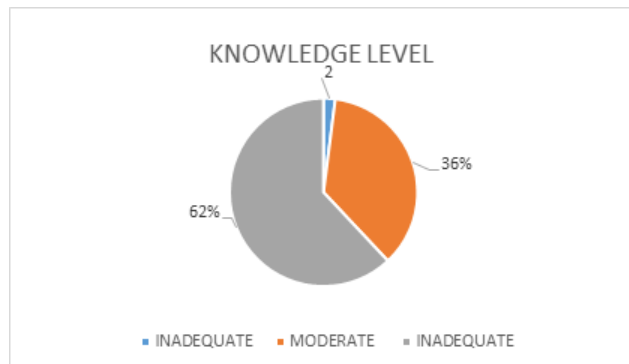


Fig 1:Percentage Distribution of population based on level of knowledge.

According to the level of knowledge on fast-food eating 1(2%) of population were having inadequate knowledge 18(36%) of population were having moderate knowledge and 31(62%) of population were having adequate knowledge.

The study finding revealed that the

- **Age:** majority (56%) were in the age between 25-33 years, (30%) of them between 34-44 years and (14%) of them between 45-50 years.
- **Gender:** majority of 27(54%) were belongs to male and 23(46%) of the female.
- **Monthly income:** majority (46%) were earning above Rs.10,000, (40%) of them were earning

Rs.5000-10,000 (15%) of them were earning below Rs.5000

- **Educational qualification:** majority (36%) were graduates, (28%) have completed their higher education (20%) of them have completed secondary education (8%) have completed their primary education education and (8%) of them are illiterate.
- **Resident:** majority 84% of them stay in house,12% stay in hostel and other 4% stay as paying guest
- **No of times eating fast food per month:** majority 50% eat 3-4 times,24% 1-2 times and 18% eat more than 5 times and 8% never eat.

Conclusion

We have conducted a research topic on a Descriptive Study to Assess the knowledge on fast food eating among adults in a selected urban community , Kelambakkam, Kanchipuram district, Tamil Nadu, India.

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Conflict of Interest- Nil

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Ethical Clearance- Obtained from Institutional Human Ethical Committee.

A Three Year Study of Skull Fracture Patterns in Fatal Road Traffic Accidents in a Tertiary Care Hospital Mortuary in Imphal From 2015-2018

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Abstract

Fatal road traffic accident cases with skull fractures were studied for three years from July 2015 to June 2018 from the medicolegal autopsy cases coming to the Mortuary of the Regional Institute of Medical Sciences, Imphal. The patterns of skull fractures in various types of victims involved in accidents with different types of vehicles were analyzed in detail. It was observed that skull fractures were encountered most commonly in pedestrian victims. Of the various types of skull fractures, comminuted fracture was observed in maximum number of cases (31.5%). Preventive and interventional measures in the form of wearing helmets by two wheeler riders, strict implementation of traffic rules and prompt emergency services especially neurosurgery facilities which can help in reducing the incidence of road traffic accident fatalities are suggested.

Key words: Road traffic accidents, incidence of victims, skull fracture patterns

Introduction

Road traffic accident (RTA) is a collision between vehicles; between vehicles and pedestrians; between vehicles and animals; or between vehicles and geographical or architectural obstacles. Road traffic accidents are human tragedy. They involve high human suffering and socioeconomic costs in terms of premature deaths, injuries, loss of productivity, and so on.¹

According to Ministry of Road Transport and Highways Transport Research Wing, Govt. of India, New Delhi, the total number of road accidents increased by 2.5 per cent from 4,89,400 in 2014 to 5,01,423 in 2015. The total number of persons killed in road accidents increased by 4.6 per cent from 1,39,671 in 2014 to 1,46,133 in 2015. Road accident injuries have also increased by 1.4 percent from 4,93,474 in 2014 to 5,00,279 in 2015. The severity of road accidents, measured in terms of number of persons killed per 100 accidents has increased from 28.5 in 2014 to 29.1 in

2015. The analysis of road accident data 2015 reveals that about 1,374 accidents and 400 deaths take place every day on Indian roads which further translates into 57 accidents and loss of 17 lives on an average every hour in our country.³ Road traffic injuries are currently estimated to be the ninth leading cause of death across all age groups globally, and are predicted to become the seventh leading cause of death by 2030.

Cranio-cerebral injuries are responsible for more than one-fourth of all traumatic deaths and nearly two-third of road traffic accidents. Incidence of head injury is steadily rising all over the world. The burden is serious as majority of head injury victims belong to young and productive age group.⁴

The present study has been undertaken at the department of Forensic Medicine of a tertiary care teaching hospital in northeast India, to assess the pattern of skull fractures in relation to the type of victim to help in evaluating the method of prevention of head injuries in road traffic accidents.

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Materials and Method

After obtaining approval from the Institutional ethics Board of the institute, a retrospective study was

undertaken in the Department of Forensic Medicine tertiary care teaching hospital in northeast India, from July 2015 to June 2018. Only cases of head injuries due to vehicular accidents were included in the study. Cases where fatal head injury is associated with fatal injuries on other parts of the body, both of which having jointly contributed towards the death were also included in the study. Decomposed bodies were excluded from the study. Details of the victim, type of vehicle involved, nature of the accident and time of occurrence were obtained from the post mortem report and the inquest papers. Statistical analysis was done at the end of the study to evaluate the findings in term of percentages, to determine the difference in the pattern of craniocerebral injuries between the type of victims and vehicles involved.

Results

During the period of July 2015 and June 2018, medico legal post-mortem examinations of 667 cases were conducted in the mortuary of Forensic Medicine department of Regional Institute of Medical sciences, Imphal. Out of these 667 cases, 236 (35.38%) were cases of fatal road traffic accidents. In these 236 cases of the fatal road traffic accidents (RTA), head injuries were observed in 133 (56.35%) cases and 103(11.29%) cases had no head injuries, as shown Table 1.

From the various types of road users in this series, the maximum victims of fatal RTAs having head injuries were pedestrians (30%) followed by motorcyclists (24%) and drivers of 3 or 4 wheelers and occupants of 3 or 4 wheelers with (15% each). The detailed findings are shown in Table 2.

Out of those 133cases, 94 (70.67%) cases had fractures of skull either in vault or base or in both. Vault and base fracture combined was seen in 57 (42.85%) cases had vault and base fracture and 26 (19.54%)

cases had only vault fracture and 11 (8.27%) cases had only base fracture. In 39 (29.32%) cases the skull was found to be intact. Table 3 show the details. All these cases had scalp injuries in forms of abrasion, contusion, laceration, or haematoma singly or in combination with other injuries.

Of the various types of skull fractures, comminuted fracture was observed in maximum number of cases in this series constituting 42 (31.5%) cases followed by fissured fracture seen in 26 (19.54%)cases, crushed fracture in 9 (6.76%) cases, depressed and depressed comminuted fracture in 7 (5.26%) cases each and sutural fracture in only 5 (3.75%) case. Table 4 illustrates the different types of skull fractures.

Most of the pedestrians sustained fissured fracture of the skull (33.3%) followed by comminuted fracture (26.7%) and crushed fracture (6.7%). On the other hand, majority of the motorcyclists (41.7%) sustained comminuted fracture of skull followed by fissured fracture (25%). Interestingly, pillion riders of two wheelers commonly sustained comminuted fracture (44.4%). Comminuted fracture was also observed in 33.3% each of the drivers of 3 or 4 wheeler and occupants of 3 or 4 wheelers. This is illustrated in Table 5.

Table 6 illustrates the site of skull fracture in relation to the type of victims. In the skull fracture sustained by pedestrians, maximum bone to be involved singly was temporal bone (13.3%). It was followed by frontal, temporal + occipital bone seen in 4(13.3%) cases. Motor cyclists and occupants of 3 or 4 wheelers had skull fractures with involvement of all the skull bones i.e. 20.8% 13.3% respectively. Drivers of 3 or 4 wheelers and pillion riders had maximum involvement of fronto temporal bone as seen in 3 (20%) cases and 2 (22.2%) cases respectively. While cyclists had maximum involvement of parietotemporal bone (20.8%).

Table 1: Showing incidence of victims with and without head injuries in 236 fatal RTA cases

Category of victims	No. of cases	Percentage
Cases with head injuries	133	56.35%
Cases without head injuries	103	11.29%

Table 2: Showing the types of victims.

Types of victim	No. of cases	Percentage
Pedestrians	37	27.81%
Cyclists	9	6.7%
Motorcyclists	30	22.55%
Pillion riders	13	9.77%
Drivers of 3 or 4 wheelers	22	16.54%
Occupants of 3 or 4 wheelers	22	16.54%
Total	133	100%

Table No.3: Showing incidence of fracture of vault, base and combined

Fracture site	No. of cases	Percentage
Vault only	26	19.54%
Base only	11	8.27%
Vault and Base	57	42.85%
Intact	39	29.32%
Total	133	100%

Table 4: Showing different types of skull fractures

Types of fractures	No. of cases	Percentage
Fissured #	26	19.54%
Comminuted #	42	31.57%
Depressed#	7	5.26%
Depressed comminuted #	7	5.26%
Sutural #	5	3.75%
Crushed #	9	6.76%
Intact	36	27.06%
Total	133	100%

Table 5: Showing types of skull fractures in relation to types of victims

Types of victim	Types of skull fracture							
	Fissured # (%)	Comminuted # (%)	Depressed # (%)	Depressed Comminuted # (%)	Sutural # (%)	Crushed # (%)	Intact (%)	P.C (%)
Pedestrians (37)	33.3	26.7	3.3		3.3	6.7	26.7	100
Cyclists (9)	42.8	28.6		28.6				100
Motorcyclists (30)	25	41.7	8.3			8.3	16.7	100
Pillion rider (13)		44.4				11.2	44.4	100
Drivers of 3 or 4 wheelers (22)	26.7	33.3		6.7			33.3	100
Occupants of 3 or 4 wheelers (22)	6.7	33.3					60	100

Table No 6: Showing Site of Skull fractures in relation to types of victims

Types of victim	Site of skull fractures					
	Frontal Bone	Parietal bone	Temporal bone	Occipital bone	All skull bones	Intact
Pedestrians (37)	8 (26.6%)	4 (13.4%)	6 (20%)	1 (3.3%)	3 (10%)	8 (26.7%)
Cyclists (9)	2 (28.6%)	3 (42.9%)	1 (14.3%)	0	1 (14.3%)	
Motor cyclists (30)	7 (29.1%)	5 (20.95%)	2 (8.3%)	1 (4.2%)	5 (20.8%)	4 16.7%
Pillion riders (13)	2 (22.2%)	1 (11.1%)	0	0	2 (22.2%)	4 (44.4%)
Drivers of 3 or 4 wheelers (22)	4 (26.6%)	3 (20%)	1 (6.7%)	0	0	7 (46.7%)
Occupants of 3 or 4 wheelers (22)	3 (20.1%)	0	0	0	2 (13.3%)	3 66.6%

Discussion

In this present study, out of 667 medico legal autopsy, 236 were of fatal road traffic accidents accounting to 35.38 %. These findings are similar to the studies done by Chavali K H et al⁶, Das D K,² and Sharma B R et al⁵, which showed that vehicular accidents comprised less than 36% of the total medico-legal autopsies.

Out of 236 fatal road traffic accident (RTA) victims, 56.35 % of victims (133 cases) died due to head injuries. This findings is almost similar with the findings of Arora S et al¹⁵, Gouda SH et al⁷, Rahman MA et al¹², and Emara AM et al¹⁰. They also reported incidences of head injuries in fatal RTAs as above 50%.

Pedestrians (27.81%) followed by motorcyclists, (22.55%) constituted the majority of the victims. Similar findings were found by Sharma BR et al⁵, Chavali KH et al⁶, Gupta S et al⁹, and Kumar S et al¹³ in their studies. This may be due to the fact that in our set up majority of the road users are pedestrians and two wheelers. Their lack of traffic sense, ignorance of traffic rules, craze for speed, lack of proper footpath and presence of vendors and other commercial installations by the side

of the roads, etc. make pedestrians and motorcyclists prone to RTA. However Kadam SS et al¹⁴ found drivers, Gouda HS et al⁷ found motorcyclists and Rahman MA et al¹² found occupants of vehicle to be the common victims involved in RTA.

Literature says that in one of four fatal head injuries, skull escapes fracture.¹⁶ The presence of skull fracture is an indication of the severity of force applied. In contrast to the vault, the base of the skull presents many jagged areas. The relative movement of the brain against the skull results in more damage to its inferior surface or base. In the present study, 94 (70.67%) cases had skull fractures. 57 (42.85%) cases had vault and base fracture and 26 (19.54%) cases had only vault fracture and 11 (8.27%) cases had only base fracture. In 39 (29.32%) cases the skull was found to be intact. Gouda HS et al⁷ and Nair SS et al¹⁵ also found that vault and base combined fracture was more than vault and base fracture alone, whereas many authors Arora S et al¹¹, Rahman MA et al¹², Gupta S et al⁹ found vault fracture to be more common than base and vault-base combined fracture.

In this study, of the various types of skull fractures, comminuted fracture was observed in maximum number of cases in this series constituting 42 (31.5%) cases followed by fissured fracture seen in 26 (19.54%) cases, crushed fracture in 9 (6.76%) cases, depressed and depressed comminuted fracture in 7 (5.26%) cases each and sutural fracture in only 5 (3.75%) case. However, Modi A D et al⁴, Gupta S et al⁹ and Kumar S et al¹³ found fissured fracture to be the commonest of all the skull fractures. It may be because this type of fracture is more common in cases where the head strikes by forcible contact with a broad resisting surface, as in road traffic accidents.

In the present study, majority of the motorcyclists (41.7%) sustained comminuted fracture of skull followed by fissured fracture (25%). Interestingly, pillion riders of two wheelers commonly sustained comminuted fracture (44.4%). But several authors viz. Shivakumar BC et al¹⁷, Ravikumar R et al⁸, Kumar S et al⁵ found linear fracture the commonest amongst the motorcyclists and pillion riders.

In the skull fracture sustained by pedestrians, the bone most commonly involved singly were temporal and frontal bones (46.6%). Maximum workers viz. Arora S et al¹¹, Modi AD et al⁴ and Gupta S et al⁹ found that temporal bone was the most commonly fractured single bone of the skull in RTAs. Motor cyclists had skull fractures with involvement of the frontal bone (29.1%) cases. Cyclists had maximum involvement of parieto-temporal bone (57.2%), which is consistent with the findings of Arora S et al¹¹ who found parieto-temporal to be the most commonly fractured bone in combined form.

Conclusion

Head injury due to road traffic accidents often leads to fatal outcomes. In the present study, fatal head injuries in road traffic accidents are relatively high in pedestrian victims compared to the other road users. This emphasizes the need for measures to ensure the safety of pedestrian road users. Wearing helmets by two wheeler riders, strict implementation of traffic rules and prompt emergency services especially neurosurgery facilities can help in reducing the incidence of road traffic accident fatalities.

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Intracranial Meningioma Aggressivity Image and Level of Malignancy in Head Magnetic Resonance Imaging (MRI)

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Abstract

Background: Meningioma is the second most common central nervous system neoplasm in adults, usually benign that originally from arachnoid cap cells. Meningioma is categorized by WHO classification as benign (grade I), atypical (grade II), and anaplastic (grade III). **Objectives:** This study to know strong correlation between the image of intracranial meningioma aggressiveness and malignancy. **Method:** Restrictively, forty-intracranial meningiomas of new cases who had undergone surgery from January 2014 to June 2015, preoperative MRI head examination and Anatomy Pathology at Dr. Soetomo Surabaya, observed signs of aggressiveness of meningioma and malignancy rate that analyzed by contingency coefficient and Spearman correlation coefficient. **Results:** Based on age 30-65 years; 82.5% of women and 17.5% of men was got a strong correlation between bone destruction ($C = 0.533$); weak association of intratumoral cystic changes ($C = 0.230$), hyperostosis ($C = 0.327$), vascular encasement ($C = 0.327$); a very weak correlation of extracranial tumor extension ($C = 0.139$), cerebral peritoneal edema ($C = 0.104$); with a malignant degree in meningioma. **Conclusion:** There was a strong correlation between bone destruction and malignancy rates in meningioma.

Keywords: Intracranial meningioma, malignancy, MRI, nervous system

Introduction

Meningiomas are the second most common central nervous neoplasm in adults and most are usually benign, while, slow-growing tumors derived from arachnoid cap cells. Atypical and malignant meningiomas are more common in men. They are rarely present in patients under 40 years old and increase in suspicion of type 2 neurofibromatosis (NF2) in young adults 1–3. NF2 tumor suppressor genes have been found to mutate in large portions of meningioma 4.

The incidence of meningioma every year was 2.3 for each 100,000, increased by age, and peak in the 7th decade 5. In the United States from 2002 to 2006 the meningioma frequency reached 33.8% of all primary tumors in the brain and central nervous system 6. Two

studies indicated that the incidence of meningioma in Asian races was lower than in European, however other study reported there was no significant incidence of race-based incidence, with 20.8%, 18.5%, and China 16.6% 7.

There are many subtypes of histologic meningiomas differ in levels of malignant behavior. The most commonly used that WHO classifies are three classes, which have different prognostic properties 8. Meningiomas were categorized by WHO classification as benign (grade I), atypical (grade II), and anaplastic (grade III), 80%, 15-20%, and 1-3% of all meningioma 5. respectively. Grade I tumors that do not meet the criteria for higher grade lesions, grade II tumors with increased mitotic activity (≥ 4 mitosis per high power field), Grade III tumors with ≥ 20 mitosis for each high power field and/or malignant characteristics that resembling carcinomas and sarcoma 9,10.

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Previous studies reported that retrospective studies in 75 patients undergoing intracranial meningioma resection were performed to determine the correlation

between aggressive imaging features and histopathologic classes in meningioma¹¹. Six aggressive imaging were evaluated: intratumoral cystic changes, adjacent cranial hyperostosis, bone destruction, extracranial tumor extension through skull base foramina, vascular encasement and peritumoral cerebral edema. Fifty-nine tumors were classified as benign, according to WHO classification and 16 as atypical/malignant. Only intratumoral cystic changes and extracranial tumor extension through the skull base foramina are more prevalent in atypical/malignant meningiomas^{11,12}.

Most meningiomas have a good prognosis, frequent surgery, and curative adjuvant radiotherapy. Although, total resection is not always possible because meningiomas might enclose vascular and neural structures, and radiation therapy is limited by neurotoxicity and tumor size. Until now, chemotherapy regimens have minimal effectiveness in the treatment of meningioma¹². The prognosis worsens with worse differentiation of the tumor^{13,14}. MRI can be used as classification process according to type of brain disease such as Glioma, Alzheimer's, and Carcinoma¹⁵. In cases with intracranial pathology, MRI is an examination option for diagnosis and characteristic of meningioma. When the picture and location are typical, the diagnosis is made to a higher degree¹⁴. Advances in identifying alternative forms of therapy for these patients have been limited by poor understanding of the molecular pathogenesis of meningiomas and molecular critical changes encouraging tumor growth, and by the lack of meningioma cell lines and tumor models for preclinical studies¹⁶. Therefore, this study aims to look at the picture of intracranial meningioma aggressiveness in head MRI with malignancy rate.

Method

The cross-sectional study was used with the samples all patients of intracranial meningioma of new cases that have been operated and performed MRI preoperative head examination and Anatomy Pathology in Dr. Soetomo General Hospital Surabaya from January 2014 to June

2015. Data were taken from head MRI examination data that using GE Optima 360 1.5 Tesla engine and Anatomy Pathology examination data (MIRSA) from patients with intracranial meningioma of new cases that have been operated in Dr. Soetomo General Hospital Surabaya. The head MRI examination was re-read by 2 neuroradiologists using the Osirinx system to saw signs of aggressiveness of meningioma and then associated with the results of Anatomical Pathology. Data from MRI preoperative head examination and Anatomy Pathology examination result (MIRSA) were collected for observation, and data were analyzed with contingency coefficient and Spearman correlation coefficient using SPSS 21 (SPSS, Inc., Chicago, IL.).

Results

The sample was 40 people, drawn from the total sample size of patients diagnosed with intracranial meningioma of newly operated cases and performed preoperative head MRI examination also anatomical pathology examination at Dr. Soetomo General Hospital Surabaya.

Frequency of Malignancy Rate

Table 1. Frequency of meningioma malignancy

Grade Meningioma (WHO)	Frequency	Percentase
Grade 1	34	85.0
Grade 2	5	12.5
Grade 3	1	2.5
Total	40	100.0

From the results, Table 1 showed WHO grade 1 meningioma was 34 patients (85%), WHO grade 2 was 5 patients (5.5%) and WHO grade 3 was 1 patient (2.5%).

*Patient Characteristics***Table 2. Distribution of patient age according to malignancy rate of meningioma.**

Age	Grade Meningioma (WHO)						Total
	1		2		3		
30-<40	6	(85.7%)	1	(14.3%)	0	(0.0%)	7
40-<50	17	(85.0%)	3	(15.0%)	0	(0.0%)	20
50-<60	10	(90.9%)	1	(9.1%)	0	(0.0%)	11
>60	1	(50.0%)	0	(0.0%)	1	(50.0%)	2
Total	34	(85.0%)	5	(12.5%)	1	(2.5%)	40

The patient's age has a mean of 47.05 ± 7.21 years. The youngest patient was 30 years old while the oldest was 65. The highest prevalence was in the 40 to 49-year-old group. Table 2 showed the age distribution of patients according to meningioma malignancy. From the study, it was found that at the age of 30-60 years old, the incidence of WHO grade 1 meningioma was more commonly obtained. While at the age of 60 years was a tendency of WHO grade 3 meningiomas.

Table 3. Sex distribution of patients according to meningioma malignancy level.

Sex	Grade Meningioma (WHO)						Total
	1		2		3		
Male	4	(57.1 %)	2	(28.6 %)	1	(14.3%)	7
Female	30	(90.9%)	3	(9.1%)	0	(0.0%)	33
Total	34	(85.0%)	5	(12.5%)	1	(2.5%)	40

The sex of patients women were 33 patients (82.5%) more than men 7 (17.5%). It was also found that in female patients had a tendency to meningioma WHO grade 1, while grade 3 occurred in men

Overview of Meningioma Aggressiveness on Preoperative MRI Examination that Correlated with Anatomical Pathology Results

The data was taken when one of the observer/assessor express positive, hence the picture of aggressiveness meningioma considered as positive.

Table 4. Meningioma aggressiveness on preoperative MRI examination that correlated with anatomical pathology

Correlation	Diagnostics Grade 1		Grade meningioma (WHO)			Total
			Grade 2	Grade 3		
Correlation of intratumoral cystic changes with meningioma aggressiveness level	Intratumoral cyclic changes	-	21 (61.8%)	2 (40.0%)	0 (0.0%)	23 (57.5%)
		+	13 (38.2%)	3 (60.2%)	1 (100%)	17 (42.5%)

Cont... Table 4. Meningioma aggressiveness on preoperative MRI examination that correlated with anatomical pathology

Total			34	5	1	40 (100%)
Correlation of hyperostosis with aggressiveness of meningioma	hyperostosis	-	28 (82.4%)	2 (40.0%)	1 (100%)	31 (77.5%)
		+	6 (17.6%)	3 (60.0%)	0 (0.0%)	9 (22.5%)
Total			31	5	1	40 (100%)
Correlation of bone destruction with aggressiveness of meningioma	Bone Destruction	-	33 (97.1%)	3 (60.0%)	0 (0.0%)	36 (90.%)
		+	1 (2.9%)	2 (40.0%)	1 (100%)	4 (10%)
Total			34	5	1	40 (100%)
Correlation of extracranial tumor extension with aggressiveness of meningioma	Extracranial tumor extension	-	30 (88.2%)	5 (100%)	1 (100%)	36 (90%)
		+	4 (11.8%)	0 (0.0%)	0 (0.0%)	4 (10%)
Total			34	5	1	40 (100%)
Correlation of vascular encasement with level of aggressiveness meningioma	Vascular encasement	-	23 (67.6%)	5 (100%)	1 (100%)	29 (72.5%)
		+	11 (32.4%)	0 (0.0%)	0 (0.0%)	11 (27.5%)
Total			34	5	1	40 (100%)
Correlation of peritumoral cerebral edema with aggressiveness of meningioma	Peritumoral cerebral edema	-	9 (26.5%)	1 (20.0%)	0 (0.0%)	10 (25%)
		+	25 (73.5%)	4 (80.0%)	1 (100%)	30 (75%)
Total			34	5	1	40 (100%)

Based on Table 4, there was a weak correlation between the presence of intratumoral cysts with meningioma malignancy ($C = 0.230$). A weak correlation between the presence of hyperostosis with meningioma malignancy ($C = 0.327$). Strong relationship between the existence of bone destruction with meningioma malignancy ($C = 0.533$). There was a very weak correlation between extension of extracranial tumor and malignancy rate of meningioma ($C = 0.139$). Weak relationship between the vascular encasement with malignancy rates meningioma ($C = 0.327$). There was a very weak correlation between peritumoral brain edema with malignancy rate meningioma ($C = 0.104$).

Total Aggressiveness Score

Table 5. Total aggressive image score of meningioma with malignancy level

Grade Meningioma (WHO)	n	Aggressive score			rs
		Median	Minimum	Maximum	
Grade 1	34	2	0	5	0.130
Grade 2	5	1	1	3	
Grade 3	1	3	3	3	

Table 5 showed that the results were a very weak correlation between the image of aggressiveness meningioma with malignancy rate meningioma ($r_s = 0.130$). In meningioma WHO grade 1 was 0-5 features (average 2 features) description of aggressiveness meningioma, WHO grade 2 was 1-3 features (average 1 feature) and WHO grade 3 was 3 features.

Discussion

Forty-patients diagnosed intracranial meningioma that performed surgery and examination of head MRI pre-operative and Anatomy Pathology examination. The patients have a mean of 47.05 ± 7.21 years. The youngest patient was 30 years old and the oldest was 65 years old. The highest prevalence in the age group 40-49 years was 20 patients (50%), whereas in the age group 30-39 years was 7 patients (17.5%), age group 50-59 years was 11 patients (27.5%) and age group over 60-year-old was 2 people (0.05%). In this study obtained female patients was 33 patients (82.5%) more than men by 7 patients (17.5%).

Meningiomas were categorized by WHO classification as benign (grade I), atypical (grade II), and anaplastic (grade III), 80%, 15-20%, and 1-3% of all meningiomas^{5,17}. From this research, there was 34 men (85%) of WHO grade 1 meningioma, WHO grade 2 was 5 (12.5%) and WHO grade 3 was 1 (2.5%). Based on age obtained there were; at age 30-59 years was 33 patients with WHO grade 1 intracranial meningioma and 5 patients with WHO grade 2 intracranial meningioma, also in the age group over 60 years old was 1 person with WHO grade 1 and 1 men intracranial meningioma with WHO grade 3 intracranial meningiomas.

Meningiomas are generally more common in women, with the dominance of 2-3 to 1, but this trend is reduced in atypical and anaplastic meningiomas in children and radiation-induced meningioma¹⁷. Based on sex, women were more likely to suffer from WHO grade 1 intracranial meningioma by 30 patients (90.9%) and 3 (9.1%) with WHO grade 2 meningiomas. In men, 4 (57.1%) patients were WHO grade 1, 2 (28.6%) intracranial meningioma with WHO grade 2 while 1 men (14.3%) intracranial meningioma with WHO grade 3 intracranial meningiomas. In this study, there was 1 men's meningioma of WHO grade 3 intrauterine with male sex and in the age group over 60 years old.

A retrospective study of 75 patients undergoing intracranial meningioma resection was performed to

determine the correlation between aggressive imaging features and histopathologic classes in meningioma¹¹. Six aggressive imaging features were evaluated: intratumoral cystic changes, adjacent cranial hyperostosis, bone destruction, extracranial tumor extension through skull base foramina, vascular encasement and peritumoral cerebral edema. Fifty-nine tumors were classified as benign, according to WHO classification, and 16 as atypical/malignant. Only intratumoral cystic changes and extracranial tumor extension through the skull base foramina are more common in atypical/malignant¹¹. From the analysis, there was a strong correlation between bone destruction and meningioma malignancy ($C = 0.533$). While on other features have a weak correlation between the picture of aggressiveness meningioma with meningioma malignancy levels, cystic intratumoral changes ($C = 0.230$), hyperostosis ($C = 0.327$) and vascular encasement ($C = 0.250$). And there is a very weak association between the aggressive picture of meningioma and meningioma malignancy, extension of extracranial tumor ($C = 0.139$) and peritumoral cerebral edema ($C = 0.104$).

The presence of an overview of intratumoral cystic changes was in 13 patients from 34 individuals (38.2%) with WHO meningioma grade 1, 3 patients from 5 (60%) with WHO grade 2 meningiomas and 1 patient from 1 (100%) with WHO meningioma grade 3. From the results, there was a weak correlation between the existence of intratumoral cystic changes with meningioma malignancy.

The presence of hyperostotic features was in 6 of 34 patients (17.6%) with WHO meningioma grade 1, 3 patients of 5 (60%) with WHO grade 2 meningioma and 0 patients of 1 (0%) with WHO grade 3 meningiomas. The results, there was a weak correlation between the presence of hyperostosis with meningioma malignancy.

Bone destruction was present in 1 out of 34 patients (2.9%) with WHO meningioma grade 1, 2 of 5 patients (40%) with WHO grade 2 meningiomas and 1 of 1 patients (100%) with WHO grade meningioma 3. From the results, there was a strong correlation between the existence of bone destruction with meningioma malignancy. Extracranial tumor extension features were present in 4 of 34 patients (11.8%) with WHO meningioma grade 1, 0 of 5 patients (0%) with WHO grade 2 meningiomas and 0 of 1 patients (0%) with WHO meningioma grade 3. From the results, that there was a very weak correlation between the extension of the

extracranial tumor with malignancy rate meningioma.

Vascular encasement was present in 11 of 34 patients (32.4%) with WHO grade meningioma 1, 0 of 5 patients (0%) with WHO grade 2 meningiomas and none of 1 patients (0%) with WHO grade meningioma 3. From the results, there was a weak correlation between the vascular encasement with the malignancy rate of meningioma ($C = 0.327$). Peritumoral brain edema was present in 25 of 34 patients (73.5%) with WHO meningioma grade 1, 4 of 5 patients (80%) with WHO grade 2 meningiomas and 1 of 1 patients (100%) with WHO meningioma grade 3. From the results, there was a very weak correlation between peritumoral brain edema with malignancy rate meningioma ($C = 0.104$). From the total score of aggressive images of meningioma was a very weak correlation between the picture of aggressiveness meningioma with meningioma malignancy ($r_s = 0.130$). Meningioma WHO grade 1 has 0-5 features (average 2 features) meningioma aggressiveness picture, WHO grade 2 meningioma has 1-3 features (average 1 feature) description of aggressiveness meningioma, and meningioma WHO grade 3 has 3 features aggressiveness picture meningioma.

Conclusion

There was a strong correlation between bone destruction and malignancy rates in meningioma. The presence of a weak association of the aggressive features of meningioma was intratumoral cystic changes, hyperostosis, and vascular encasement with malignant levels in meningioma. The presence of a very weak correlation from the image of aggressive meningioma extension of extracranial tumor and peritumoral brain edema with malignancy levels in meningioma. From the total score of aggressive images of meningioma, there was a very weak correlation between the picture of aggressiveness meningioma with meningioma malignancy.

Ethical Clearance: This study protocol was approved by ethical clearance Dr. Soetomo Surabaya, Indonesia teaching hospital research.

Conflict of Interest: The author reports no conflict of interest of this work.

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Practice and Perceived Barriers among Health Care Workers to Control Infection in Dialysis Unit

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Abstract

Aim: Study investigated the practices and perceived barriers towards infection control measures among healthcare workers in the dialysis unit.

Method: Descriptive survey design was adopted. Data was collected by administering checklist on barriers towards infection control measures in dialysis unit among 50 healthcare workers and 602 events on infection control measures in dialysis unit was observed using observation checklist.

Findings: The study findings revealed that majority of healthcare workers perceived that wash basin for hand washing is away from patient area, lack of appropriate staffing, high work load, washing agents cause irritation to my hands, nobody checks, too busy, not following infection control measures in dialysis unit as the barrier and healthcare workers were not following all the infection control measures in dialysis unit.

Conclusions: This study indicates that majority healthcare workers did not follow infection control measures in dialysis unit. It is alarming and mandates the need for reinforcing the healthcare workers to follow the infection control measures which can prevented healthcare associated infections in the unit. Healthcare associated infection are the most common cause preventable infections in patients undergoing dialysis.

Key words: Infection Control nursing, dialysis, practice, barriers, healthcare workers, hand hygiene, hospital infection management, reuse.

Introduction

Patients on dialysis treatment has an increased risk for acquiring an infection because of the nature of complex dialysis process requiring frequent use of vascular access. Dialysis patients have weakened immune system which increases their risk for infection¹. Approximately 2,250,000 patients worldwide are on maintenance dialysis². In 2013, there were 9,09,000 Asians on dialysis³. Total admission rate in dialysis

patient among Asians is 1,248. Mortality rate by primary cause of mortality in Asians septicemia is 6.5%, viral infections is 0.1% and 1.0% are other infections⁴. Dialysis patient and Healthcare Workers in the dialysis unit are at greater risk of blood borne pathogens such as Hepatitis C, hepatitis B and human immunodeficiency virus. As the disease is not a curative but life sustaining patients undergoes dialysis in same centre for years repeatedly and also patients usually may have to be dialysed in three or four shifts everyday were in the unit of healthcare workers also go through the periods of extreme activity during which after termination of one shift of patients the next shift have their treatment would be initiated. In most of the dialysis unit the dialysis machine and patient bed are placed in proximity to each other along the walls and also the hand washing basins are usually located at a distance in the facility hence the

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risk of transmission of these blood borne pathogens is more outpatient dialysis centres⁵. Therefore, the present study was conducted to assess the practices and barriers regarding infection control measures among healthcare workers in dialysis unit which in turn helps to reduce the transmission of infections by enhancing their awareness regarding infection control measures to be followed in dialysis unit which will also help to bring down the infection rate.

Material and Method

After approval from Institutional ethics committee with informed consent, 602 events of practice towards infection control measures in dialysis unit were observed and the barriers were assessed among all the health care workers available during data collection. The total number of events required for the observation of practice was calculated using estimation of proportion formula. The study was registered with the clinical trials registry - India (CTRI) No CTRI/2017/03/008109. The inclusion criteria were healthcare workers working in dialysis unit during period of data collection and willing to participate in the study. The checklist was validated and tested for reliability. The reliability obtained for observation checklist (0.97), resource checklist (0.93) and perceived barriers checklist was (0.96) thus the tools were reliable.

The researcher observed the practices among healthcare workers of dialysis unit regarding infection control measures using an observation checklist and resources necessary to practice infection control measures in the dialysis unit using resource checklist. Self-administered checklist was used to assess the barriers on infection control measures in dialysis unit after obtaining the informed consent. To interpret the collected data descriptive statistics were used. The data were analysed using Statistical Package for the Social Sciences (SPSS) version 16.

Findings

Barriers to infection control measures among healthcare workers were assessed (Table 1). Among 50 healthcare workers, majority of healthcare workers 32 (64%) perceived that wash basin for hand washing is away from patient area was the one of the barrier towards infection control measures in dialysis unit, 30 (60%) perceived that lack of appropriate staffing as the barrier, 29 (58%) perceived that there was high work load, 19 (38%) Washing agents cause irritation to hands, 16 (32%) nobody checks whether I follow infection

control measures or not, 5 (10%) I am too busy, I can't follow infection control measures in dialysis unit as the barriers. Other barriers expressed by the participants were staff shortage, no separate eating room for patients, lack of organisation, more number of patients, less dialysis machines, sometimes forget guidelines and protocols, busy in the night duty, busy due to increased workload, feel uncomfortable to wear goggles during the procedure, adhesive plasters and ointments are not designated to each patients, lack of appropriate staffing due to continuous ward change for senior staff, inadequate slippers, there is no sphygmomanometer for each block, no separate isolation room, no regular classes for newly joined staffs, no needle puncture resistance container for each block.

Practice towards infection control measures in dialysis units were: Out of 92 events of setting dialysis machine, priming of dialyser and tubing, majority 92 (100%) events they did not remove the gloves after setting the machine, 91 (99%) times did not perform hand hygiene after setting machine, 81 (88%) events had put on new, clean gloves before setting the machine, 88 (96%) mask was worn properly and 70 (76%) performed hand hygiene before setting the machine and 67 (72%) performed hand hygiene after priming.

During 92 events of arteriovenous fistula/ graft cannulation and dialysis tubing connection, most 89 (97%) connects cannula to arterio venous tubing aseptically, 65 (71%) contaminated fistula/ graft site after antisepsis and 54 (59%) did not perform hand hygiene before arteriovenous fistula / graft cannulation, and 33 (36%) did not perform hand hygiene after arteriovenous fistula / graft cannulation and dialysis tubing connection.

Out of 92 injectable medication preparation events majority 92 (100%) of the events, medication preparation in bedside medication trolley with sterile tray and medication was not prepared aseptically instead the medication was prepared on the same dressing set which was used for cannulation and decannulation which was placed on the bedside multipurpose cardiac board, 84 (91%) hand hygiene was not performed before injectable medication preparation.

In total of 92 events, majority 72 (78%) disconnects from blood lines aseptically, 66 (72%) do not performs hand hygiene before arteriovenous fistula / graft decannulation, 38 (41%) dressing were not applied aseptically as they did not use sterile gloves and touched

unsterile equipment's before applying dressing with sterile gloves and 41 (45%) did not perform hand hygiene after the arteriovenous fistula / graft decannulation and dialysis catheter disconnection, 15 (16%) of the events they did not put on new, sterile gloves as per the technique instead used the same gloves which was used for arteriovenous fistula / graft cannulation and connection, 15 (16%) times needles were not removed aseptically because they did not use the sterile gloves while removing the needle during arteriovenous fistula / graft decannulation and dialysis catheter disconnection and after removing needles were placed on the bed of the patient which was carried with the gloved hand and disposed in the resistance puncture container in the dialysis unit after the procedure.

During 92 events of termination of dialysis, majority 86 (93%) times priming bucket has not been emptied and the same bucket was used for another patient and 70 (76%) of the events the tubing and dialyzers were not placed in a leak-proof container instead it was carried to reprocessing area with the gloved hand and 44 (48%) hand hygiene were not performed after termination of dialysis.

During 92 events of reprocessing dialyser and tubings, majority 92 (100%) times health care workers wore personal protective gear like gloves and plastic aprons but goggles and mask were not used all the time, 92 (100%) tubings and dialyser was stored in sealed polythene bag and 82 (89%) times dialyser was backwashed for 15 minutes direction of flow reversed in 5 minutes was not done after reprocessing dialyser and tubings, removal of glove and hand washing need to be done after reprocessing of dialyser and tubing of each patient but 77 (84%) times hand hygiene after reprocessing of each dialyser and also tubings was not done instead gloves was removed after each shift and hand hygiene was done and the reprocessing operator as

per hospital policy and guidelines is dialysis technician but reprocessing was done by class four workers and all the tubings and dialyser of different patients which was supposed to be reprocessed separately was not reprocessed separately instead were dumped in the same base and reprocessed.

Out of 25 events of cleaning and disinfection, most 25 (100%) dialysis bed was not disinfected after each patient with 1% hypochlorite, 25 (100%) disinfection of the reusable jugs for sodium bicarbonate using 1:100 dilution bleach at least weekly and priming bucket disinfection with 1:100 bleach were not done, 23 (92%) monitors were not disinfected with virkon 1% 4 times a day, 21 (84%) all high touch surfaces were not cleaned.

Resources present in the dialysis unit were observed (Table 2).In dialysis unit hand rub solutions were available at every patients bed side, disinfectants gluteraldehyde solution, hypochlorite solution, virkon solutions, hydrogen peroxide were available all the time 25 (100%), wash basins to wash hands available near the entrance of dialysis unit with two wash basins and are adequate as they was no overcrowding found near wash basins for washing hands, sufficient supply of hand washing solutions as hand washing solutions were present all the time 25 (100%), sterile gloves supplied adequately, mask, cap, gown, goggle for eye protection, disposable syringes, hand rub available in the medication trolley sufficient sterile dressing packs adequately supplied 25 (100%), 13 (52%) times hand rub was not present in all medication trolley, 23 (92%) times povidin iodine was not present in all medication trolley, 20 (80%) AHD solution not present in all medication trolley, 7 (28%) times spirit solution present in all medication trolley biomedical waste bins were in every cubical but puncture resistant container to dispose fistula cannula was not present in all cubicles.

Table 1: Frequency and percentage of barriers towards infection control measures in dialysis unit

N=50

Barriers towards infection control measures in dialysis unit	Yes		No	
	(f)	(%)	(f)	(%)
Washing agents cause irritation to my hands	19	38	31	62
Forget to follow infection control measures	4	8	46	92

Cont... Table 1: Frequency and percentage of barriers towards infection control measures in dialysis unit**N=50**

Lack of knowledge of guidelines and protocol	2	4	48	96
High work load in Dialysis unit	29	58	21	42
Wash basin for hand washing is away from patient area	32	64	18	36
My colleagues also do not follow infection control measures	4	8	46	92
Nobody checks whether I follow infection control measures.	16	32	34	68
I am too busy, I can't follow infection control measures.	5	10	45	90
Lack of appropriate staffing	30	60	20	40
Interference with practice of care.	2	4	48	96
Insufficient supply of resources	5	10	45	90
I wear protective equipment while performing reprocessing of dialyser tubings	49	98	1	2

Table 2: Frequency and percentage of the resources necessary to practice infection control measures in the dialysis unit
N=25

Resources necessary to practice infection control measures in the dialysis unit	Yes		No	
	(f)	(%)	(f)	(%)
Hand rub available at every patients bed side	25	100	0	0
Disinfectants gluteraldehyde solution available	25	100	0	0
Disinfectants hypochlorite solution available	25	100	0	0
Disinfectants virkon available	25	100	0	0
Wash basins to wash hands available and are adequate	25	100	0	0
Sufficient supply of Hand washing solutions	25	100	0	0
Sterile Gloves supplied adequately	25	100	0	0
Mask supplied adequately	25	100	0	0
Cap supplied adequately	25	100	0	0
Gown supplied adequately	25	100	0	0
Goggle for eye protection is adequately supplied	25	100	0	0
Disposable syringes adequately supplied	25	100	0	0
Hand rub available in the medication trolley	12	48	13	52

Cont... Table 2: Frequency and percentage of the resources necessary to practice infection control measures in the dialysis unit **N=25**

Sufficient Sterile dressing packs	25	100	0	0
Povidin iodine in all medication trolley	2	8	23	92
AHD solution present in all medication trolley	5	20	20	80
Spirit solution present in all medication trolley	18	72	7	28
Disinfectant hydrogen peroxide available	25	100	0	0
Biomedical waste bins for every cubical	25	100	0	0
Adequate supply of bicarbonate cans	25	100	0	0

Conclusion

The study found that majority healthcare workers did not follow infection control measures in dialysis unit though they had good knowledge. Hence, it is essential and necessitates the need for reinforcing the healthcare workers to follow the infection control measures to prevent healthcare associated infections in the unit as healthcare associated infection which are the biggest cause of avoidable harm and unnecessary death in the health system. The policy for infection control measures need to be strictly followed in the dialysis unit. All the facilities and equipment that are required for applying infection control measures should be available in the setting. It is very much essential to assess the barriers which hinders the healthcare workers in practicing infection control measures which in turn helps in reducing the practice of care and prevent the healthcare associated infections in the dialysis unit.

Conflict of Interest Statement: The authors declare no conflict of interest.

Ethical Clearance- Taken from Institutional Ethics Committee.

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Profile of Medicolegal Autopsy Cases at Tertiary Care Centre in Belagavi, Karnataka. A One Year Retrospective Study

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Abstract

Background: The profile of medico legal autopsy cases is important in order to know the death statistics in a region due to unnatural causes and also help to address the demographic needs according to the mortality statistics specific to that region.

Materials and Methods: The present study is a retrospective study of autopsies performed at KAHER'S tertiary care centre K.L.E Hospital, Belagavi, Karnataka India in the year 2017. During this period a total of 159 autopsy cases were conducted. Relevant information and subjective data like age, sex, marital status & manner of death have been collected from medicolegal autopsy register from January 2017 to December 2017.

Results: Out of 159 cases analyzed, maximum number of autopsies were in the age group of 21-30 years with 55 cases(34.6%). Majority of victims were males 118(74.2%). Hindus were majority in number with 147 cases(92.6%), married were 122(76.7%) & unmarried were 37 cases(23.3%). In our study 67.9% were rural residents & only 32.1% were urban. Accident, Suicide and Homicide deaths were 110(69.2%), 37(23.3%)& 1(0.6%) cases respectively. Natural deaths were seen in 6.9% cases. Maximum number of deaths were due to road traffic accidents with 92 cases (57.9%) followed by poisoning with 27 cases (17%). Out of total 159 cases maximum number of autopsy cases 60(37.7%) were conducted in the month of April to June.

Conclusion: In our present study it is observed that maximum cases were in 3rd decade of life, Males outnumbered females, rural residents were more in number. Hindus being majority formed bulk of cases. RTA, Poisoning & burns were seen as leading cause of death & maximum deaths were in the second quarter of the year (April, May & June).

Keywords: Medicolegal Autopsy, Road traffic accidents, Poisoning

Introduction

Worldwide 55.3 million people die each year^[1]. About 5.8 million people die each year as a result of injuries. This accounts for 10 % of the total deaths.

Deaths due to unnatural causes includes road traffic accidents, railway accidents, mechanical asphyxia, drowning, accidental fire, electrocution, air crash, stampede, mines disaster, deaths during pregnancy, killed by animals, illicit liquor, snake bites and food poisoning.^[2]

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The rate of unnatural death in India is 39.2 per 1000 live birth per year, while the rate of unnatural deaths in Karnataka is 32.2 per 1000 live birth per year.^[3] As per UN report Crude death rate (CDR) between 2015-2020 is 8.1.^[4]

The profile of medico legal autopsy cases is important in order to know the death statistics in a region due to unnatural causes and also help to address the demographic needs according to the mortality statistics specific to that region. It is also necessary in order to prevent the preventable casualties in future and to study the genuine crime rate in the area.

This study aims to set up a profile of deaths owing to unnatural causes, so that we can direct rigorous efforts to curb their incidence. The finding of this study will create awareness among the people and it will also be helpful for law enforcement agencies to make the strategies for prevention of such incidences.

Material and Method

The present study is a retrospective study of medico legal autopsies conducted at KAHER'S Jawaharlal Nehru Medical College & KLE Hospital, Belagavi, Karnataka, India from January 2017 to December 2017. Detailed information regarding the circumstances of death was collected from inquest panchanama, hospital records

and post-mortem report. During the study period 159 medico legal autopsies were conducted in the mortuary of KLE Hospital. Data like age, sex, marital status, religion, calendar month, residence, causes of death & manner of death was compiled and analysed. Causes of death were grossly classified as trauma, thermal injuries, violent asphyxia, poisoning and other natural causes.

Results

A total of 159 medico legal autopsies were conducted during the period of 1 year from January 2017 to December 2017. During this period maximum number of cases were in the second quarter of the year i.e April to June (37.7%) and minimum number of cases were in the last quarter of the year i.e October to December (22%). Males outnumbered females (74.2%) with male to female ratio of 3:1. It was observed in the study that the maximum number of autopsy cases i.e. 55(34.6%) in both sexes were in the age group of 21-30 years followed by the age group of 31-40 years and 41-50 years [**Table 1**]

Table 1: Age and Sex wise distribution of cases

Age (years)	Male	Female	Total	Percentage
0-10	1	0	1	0.6
11-20	9	3	12	7.6
21-30	43	12	55	34.6
31-40	17	9	26	16.3
41-50	19	7	26	16.3
51-60	18	4	22	13.9
61-70	6	5	11	6.9
71-80	4	1	5	3.2
>80	1	0	1	0.6
Total	118	41	159	100

Hindus were majority in number with 147 cases (92.6%) followed by muslims with 12(7.4%), married were 122(76.7%) & unmarried were 37 cases (23.3%).

Table no-2 depicts that majority of the cases were from rural background i.e, 108 cases (67.9%) .

Table. 2: Distribution of Cases according to regions of living

Region	No.of Cases	Percentage
Urban	51	32.1
Rural	108	67.9
Total	159	100

Table no-3 depicts various manners of death. Accidental deaths were 110(69.2%), Suicidal 37(23.3%) and Homicidal deaths were 1(0.6%).

Table 3: Distribution of cause and manner of death cases.

Cause of death	Accidental	Suicidal	Homicidal	Natural	Total	Percentage
RTA	92	--	--	--	92	57.9
Poisoning	05	18	--	--	23	14.5
Burns	06	05	--	--	11	6.9
Electrocution	06	--	--	--	06	3.8
Fall from height	06	--	--	--	06	3.8
Snake bite	04	--	--	--	04	2.5
Hanging	--	02	--	--	02	1.3
Drowning	--	01	--	--	01	0.6
Lightening	01	--	--	--	01	0.6
Assault	--	--	01	--	01	0.6
Others	01	--	--	11	12	7.5
Total	110	37	01	11	159	100

From Table 4- Maximum number of RTA deaths were due to 2 wheeler vehicular accident (69.6%), followed by 4 wheeler vehicles (23.9%) & Pedestrian (4.3%)

Table 4: Distribution of cases according to Type of RTA cases

No. of Cases	Percentage	Type of RTA cases
04	4.3	Pedestrian
64	69.6	2 Wheeler
22	23.9	4 Wheeler
02	2.2	Heavy Vehicle
92	100	Total

In our study, RTA was most common cause of death (n=92, 57.9%), followed by poisoning including snake bite (n=27, 17%) & burns including electrocution and lightning (n= 18, 11.3%). Regarding age groups pattern among RTA cases majority of victims were in 21-30 years age group (n=27). The age group in which poisoning were common was between 21-30 years(n=11,

40.7%) followed by 41-50 years(n=4, 14.8%). Chemical poisoning was the most commonest (n=23, 85.2%) followed by snake bite(n=4, 14.8%). In thermal injuries 21-30 years (n=5, 27.8%)were common. There were 18 cases (11.3%) from thermal injuries of which commonest cause was burns (n= 11, 61.1%) followed by electrocution (n= 6, 33.3%) and only one case of lightning was autopsied. [Table 5]

Table 5: Distribution of cause of deaths according to Age

Cause of death	Age (Years) 0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	>80
RTA	01	09	27	12	17	12	09	03	02
Poisoning	--	02	11	03	04	03	--	--	--
Burns	--	--	06	05	--	--	--	--	--
Electrocution	--	--	--	06	--	--	--	--	--
Fall from height	--	--	02	--	--	02	01	01	--
Snake bite	--	--	02	--	01	--	--	01	--
Hanging	--	--	--	01	--	01	--	--	--
Drowning	--	01	--	--	--	--	--	--	--
Lightening	--	--	--	01	--	--	--	--	--
Assault	--	--	--	01	--	--	--	--	--
Natural	--	--	05	02	03	02	--	--	--
Total	01	12	53	31	25	20	10	05	02

Deaths due to RTA was most common among males (n=73, 45.9%) compared to females(n=19, 11.9%) Thermal deaths were common in females(n=12, 66.7 %) as compared to males(n=6,33.3%). Most of the thermal deaths were suicidal (n=11, 61.1 %) followed by accidental(38.9%).Chemical poisoning was most commonly seen in males(n= 14, 60.9%) as compared to females(n=9,39.1%). Maximum number of deaths due to poisoning were suicidal(n=23, 85.2%) followed by accidental(n=4, 14.8%)

Discussion

During the study period a total of 159 cases of medico legal autopsies were performed at KAHER'S J.N Medical College and KLE hospital mortuary. Out of 159 cases maximum number of autopsy cases were in the age group of 21-30 years which is the most productive year in one's life. These findings are in consistency with findings of Kannan K^[5], Mathiharan K^[5], Curran WJ^[6] &

ME Bansude^[7].

In our study majority of victims were males(74.2%). Similar findings are seen in studies done by Murthy et al^[8] who studied 150 cases out of which 123(82%) were males & 27(18%) females. Mugadlimath et al ^[9]studied 64 cases out of which 39(61%)were males &25(39%) females.

The reason being that as males are bread earners and females usually doing household work, which makes the males more vulnerable to accidents, violence and stress & also males predisposed for risk taking behaviour.

In our study 92.6% were Hindus, and 7.4% were Muslims. Similar findings are observed in studies by Kannan K^[5], Mathiharan K^[5] and Curran WJ^[6]. Rural residents were 67.9% and only 32.1% were from Urban. This finding is contradicting to results of other studies done by Radhakrishna KV^[13] et al and Patel JB^[14] et al in which Urban residents were in majority. This difference

is due to our centre serves more rural population.

Deaths due to road traffic accidents & its complications constituted majority of cases 57.9% followed by poisoning 17% and burns 11.3%. Similar findings are observed in studies done by K Awdesh et al^[15] and ME Bansude.^[7] The reason being that our centre being tertiary care hospital, most of the accident cases are referred to our hospital including from rural areas.

According to month wise distribution of cases, findings of our study showed more number of cases between April to June. Similar findings are seen in studies by Patel et al^[14] and Awdesh et al^[15].

Conclusion

Study conducted at KAHER'S Jawaharlal Nehru Medical College & KLE Hospital Belagavi, to know the profile of medico legal autopsies during a period of one year from January 2017 to December 2017 comprising a total of 159 medicolegal autopsies. In our study we found that majority of cases were in 3rd decade of life, males outnumbered females, rural residents were more in number, Hindus being majority in number formed bulk of cases, RTA, Poisoning and burns were seen as leading cause of death, among road traffic accidents 2 wheeler accidents were more in number. Maximum number of cases were seen in the period between April-June. This study helps to interpret different types of medico legal autopsy cases, thereby providing an insight to the policy makers, law custodians, and the community to look into the specific aspects of the cases and then to take proper measures to reduce mortality.

Conflict of Interest- None

Source of funding- Self

Ethical Clearance- Institutional Ethical Committee approval/ Clearance taken

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Accuracy of Demirjian Age Estimation Method in South India Kadapa [A.P] Population-A Cross Sectional Study

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Abstract

Background:Demirjian's technique of age assessment based on tooth development stages has been extensively investigated in different populations of the world. **Aim:** The present study is to assess the applicability of Demirjian's modified 8-teeth technique in age estimation of population of south India (Kadapa) **Materials and Method:** Two hundred pre-treatment orthodontic radiographs of patients in an age group of 10-20 years with representation from both genders were assessed for eight left mandibular teeth and scored as per the Demirjian's criteria. Statistical analysis was performed to compare the estimated and actual age. **Results:** The results revealed that the mean value in age estimation of the entire sample was 1.39years. The Mean value in males and females (10–20years) was 1.33and 1.46 respectively.**Conclusion:** significant positive correlation with estimating dental age in which chronological age is higher compared to dental age.

Keywords: Age estimation, Demirjian's method, forensic odontology, Indian-specific formulas.

Introduction

Age estimation has a particular medico legal significance. Estimation of age is one of the major components towards establishment of one's identity¹. Age estimation of the individuals play a vital role in many dental forensic as well as anthropology and archaeology disciplines. Age estimation is essential for the purpose of absolute identification in the living individual in civil cases like attainment of majority, voting rights, marriage, pension payments, inheritance, passport, driving license, insurance claims, disputed sex, missing persons, consent for operations, organ donation and criminal cases like persons accused of assault, forced prostitution, murder, rape, impersonation, kidnapping and juvenile offenders etc².

The method most frequently used in forensic dentistry was described by Demirjian et al^{3,4}. Their method described the use of tooth development stages

to calculate the dental age by using statistical equations. Further the classic Demirjian Method had divided the tooth development into 8 stages (A to H stages) of development, whereas the researchers have studied and added two more development stages between these 8 stages and have modified to give numbers to the ten developmental stages i.e. from 0 stage to 9 stages, to bring about more accuracy in the dental age estimation using Demirjian Method^{3,4}. Also these modifications in Demirjian Method studied in Indian samples have shown promising results^{5,6}.

The present study is to assess the applicability of Demirjian's modified 8-teeth technique in age estimation of population of south India (Kadapa). In this study shall be to correlate the developmental stages of all the 8 teeth Present on the lower left quadrant with chronological age evaluated on orthopantomograms [OPGs].

Materials and Method

OPGs of 200 patients of Andhra Pradesh [Kadapa] origin with known age proof between the age Group of 10-20 years were selected. The sample consisted of 100 boys and 100 girls and procured from the private diagnostics institution and clinics in Kadapa. It is a cross-

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sectional study. Approval from Ethical committee of JSS Academy of higher education and research, Mysore was obtained. Indian Formulas for Age^{7,8,9}. Estimation (developed on a sample of 165 males and 296 females aged 7 to 25 years):

1. For males, Age = $27.4351 - (0.0097 \times S2) + (0.000089 \times S3)$

2. For females, Age = $23.7288 - (0.0088 \times S2) + (0.000085 \times S3)$

All the data were analyzed using Microsoft Excel and statistical package SPSS version 20.0. Paired 't' test for mean chronological and dental ages of the selected sample was done. The date was sorted with respect to sex. Means are calculated for males and females separately. Linear correlation coefficient was calculated between each pair of chronologic age and the dental age

Inclusion Criteria

- 1) Subjects with both parents from Andhra Pradesh
- 2) Having no medical history and no obvious dental pathology on the panoramic radiograph related to mandibular left teeth
- 3) Patients between the age of 10 and 20 years at the time the OPG was taken.

Exclusion Criteria

- 1) Subjects without proper age proof.
- 2) Any teeth missing in the left mandibular arch
- 3) Image deformity affecting area of study.
- 4) Impacted/malformed teeth
- 5) Orthopantomogram showing obvious dental pathology.

Results

The radiographic evaluation of the tooth developmental stages was determined according to the 10 stage criteria given by Modified Demerjans Method. The results showed significant correlation between the chronological age and the estimated dental age.

Table 1: Age wise distribution of subjects used for the study

Age group	Boys	Girls	total
10-11	12	14	26
11-12	12	18	30
12-13	11	6	17
13-14	10	10	20
14-15	9	6	15
15-16	11	8	19
16-17	16	19	35
17-18	2	7	9
18-19	17	12	29
Total	100	100	200

Table 2: T-Test: Overall table

Mean Chronological And Dental Ages Of The Entire Sample					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	dental age	12.5802	200	2.04465	.14458
	chron_age	13.9794	200	2.69597	.19063

[Table 03] Results of paired 't' test for mean chronologiactal and dental ages of the entire sample						
Mean		Paired Differences		T	Df	Sig. (2-tailed)
		Std. Deviation				
Pair 1	dental_age - chron_age	-1.39925	1.91603	-10.328	199	.000

The mean dental age was 12.5802 years with the standard deviation of 2.04465, where as the mean chronological age was 13.9794 with the S.D value of 2.69597. When Independent samples 't' test was applied for the mean difference of 1.39925, t value of 10.328 was found to be significant at .000 level. From the mean values it is clear that chronological age was significantly higher than the dental age.

Table 4 : T –Test[Males]

MEAN CHRONOLOGICAL AND DENTAL AGES OF THE MALE SAMPLE					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	dental_age	12.7312	100	1.89189	.18919
	chron_age	14.0616	100	2.70011	.27001

[Table 5]: Results of paired samples 't' test for mean chronological and dental ages of the male sample						
Mean		Paired Differences		T	df	Sig. (2-tailed)
		Std. Deviation				
Pair 1	dental_age - chron_age	-1.33040	2.07253	-6.419	99	.000

The mean dental age was 12.7312 years with the standard deviation of 1.89189, where as the mean chronological age was 14.0616 with the S.D value of 2.70011. When Independent samples 't' test was applied for the mean difference of 1.33040, t value of 6.419 was found to be significant at .000 level. From the mean values it is clear that chronological age was significantly higher than the dental age.

Table 6 : T –Test [Females]

Mean chronologiactal and dental ages of the female sample					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	dental_age	12.4291	100	2.18588	.21859
	chron_age	13.8972	100	2.70290	.27029

Summary

The determination of dental age is of great importance in the field of dentistry, forensic medicine, anthropology etc. Many researchers have studied and analyzed dental age using the classic Demirjian method which had originally been formulated on French-Canadian population^{12,13}. Later on modifications were done in this method like addition of two extra teeth developmental stages making it to total 10 stages in place of 8 stages. Similarly due to effects of many external factors like different population groups, caste, culture, gender, environments etc, the area specific studies were conducted by many scholars. The present study has used the India specific Formula for the south Indian study group to know its reliability. The easy availability of panoramic radiographs in dental disciplines for various Clinical purposes can also help in age estimation through assessment of the different stages of tooth development are considered the best way to estimate the age in individuals^{14,15}.

This shall also indicate the skeletal maturity in the subjects under test, thereby reducing the radiation exposure towards obtaining multiple hand-wrist radiographs. More over the estimation of dental age using the Modified 10 Scale Demirjian's Method gives the reliable results¹⁶.

Thus, the present study indicates that this population specific age estimation method can have valid clinical as well as forensic applications for south Indian KADAPA population. The results of our study have concluded that the Demirjian method showed high accuracy when applied to Andhrapradesh Kadapa population. The results demonstrated that Demirjian method produced significant differences between dental age and chronological age in the study group. Significant positive correlation with estimated dental age in which chronological age is higher compared to dental age.

Ethics committee approval: Taken

Conflict of Interest: None declared

Source of Funding- Self

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Iatrogenic Factors and Oral Health

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Abstract

The periodontium must be in a state of health for the effective functioning of normal dentition. Etiology of diseases related to periodontium may be iatrogenic i.e. those diseases that result from careless procedure done by a physician or a dentist. This article discusses iatrogenic factors affecting oral health.

Keywords: *Iatrogenic, Periodontics, Non-surgical Periodontal Therapy, Surgical Periodontal Therapy*

Introduction

“To err is human”

“**Iatrogenic**” is derived from Greek Language where “**Iatros**” means Doctor/Healer “**Gennan**” means “**as a Result**”.¹A tradition of conservatism in medical practice has understandably grown up in the centuries since Hippocrates told his disciples “Primum non nocere” i.e. do no harm. Man has always been aware of the hazards of the doctor-patient relationship, as well as the benefits. Napoleon, when advised to consult his physician said, “I do not want two diseases - one nature-made, one doctor made”.² Iatrogenic disease is defined as those diseases induced by physicians’ activity, manner, or therapy³and this term is usually used for an infection or other complications of treatment while iatrogenic factors in dentistry is defined as inadequate or inappropriate dental procedures that contribute to deterioration of teeth or periodontal tissues.It can be due to careless therapeutic procedures, injudicious use of instruments and chemicals, improper treatment planning and negligence which cause traumatic injuries to the periodontium.⁴

The etiology of periodontal disease can be iatrogenic in nature. If the procedure is not performed properly diagnostic procedures, restorations, endodontic therapy, fixed and removable prosthesis, orthodontic therapy and oral and maxillofacial surgical procedures have the potential to become iatrogenic.⁵

Iatrogenic factors related to periodontics:

1. Iatrogenic Problems due to Non-surgical Periodontal Therapy

- a) Reaction to any medication /local anesthesia.
- b) Post-operative bleeding.
- c) Post-operative pain.
- d) Post-operative swelling and bruising.
- e) Post-operative infection.
- f) Increased sensitivity to temperature
- g) Apparent changes in appearance of teeth due to gum recession as result of decreased inflammation.
- h) Tooth mobility/loss.

Pocket debridement in periodontal therapy by handinstrumentation (scaling and root planing, SRP) or ultrasonics is necessary for the treatment of periodontal disease. But it can cause many side effects. It can cause gingival recession resulting in exposure of root surface, inadvertently remove rootcementum and sometimes superficial parts of dentin also. Hence, a number of dentinal tubules will be exposed to the oral environment as treated root surfaces are normally left unprotected.⁶

Bergenholtz and Lindhe⁷ found that the incidence of pulpal lesions did not increase when teeth were subjected to scaling and root planing as compared to untreated teeth subjected to periodontal breakdown.

Patients who have received pocket/root debridement in periodontal therapy frequently experience sensitivity of the treated teeth to evaporative, tactile, thermal, and osmotic stimuli.⁸ Usually, the symptoms develop and peak during the first week, and then they

may subside or disappear within the subsequent weeks they are although uncomfortable.⁹

It has been observed that tissue trauma occurs during non-surgical periodontal therapy¹⁰ which triggers local mechanoreceptors and nociceptors that gets activated and release chemicals such as prostaglandins, bradykinin, and histamine leading to perception of pain in the central nervous system. Pihlstrom et al¹¹ reported that patients experienced pain of significant duration and magnitude after scaling and root planning.

2. Iatrogenic Problems Caused By Surgical Periodontal Therapy

An iatrogenic problem related to periodontics is formation of periodontal abscess which is of 3 types :

a) Post-therapy periodontal abscess: When small fragments of calculus is forced into the deep- periodontal tissues.¹²

b) Post-surgery periodontal abscess: When there is inadequate removal of subgingival calculus or there is presence of foreign bodies in periodontal tissues.¹³

c) Post-antibiotic periodontal abscess: When systemic antibiotics are prescribed without subgingival debridement in patients with advanced periodontitis which causes formation of abscess.¹⁴

Another iatrogenic problem is gingival recession which may result due to periodontal therapy. Since it occurs primarily as an outcome of resolution of the inflammation in the periodontal tissues, it is seen both following non-surgical and surgical therapy.¹⁵

Iatrogenic factors related to Endodontics:

1. **Sodium hypochlorite extrusion:** Sodium hypochlorite (NaOCl) is the most widely used irrigant, with a concentration ranging from 0.5–5.25%.¹⁶ It is bacteriocidal and has capacity to dissolve organic matter, dislodge debris from the root canal system and provide a degree of lubrication whilst shaping the canals during RCT.¹⁷ Although, there is a risk that NaOCl can get extruded into the periradicular and soft tissues leading to an intense inflammatory response and extensive damage of tissue.¹⁸ Sodium hypochlorite extrusion occurs when there is over preparation of apical foramen, pre-existing open apex, poor working length control and absence of dedicated endodontic irrigation needle and syringe.

Prevention:

a) Irritating syringes are not jammed into the apical part of canal.

b) Irrigation should always be performed relatively passively without excessive hydraulic pressure.

c) Side vented needles should be used.

2. **Instrument separation:** It is during non-surgical root canal therapy an instrument will separate in a canal system, blocking access to the canal terminus. This instrument is usually some type of file or reamer.

Causes:

- Improper use
- Too much apical pressure during instrumentation
- Inadequate access cavity preparation
- Excessive or unnecessary force is applied to instrument
- Overused instrument

Prevention:

- Flaws such as shiny areas or unwinding, are detected on the flutes.
- Excessive use had caused instrument bending or crimping.
- Excessive bending occurs during file usage.
- The file knicks instead of curving.
- Corrosion is noted on the instrument.¹⁹

3. **Aspiration of instruments:** Foreign body aspiration is a possible complication of dental treatment that may result in a life-threatening situation. The foreign body is often spontaneously ejected from the airway, but in other cases, surgical intervention is needed. Items that are more commonly accidentally inspired or swallowed include teeth, restorations and restorative materials, implant parts, rubber dam retains, impression materials etc. It is important for the clinician to employ all the correct techniques to reduce the risk.

Prevention:

- Using rubber dam

- Tie floss with stainless steel crown
- Floss is tied to endodontic file to prevent aspiration

Management:

Aspiration is managed by performing Heimlich manoeuvre which is a first aid procedure used to treat upper airway obstructions (or choking) by foreign objects and X-ray films should be taken to confirm the location of foreign objects in the respiratory tract.²⁰

4. **Iatrogenic pulp exposure:** Vital tooth is asymptomatic with sound dentin at the periphery. It may be due to small mechanical or traumatic exposure of pulp.

Prevention: By taking proper radiograph.

Management: In direct pulp capping, the protective dressing is placed directly over an exposed pulp;

For root canal treatment the inflamed or infected pulp is removed and the inside of the tooth is carefully cleaned and disinfected, then filled and sealed with a rubber-like material called **gutta-percha**.²¹

Iatrogenic factors related to Oral & Maxillofacial surgery:

1. **Inadvertent removal of Wrong Tooth^{22:}**

Causes:

- Use of different tooth numbering systems
- Differences in mounting of radiographs

Prevention:

- Focus attention on procedure.
- Check with the patient and the assistant to ensure that the correct tooth is being removed.
- Check, then recheck, images and records to confirm the correct tooth.

Management:

- The tooth should be replaced quickly into the tooth socket.
- Splinting is done.
- Endodontic treatment after successful

reattachment.

2. **Mandibular angle fractures during third molar removal^{23:}**

The magnitude of tooth impaction, deep vertical and horizontal impaction of third molars is considered to be a risk factor for iatrogenic mandibular fracture.

Causes:

- Type of tooth angulation, in cases of horizontal and distal 3rd molar angulation there are more chances of fracture.
- Length of roots,,
- Presence of a cyst or tumor around an impacted third molar,
- Systemic disease or medications that may impair bone strength,

Prevention: Can be prevented by taking proper history of the patient and taking radiograph.

3. **Luxation of an Adjacent Tooth during extraction^{24:}**

Causes:

- Due to Inappropriate use of extraction instruments.

Prevention:

- Judicious use of force with elevators and forceps
- Other teeth should not be used as fulcrum for an elevator.
- Narrow forceps may be useful for the extraction of tooth that is crowded and has overlapping adjacent teeth (eg. Mandibular anterior crowding)

Management:

- I. If an adjacent tooth is significantly luxated or partially avulsed
 - Reposition in the tooth socket and left alone
 - Occlusion should be checked
- II. Luxated tooth is mobile
 - The tooth should be stabilized with semi-rigid

fixation.

- For this a simple silk suture that crosses the occlusal table and is sutured to the adjacent gingiva is usually sufficient.

4. **Subcutaneous Emphysema²⁵**: It is caused by entry of air into fascial spaces of face and neck, resulting in distention of overlying skin or mucosa and is characterized by air being forced underneath tissue, leading to swelling, crepitus on palpation, and with potential to spread along the fascial planes.

Causes:

- Crown preparation when osseous surgery is done with arotar instead of a micromotar.

- Endodontic therapy when air is used for drying the canal instead of paper points.

- Extractions and other oral surgery.

Prevention:

- Handpieces that exhaust air into the surgical field are not used.

- Air-cooled instruments used in surgical orofacial procedures should vent air away from the immediate area or recirculate air to reduce risk of introducing it into tissues.

Management:

- Handpieces that exhaust air into the surgical field are not used.

5. **TMJ injury due to extended period of mouth opening during surgical procedure²⁶**:

Causes:

- Not using correct surgical technique.

- Failure to support mandible while removing mandibular third molars.

- Patient's protective mechanism for opening exceeded while under general anesthesia.

Prevention:

- Dentist should include examination of the temporomandibular region, evaluation of joint sounds, opening and excursive movements, and temporal/

masseter/ pterygoid muscle tenderness in all preoperative third molar extraction patients.

- A bite block should be used to stabilize the mandible upon surgical mobilization of the lower third molar teeth.

6. **Needle Breakage²⁷**:

Causes:

- Size of the needle
- Previously bent needle
- Defective needles

Prevention:

- Use larger gauge needle [25 gauge is adequate]
- It should be kept in mind that Hub is the weakest part

- Needle should not be redirected , once it is inserted into the tissue

Management:

- By evaluating the broken needle in a 3D CT scan.

7. **Needle Aspiration²⁸**

Causes:

- Improper fit of needle.
- Applying excessive pressure

Prevention:

- By using lower lock syringes instead of friction lock syringes

Iatrogenic problems related to Orthodontics

1. **Root Resorption²⁹**: Some degree of external root resorption is inevitably associated with fixed appliance treatment, although the extent is unpredictable. Resorption may occur on the apical and lateral surface of the roots. Vertical loss of bone through periodontal disease creates a far greater loss of attachment and support than its equivalent loss around the apex of a tooth.

2. **White Spot Lesions**: White spot lesion is one of

the most prevalent iatrogenic side effect of orthodontic treatment. White spot lesions are subsurface enamel porosities caused by enamel demineralization. According to Ogaard et al. white spot lesions develop as a result of prolonged plaque accumulation on the enamel surfaces adjacent to orthodontic devices, commonly due to poor oral hygiene.

Prevention:

- By improving patient oral hygiene using mechanical plaque control methods
- By enhancing the enamel resistance to the microbial acid by using topical fluoride
- By additional methods using different mechanisms.

3. Soft tissue injury:

- Minor aphthous ulcerations, or canker sores, can develop around the miniscrew shaft or on the adjacent buccal mucosa in contact with the miniscrew head.
- Soft-tissue coverage of the miniscrew head and auxiliary.

Iatrogenic problems related to Prosthodontics³⁰

1. Removable partial denture (RPD) is a denture for a partially edentulous patient who desires to have replacement of teeth for functional or aesthetic reasons but they favor plaque accumulation resulting in:

- Gingival inflammation
- Periodontal pocket formation
- Mobility of the abutment teeth.

2. **Denture Associated Mucosal Trauma** leads to keratotic, hyperplastic, inflammatory and ulcerative lesions.

3. **Traumatic Ulcers Due To Denture:** Because of reileff (resilient like effect), settling of mucosa after prosthesis may lead to pressure spots or ulcer. It can be prevented by removing sharp points in the denture.

Iatrogenic problems related to Paedodontics:

1. **Accidental swallowing of crown/bands³¹:** Accidental swallowing of Stainless steel crown/bands during a procedure

Prevention:

- Oral packing or tie floss to stainless steel crown

Bands could be secured by an adequate length of floss through the molar tubes and the free ends left outside the mouth, especially while banding the second molars.

2. **Removal of Premolar Bud:** Removal of premolar bud occurs during extraction of primary mutilated tooth in attempt to remove broken roots. It can be prevented by leaving small root portions as such, avoiding cryer's. If it comes out replace and suture it.

Iatrogenic problems related to Implant Surgery:

1. Sinus Perforation during implant placement³²:

Because of the close relationship between maxillary posterior teeth and the sinus cavity, a communication between the sinus and the mouth may result while implant placement. It occurs when indirect sinus lift perforation occurs.

Prevention: By Valsalva maneuver *which is performed by moderately forceful attempted exhalation against a closed airway, usually done by closing one's mouth, pinching one's nose shut while pressing out as if blowing up a balloon.*

Management: By simple closure of sinus.

2. **Sinus membrane perforation:** It may occur when direct sinus lift sinus membrane perforation occurs.

Causes:

- Anatomical variations such as a maxillary sinus septum, spine, or sharp edge are present
- Very thin or thick maxillary sinus walls

Management:

- A pericor membrane is placed to close the area.

3. **Inferior alveolar nerve injury during implant placement³³:** The mandibular nerve is a peripheral nerve which is the largest of the trigeminal branches and is the most common branch that is involved with neurosensory disturbances following dental implant surgery.

It can be prevented if

4. Implant size is proper
5. Accurate assessment of CBCT

Prevention:

- By proper planning before implant placement and proper skills.

Conclusion

Iatrogenic factors play a considerable role in dental diseases. When treating patients objectives of dentists must be clear, to avoid any undesirable outcomes of treatment. There is a need to increase awareness among dental practitioners about role of iatrogenic factors in order to get successful outcome of any dental therapy, which unfortunately is ignored for a long time.

Ethical Clearance- It is a review article.

Source of Funding- Self

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Medical Malpractice in India: A Critical Analysis of Liability and Defense Framework

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Abstract

Expectation of a reasonable degree of care is the foundation for alleging a breach of duty. In the wake of recognition of 'right to health' as a fundamental right declared universally. Moreover, the era of consumerism has dug deep into the medical profession making consumers aware of their lawful demands and rights making it a weapon in their hands for civil proceeding for tortuous or criminal prosecution for disregard and for lack in service in the consumer courts. The doctor-patient relationship stands on trust and faith. With the life expectancy being increased for technological and advancement in the medical science, no disease seems to be untreatable and challenged. However, concerns are their professional competence, compliance to therapeutic and laboratory standards of MCI on equipments and facilities, Wrong prescriptions, overdoses and non expertise, improperly equipped hospitals and on specific still continue raise agitations amongst the patients and relatives. Given all the justified reasons, often it becomes very difficult to sustain a claim for all the economic and non economic damages.

Keywords: medical malpractice, negligence, physician

Introduction

Ancient world civilizations have imprints of medical negligence being treated as a crime than a tort, However, with time, the judiciary treated it more of a civil wrong than a crime with a reluctance to implicate physicians with any reckless behavior or for deviation from the normal practice standards because of an underlying presumption that a sensible practitioner on good faith intends to extend best possible care and intends to cure. The evolution of common law on professional negligence dates back to the landmark case of Donoghue v. Stevenson . Medical negligence is a subset of professional negligence, requiring an additional perspective through the *Bolam's*¹ test which was accepted and reiterated in the landmark judgment of Jacob Mathew v. and as put by Bingham L.J. could mean

that, "professional man should command the corpus of knowledge which forms part of the professional equipment of the ordinary member of his profession. He should not lag behind other ordinary assiduous and intelligent members of his profession in knowledge of new advances, discoveries and developments in his field."²

Patient- Doctor Relationship

The doctor-patient relationship is a an relationship of a special trust and confidence with an underlying understanding of duty to act for the benefit of the fiduciary with a strong reliance on the skills and acumen of the doctor, he being in a string influential position .

The relationship of a patient and doctor being build on the highest level of trust and confidence, and health being the dearest assets to a person's wealth and his sustenance of family, any slip of advice, wrong and untimely diagnosis, compromised standard of care and precaution etc. often threatens the sanctity of the profession with allegation of commercialization and money making business. In a land mark case the court held that "the attitude of a patient is poised between trust

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in the learning of another and the general distress of one who is in a state of uncertainty and such ambivalence naturally leads to a sense of inferiority and it is, therefore, the function of medical ethics to ensure that the superiority of the doctor is not abused in any manner. It is a great mistake to think that doctors and hospitals are easy targets for the dissatisfied patient.³

Apart from this fiduciary relationship, admittance of a patient under a doctor's treatment leads to a implied contractual obligations (except where it requires consent) utmost good faith, informed consent and assurance of appropriate standards of quality in due course of recovery.

Tortious Liability of medical Professionals

This is a specific tort of professional negligence where the act or omission falls short of the test of 'reasonable and prudent person. The widely acclaimed judgment of *Jacob Mathew v. State of Punjab & Another*⁴ has been instrumental in deciding the distinction between the jurisprudential concept of negligence in civil and criminal law. It observed that, "for negligence to amount to an offence, the element of mens rea must be shown to exist. For an act to amount to criminal negligence, the degree of negligence should be much higher i.e. gross or of a very high degree. Negligence which is neither gross nor of a higher degree may provide a ground for action in civil law but cannot form the basis for prosecution."

For negligence to be proved, the following elements are necessary

a. **Duty of Care**

b. **An act** : There must have been an omission or commission of an act by the doctor which was not supposed to be done

c. **Breach of duty**: "Such act or omission must have been occasioned either by not doing something which a reasonable man, under given set of circumstances, would do, or by doing some act which a reasonable prudent man would not do."

d. **Consequential damage**: Breach in duty has directly resulted in the injury of the person, either economic and non economic.

Any allegation of negligence against the doctor has to be materially substantiated with the best of evidence available in medical science and opinion of the experts.

Criminal Liability of Medical Professionals: Existing Legal Framework in India

The subjective state of mind with a guilty mind is the critical factor in implicating an accused doctor for criminal negligence. As observed in the case of *P.B. Desai v. State of Maharashtra and Another* (2013 15 SCC) it was rightly observed by the Apex court that, "the only state of mind which is deserving of punishment is that which demonstrates an intention to cause harm to others, or where there is a deliberate willingness to subject others to the risk of harm. Thus, negligent conduct does not entail an intention to cause harm, but only involves a deliberate act subjecting another to the risk of harm where the actor is aware -of the existence of the risk and, nonetheless, proceeds in the face of the risk."

Further in another case it has been held that, "to prosecute a medical professional for negligence under criminal law, it must be established that he/she did something or failed to do something which, given the facts and circumstances, no medical professional in his right senses would have done or failed to do. The risk taken by the doctor should have been of such a nature that the resulting injury was most likely imminent⁵."

Under the Indian Penal code, case of medical negligence are often filed under section 304-A making a rash and negligent act punishable with imprisonment for a term of two years, or with a fine or with both even though it was not intended either to cause death, or there was any like hood that he shall cause such. However, safeguard measure has been set in much known case of *Suresh Gupta (Dr) v. Govt. of NCT of Delhi*⁶, wherein, the standard of negligence required to be proved against a doctor under section 304A should be so high that it can be described as 'gross negligence' or 'recklessness', not merely lack of necessary care.

Some inherent immunity measures have been carefully crafted to protect practitioners for acts done in good faith. Section 88 of the IPC provides "exemption for acts not intended to cause death, done by consent in good faith for person's benefit. Section 92 states that treating without consent of patient is permissible if patient is unconscious, mentally ill or gravely sick. When the time required for disclosure would create a substantial risk of harm to the patient or third parties, full disclosure requirements may not apply. It is implied that the procedure and surgery is done to save the life or limb

of the patient. If possible, surrogate and proxy consent should be taken.”

The court also held that, “while, the medical professional is often called upon to adopt a procedure which involves higher element of risk, but which he honestly believes as providing greater chances of success for the patient rather than a procedure involving lesser risk but higher chances of failure. Just because a professional looking to the gravity of illness has taken higher element of risk to redeem the patient out of his/her suffering which did not yield the desired result may not amount to negligence⁷.”

Consumer Protection Act:

The advent of Consumer protection Act, 1986 brought a swiping change in the perspective of rights of consumers ranging from right to be informed on quality, standard of services, consumer awareness, redressal for any exploitation of consumers’ interests. Thus, questions have often been raised on patient’s status of being a ‘consumer of services’, medical practitioner’s status as rendering ‘service’ under section 2(1)(0) and circumstances when it can be deemed to a service.

The verdict in *Indian Medical Association v. VP Shantha*, (1995) 6 SCC 651 “settled all the concerns by covering the medical profession within the ambit of ‘service’ excluding those services of consultation, diagnosis and treatment (both medical and surgical) being rendered free of charge or under contract of personal service. However, service rendered at a non-Government hospital/nursing home where charges were required to be paid by persons who were in a position to pay and persons who could not afford to pay were rendered service free of charge would fall within ‘service’ as defined in section 2(1)(0). Thus settlement of legitimate claims arising under section 14(1)(d) and section 2(1)(g), the Consumer Disputes Redressal forums would apply the same principle as is applied before the civil courts. However the allegation of ‘deficiency of service’ would fail in a high risk case where accidental eventualities are not controllable.”

General Safeguards

It is a common knowledge that there is often a tendency to search for a human factor resulting in the unfortunate event and thus attribute the blame with some ‘act or omission’ which is normal reflection of distressed patient or the relatives. The Judiciary is in a process of

continuous efforts in retaining the sanctity of patient and doctor relationship and balancing the interests of the consumers and the service providers, certain safeguards and precautions/guidelines have to be maintained.

With successful implication of doctor for “professional misconduct” and setting Rs 6.08 crore compensation on Advanced Medicare Research Institute (AMRI) to pay for medical negligence, the famous case of *Kunal Shah v. Dr. Sukumar Mukherjee And Ors* clearly underlines some precautionary approach to be adopted by the Courts. It stated that “on receipt of complaints against a doctor or hospital, the consumer forum or criminal court, before issuing notice, should first refer the matter to a competent doctor or a committee of doctors, specializing in the field where negligence was attributed. Only after that doctor or committee “reports that there is a prima facie case of medical negligence should notice be issued to the doctor/hospital concerned. Stating that, no sympathy will be shown for doctors who are negligent, it reinforced a patient’s right to know the line of treatment being followed by doctors, including the risks involved in the treatment.”

The Constitutional bench in *Lalita Kumari v. Govt. of U.P* (2014) 2 SCC 1, provided a safeguard making an exception to mandatory registration of FIR, and held that there can be no registration of FIR against medical practitioners without preliminary inquiry.

Additionally, it requires individual medical practitioners and hospital administration to ensure;

a) Transparent Disclosures: “To secure the consent of the patient, an entailing (a) nature and procedure of the treatment; (b) any possible side effects of the medication; (c) availability of alternatives if any; (d) an outline of the substantial risks; and (d) adverse consequences of refusing treatment.”

b) Maintaining of Medical records

Conclusion and Suggestion

Every mishap, untoward incident or death during medical treatment need not necessarily points to the reckless conduct of the doctor and thus, criminal prosecutions without sufficient and satisfactory medical opinion pointing to their guilt could result in building mistrust amongst the patients and a great disservice to the community at large. In the field of medical profession service may vary from doctor to doctor however

adhering to the standard principles of service. Skills of the doctor also vary from person to person. Therefore it is said that, “negligence cannot be attributed to a doctor so long as he is performing his duties to the best of his ability and with due care and caution. Merely because the doctor chooses one course of action in preference to the other one available, he would not be liable if the course of action chosen by him was acceptable to the medical profession.”

Ethical Clearance: Not required, as the research article is based on medical malpractice and liabilities of professional negligence. The research is doctrinally undertaken.

Source of Funding : Self

Conflict of Interest : Nil

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Preclinical Diagnosis of Diabetes with Tongue Infrared Thermography and PSO Algorithm

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Abstract

The tongue use as an initial biomarker for disease diagnosis in Greek, western and Chinese culture. The tongue provides a non-invasive method to diagnose diseases in health care. The tongue shows gamut of symptoms due to disease and disorder. The traditional tongue diagnosis requires quantitative experience. In western medicine the tongue symptom use as one of the criteria for disease diagnosis. The tongue reflexology shows functioning of internal organs in body. Recent studies attribute chronic pancreatitis to saliva secretion. In this paper, we propose to diagnose diabetes with tongue thermal image. The Particle swarm optimization (PSO) algorithm to cluster thermally active pixels with similar intensity. The clustered tongue thermal region show drastic change for normal and diabetic person. The study involved 25 normal person and 25 type 1 diabetic person. The proposed approach diagnoses diabetes with 86% accuracy.

Keywords: Tongue, type 1 diabetes, Pancreas, salivary gland, insulin, Thermal image Particle swarm optimization.

Introduction

Diabetes, a heterogeneous disorder cause due to etiologic, pathophysiologic and genetic mechanisms. The insulin deficiency in body cause glycemic index of blood to increase. The insulin deficiency cause due to partial insulin production or no production by pancreas. Over 300 million people in the world affect by diabetes and the numbers are still increasing. The diabetes classify as type 1 diabetes, type 2 diabetes, gestational diabetes and monogenic diabetes. The type 1 diabetes cause due to insufficient insulin in body to regulate blood glycemic index. The insulin production in pancreas affect due to β - cell destruction. The β cells induce insulin production and secretion in pancreas. The β cell destruction causes due to autoimmune disorder. The type 1 diabetes further classify as type 1A and idiopathic or type 1B diabetes.

The tongue reflexology use in traditional Chinese medicine for disease diagnosis. The Greek and Chinese medicine relates tongue to internal body organs. The tongue reflects different organs such as epigastric, abdominal cavity, gall bladder, liver, spleen areas, pancreas and stomach. The tongue color and tongue coating reflects health of internal organs. The tongue

coating such as pale white, thick solid white color reflects operation of digestive system, metabolic and nutritive condition of tongue. The tongue coating use as biomarker to evaluate overall body health. The tongue free from stinging, swelling, burning and scarring reflect healthy tongue. The tongue diagnosis provides information about abnormal functioning of digestive tract and metabolism. Traditionally, doctors look at tongue to diagnose yeast infection, cancer, oral hygiene, candida growth, iron, B12 deficiency and herpes. In this paper, we propose computer aided diabetes diagnosis with tongue thermal image. The tongue thermal image process with Particle Swarm Optimization (PSO) to outline thermally active region.

Related Work:

A novel non-invasive method performed to diagnose Diabetes mellitus based on Sparse Representation Classifier (SRC) with facial block colour characteristics. The non-invasive capture device along with image correction is utilized to capture facial image. The facial image comprising of 4 facial blocks and the facial block placed around the face. From facial colour range, the Six centroids are used to estimate the facial colour

characteristics of each block. The facial blocks denote by facial colour characteristics. For Sparse Representation Classifier, Diabetes mellitus facial colour sub dictionary and Healthy facial colour sub dictionary are used in SRC process¹.

The novel invasive method is used to discover Non-proliferative Diabetic Retinopathy (NPDR) and Diabetes Mellitus. From tongue, image three different features extract namely texture, geometry and colour in Diabetic Retinopathy. Initially, the tongue images capture by using the non-invasive device along with image correction. Tongue colour range is separated with twelve colours, each colour represents tongue colour characteristics².

Human tongue colour has certain statistical distribution characteristics. The diagnostic feature extraction for tongue colour can be performed through analyzing these characteristics in-depth to describe the tongue colour space. There are three tongue colour space characteristics. The tongue colour range describes, colours centres with 12 colour types of tongue and tongue colour representing the colour distribution of particular image characteristics were analysed³.

The Munsell colour checker is used to enhance correction accuracy of tongue colours. The Munsell colour checker is designed with the help of tongue colour space. Tongue colour space is implemented by whole visible colours. Initially the tongue colour space is depends on the comprehensive tongue database. The visible colours categorize as tongue or non-tongue colours. From tongue colours, the tongue colour checker colours designed to attain maximum correction performance. Secondly, In colour checker, the minimum sufficient number of colors is created by comparing the correction accuracy when the range is different (ranges from ten to two hundred). Finally, for optimum colour selection technique, the objective function is presented. Two color selection techniques that is greedy & clustering based selection technique is used to solve objective function⁴.

The colour images are created by digital camera. The created information is dependent with the imaging characteristics of particular cameras. This is the major problem of tongue image analysis. Since, the tongue image analysis depends on the accurate performance of colour information. The optimized correction method is performed to adjust the captured tongue images in

several device dependent colour spaces into target independent colour space. By comparing different correction algorithm, the correction algorithm system is created with ridge regression, polynomial-based regression, neural network mapping, and support vector regression algorithms⁵.

Methodology

The tongue reflexology show changes in abnormality of organs in body. The tongue diagnosis is based on tongue color. The tongue color and tongue thermal activity boundary detect with pixel clustering. The tongue has different color such as dark-red, red, light red, purple and white. The thermally active region of tongue determine with infrared thermography camera. The tongue thermal activity change due to organ operation. The tongue thermally active region extracts to determine normal functioning of pancreas. The Infrared thermal camera acquires tongue thermal image. The low pass filter applies on thermal image to remove noise. The thermally active region in tongue cluster with particle swarm optimization (PSO). The PSO algorithm cluster pixel with similar intensity for thermally active region detection and extraction. The thermal region clustering aid in diabetes diagnosis.

Particle swarm optimization algorithm (PSO):

The PSO algorithm is based on social behavior of birds in a flock. The PSO algorithm processes alternative solution to particular optimization problem. The alternative solution to each problem is referred to as particle. For an 'n' number of variables, the alternative solutions represent by n dimensional point with search space. The fitness function applies to detect particle relation to optimal solution. The alternative solutions are flown through search space by adjusting the particle solution with respect to best position. The best solution select based on the swarm of particle. The alternative solution performance measure through solution relation to optimization problem.

The alternative solution has information such as current position of solution (x_i), current velocity of a particular solution (v_i) and best optimal solution (y_i).

The best position for a solution determine by solution visit to particular position in swarm. Hence, the particular position yields higher fitness value. The higher fitness value saves in memory. The objective function of fitness value denote by f and the alternate solution for

each position with respect to time denote by

$$\mathbf{y}_i(t+1) = \begin{cases} \mathbf{y}_i(t) & \text{if } f(\mathbf{x}_i(t+1)) \geq f(\mathbf{y}_i(t)) \\ \mathbf{x}_i(t+1) & \text{if } f(\mathbf{x}_i(t+1)) < f(\mathbf{y}_i(t)). \end{cases} \quad (1)$$

The information about alternative solution exchange between members in swarm. The information exchange provides best solution and its position in swarm. The information help particles to adjust to best solution. The particles deploy either in star or ring topologies. The star topologies aid particular particle to initiate communication with all other particles. The best optimal solution determines and all particles move to global best solution. The algorithm refers to as *gbest* PSO. The ring topology, determine particles that overlap with each other. The particles communicate with other particles to determine best particle solution. Once done, the solution adjusts to best neighborhood space. The above process is referred to as *lbest* PSO.

In *gbest* PSO the best solution determine by swarm of particles represented by

$$\hat{\mathbf{y}}(t) \in \{\mathbf{y}_0, \mathbf{y}_1, \dots, \mathbf{y}_s\} = \min\{f(\mathbf{y}_0(t)), f(\mathbf{y}_1(t)), \dots, f(\mathbf{y}_s(t))\} \quad (2)$$

Where

‘s’ represents particles in swarm.

In *lbest* PSO the neighborhood determine by

$$N_j = \{\mathbf{y}_{i-l}(t), \mathbf{y}_{i-l+1}(t), \dots, \mathbf{y}_{i-1}(t), \mathbf{y}_i(t), \mathbf{y}_{i+1}(t), \dots, \mathbf{y}_{i+l-1}(t), \mathbf{y}_{i+l}(t)\} \quad (3)$$

The best particle solution in N_j neighborhood represent by

$$\hat{\mathbf{y}}_j(t+1) \in N_j \mid f(\hat{\mathbf{y}}_j(t+1)) = \min\{f(\mathbf{y}_i)\}, \quad \forall \mathbf{y}_i \in N_j. \quad (4)$$

The neighborhoods determine by particle indices and topographical particles. In a swarm, the *gbest* PSO is simply equivalent to *lbest* PSO. The best optimum solution for *gbest* PSO determine by

$$\mathbf{v}_i(t+1) = w\mathbf{v}_i(t) + c_1\mathbf{r}_1(t)(\mathbf{y}_i(t) - \mathbf{x}_i(t)) + c_2\mathbf{r}_2(t)(\hat{\mathbf{y}}(t) - \mathbf{x}_i(t)) \quad (5)$$

$$\mathbf{x}_i(t+1) = \mathbf{x}_i(t) + \mathbf{v}_i(t+1) \quad (6)$$

Where,

w - inertia weight.

C_1, C_2 represents acceleration constants.

$r_1, (t), r_2 (t)$ represents vector sampled with uniform distribution.

In equation (5), the inertia term saves previous velocity in memory. The previous velocity in memory alters inertia weight. The high inertia weight induces exploration and low inertia weight causes exploitation.

The $\mathbf{Y}_i(t) - \mathbf{x}_i$ represents particles experience to determine best location for solution. The cognitive component saves previous best positions in memory.

The social component - $x_i(t)$ represents entire swarm prediction where the best solution is. The PSO influence by parameters such as ω , c_1 and c_2 . The theoretical studies show certain bound on values given by

$$w > \frac{1}{2}(c_1 + c_2), \quad w < 1 \quad (7)$$

In such cases, the PSO shows convergent behavior. The particle adjustment limit by allocating predefined search space and limiting particle velocity.

The PSO algorithm updates the search space until the iterations are met or the velocity is close to zero. The fitness function applies to measure particle quality. However, all the particles converge to an optimum point, which cause particle stagnation. The particle stagnation overcomes by local convergence. In local convergence, the global best particle index update with velocity given by

$$v_{\tau,j}(t+1) = -x_{\tau,j}(t) + \hat{y}_j(t) + wv_{\tau,j}(t) + \rho(t)(1 - 2r_{2,j}(t)) \quad (8)$$

Hence, the position update is represented by

$$x_{\tau,j}(t+1) = \hat{y}_j(t) + wv_{\tau,j}(t) + \rho(t)(1 - 2r_{2,j}(t)). \quad (9)$$

Where, $-x_T$ represents reset of particle position for global best position v_T represents direction for search and addition of random search term $r_2(t)$.

Where, ρ determines search space for optimal solution. The ρ initialize to 0 with ρ defined by

$$\rho(t+1) = \begin{cases} 2\rho(t) & \text{if } \# \text{ successes} > s_c \\ 0.5\rho(t) & \text{if } \# \text{ failures} > f_c \\ \rho(t) & \text{otherwise.} \end{cases} \quad (10)$$

The failure state occur when $f(\hat{y}(t)) \geq f(\hat{y}(t-1))$ and variable are incremented. The success state occurs when $f(\hat{y}(t)) < f(\hat{y}(t-1))$. The values of f_c and S_c vary dynamically represented by

$$s_c(t+1) = \begin{cases} s_c(t) + 1 & \text{if } \# \text{ failures}(t+1) > f_c \\ s_c(t) & \text{otherwise.} \end{cases} \quad (11)$$

$$f_c(t+1) = \begin{cases} f_c(t) + 1 & \text{if } \# \text{ successes}(t+1) > s_c \\ f_c(t) & \text{otherwise.} \end{cases} \quad (12)$$

The success state becomes hard to achieve when multiple failures occur. The failures cause due to over confident convergent behavior, which make the search space to be smaller surrounding global best position. The success rate and failure rate represent by equation

$$\begin{aligned} \# \text{ successes}(t+1) > \# \text{ successes}(t) &\Rightarrow \# \text{ failures}(t+1) = 0 \\ \# \text{ failures}(t+1) > \# \text{ failures}(t) &\Rightarrow \# \text{ successes}(t+1) = 0. \end{aligned} \quad (13)$$

The algorithm reaches a stop position when ρ becomes a small value or when stopping criteria is met.

Result and Discussion

The thermal flow on the tongue surface is measured using the thermal camera. Fluke infrared thermal camera is utilised to capture the thermal images of tongue from normal and diabetic patients. The recorded thermal image is applied to PSO segmentation and texture analysis to identify the variation in the flow of heat over the surface of the tongue. Before applying to the algorithm the thermal image should be pre-processed with image filters and Haar wavelet transformation. Pre-processing the thermal image results in elimination of noises added during the image-processing unit within the thermal camera. The noise from surrounding environment affects the pixel values of the recorded Thermal Image. To overcome this additional noise the thermal image is initially pre-processed with the Gaussian High pass and Low Pass filters. Gaussian Low pass filter is used to smoothen the input image. This results in blurred output of the input image. Gaussian smoothing is used to remove the high frequency noises and enhance the structures in diabetic tongue and normal tongue image. The excessive edges generated by the noises were smoothen and the enhanced image is generated.

The high pass filter sharpens the input image by highlighting the fine details in the input image. Gaussian high pass filter is applied over the diabetic tongue and normal tongue thermal images.

The filtered thermal image process with HAAR Wavelet transformation. The HAAR wavelet transformation extracts the features from the input image. Identifying the edges in the input image is more important in segmentation process. The filters applied over the input image removes the noise but the resultant image was blurred. To enhance the edges from the filter output the HAAR wavelet transformation is applied which process over the time frequency medium, which enhance the time frequency resolution of provided image.

The HAAR wavelet transformation enhances colour regions of thermal flow, which assists the colour analysis to identify sharp edges in resultant image of wavelet transform. The colour analysis is used to enhance the thermal flow by increasing the contrast of colour pattern of input image. Red colour represents the higher heat flow, Yellow moderate heat flow and green represents

low heat flow. Thus, the exact region of heat flow can be measured from the results of colour analysis. Figure 1 and 2 represents the original and colour analysis image of diabetic tongue and normal tongue image. The heat flow is higher at the centre segments of the diabetic tongue, which is not present in normal tongue thermal image. The normal tongue thermal image shows the uniform heat flow but diabetic tongue image shows increase in heat flow in middle regions of the tongue.

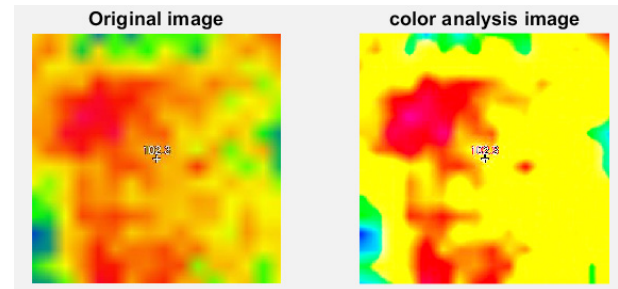


Figure 1: Colour analysis for Diabetic Tongue Image.

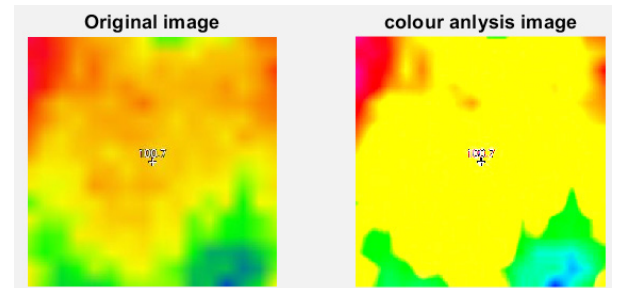


Figure 2: Colour analysis on Normal Tongue image.

The output of the colour analysis is applied to the Particle swarm optimisation technique to perform image segmentation to identify the exact location of heat change in diabetes and normal tongue thermal image. PSO algorithm groups the data set into regions. The image segmented using PSO algorithm is well grouped into regions of homogeneous colours and provides the knowledge about the presence of number of regions in the input image. Figure 3 shows the PSO output for Diabetic tongue thermal image and normal tongue thermal image. The group of heat zones and spreading out of temperature was segmented clearly. It shows the thermal hotspots on the surface of diabetes tongue. The figure 3 shows the grouping of heat zones in the normal tongue thermal image. The comparative analysis shows absence of heat zones in normal tongue. The heat flow is evenly dissipated throughout the tongue surface.

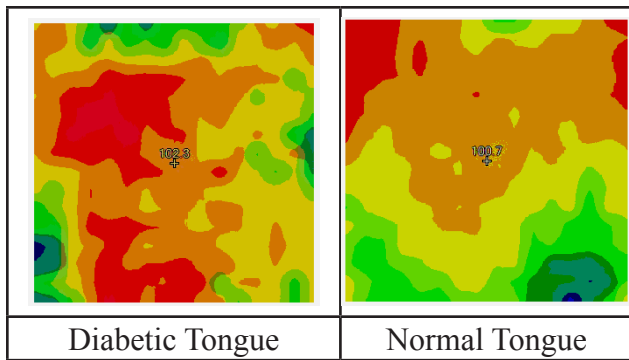


Figure 3: PSO segmentation for Normal and diabetic tongue images.

Local Binary pattern (LBP) is an efficient tool to perform texture analysis over the input images. LBP

converts the pixel values of the image into binary codes based on the threshold value of the centre pixel. Eight neighbour points of every centre frequency was grouped together. The pixel value greater than or equal to centre value is assigned as 1 and the value smaller than centre pixel value is assigned as 0. The input image was grouped into local structure with a centre pixel value. Histogram analysis is performed over each structure of LBP. The combined histogram output of each structure of normal tongue thermal image and diabetic tongue thermal image, are spitted sparse and tight histogram plots are shown in figure 4 and 5. The output of Efficient LBP image and Pixel wise LBP image shows the change in tongue thermal image pixel intensity.

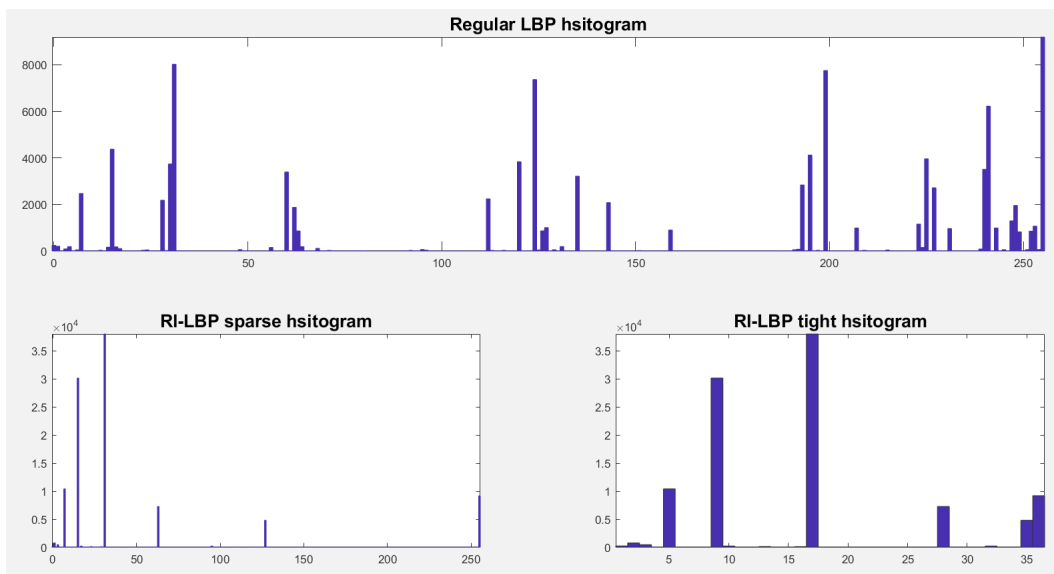


Figure 4: Histogram for Local Binary Pattern for Diabetic Tongue Image

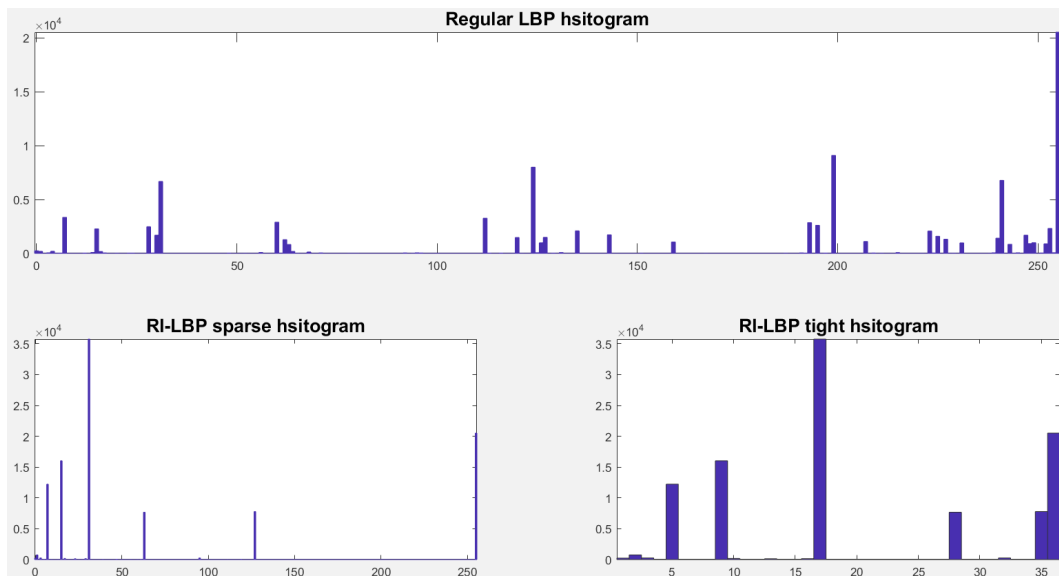


Figure 5: Histogram for Local Binary Pattern for Normal Tongue Image

Conclusion

In this paper, we propose to a non-invasive approach to diagnose diabetes at an earlier stage through tongue thermal image. The tongue thermal colour differences acquire via fluke thermal camera for normal and diabetic person. The PSO algorithm apply to cluster thermally active pixel in image. The texture extract from clustered thermal image for diabetes diagnosis. The texture show change in tongue texture, geometry and colour. The effectiveness of proposed method validate by processing thermal tongue images of 25 normal person and 25 type1 diabetic person. The tongue thermal features show positive correlation for diabetic person.

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Medico-Legal Profiling of Sher-i-Kashmir Institute of Medical Sciences Srinagar under Consumer Protection Laws of Union Territories of Jammu and Kashmir

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Abstract

The *Jammu & Kashmir (J&K) Consumer Protection Act, 1987* needs a closer scrutiny from the standpoint of medico-legal services in the wake of J&K Union Territories' (UTs) uneven health profiling and developmental progress. The doctor-patient's relationship needs an analysis in terms of access to health care and medical and para medical services. The consumer rights under *Consumer Protection Act, 1986, Jammu and Kashmir Consumer Protection Act, 1987* and *Consumer Protection Act, 2019* represents a trajectory of deficiency of medical service and lack of medical professionalism and capacity building among health personnel. The paper is a medico-legal profiling of Sher-i-Kashmir Institute of Medical Sciences (SKIMS), Srinagar in regard to diligence and negligence of doctors and para legal medical inspectorate in auguring health care and medical services to patients.

Key words: *Medico-Legal Services, Uneven Health Profiling, Health Care Services, Diligence & Negligence of Doctors, Para Medical Inspectorate.*

Introduction

The health services in UTs of J&K since three decades discern uneven health profiling and developmental progress. The state is reeling under infectious diseases and chronic health disorders. The inadequacy of preventive and curative system is adversely affecting health equity as well quality.¹ The healthcare system, emergency preparedness and trauma prevention in geographic oddities of UTs of J&K are proving detrimental to health and welfare of people. This is further aggravated by inverse doctor-patient ratio of 1:1880 as against the World Health Organisation ratio of 1:1000.² The woefully understaffed 14,686 paramedics against the requirement of 18,436 paramedics makes the access to health care precarious to sickness. Despite

sizable number medical institutions and mammoth funding there is a shortage of critical care ambulances at district, sub-district and medical colleges in the state to provide life support system to seriously injured patients. The healthcare infrastructure seems to be ineffective in innovative quality care, accessibility and affordability and regulatory measures standards and norms.³ There was a sudden decline in annual birth rate which fell to nearly 20 per million from the level of 34 per million. The annual death rate also registered a sharp decline from 7.90 in 1990 to 5.40 in 1998 in the state. A comparison of infant mortality with the rest of the country shows that the IMR in Jammu and Kashmir is 45.4, far below the national average of 71.6 per thousand. The state of J&K has once again registered a significant decline in the infant mortality rate (IMR) from 26 per 1000 live births to 24 per live births as per latest sample registration system (SRS) bulletin by Registrar General of India.⁴

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Materials & Method

The study employs material and methods of legal research by critical scrutiny of consumer laws at central and state levels in legal pragmatism discourse.⁵

The *Consumer Protection Act, 1986*, *J&K Consumer Protection Act, 1987* and *Consumer Protection Act, 2019* are studied *pari materia* under canons of statutory interpretation in Scalia and Garner construct in the context of health care services.⁶ The material and method partakes an empirical frame work of SKIMS, Srinagar a premier medical institution in J&K state on medical services, doctors diligence and negligence, Emergency and trauma, capacity building assessment of para medical personnel in actualisation of consumer justice.

Findings

The need of for transparent management of consumer justice and compensation inclusive of health services and disease overburden needs proper regulation. The health status has not been able to keep pace with the national level of achievements because of the political turmoil and poor infrastructure. The J&K Consumer Protection Act, 1987 has substantially vindicated patient's rights to health access and compensatory justice.⁷

Constitutional & Legal Dimensions: The *Consumer Protection Act, 1986* was not applicable to J&K because of its special status under Article 370 of the Constitution of India, 1950. Under this constitutional scheme, the state of J&K has to decide either to extend the central law to state or to enact similar law for state of J&K.⁸ Accordingly the State enacted *J&K Consumer Protection Act, 1987* to give effect to *Consumer Protection Act, 1986* with a few variations to take care of health care services. The government took a constitutional leap by abrogating Article 370 and bifurcated the State into two Union Territories (UTs) under *Jammu and Kashmir Reorganisation Act, 2019* on 9th August, 2019. Coincidentally the Consumer Protection Act, 2019 was also passed on same date *i.e.*, 9th August, 2019 but clearly mentions that 'it extends to the whole of India except the State of Jammu and Kashmir.' Therefore the *J&K Consumer Protection Act, 1987* is still a valid law although it will undergo a revamping in the light of *Consumer Protection Act, 2019* by the J&K legislature under *J&K Reorganisation Act, 2019*.

J&K Consumer Protection Act, 1987: The *J&K Consumer Protection Act, 1987* provides speedy redressal to consumer complainants inclusive of health care services by setting up of a District Consumer Redressal Forum and State Commission having jurisdiction to claim of Rs. 10 lakhs and Rs. 30 lakhs respectively. Section 2 (1) (d) *J&K Consumer*

Protection Act, 1987 defines 'consumer' to mean any person who buys any goods or hires any service for a consideration which has been paid or promised or partly paid and partly promised, or under any system.⁹ Section (2)(1)(g) defines 'deficiency' to mean any fault, imperfection, shortcoming or inadequacy in the quality, nature and manner of performance which is required to be maintained by or under in any law for the time being in force or has been undertaken to be performed by a person in pursuance of a contract or otherwise in relation to any service. section 2(1) (0) defines 'service' to means service of any description which is made available to potential users and includes the provision of facilities in connection with banking, financing, insurance, transport, processing, supply of electrical or other energy, board or lodging or both, entertainment, amusement or the purveying news or other information, under a contract of personal service. Thus it applies to all goods and services except those which are specially exempted by notification by the state government; however the state government has not specifically exempted health care services provided by government hospitals.¹⁰

Comparison of Central & State Consumer Laws: This Consumer Protection Act applies to the whole of India except the State of Jammu and Kashmir having their own legislation J&k consumer protection act 1987 with some variations and covers all goods and services purchased by the consumers and to all sectors private, public and cooperative. The objective of the Act is "to provide for better protection of the interests of consumers and for that purpose to make provisions for the establishment of Consumer Councils and other authorities for the settlement of consumer disputes and for matters connected therewith". It protects the consumers from unfair trading or unfair trade practices. It is important to note that the both Consumer Protection Acts are social welfare legislation and has been designed to avoid technicalities, procedural delays, procedural requirement, court fees and costs. Under the Consumer Protection Act 1986 three-tier consumer disputes redressal system at the District, State and National levels has been set up and in state of J&K two tier redressal agencies one Divisional forum and state commission. The Consumer Commissions are authorized to impose penalties on trader or person against whom complaint is made if he fails to comply with the order of the redressal agency. The penalty or punishment may involve imprisonment for a period not more than 3 years or a fine or both.¹¹ The 'service

of any description made available to potential users’

under *Consumer Protection Act, 2019* can be statutorily interpreted and liberally construed as a beneficial piece of legislation for auguring consumer justice but does not absolve doctor from the purview *Consumer Protection Act, 2019*.¹² Moreover the judicial enunciations in *Indian Medical Association v. V.P. Shantha* Case by Supreme Court in 1996 being good piece of law is not even barred by the *Consumer Protection Act, 2019*.¹³

Discussions

The perusal of The *Consumer Protection Act, 1986*, *J&K Consumer Protection Act, 1987* and *Consumer Protection Act, 2019* applied to the case study of SKIMS manifests that the doctor owes duty of care in treatment and any breach gives a cause of action by patient for medical negligence and award of compensation. The medical negligence and deficiency of service is based on the cardinal test for liability in tort and *ipso facto* applied by Section 2 (I) (o) *J&K Consumer Protection Act, 1987* in SKIMS. The institution is semi-

autonomous super-specialty hospital and the deemed university having gastroenterology, cardiology, urology nuclear medicine and general medicine etc. These departments are delivering functions on across modern and scientific lines also the hospital administration is supervising the administrative affairs of hospital.¹⁴ It has College of Nursing and College of Paramedical Sciences. It awards degrees in all subjects of Medicine and allied specialties such as DM, M Ch, MD, MS, Ph D, MBBS, M Sc Technology, M Sc. Nursing, B Sc Nursing & Technology, etc. It is one of the top ranking medical institutes in India and provides prevention, treatment, rehabilitation, obstetrics, substance abuse, health education, and screening for cancers and other diseases.¹⁵

Medical & Health Care Services: The central inquiry pertains to medical and health care services by applying randomized sample survey of 100 patients in and out patients department of SKIMS. The Table-1 depicts the responses of patients having varying degree of satisfaction towards medical and health services.

Table -1: Medical & Health Care Services

Patients	Respondents	Yes	%age	No	%age	Indifferent	%age
In Patients	50	33	66	15	30	02	04
Out Patients	50	15	30	24	48	11	22
Total 100	100	48	48	39	39	13	13

Source: Field Work

The above table discerns that 48% respondents faced trouble while getting admitted in the hospital while as 39% respondents said they have not faced any problem admitted in hospital. However the remaining 13% respondent is oblivious of any opinion on the subject.

Doctors Diligence & Health Care: The aim and the objectives of medical services are to provide treatment to those who are in need of urgent medical care and patient needs immediate health care in hospitals.

Table-II: Doctors Diligence & Health Care

Patients	Respondents	Yes	%age	No	%age	Indifferent	%age
In Patients	50	33	66	12	24	05	10
Out Patients	50	26	52	21	42	03	06
Total 100	100	59	59	33	33	08	08

Source: Field Work

The patients interviewed while undergoing the treatment in SKIMS reveals that 59% respondent are pretty satisfied with doctors’ diligence while 33% shows that doctors don’t show their due care and circumspection in examining and treating the patients. However 8% respondents are either ignorant or indifferent about doctors’ diligence and negligence.

Medical Negligence & Liability: Put it differently, as to whether the doctors are having negligent behaviour towards medical care and therapeutic treatment in SKIMS, the 33% respondents said that they are quite satisfied with their due diligence.

Table-III: Medical Negligence & Liability

Patients	Respondents	Yes	%age	No	%age	Indifferent	%age
In Patients	50	13	26	29	58	08	16
Out Patients	50	20	40	18	36	12	24
Total 100	100	33	33	47	47	20	20

Source: Field Work

Whereas a majority of 47% respondents express dissatisfaction about hospital housekeeping staff with specialised knowledge are indifferent towards specific to health care site and cleaning protocols at work. However, one fifth of respondents ignore to have any opinion about the housekeeping facilities in hospitals.

Health Care Services & Emergency Preparedness: The health care services can be gauged from the emergency preparedness’ of SKIMS which involves acute injury or illness, immediate risk to a person’s life and long-term health effects.

Table -IV: Health Care Services & Medical

Emergency

Patients	Respondents	Yes	%age	No	%age	Indifferent	%age
In Patients	50	25	50	23	46	02	04
Out Patients	50	15	30	29	58	06	12
Total 100	100	40	40	52	52	08	08

Source: Field Work

The health care services can be gauged from the emergency preparedness’ of SKIMS which involves acute injury or illness, immediate risk to a person’s life and long-term health effects. The medical care in an

emergency data revealed that 40% respondents agreed to adequacy of safeguard mechanism. On the other hand, 52% respondents are deprived of medical care in emergency while and 8% respondents feign ignorant

about it.

Para Medical Personnel & Health Care Delivery: The overall perception about medical and para medical personnel in health care delivery, protocol and therapeutics seems at a low level. There is no denying of fact that the hospital administration have duty to provide care but while interacting with patients they are not found sobering towards medical ethics.

Table -V: Para Medical Personnel & Health Care Delivery

Patients	Respondents	Yes	%age	No	%age	Indifferent	%age
In Patients	50	13	26	29	58	08	16
Out Patients	50	20	40	18	36	12	24
Total 100	100	33	33	47	47	20	20

Source: *Field Work*

The behaviour of hospital staff, according to survey reveals that 33% of respondents saying it up to mark. The 47% respondent chooses to disagree and 20% remain indifferent to behaviour of hospital staff and nurses. It is under this backdrop, the Comptroller and Auditor General (CAG) of India has reported that there are over 4,000 deaths at SKIMS in 2007-2012. In a published report that says that Kashmir's dream hospital has seen 12,860 deaths. It is based on CAG Report which has noticed that out of 12,860 hospitalized patients died as many as 7,875 after 48 hours of their admission during 2007-2012.¹⁶ The pragmatic analysis of *J&K Consumer Protection Act, 1987* reveals that there has been substantial consumer right awareness¹⁷ and realization of right to health and medical services during last three decades of its enactment.¹⁸

Conclusion

The medico-legal profiling of SKIMS under *J&K Consumer Protection Act, 1987* in regard to health status of the people in the union territories of Jammu and Kashmir has been deeply interwoven with medical care, doctors' diligence, negligence and liability, emergency preparedness, protocol and therapeutic delivery by medical and para medical staff. On the broader plain, the medico-legal profiling has direct nexus with poverty, poor infrastructure and incidence of chronic and infectious and political instability driven life style diseases. Thus the trajectory of *Consumer*

Protection Act, 1986, J&K Consumer Protection Act, 1987 and Consumer Protection Act, 2019 orient to a novel discourse in medical & health care services, doctors diligence and negligence, health care services and emergency preparedness, para medical personnel in health care delivery. The *Consumer Protection Act, 1987* is nicely drafted enactment and meticulously tilted towards consumer oriented aspirations but eludes in therapeutic perception as well as consumer justice. The judicial annihilation of compensatory jurisprudence in medico-legal cases are far clear in clamping civil and criminal liability but seems in nascent stage of formation in union territories of Jammu and Kashmir. The empirical evidence of SKIMS under the preponderance of balances is not very encouraging to healing effects of patients under the *J&K Consumer Protection Act, 1987*.

Conflict of Interest – No

Source of Funding- Self

Ethical Clearance – No

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The Prospect of Environmental Law to Achieve Healthy Environmental Development in Indonesia

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Abstract

Every citizen has the right to achieve the constitutional guarantee to live in a good and healthy environment, to be able to grow and develop. The environmental law's role and prospect as the agent of stability, agent of development, and agent of change is something which cannot be negotiated to achieve a healthy environmental development in Indonesia. It is to avoid pollution and environmental devastation for the sake of today's and the future's generations.

Keywords: *Environmental law, Healthy environment in Indonesia.*

Introduction

One of the problems which occur in this modern-day era is ecological problems. These past few decades, the nature has become a real threat for the life of human beings.¹ Even though human beings are actually posing the most serious threat towards the environment compared to other organisms.² The action of human beings which places the nature as a commodity which is exploited without taking the environment's carrying capacity into consideration. Such actions will make the environment experience degradation.³

There needs to be a combination of teamwork and harmony to prevent and to deter the environmental degradation and pollution. The aspects of environmental management legal regulations and natural resource's conservation in Indonesia must be reviewed intensively. That is the main role of environmental law.⁴ The regulatory aspects of environmental management and natural resources conservation in Indonesia need to be studied intensively, this is where the main role of environmental law.⁵

The environmental law has developed rapidly, the legal function acts as protection, control and certainty of the community with the role of agent of stability, also acts as an agent of development or agent of change.⁶ Environmental problems are getting bigger, wider and more serious. Like a snowball, the longer it rolls the bigger it comes. The problem is not only local or trans local, but regional, national, transnational, and global. The impacts towards the environment are not only related to one or two aspects, but it interrelates in accordance with the nature of the environment which has multi chains of relation that influence each other sub-systematically. If one aspect of the environment is affected, then the other aspects will also have an impact or effect.⁷

The environmental problems basically are everyone's problem and it is a must that awareness movements to restore environmental conditions to a better direction are built, by taking whatever role can be done by all parties to repair the surrounding environmental damage. The 1945 Constitution of the Republic of Indonesia, Article 1 stated explicitly that the sovereignty is on the hands of the people. Hence, it is the people's authority to make the efforts to save the environment in Indonesia. In the 1945 Constitution Article 28H paragraph (1), it determines "everyone has the right to live in physical and spiritual prosperity, to

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life, and to have a good and healthy living environment and the right to obtain health services”, then explained in the Constitution Number 32 of 2009 regarding The Environment Protection and Management (UUPPLH).

Based on this background, the problem that can be formulated is: how is the environmental law’s prospect in realizing a healthy environmental development in Indonesia?

Research Method

The research method used in this study is the method of normative legal research, which put law as a structure of norm system⁸ with conceptual and constitutional approach.⁹

Findings and Discussion

Various environmental repairs and recoveries are not in par with the rate of damage and pollution that occur. It indicates that environmental issue is not yet at the center of the Indonesia’s development. Under the pretext of development and free trade, government and companies or national and transnational corporations continuously exploit the environment and the natural resources.¹⁰ According to J. Barros and J.M. Johnston, the disasters occurred are closely related to the development activities by human.¹¹ This will affect the survival of today’s and the future’s generation.¹²

Based on its development, the conception of healthy environment as a part of the human rights was apparent when the United Nations Conference on the Human Environment was held in Stockholm, Sweden, on June 5th-6th 1972, which sparked the Stockholm Declaration. This conference is the first step of the awareness from the international community on the importance of the environmental sustainability as basic part of the Human Rights fulfillment. In Principle 21 and Principle 11 of Declaration on the Human Environment from Stockholm Conference, it stated that the States have sovereign rights to exploit their natural resources in accordance with their environmental protection and preservation policies. In its exploitation, the States have the responsibility on every activity that damages the environment or the areas of the other states beyond their national jurisdiction.

The rights to life and to obtain a good and healthy environment mean that every citizen has the right to achieve the constitutional guarantee to live in a good and healthy environment, so as to grow and develop.

This provision can be juxtaposed with the Article 25 of Universal Declaration of Human Rights (DUHAM) which stated, “everyone has the right to a standard of living adequate for the health and well-being of himself and of his family”. Then the Article 12 paragraph (1) of ICESCR emphasized, “The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health”. It means the life needs of Indonesian citizens must also be met with the adequate standard of their health or other matters related to supporting one’s life. More broadly, the meaning of this norm is strengthened by stipulating one of the State’s goals as the purpose of the State (*staadsidee*) in the Fourth Paragraph of the 1945 Constitution’s Preamble, it is to protect the whole people of Indonesia and the entire homeland of Indonesia.¹³

It is very relevant if the author states that the right to the environment as part of the Human Rights is by nature a gift from God to the mankind. Therefore, it is also very relevant if the Human Rights theories or teachings are related to various violations on the environment, which have occurred in almost all levels of the society. The violation on the right to the environment should be defined as a threat towards human civilization. Eventually, it accumulates and leads to the violations of economical right, social and cultural right, civil and political right, or in other words a violation of human rights.¹⁴

The regulation on the right to the environment is also contained in the Fourth Paragraph of the 1945 Constitution’s Preamble, which stated “...to form a Government of the State of Indonesia that shall protect the whole people of Indonesia...” And based on Article 28H (1) which states that, “Each person has the right to obtain a prosperous life, a proper place to live with good environment and health services.” Article 33 paragraph (4), “The national economy is implemented based on economical democracy by the principles of togetherness, justice, sustainable with environmental-concept efficiency, independency, also by stabilizing the progress and unity of the State’s national economy.

The human rights charter which is an inseparable part of People’s Consultative Assembly’s Decree No. XVII/MPR/1998 which was stipulated by People’s Consultative Assembly’s Special Trial on 1998, stated, that humans are God Almighty’s creature, whose role is to manage and preserve the nature in harmony and

balanced with their loyalty to Him. Humans are blessed with the human rights alongside with the rights and responsibilities for them to ensure their existence, values of being human, and to keep a harmonious life. The perspective and behavior of the nation towards human rights which is based on the religion, universal moral values, and the nation's cultural value itself, are based on Pancasila and 1945 Constitution.¹⁵

Article 1 of the Human Rights Charter contains a stipulation regarding the rights to live which stated as, "Each person has the right to live, to survive and maintain their lives". However, Article 36 contains a restriction regarding human rights, including the rights to live as stated as, "In implementing their freedom and rights, each person is obliged to comply to the restrictions stipulated by the Law for the sake of ensuring respect and acknowledgment of the rights and freedom of the others, and to meet fair demands in accordance with moral considerations, security and public order in a democratic society".

The preamble "in letter a" of UUPPLH/ Environmental Protection and Management Law states that: "A good and healthy environment is included within the human rights of Indonesian citizen as mandated in Article 28H of the 1945 Constitution of the Republic of Indonesia." In Article 3, the UUPPLH states that protection and environmental management aims: (1) to protect the area from environmental pollution and/or damage; (2) to ensure safety, health, and survival of human beings; (3) to ensure the survival of living creatures and the preservation of ecosystems; (4) to preserve environmental functions; (5) to achieve harmony and environmental balance; (6) to ensure justice for the present and the future generations; (7) to ensure the fulfillment and protection rights of the environment as human rights; (8) to control the use of natural resources wisely; (9) to establish sustainable development; and (10) to anticipate global environmental issues.

If observed closely, the provisions of the UUPPLH and its legal policies intend to protect and manage the environment so that humans can develop according to their dignity. Also, this law emphasizes that the right to obtain a good and healthy environment is a basic human right.¹⁶

Regarding the right to a good and healthy environment, the provisions of Law Number 40 of 2007 concerning Limited Liability Companies can

be observed, in which this law also regulates social and environmental responsibility. In Article 74, it is specifically stated that "The Company which carries out activities in the field and/or relating to natural resources is obliged to carry out social and environmental responsibility". From contextual perspective, companies are also burdened with social and environmental responsibility, such as companies whose objectives and activities are to explore natural resources. Forms of the said social responsibility may vary, the most important is to "rescue" the natural resources, whose balance is increasingly disrupted. The government begins to consider this as an urgent matter, given the impact may affect the lives of many people.¹⁷

The lack of the same perspective regarding the environment roles as a life buffer arises a sectoral and short-term approach in its management. There is a tendency for environmental damage escalation due to not considering the integrity of human beings and the environment. The environment is only interpreted as a static object with no human interaction. The rights of the people to a good and healthy environment and the obligation of the state to guarantee citizens' constitutional rights are not being properly depicted as related to various technologies in order to suppress the environmental damage.¹⁸

The rights to a good and healthy environment is closely related to a number of other human rights, such as:

a. the rights of housing, mainly related to the fulfillment of habitability principle (residential comfort). In the General Comments of the Committee on Economic, Social and Cultural Rights/CESCR, it is stated that, "inadequate and deficient housing and living conditions are invariably associated with higher mortality and morbidity rates". To ensure the fulfillment of the right to the people, the government is obliged to coordinate between the ministers and local authorities in formulating policies related to economy, agriculture, environment, energy, etc.);

b. the rights of food, particularly in relation to the government's obligations in formulating environmental policies which can support the fulfillment of the said rights for food. Poor hygiene in the environment may both directly and indirectly end up as a major hazard for food safety;

c. the rights for education. The CESCR states that, “Education has a vital role in empowering women, safeguarding children from exploitative and hazardous labour and sexual exploitation, promoting human rights and democracy, protecting the environment, and controlling population growth”;

d. the rights to a healthy work environment;

e. the right of each human being to be provided with prevention, treatment, and supervision of disease outbreaks; and

f. the rights for water. The fulfillment of this right aims to realize a number of other rights, including the rights to the environment.

The right to a good, healthy and balanced environment in the UUPPLH, specifically becomes the authority and responsibility of the government in its implementation, by: (1) regulating and developing policies in the framework of environmental management; (2) regulates the supply, designation, use, protection, management of the environment, and the reuse of natural resources, including genetic resources; and (3) regulating instruments for preventing pollution and/or environmental damage.

Conclusion

Prevention and control of environmental pollution and damage requires cooperation and integration. The legal aspects of environmental management and conservation of natural resources in Indonesia need to be studied intensively, this is where the environmental law roles as the agent of stability and the agent of development/agent of change takes place. The prospect of environmental law in realizing the development of a healthy society in Indonesia is something that is unable to be negotiated as a healthy environment is a part of human rights which is guaranteed in the UDHR/ Declaration of Human Rights and the Constitution of the Republic of Indonesia (1945 Constitution), which is set out in the Act Law Number 32 of 2009 concerning Environmental Protection and Management.

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Measurement of Lipid Profile in Fasting Persons

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Abstract

This study was performed within the DM center in Al-Sadder Teaching Hospital in Al-Najaf province to see the impact of not having breakfast for males in relation with Diabetes Mellitus sort two and supermolecule Profile. This study includes (25) male that not having breakfast, and (5) male that thought to be management cluster. (The results show important increase ($P \leq 0.05$) in abstinence glucose, cholesterol, acylglycerol, LDL, lipoprotein and high-density lipoprotein in comparison with management group).

Keyword: Mellitus type two, supermolecule Profile, Breakfast.

Introduction

Breakfast is the first meal of each day, most frequently eaten within the early morning before enterprise the day's work⁽¹⁾. Among English speakers, "breakfast" will be accustomed discuss with this meal or to discuss with a meal composed of ancient breakfast foods (such as eggs, dish and sausage) served at any time of day. The word virtually refers to breaking the fasting period of the previous night⁽²⁾. Breakfast is that the most significant meal of the day has been spoken by innumerable moms throughout the ages. it's been voiceless within the ears of faculty youngsters on early-to-rise mornings for hundreds of years, however the depth of understanding on why breakfast is thus necessary has solely been delivered to light-weight in recent years. The aspect effects of not intake breakfast negatively impact weight, secretion health, memory, noesis and mood⁽³⁾. According to the studies conducted on the negative effects of not eating breakfast, that people who skip the morning meal they had the chances higher for the exact opposite of the goal of slimming. Skipping breakfast increases the craving for sugary and fatty foods, in addition hunger pangs will be intense, and ultimately will deal with whatever comes in front of we during the day due to high levels of hunger and the greater the amount of food intake stab to overcome the daily calories recommended, and the increase

continued to skip breakfast eventually lead to weight gain, not weight loss⁽⁴⁾. Avoiding breakfast can have negative effects on energy and mood, help we avoid breakfast can reduce our energy levels and adversely affect our memory⁽⁵⁾. Skip breakfast make we abound in eating during the day, which in turn paves the way for the increased prevalence of obesity that a person who suffers from overweight or obese have an increased risk of cancer⁽⁶⁾. Hypoglycemia is a medical term used to refer to lower blood sugar levels, skipping meals lead to a significant drop in blood sugar levels, in turn, causes the release of hormones that can compensate for low levels of sugar, that on the other hand increases the pressure levels blood, causing headaches and migraines. The incidence is highest when neglect breakfast, because it is the first meal of the day, which consumes about 12 hours of fasting⁽⁷⁾. Meal containing low levels of the protein can affect the keratin levels, reduce hair growth and cause hair loss, breakfast is the perfect meal any day, and has a great role in promoting hair follicle growth, so if you want to enjoy a strong and healthy hair with the disposal of hair loss, you have to deal with a breakfast rich in protein per day should⁽⁸⁾. people who eat breakfast have a higher metabolic rate that skipping breakfast will cause low blood sugar levels, causing headaches and nausea⁽⁹⁾. DM is a metabolic diseases cluster characterised by symptom ensuing from defects in insulinaction, hormone secretion, or each of them. symptom if his a Chronic have metabolic disturbances and DM cause impact on tissue and organ harm also as disfunction involving the, kidneys, nervous, tube-shaped structure systems and eyes⁽¹⁰⁾. the foremost common kind of polygenic disease is sort two polygenic disease.

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over ninety nothing of individuals with polygenic disease have sort two. this type of polygenic disease is joined (with the older age, obesity, case history of polygenic disease, previous history of physiological condition polygenic disease, physical inactivity and ethnicity⁽¹¹⁾. Around eighty of people with kind two polygenic disease square measure overweight. sort two polygenic disease is more and more being analyzed in kids and teenagers. At the purpose once sort two polygenic disease is analyzed, the duct gland is often making enough hormone, however for obscure reasons, the body cannot utilize the hormone adequately, a condition known as hormone opposition. Following quite whereas, hormone generation diminishes. the end result is like for kind one diabetes-glucose develops within the blood and therefore the body cannot utilize its primary wellspring of fuel⁽¹²⁾. Supermolecule profile, additionally referred to as coronary risk panel or supermolecule panel, is that the collective term to the estimation of total cholesterol (TC), triglycerides (TG), rarity lipoprotein-cholesterol (LDL-C) and high density lipoprotein-cholesterol (HDL-C), accustomed assess risk of DM unwellness. associate degree extended supermolecule profile might embrace terribly rarity conjugated protein cholesterol (VLDL-C)⁽¹³⁾. The 2 main sorts of supermolecule within the blood square measure cholesterol and triglycerides that square measure incorporated within the lipoproteins that act as a vehicle for his or her transport. There square measure four major subtypes of lipoproteins that disagree in their mass, supermolecule and fat content, together with rarity lipoprotein-cholesterol (LDL-C), terribly rarity lipoprotein-cholesterol (VLDL-C), high density lipoprotein-cholesterol (HDL-C) and particle⁽¹⁴⁾. Dyslipidemia portrayed by raised complete cholesterol, LDL-C and brought down HDL-C, is an ordinary hazard consider watched myocardial dead tissue patients and is the significant reason for atherosclerosis are proposed to act synergistically with non-lipid hazard variables to build atherogenesis. Expanded TG and diminished HDL-C and the expanded TG/HDL-C proportion are considered as real hazard factors in the improvement of insulin opposition and metabolic disorder. The exactness of TG/HDL-C proportion in anticipating CVD hazard isn't appropriately by late research⁽¹⁵⁾.

Materials and Method

The study was conducted on at random designated (25) male that not having breakfast within the DM center in Al-Sadder Teaching town in Al-Najaf province. A group of (5) apparently management subjects were

enclosed as a healthy group. The age of males was vary of 35-65y . the data of males were obtained through a form consisted of the name, age, weight, Blood pressure .

Blood and humor collected from patient that which tests the flowing :-

1-Determination of abstinence glucose concentration (FBG)⁽¹⁶⁾.

2-Measurements of total cholesterol (TC)^(17, 18).

3-Measurements of Triglycerides (TG)⁽¹⁹⁾.

4-Calculation of rarity lipoprotein-cholesterol (LDL-C)

5-Calculation of terribly rarity lipoprotein-cholesterol (VLDL-C)

6-Measurements of high density lipoprotein-cholesterol (HDL-C)⁽²⁰⁾.

Results

The results of this Table 1 indicate a big increase ($P \leq 0.05$) in abstinence glucose (FBG) level, cholesterol (TC), Triglyceride(TG), LDL, lipoprotein and high-density lipoprotein in males that not having breakfast (338.411.21±, 357.5612.12±, 299.2411.55±, 255.56±12.21, 59.042.49±, 35.8±0.77) severally in comparison with management groups(931.09±, 2.30±104.2,67±1.09, 61.2±2.14, 13.4±0.21, 29.60.45±) severally.

Table 1: humor level of FBG and supermolecule profile elements in males while not breakfast and management teams.

Parameters	Mean±S.D	
	Males without breakfast	Control
FBG (mg/dl)	338.4±11.21*	93±1.09
Cholesterol (m mol/L)	357.56±12.12*	104.2±2.30
Triglyceride (m mol/L)	299.24±11.55*	67±1.09
LDL-C (m mol/L)	255.56±12.21*	61.2±2.14
VLDL-C (m mol/L)	59.04±2.49*	13.4±0.21
HDL-C (m mol/L)	35.8±0.77*	29.6±0.45

* means that important distinction at ($P \leq 0.05$)

Discussion

The study unconcealed a big elevation in abstinence glucose in patients comparison with management cluster as conferred within the table. These results square measure expected thanks to the very fact that the most characteristic feature of DM is symptom. glucose is tightly controlled by 2 key processes: hormone secretion by exocrine gland β -cells in response to a nutrient and hormone action on major target organs, i.e. striated muscle, liver and fat. T2DM, is usually related to fatness and results from scarce hormone production/secretion and hormone Receptor (IR)⁽²¹⁾. The results show that there's a big increase in humor cholesterin, triglycerides, LDL-C and VLDL-C in patients comparison with management cluster as conferred within the table. The dyslipidemia detected within the patients cluster square measure common in diabetic patients and has totally different explanations⁽²²⁾. In polygenic disease, glucose isn't used by tissues leading to symptom, the fatty acids from fat square measure mobilized for energy purpose and way over fatty acids is accumulated within the liver then reborn to triglycerides⁽²³⁾. The dyslipidemia of visceral fatness is that of will increase within the proportion of little dense low-density lipoprotein particles and elevated triglycerides. a rise in VLDL-C occurred in DM thanks to increase handiness of aldohexose for VLDL-C synthesis and reduce in conjugated protein enzyme activity resulting in decrease of VLDL-C from peripheral circulation. Active lipolysis in DM redoubled cholesterin synthesis resulting in the buildup of this compound within the walls of blood arteries⁽²⁴⁾. Visceral fat refers to intra-abdominal fat round the intestines and correlates with liver fat. Visceral fat has metabolic characteristics that disagree from that of body covering fat. it's a lot of metabolically active with relation to free carboxylic acid turnover; the redoubled flux of free fatty acids promotes IR at a cellular level and will increase viscus lipoprotein production and will increase adipocyte-derived free fatty acids prompting triglycerides accumulation in these tissues⁽²⁵⁾. The supermolecule abnormalities related to IR have an effect on all supermolecule fractions. they're characterised by elevated triglycerides levels, elevated postprandial triglycerides wealthy remnant lipoproteins, high HDL-C and high little dense low-density lipoprotein particles. This pattern correlates powerfully with vessel risk and treatment decreases this risk. Poor glycemic management is related to hypertriglyceridemia and in some patients, high humor LDL-C and high HDL-C concentration⁽²⁶⁾, 1990). The hypertriglyceridemia results from each redoubled substrate handiness (glucose and

free fatty acids) and faded lipolysis of VLDL-C on cet of expressed symptom and is believed to result partially to hyperinsulinemia⁽²⁷⁾. Elevated levels of supermolecule peroxide in DM could also be thanks to the alteration of perform of erythrocytes membrane. This inhibits the activity of SOD catalyst resulting in accumulation of superoxide radicles that cause the most supermolecule peroxidation and tissue harm in polygenic disease. the opposite necessary issue for the dyslipidemia in T2DM patients thanks to IR that is closely associated with cardiovascular disease, obesity, redoubled lipoprotein and triglycerides⁽²⁸⁾.

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Legal Protection of Medical Records for Hospital Patients

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Abstract

Providing Medical Records in a health service facility is one indicator of service quality at the institution. Based on the data in the Medical Record, it can be assessed whether the services provided are good enough or not, and whether they are in accordance with standards or not. Therefore in medical partners is a picture of the process of health care for every patient who goes to the hospital. Based on Article 1 of the Republic of Indonesia's Minister of Health Regulation No. 269 / MENKES / PER / III / 2008, that medical record is a file containing records and documents about patient identity, examination, treatment, actions and other services provided to patients. This means that the medical record is a systematic procedure given to the patient and the hospital patient's right to know.

Keywords: *Legal Protection, Medical Records and Hospitals*

Introduction

Good hospital services cannot be separated from the patient's medical record, where the medical record is written and recorded information about the identity, history, physical determination, laboratory, diagnosis and medical action given to patients whether hospitalized, outpatient or receiving emergency services. Medical records have a very broad understanding, not just recording activities, but also have an understanding as a system of organizing medical records that starts recording as long as patients receive medical services, followed by handling medical record files which include organizing storage and releasing files from storage for serving requests or borrowing from patients or for other purposes. Medical records are part of the archive that describes all activities by an agency within a certain period. The hospital must have a medical record as a standard of service in the health sector that is useful for improving quality in providing optimal services to all clients. The existence of records plays a significant role in determining policies and work guidelines for achieving the vision and mission of an agency. Medical records

have an important role to support the achievement of orderly administration in efforts to improve health services in hospitals and must be managed properly that is beneficial for patients, doctors and hospitals. Problems in the medical record will be seen as insignificant, but will greatly affect health services, as argued by Nugraheni.¹ Therefore, the existence of a medical record can provide health services according to standards based on the objective condition of the patient through his medical history.

Providing Medical Records in a health service facility is one indicator of service quality at the institution. Based on the data in the Medical Record, it can be assessed whether the services provided are good enough or not and whether they are in accordance with standards or not. For this reason, the government, in this case the Ministry of Health, felt that it was necessary to regulate the procedure for organizing Medical Records in a Minister of Health regulation to make it clear. Broadly speaking, the implementation of the Medical Record in the Minister of Health Regulation is regulated as follows (RI Minister of Health Number 269 / MENKES / PER / III / 2008):

1. The Medical Record must be immediately made and fully completed after the patient receives the service (article 4). This is so that the data recorded is original and nothing is forgotten because of the grace period.

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2. Every record of Medical Records must be affixed with the name and signature of the health service officer. This is needed to facilitate the system of accountability for the recording (Article 5), as opined by Nurani.²

Medical records recorded by the hospital must be known by patients as a form of patient rights.

Research Methodology

In research, the method is a means to measure the validity of research conducted by researchers. Therefore in this study related to “Legal Protection of Medical Records for Hospital Patients”, focus on the object of the medical record and the rights of hospital patient by conducting qualitative research and normative juridical approaches.

Findings and Discussion

Indonesia’s national goal is to advance public welfare, to educate the nation’s life, and to participate in maintaining world order as stated in the Preamble to the 1945 Constitution of the Republic of Indonesia. Public welfare itself means security, order, the fulfillment of needs and health. In order for a human being to live productively and be active, health is needed. In realizing health, surely efforts are needed such as promotive, preventive, curative and rehabilitative. Bambang Poernomo mentioned about health efforts in the health law that “health efforts are activities to maintain and improve health carried out by the government and or by the public by using the services of health workers,” as argued by Poernomo³ which is based on professional standards and services.

The hospital is an institution that plays a role in health care. Soekidjo Notoatmojo said that the organization of hospitals prioritized social functions that were intended:⁴

- a. Facilitate community access to health services.
- b. Provide protection for patient safety, the community, the hospital environment and human resources at the hospital.
- c. Improve quality and maintain hospital service standards.
- d. Provide legal certainty to patients, the community, hospital human resources, and hospitals itself.

According to Permenkes No.82 of 2013 concerning

SIMRS is a communication information technology system that processes and integrates the entire flow of hospital services in the form of a network of coordination, reporting and administrative procedures to obtain information precisely and accurately and is part of the Health Information System. SIMRS management must be able to improve and support the process of health services in hospitals including speed, accuracy, integration, service improvement, efficiency improvement, ease of reporting in operational implementation, as argued by Novia.⁵

The medical record is one of the most important pillars, so the organization of medical records must be managed with professional personnel. The role of medical records is needed to manage evidence of health services safely, comfortably, efficiently, effectively and confidentially. The medical record unit is one of the units in the hospital that plays an important role in providing patient data and information related to health services received by patients. The quality of health data and information is important to consider. Quality data and information obtained from the performance of good medical records officers, as opined by Utami.⁶

The hospital as an individual health service facility is part of the health resources that are indispensable in supporting the implementation of health efforts. The delivery of health services in hospitals has very complex characteristics. In the era of globalization, hospitals need to prepare themselves to compete. The rapid development of science and technology (science and technology) has led to increasing public demands for hospitals to provide fast and professional health services to the needs of medical information. Hospitals must run medical records properly. In a complete and correct medical record, information can be obtained that can be used for various purposes. These requirements include evidence for court, education and training, and can be used for analysis and evaluation of hospital service quality. Given the many uses of medical records, it is necessary to control the filling out of medical record forms, according to Winarti.⁷

Medical record document storage system is one very important factor in providing services in hospitals. Medical record document storage system provides data availability about all services that have been provided to patients. Therefore, medical record document storage must be managed properly to be able to provide optimal service to patients. According to Permenkes 269 of 2008

concerning medical records, medical record document storage space can be used to accommodate active medical record documents for five years, whereas according to the Director-General of Medical Services Development in 2006 storing medical record documents is recommended or recommended to use the system centralized storage with the alignment of the final number system, as argued by Kusnadi.⁸ So that the patient's patient record will always be maintained, to find out the patient's history.

Improved health services are intended to increase awareness, comfort and ability to live healthy for every citizen in order to realize optimal health status as one of the elements of the general welfare as mandated in the opening of the 1945 Constitution of the Republic of Indonesia. Health Personnel as one of one main component of health service providers to the community has a very important role because it is directly related to the quality of service. Implementation of health efforts must be carried out by doctors and dentists who have high ethics and morals, justice and authority that must be continuously improved. One of the main elements in a prime health care system is the availability of medical services by doctors and dentists whose quality is maintained in accordance with the mandate of Law Number 29 of 2004 concerning Medical Practices. In the implementation of medical practice, every doctor and dentist must refer to the applicable standards, guidelines and procedures so that the community can obtain professional and safe medical services. By providing good services, it will lead to public confidence in hospitals and doctors.

In order to realize optimal health status for the whole community, it is necessary to improve the quality of health services which must be accompanied by adequate supporting facilities, among others through the implementation of Medical Records (hereinafter referred to as RM) in each health care facility in the form of examinations, treatment and care. Examination, treatment and care give birth to a legal relationship between the patient or his family with a doctor and / or hospital, which is recorded in the "Medical Record", according to Sudjana.⁹

According to Regulation of the Minister of Health No. 269/MENKES/PER/III/2008, the requirements for quality medical records are: related to the completeness of the contents of the medical record; accuracy; the accuracy of medical record records; punctuality; and fulfilment of legal aspects requirements. Meanwhile,

if referring to the hospital's minimum service standard (SPM) guidelines, there are four quality target indicators, one of which is the timely delivery of medical record documents, according to Winarti.⁷

In the implementation of health services, each hospital is required to provide quality services is the implementation of medical records. The role of the medical record is very important and is very attached to the service activities because such records are useful for recording the patient's condition, examination results and the actions given at that time. Today, the rapid development of technology has penetrated various sectors including health. In this case the researcher wants to examine developments in the medical record section, where the medical record is very influential in the implementation of patient services. Medical records will be a reference in the handling of patients let alone returning to treatment so that doctors can be easier, faster and more precise in the examination and treatment of patients. The medical record is an asset to ensure the smooth running of health services, therefore an electronic-based medical record (medical records information system) is needed that is easy to use and useful to help the doctor's performance inpatient care. Basically an electronic medical record is the use of electronic methods for the collection, storage, processing and accessing of medical records of patients in hospitals that have been stored in a multimedia data basis management system that collects various sources of medical data, as opined by Dharmawan.¹⁰

Realizing the application of electronic medical records, previously required the process of migrating paper medical records to electronic medical records, namely a series of processes that began with the introduction of electronic medical records and their benefits¹¹ and they were able to use them when providing services to patients¹².

Conclusion

Medical records are hospital actions performed on patients related to identity and related to the history of treatment given by doctors and hospitals to patients. With the existence of a medical record is an effort to provide the service standards needed for hospital patients. Medical records are regulated in 1 Regulation of the Minister of Health of the Republic of Indonesia Number 269 / MENKES / PER / III / 2008. Medical records are an effort to occur in the practice mall in the

field of health services for patients.

Ethical Clearance: Yes

Conflict of Interest: No

Source of Funding: Sultan Ageng Tirtayasa University, Banten, Indonesia

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Prevalence of Coronary Artery disease in Patients undergoing Non Coronary Cardiac Surgery: A Single Center Study

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Abstract

Objectives: to evaluate the prevalence of significant coronary artery disease (CAD) in patients referred for open heart surgery for various valvular and non valvular etiologies.

Methods and materials: a total of 160 patients (73 males and 87 females) were included in this study: old age, male gender, hypertension (HT), diabetes mellitus (DM), hyperlipidemia, smoking and left ventricular (LV) systolic dysfunction are recorded as risk factors for CAD. Of the 160 patients: 143 (89.4 %) have valvular disease (VHD) and 17 (10.6%) have non valvular disease. Patients with VHD were classified according to valve lesions into: mitral stenosis (MS), mitral regurgitation (MR), aortic stenosis (AS), aortic regurgitation (AR), tricuspid regurgitation (TR) and mixed valvular disease. Correlation between various types of valve diseases and CAD are assessed.

Results: CAD were detected in 26.9% (43) of patients. Old age, HT, DM, hyperlipidemia and smoking were significantly correlated with CAD. CAD were more common in patients with VHD than non VHD. 25(50%) patients with AS have significant CAD (P value= 0.0001), in patients with MR: 8(12.7%) have significant CAD, while patients with MS and AR were have CAD in 15.1% and 25% respectively. Among patients with non valvular heart disease (17 patients): 13 patients have atrial septal defect and 4 patients have atrial myxoma. 3 patients (6.1%) have significant CAD (P value=0.2), one of them had HT, DM and smoker man presented with chest pain on exertion.

Conclusion: Obstructive CAD were more common in patients with AS and MR and higher in patients with risk factors for CAD.

Key words: coronary artery disease, valvular heart disease, Aortic stenosis.

Introduction

Many patients referred for surgical correction of valvular and non valvular heart disease have concomitant asymptomatic coronary artery disease (CAD)(1). Lytle et al. (2), and Karp et al (3) observed and recommend that complete revascularization is superior to no

revascularization in patients with valvular heart disease and CAD. In such patients valve replacement and CABG is associated with A significant reduction in mortality, Therefore, it is desirable to identify CAD in patients presenting for valve surgery. Coronary angiography (CAG) remains the gold standard for identifying such patients (4). Due to its high negative predictive value, coronary CT angiography to exclude CAD may be an option in patients with low or intermediate pretest probability of CAD (5).

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According to the American College of Cardiology/ American Heart Association (ACC/AHA) guideline

for the Management of Patients with Valvular Heart Disease (5) it is class I indication to perform coronary angiography before valve intervention in patients with symptoms of angina, objective evidence of ischemia, decreased LV systolic function, history of CAD, or coronary risk factors (including men age >40 years and postmenopausal women).

In our center coronary angiography is usually performed routinely in any patient more than 40 years of age before cardiac valvular and non valvular surgery, this study aims to identify prevalence of coronary artery disease in patients with various valvular and non valvular scheduled for open heart surgery.

Patients and Method

This study includes 160 patients with age ≥ 40 years and various cardiac valvular and non-valvular diseases referred for heart surgery between October 2016 and January 2019 at ibn – albittar cardiac center, Baghdad, Iraq. Valvular heart diseases included rheumatic heart disease, mitral stenosis (MS), mitral valve prolapse (MVP), sclerotic aortic valve disease and bicuspid aortic valve (BAV). Non-valvular cases included atrial septal defect (ASD) and atrial myxoma. Patients with known case of CAD, prior CABG or percutaneous coronary intervention or age <40 years were excluded from the study.

Detailed assessment of symptoms such as chest pain, dyspnea, syncope, and fatigue and of risk factors like hypertension (HT), diabetes mellitus (DM), smoking and dyslipidemia was done in all patients. Etiology of cardiac disease was evaluated by transthoracic and if required, transesophageal echocardiogram with two dimensional and color flow imaging. All selected patients underwent coronary angiography and angiographic data was collected and assessed by at least two interventional cardiologist for presence or absence of significant coronary artery stenosis (defined as $\geq 50\%$ luminal narrowing of left main coronary artery, and $\geq 70\%$ narrowing for other coronary tree) and number of coronaries involved, decision made after discussion with cardiac surgeon to perform valvular surgery only or revascularization plus valvular surgery, then patients referred to surgical department.

Statistical Analysis

Statistical analysis was performed using SPSS 22.0 software (SPSS Inc., Chicago, IL, USA). Continuous

variables are presented as mean \pm standard deviation (SD). Means were compared using Student's ttests. Pearson Chisquare and Fisher's exact test were used to analyze differences in categorical variables. a P-value of < 0.05 was considered statistically significant.

Results

Table 1: Baseline characteristic of patients:

Age(year) \pm SD	56,1 \pm 9.8(y)
Gender, n(%)	
Male, n(%)	73(45,6%)
Female, n(%)	87(54,4%)
Hypertension, n(%)	72(45%)
DM, n(%)	44(27,5%)
Hyperlipidemia, n(%)	18(11.25%)
Smoking, n(%)	16(10%)
LV dysfunction, n(%)	7 (4,4%)
Valvular heart disease, n(%)	143(89.4%)
- Mitral Stenosis, n(%)	33(20.6%)
- Mitral Regurgitation, n(%)	63(39.4%)
- Aortic Stenosis, n(%)	50(31.3%)
- Aortic Regurgitation, n(%)	24(15%)
- Tricuspid Regurgitation, n(%)	2(1.3%)
- Mixed valvular heart disease, n(%)	29
Non valvular heart disease, n(%)	17(10.6%)
Coronary angiography:	
No Significant CAD:	117 (73.1%)
Significant CAD:	43(26.9%)
- single vessel disease:	24(55.8%)
- 2 vessel disease:	7(16.2%)
- 3 vessel disease:	11(25.6%)
- LMS lesion:	1(2.3%)

Table 2: Correlation between coronary artery disease and risk factors:

Risk factors	Total	Coronary angiography		P value
		CAD	No CAD	
Male gender, n(%)	73(45.6%)	30(41%)	43(59%)	0.0001
DM, n(%)	44(27.5%)	17(38.6%)	27(61.3%)	0.033
HT, n(%)	72(45%)	25(34.7%)	47(65.2%)	0.033
Hyperlipidemia, n(%)	18(11.25%)	7(38.9%)	11(61.1%)	0.02
Smoking, n(%)	16(10%)	11(68.7%)	5(31.2%)	0.0001
LV dysfunction, n(%)	7(4%)	2(28.6%)	5(71.4%)	0.6

CAD: coronary artery disease, DM: diabetes mellitus, HT: hypertension, LV: left ventricle. P value <0.05 is significant

This table showing the correlation between variable risk factors for atherosclerosis and prevalence of CAD, 30 males (41%) out of 73 males have CAD with P value= 0.0001. DM found in 44 (27.5%) of patients, 17 (38.6%) of them have significant CAD (P value =0.03). 72 patients had HT, 25 (34.7%) have CAD. Hyperlipidemia detected in 18 patients, 38.9% of them have CAD (P value= 0.02). 68% of smokers have significant CAD (P value= 0.0001)

Table 3: Correlation between coronary artery disease and indications for cardiac surgery:

	coronary angiography		Total	P value
	CAD	No CAD		
Mitral stenosis	5(15.1%)	28	33	0.065
Mitral regurgitation	8(12.7%)	55	63	0.001
Aortic stenosis	25(50%)	25	50	0.0001
Aortic regurgitation	6(25%)	18	24	0.5
Tricuspid regurgitation	2(100%)	0	2	0.07
Mixed valvular disease	6(22.2%)	21	27	0.3
Nonvalvular	3(17.6%)	14	17	0.27

CAD: coronary artery disease. P value <0.05 is significant.

This table show that CAD is most correlated with aortic stenosis (50%) with significant P value (0.0001) most of cases are due to degenerative sclerosis of aortic valve and associated with increasing age, 8 cases of mitral regurgitation have significant CAD (12.7%) with P value =0.001, while mitral stenosis which is mainly rheumatic in origin (15.1% with P value= 0.06), aortic regurgitation (25%, P value=0.5) are not significantly associated with CAD.

The two cases of TR have CAD, one of them was diabetic and treated with endocarditis of TV and then referred for surgery, second patient had sever TR secondary to sever rheumatic MS (mixed valvular disease).

Among patients with non valvular heart disease (17 patients): 13 patients have atrial septal defect and 4 patients have atrial myxoma. 3 patients (17.6%) have

significant CAD (P value=0.2), one of them had HT, DM and smoker man presented with chest pain on exertion.

Discussion

The prevalence of coronary artery disease among patients undergoing non coronary cardiac surgery range between 8.7 to 42.6% (1,6-8), and this associated with increases perioperative and postoperative morbidity and mortality if revascularization not done at same time during non coronary cardiac surgery, in our study we found that the overall prevalence of CAD is 26.9% (43 patients) among patients assessed by coronary angiography before cardiac surgery and this is comparable to Ayaz H. Shaikh et al, who showed in his retrospective study that ,Out of 144 patients, 99 (68.8%) found to have <50% coronary stenosis and remaining 45 (31.3%) had > 50% stenosis(9).

Ganesh N et al found that the incidence of coronary artery disease was 25% among patients with rheumatic heart disease referred for valvular cardiac surgery (8).

CAD was significantly higher in male gender, in association with DM, HT, smoking and hyperlipidemia and this is consistent with Jose G. et al (7), Deepak K. et al (10) and Cholenahally N. Manjunath et al (1) all mentioned that among patients with CAD the presence of increasing age, male gender, DM, HT, dyslipidemia and smoking were significantly greater as compared to those with normal coronaries.

In our study the presence of LV systolic dysfunction was not found to be correlated significantly with CAD (P value= 0.6) and this may be due to low number of cases (just 7 cases with LV systolic dysfunction versus 154 patients with normal LV systolic function).

The prevalence of CAD is higher in patients with valvular than patients with non valvular heart disease (27.9% Vs 17.6%) and this is consistent with Cholenahally et al (1) who found that among 300 patients CAD was found in 26 (8.7%) and CAD was more common in patients with valvular heart disease (9.3%) as compared with non valvular heart disease (3.3%).

The most common cause of aortic stenosis in adults is age related aortic sclerosis and calcification (11), atherosclerosis plays an important role in progression of aortic calcification and development of CAD. And explain the high incidence of CAD in patients with AS in our study (50%, P value= 0.0001). 8(12.7%)

patients with mitral regurgitation have CAD (P value= 0.001), CAD was detected in 5(15.1%) of patients with MS (P value= 0.06), AR is least correlated with CAD (6 patients with P value =0.5) and this consistent with Zeynep Y. Emren et al found that among 241 patients: Coronary artery disease was detected in 26.4% of patients with mitral stenosis and 57.7% of patients with aortic stenosis. Of the patients with mitral insufficiency, 41.9% had CAD, and 44.4% of the patients with aortic insufficiency had CAD (6).

Sonmez et al. (12) evaluated 760 patients who underwent valvular heart surgery, and they found occlusive CAD in 15.8% of the patients (p < 0.001), and the highest prevalence rate was noted in patients with AS (p < 0.05), a finding similar to that reported in the present study.

Conclusion

This study provide an idea about the prevalence of CAD among patients referred for non coronary cardiac surgery in our locality, although small sample used but it provided us with the high prevalence of CAD (26.9%) among those patients, and CAD is more frequent among patients with AS and in patients with multiple risk factors for atherosclerosis.

Conflict of Interest: (nil – There are “NO CONFLICT OF INTEREST”).

Source of Funding: By All researchers (self).

Ethical Clearance: Committee members are approved to perform a study about:

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Incidence of Early Complications in Laparoscopic Total Thyroidectomy Vs Open Thyroidectomy Using Breast Approach in Simple Multinodular Goiter

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Abstract

Total thyroidectomy is a popular and common surgical operation in the world. It's done through collar incision that may culminate with bad cosmetic appearance for this type of wound in the neck. Recently laparoscopic total thyroidectomy has become popular in experienced laparoscopic hand surgeons. Among patients, we noticed many early complications that may occur after laparoscopic total thyroidectomy due to a new technique in total removal of thyroid gland to give an excellent cosmetic result. In our study we want to do comparative study for incidence of early complication (which occur within early 30 postoperative day) between LTT (laparoscopic total thyroidectomy) and OTT (open total thyroidectomy). The prospective study done to 122 patients who had total thyroidectomy for simple multinodular goiter. 58 patients underwent LTT and 64 patients OTT in GIT center in Thi-Qar city which are done by the same surgeon for all patients. Study done through 2 years 1/5/2017 till 30/4/2019 through breast approach and collar incision. Surgical outcome records the complications that occur to the patients within 30 days post-operatively. The main age of patients in LTT was 39.6 ± 6.4 and in OTT was 48.2 ± 8 ($p=0.04$). The operating time in LTT 125.4 ± 4 minutes while in OTT was 92.6 ± 2 ($p=0.03$). There were no significant differences in hospital stay in both groups. Patients with OTT experienced more pain than LTT group postoperatively as evaluated by a visual analog scale. Cosmetically group LTT were very satisfied with this procedure according to the questionnaire we used. The follow up period was 30 days only. Most of early complications are no significant differences between 2 groups as the LTT done by experienced laparoscopic hands. 2 cases (3.5%) only were converted to open procedure. Conclusion: LTT procedure is a new technique used to give an excellent cosmetic result rather than used collar incision in the midline of the neck, there are no significant differences in all early complications that may occur in LTT and OTT. LTT must be done by an experienced laparoscopic hand.

Keywords: Early complications, laparoscopic total thyroidectomy.

Introduction

Thyroid gland is one of the largest endocrine glands, thyroid disorder may cause thyroid enlargement (goiter) and some of enlargement need surgical removal of the gland⁽¹⁾ due to popular increase of the minimally invasive surgery. The laparoscopic surgery for the

neck and especially the thyroid gland increases also. Endoscopic neck surgery was first done by Gagner in 1996⁽¹⁾ while the Husker performed the first endoscopic thyroidectomy in 1997⁽²⁾. After that the procedure of LT and the approaches will develop rapidly and become different approach as axillary, breast, chest wall and submental^(3,4,5). At the beginning the LT was done for benign thyroid condition and contraindications for malignant thyroid disease⁽⁶⁾. However, endoscopic techniques present some difficulties in obtaining adequate surgical view because of the small working space and two-dimensional operative view⁽⁷⁾. The goals of LTT are to limit external scarring and improve

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cosmoses, as well as, to reduce post-operative pain to enhance post-operative recovery⁽⁸⁾. The most common approaches used is axillary⁽⁹⁾ via breast, lateral, transoral^(10, 11, 12).

Material and Method

122 patients of 245 patients selected 58 with LTT and 64 patients with OTT, through 2 years from 1.5.2017 till 30.4.2019 through breast approach and collar incision, respectively. All operations of LTT and OTT performed by single surgeon assisted by two of the authors. Informed consent was obtained from all the patients preoperatively, the study was approved by the institutional review board of our hospital. Preoperative evaluation of all patients were done using ultrasonography, fine needle aspiration cytology to exclude malignancy conditions. Thyroid functions test, chest x ray, direct laryngoscope examination of vocal cord. The main surgical outcome measures were done at early complications that occur within 30 days' post operatively as, bleeding, recurrent nerve palsy,

superior laryngeal nerve palsy, seroma, hematoma, hypocalcemia, esophageal injury, conversion of LTT to open procedure, postoperative pain, operating time, duration and amount of drainage the data were analysis for statically significance using the student t-test and chi-square test. p-values <0.05 were indicated as statistically significant.

Results

The main age of the patients in group LTT was 39.6 ± 6.4 while in OTT was 48.2 ± 8 years ($p=0.004$) where the first group with LTT is younger than the other group, the operative time was shorter in OTT 98 ± 42 minutes while in LTT 128 ± 31.6 ($p < 0.01$) minutes. there was no significant differences in post-operative hospital stay (3.25 ± 0.93 vs 3.21 ± 1.23 days $p < 0.01$), with OTT was more painful VAS 7; $P=0.034$ while in LTT VAS 1 ($P=0.054$) (VAS 1 visual analog scale 1 day after the operation), about cosmoses the LTT group are very satisfied than the other group according to the questioner, other differences in post-operative complications are summarized in table 1.

Table1: The characterize and post-operative. Complications in both procedures of total

Complications	L.TT	OTT	P Value
Age(Years)	39.6 ± 6	48.2 ± 8	0.003
Operative Time	128 ± 31.6	98 ± 42	<0.01
Hospital Stay	3.25 ± 0.93 days	3.21 ± 0.871 day	0.447
Duration of Drainage	3 days	1 day	0.576
Amount of Drainage	moderate	mild	0.79
Bleeding	2/58	1/64	0.01
Rln Injury	2/58	1/64	0.01
Sup. L N. Injury	1/58	0/64	0.003
Seroma	5/58	1/64	0.584
Hypocalcemia	2/58	1/64	0.01
Oesophageal Injury	1/58	0/64	0.003
Conversion to Open	2/58	--	--
Post-Operative Pain	3/58	10/64	0.932

The post-operative complications of both groups were checked, through the first 30 post-operative days. Regarding to the recurrent laryngeal nerve palsy 2 cases with LTT and one case with OTT all of patients return to normal voice and hoarseness gone with the first 22 days followed by indirect laryngoscope examination appear normal vocal cord. One case in LTT get superior laryngeal nerve palsy which also return to normal high pitch voice after 28 days post-operatively. Seroma more occur 5/58 patients occur with LTT vs 1/64 in OTT which all disappear gradually without intervention. One case on LTT get esophageal injury which also treated conservatively. the cosmetic result was evaluated by using scoring system (1. extremely 2. fair 3. Normal 4. Not at all), other complication no significant differences finding between two groups.

Discussion

Laparoscopic total thyroidectomy (LTT) is a new technique in our country as a part of minimal invasive surgery. This procedure done through breast approach in our center. it's done by single corresponding surgeon help by other 2 authors. It gives an excellent result as cosmoses with no significant differences in complications occur as comparing with the traditional open technique. This type of surgery has been growing recently in the world due to improvement of laparoscopic instruments and improve in surgeon experiences provide minimally invasive surgery even to the thyroid tumors (13) endoscopic neck surgery was attempted by ganger in 1996(2). The first laparoscopic thyroidectomy was performed by (3) Since then various methods including axillary, breast, anterior chest approaches, have been introduced by many surgeons. (14, 15) Most of comparative studies reported that there was no significant difference regarding to the technical safety between LTT and OTT and they found that LTT have very good cosmetics results (7, 16, 17, 18, 19). There are many researches emphasized on laparoscopic removal of malignant thyroid gland, indications and contraindications (20). In our study, we talk about laparoscopic thyroidectomy in symptomatic simple multi nodular goiter including toxic goiter after return the patients medically to the au thyroid state. The incidence of recurrent laryngeal nerve palsy after OTT is reported to be 0% to 6% and the permanent nerve palsy less than 1% (21, 22) but in our study (transient nerve palsy 3.4% in LTT while 1.7% only in OTT this high percentage decrease with the time due to increases of hand experiences in laparoscopic procedure. while hypocalcemia in our study (3.4) in LTT while in open

1.7% this also transient which return to normal after 28 days. One case 1.7% got esophageal injury which occur on first case only treated conservatively. This complication not mention in any previous researches, we don't know why which may occur in early cases done by laparoscopic surgeons. Human and his colleagues reported disadvantages of endoscopic thyroidectomy with thyroid diseases and thyroid cancer (16, 22) . The operating time for LTT is longer in our study than OTT this time were decrease gradually with the increasing laparoscopic experiences. Seroma occur more common in LTT in our study which resolve spontaneously without intervention, so laparoscopic thyroidectomy was safe and effective for treating of benign symptomatic goiter.

Conclusion

Laparoscopic total thyroidectomy using breast approach is a safe minimally invasive surgery that give outcome similar to the open total thyroidectomy and give very good cosmetics result

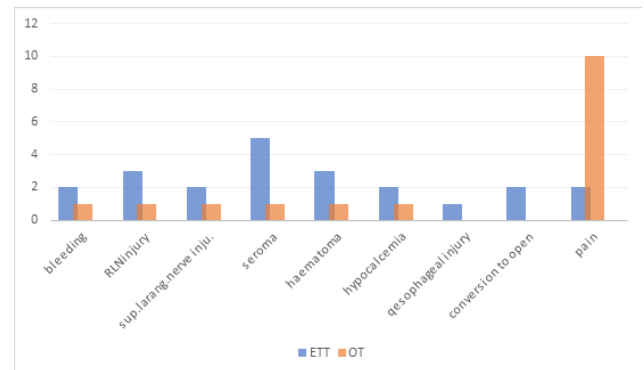


Fig 1: Shows the differences of early complication between LTT and OTT

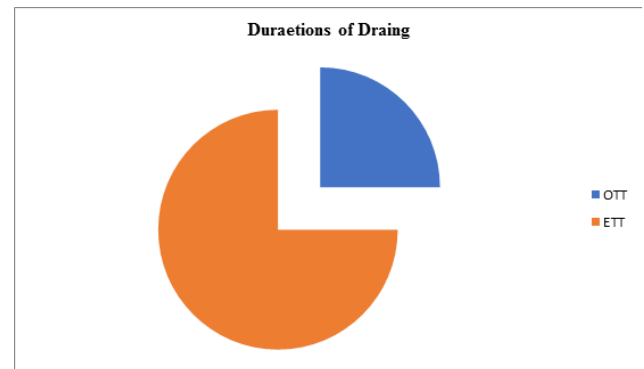


Fig 2: Duration of drainage in OTT one day only while in ETT is 3 days

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Molecular Detection of Mutations in mtCOX1 Gene in Iraqi Patients with Aortic and Mitral Valve Diseases

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Abstract

Many evidences suggest that aortic and mitral valve diseases are not a direct result of aging but may be linked to various genetic factors. This study was designed to determine the potential role of mutations in certain mitochondrial genes and their association with aortic and mitral valve disease. The study included 31 patients, 16 with aortic valve defect and 15 mitral valve patients in addition to 20 healthy volunteers as comparative group. The results of the molecular analysis showed that there were 11 mutations of those with an aortic valve, seven silent mutations and two mutations recorded for the first time in the present study at the sites m.6922 G>T; p.W340L, m.6690 G> C; p.G263R and deletion mutation at m.6936 delA site recorded at the clinical variation site with accession number SCV000845763 and one insertion mutation at m.6908 insG site and registered with accession number SCV000845764. The results of the study recorded 12 mutations of the mitral valve eight silent mutations and the other significant mutations at sites m.6253 T>C; p.M117T, m.6366G>A; p.V155I, m.6690G> C; p.G263R and deletion mutation m.6607 insT site registered with the accession number SCV000852048.

Keywords: aortic valve, mitral valve, mtCOX1, novel mutation.

Introduction

More than 250,000 heart valves defects patients worldwide have been treated by heart valves replacement (¹). Although heart valve disease is less common than coronary artery disease or hypertension, it is still a common disease and surgical intervention is often required because treatments for infected valves are limited, and studies on valve diseases are still few compared to other heart diseases (²). Cardiac valve diseases, both congenital and acquired forms are contributing factors leading to death (³). The prevalence of these diseases increases with age, sex, high body mass index, smoking and hypercalcemia (⁴).as well many other factors such as rheumatic fever (⁵).

Most cell energy is produced in mitochondria by the oxidative phosphorylation (OXPHOS) of five multi-secondary complexes(⁶). The mutations in the

mitochondrial genome, especially in the genes that encode the cytochrome c subunits, associate with many clinical symptoms such as heart diseases (⁷). This complex has a key role in the process of producing energy and works to transfer electrons from cytochrome c to molecular oxygen, turning water into a water molecule (⁸).

Materials and Method

Case-control study was performed on 31 patients with aortic valve and mitral valve replacement operations at the Nasiriyah Heart Center in southern Iraq for the period from 2017 to 2018. The surgery was assessed through a test performed on patients at the same center. The number of patients were 16 (11 males and 5 females). The patients with mitral valve disease were 15 (8 males and 7 females) in addition to 20 comparative samples that were identical in age, sex, ethnicity and did not have a family history heart valves diseases.

The research and laboratory tests were approved by the Ethics Committee of the College of Education for Pure Sciences / Basrah University and the Ethics

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Committee at the Nasiriyah Heart Center and obtained written approval by the patient.

Forty to fifty mg of valve replacement tissue were extracted for mitochondrial DNA. Extraction was performed by gene extraction kit equipped with Geneiad / south of Korea. A pair of primers were used to amplify a piece of the mtCOX1 gene starting at 5909 bp and ending at 6960 bp. The primers were designed by Primer3plus program, [http://www.ncbi.nlm.nih.gov.primer3plus](http://www.ncbi.nlm.nih.gov/primer3plus) and was as follows:

Forward: 5'-CGCCGACCGTTGACTATTCT-3'

Reverse: 5'- GGCCACCTACGGTGAAAAGA-3'

A PCR reaction was performed using 200ng for mtDNA and 5 pmol for each primer and 5 microliter from Master Mix supplied from Bioneer / south of Korea and 5 microliters of deionized distilled water. The first cycle of amplification program (first amplification) lasted for 5 minutes at 94C° and after 30C° Cycle 94C° for 45 seconds and 60C° for 30 seconds 72C° for 30 seconds after final elongation at 72C° for 5 minutes. The results

were then transferred to the 2% agarose gel. Samples were sent to Macrogen company, Seoul, South Korea for a nucleotide sequence analysis. Mutation Surveyer program V.5.2.1 was used by Softgenetics, USA to analyze mutations and detect their location on the mitochondrial genome and to determine whether it was nonsynonymous or synonymous.

Statistical Analysis

Statistical analysis of this study was conducted, using the P.value with 95% confidence intervals (95% CI) by SPSS V.18

Results

Results of the current study showed that the mean age of patients with aortic valve patients was 42.56 ± 15.80 and those with mitral valve 42.60 ± 12.09 . Comparison group age was 40.30 ± 11.50 , and the results also revealed an increase in the percentage of men with mitral valve which was 68.75% compared to females. The percentage of smokers with an aortic valve was 37.50% and those with mitral valve was 46.67%. Table (1).

Table (1) clinical features of aortic, mitral valve and control group

Parameter	Control (N=20)	AVR patients (N=16)	MVR patients (N=15)
Age (Mean±SD)	40.30 ± 11.50	42.56 ± 15.80	42.60 ± 12.09
Gender			
Male	12 (60.00%)	11 (68.75%)	8 (53.33%)
Female	8 (40.00%)	5 (31.25%)	7 (46.67%)
P.Value		0.587	0.693
Smoking			
Smoker	12 (60.00%)	6 (37.50%)	7 (46.67%)
Non-smoker	8 (40.00%)	10 (62.50%)	8 (53.33%)
P.Value		0.180	0.433

The current study found 11 mutation in patients with aortic valve, 7 synonymous mutations at the following sites: m.6446G>A, m.6671T>C, m.6680T>C, m.6170C>T, m.6531C>T, m.6026G>A, m.6272A>G. The mutation allocated in the two sites: m.6922G>T,p.

W340L and m.6690G>C,p.G263R were recorded for the first time (Novel) fig.(1). The study recorded a mutation of deletion at m.6936delA site and was registered at the site of clinical variations at the National Center for Biotechnology Information at accession

number SCV000845763 which led to frame shift mutation associated with protein alteration as well as mutation in m.6908insC, recorded with SCV000845765 accession number. table (2).

Table (2) Mutations in mtCOX1 gene for patients with aortic valve

Sequence variation	Amino acid change	Originality	Accession number
m.6922 G>T	W340L	Novel	LC435698.1
m.6446 G>A	Synonymous	mitomap	LC435442.1
m.6671* T>C	Synonymous	mitomap	LC435442.1
m.6680 T>C	Synonymous	mitomap	LC435442.1
m.6936 del A	Frame shift	Novel	SCV000845763
m.6170 C>T	Synonymous	mitomap	LC435696.1
m. 6531 C>T	Synonymous	mitomap	LC435697.1
m.6908 ins C	Frame shift	Novel	SCV000845765
m.6026 G>A	Synonymous	mitomap	LC435699.1
m.6272 A>G	Synonymous	mitomap	LC435699.1
m.6690 G>C	G263R	Novel	LC421988.1

* A common mutation with control samples

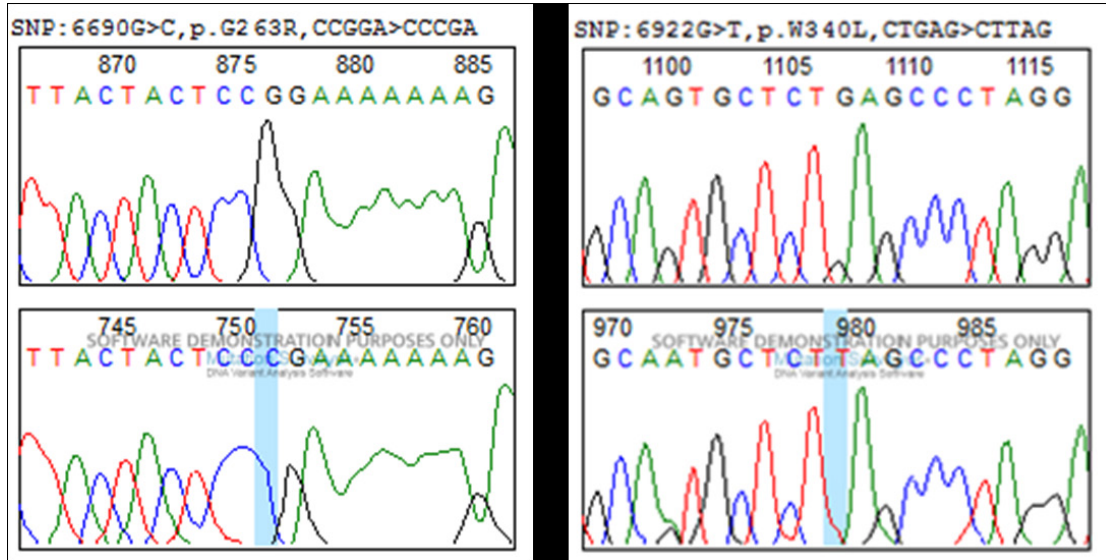
The study explored 12 mutation in mitral valve patients, 8 silent mutations at sites: m.5981T>C, m.5987C>T, m.6026G>A, m.6185T>C, m.6257G>A, m.6297T>C, m.6621T>C and recorded the presence of a mutation at m.6690G>C site, which was previously

recorded in patients with aortic valve and two mutations affecting the sites: m.6366G>A,p.V155I; m.6253T>C,p.M117T In addition to detecting a mutation in the m.6607delT site, that was registered with the accession number SCV000852048. Table (3).

Table (3) Mutations in mtCOX1 gene for patients with mitral valve

Sequence variation	Amino acid change	Originality	Accession number
m.6185 T>C	synonymous	mitomap	LC435700.1
m.6257 G>A	synonymous	--	rs281865417
m.6297 T>C	synonymous	mitomap	
m.6690 G>C	G263R	Novel	
m.6026 G>A	synonymous	mitomap	LC435701.1
m.5981 T>C	synonymous	mitomap	LC435704.1
m.5987 C>T	synonymous	mitomap	LC435702.1
m.6221* T>C	synonymous	mitomap	
m.6366 G>A	V155I	mitomap	LC435704.1
m.6607 del T	Frame shift	Novel	SCV000852048
m.6371 C>T	synonymous	mitomap	LC435706.1
m.6253 T>C	M117T	mitomap	LC435707.1

* A common mutation with control samples



Figure(1)Sequencing chromatogram showing the m.6690G>C, m.6922G>T mutation in the mtCOX1 gene.

Discussion

The current study showed that the mean age of aortic and mitral valves patients was less than healthy controls at time of blood sampling for DNA extraction, but the difference was not significant, this is may be due to the small sample size. Mitochondrial genome accumulates mutations with progressing age, but our results showed no significant differences between aortic and mitral valve patients. Our investigation showed that the percentage of male aortic valve infection is significantly higher than that of females. These results are consistent with (9). Our findings did not show significant association between smoking and valve defects in the studied cases. Experiments with aortic valves patients identified 11 mutations in the COX1 gene Seven of these mutations were silent. The mutation m.6922 G>T p.W340L a m.6690G>C p.G263R was recorded for the first time and the study recorded a mutation at m.6936 delA site which was registered at the site of clinical variations at the National Center for Biotechnology Information at accession number SCV000845763, it causes frame shift mutation which led to the alteration of the resulting protein in addition to the m.6908 inC, which is registered as well at the clinical variation with the accession number SCV000845765.

For those with mitral valve defect, the study identified 12 variants, 8 of which were silent mutations, while the variant m.6366G>A; altered the amino acid

V115I and a deletion mutation at m.6607 delT resulted in frame shift mutation and recorded with SCV000852048. (10) found that the defect in the fourth complex in the respiratory chain is associated with many abnormalities that occur in the heart, muscles, and brain tissue. The defect in the complex involves the occurrence of deletions or mutations which are usually associated with age progression due to the presence of ROS free radicals antioxidants tissues due to aging, in his study a mutation at site 6708A>G in the COX1 subunit proved to be a termination code of the premature codon which led to the cessation of protein production component of the COX1 subunit. (11) noted that increasing formation of free oxygen radicals (ROS), especially hydrogen peroxide (H₂O₂), would promote increased calcification of the aortic valve and blood vessels due to increased calcium deposition in the valve. (12) found that mitochondrial functions were damaged in infected heart valves. (13) proved COX1 activity in patients with heart disease is lower than that in healthy people as well as that oxidative stress and imbalance in the mitochondrial genome are directly involved in several forms of heart disease. (14) recoded the mutation 7339A>G in the COX1 subunit in an anemic patient, leading to the formation of a termination codon in the wrong place. The study showed that this mutation resulted in poor oxidative phosphorylation rate in the mitochondria.

The mutations will destabilize the factors of the fourth complex of the respiratory chain in addition to

the mutations in the subunit are not the only defect in one complex but lead to a decrease in the respiratory chain efficiency when the mutation load exceeds a certain threshold (¹⁵). The presence of mutations will lead to structural changes in the protein produced by the subsidiary COX1 which cause the instability of the components of the fourth complex in the respiratory chain, which affects the biological synthesis of the peptide chains effect required for the functioning of this complex, especially mutations that change the amino acids, and the addition, which has caused a reading frame shift and therefore will lead to a defect in the heart valves efficiency due to lack of COX1 component or a defect leads to increase risk of heart valve defects.

Conclusion

The presence of missense, deletion, and insertion mutations which led to frame shift reading changes and that in turn could cause an aortic and mitral valve defects.

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Ethical clearance: The research and laboratory tests were approved by the Ethics Committee of the College of Education for Pure Sciences / Basrah University and the Ethics Committee at the Nasiriyah Heart Center and obtained written approval by the patient.

Source of Funding : Self

Conflict of Interest : Nil

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Rubik Play Therapy Influence on the Level of Anxiety in Children Preoperative

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Abstract

Morbidity of children aged 0-21 years if it is calculated on the total population was 14.4%. Often Problems Arise before the operation is anxiety. Play an effective coping way to reduce the anxiety experienced by children. This study aimed to identify the effect of play therapy Rubik's on the level of preoperative anxiety in children in Room Kemuning Hospital Dr. Moeloek H.Abdul Lampung Province. The method used in the current research was the study design quasy experiment with one group pretest-posttest. Sample was selected by purposive sampling. Data collection technique used observation sheet, using a measuring instrument anxiety MYPAS (Modifiet Yale Preoperative Anxiety Scale). Data were analyzed using t-test. The average score of anxiety before the play therapy Rubik's was 73.40 and after therapy play Rubik was 52.10. The p-value = 0.000 (there was difference in preoperative anxiety scores before and after therapy using play Rubik).

Keywords: *Play therapy, Puzzle, Rubik, Anxiety*

Introduction

Surgery is an act of treatment using invasive way to open and display the body part to be handled. The opening of parts of the body is generally performed by making an incision. After the parts to be handled displayed, further improvements in the end with the closure and suturing wounds. Each surgical incision is always associated with a trauma for patients who cause a variety of complaints and symptoms.⁽¹⁾ According Muttaqin & Sari⁽²⁾ surgical procedure will provide for the patient's emotional reaction such as fear or feelings of calm, anger and fear. Mental preparation is of no less importance in the process of preparation for surgery anxiety due to mental patients who are not ready can affect physical condition. Mental problems that arise in the preoperative patient's anxiety.

Based on the National Health Survey (Susenas) in 2010, the incidence of surgery in children in urban areas

according to age group 0-4 years amounted to 25.8%, 5-12 years of age as much as 14.91%, age 13-15 years of about 9.1 %, age 16-21 years of 8.13%. Morbidity of children aged 0-21 years if it is calculated on the total population is 14.44%. Children who are hospitalized will have an effect on the physical and psychological condition, it is called with hospitalization.

Child care in hospitals forcing a child to be separated from the environment that feels safe, loving and fun, which is the home environment, games and playmate. Reactions to the show separation in preschool children is by refusing to eat, often asked, crying albeit slowly and uncooperative towards health workers. Child care in the hospital also makes children lose control of himself. Hospitalizations require restrictions on activities of children so that children feel lost power themselves. Fear of children against injury arises because children consider the actions and procedures threaten the integrity of the body. Therefore, this raises the aggressive reaction to anger and revolt, verbal expression with angry words, do not want to cooperate with the nurses and dependence in older people.

Small children, immature, and depending on the character's mother, is particularly vulnerable to the

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anxiety associated with separation, for example children who are hospitalized (hospitalization) because the child has a sequence of fear development is the fear of losing a mother, fear of losing the love of a mother, afraid of injury to the body, fearing his impulses and anxious fear of punishment (punishing anxiety) of superego and guilt. Most children experience separation anxiety based on one or more of these fears.

The level of anxiety in inpatient in a hospital in the high category, there is even very high. The anxiety level should immediately get treatment so that children do not feel the stress is in the hospital. For the mind that stress will cause the child to be a long time recovering from the treatment being undertaken. Therefore, this form of therapy so that children feel comfortable in the hospital can be with the game.

Nurses can help parents face the problems related to child care in hospitals because nurses are next to the patient for 24 hours. The focus of nursing interventions is to minimize the psychological support to children of family members. One of the nursing interventions in addressing the impact of hospitalization in children is by providing play therapy. Play therapy can be done before performing the procedure on a child, this is done to reduce the tension and emotions felt by children during the procedure.

Although children got sick or hospitalized, the task of development does not stop. It aims to continue to grow and develop during treatment so that the continuity of growth can walk, can develop creativity and experience, children will easily adapt to the stress due to illness in the patient. The principle of playing at a hospital that is not much energy issue, consider the security and cross-infection, the age groups of the same age, the game does not conflict about the treatment, involving parents or family.

One alternative to distract children are hospitalized are in the presence of the support means to menfasilitaasi child's play to reduce the anxiety and fear that hospitalized children, because children are still happy to play.

The role of hospital health workers (doctors, nurses), which are expected health workers, especially nurses should respect the child's attitude because in addition to the elderly nurse is the person closest to the child during hospitalization. Even if the child refuses strangers (nurse), but the nurse must still provide support

by taking time to physically close to the child invited to play by the stages of child development for the benefit of the therapy.

According to Wong⁽³⁾ played an effective coping way to reduce the anxiety experienced by children. Play therapy helps release stress and anxiety being felt by children because play has merit as a means of distraction (distraction) that cause children to be relaxed. This leads to children who initially suffered anxiety becomes anxious again. Playing a good medium for learning because the children's playground will speak (communicate), learn to adapt to the environment, doing what they can do and about the time of the distance and the sound.⁽⁴⁾

In line with its growth and development, children have a gross and fine motor skills are more mature than the toddler age children. Children are more active, creative and imaginative. Similarly, the ability to speak and relate socially with friends is increasing. To that end, the right kind of plaything given to children for example, play Rubik, read a story / fairy tale, drawing tools and massive beams game.

Research Septi⁽⁵⁾ obtained marginal homogeneity with p-value of 0.000, all respondents, which decreased anxiety therapy after playing puzzle is severe anxiety 19 children become 0 child, anxious were 12 children to 11 children, mild anxiety 4 of children increased to 0 child, while not having anxiety as much as 5 children.

Data pre survey dated January 5 2019 in Dr.H.Abdul Moeloek Hospital, Lampung obtained information that the incidence of surgery in Kemuning Room in the last 3 months is the 120 children who will undergo surgery. Data showed 80% of children experience anxiety, such as crying when will do the nursing actions, asking to go home, it's hard to sleep, etc. Based on this phenomenon, the researchers will melakukam research on the effects on the level of play therapy Rubik preoperative anxiety in Kemuning Room.

Method

The method used in the current research was the study design quasy experiment with one group pretest-posttest. The population in this study was 30 boys of preoperative in hospitals Kemuning room Dr.H.Abdul Moeloek Lampung. Sample was selected by purposive sampling. Data collection technique used observation sheet, using a measuring instrument anxiety MYPAS

(Modified Yale Preoperative Anxiety Scale). Data were analyzed using t-test.

Findings

Table 1. Anxiety scores before and after given rubik play therapy

Variables	Mean	Median	SD	Min	Max	p-value
Before	73.40	73.00	7.407	53	86	0.000
After	52.10	53.00	10.380	31	65	

The mean-score of anxiety before therapy was 73.40, and after therapy was 52.10. The p-value of t-test was 0.000 (there was difference of the anxiety score between before and after Rubik play therapy).

Discussion

Most stress in middle age child preschool period is anxious because of the separation. Mother and child relationship is very close, resulting in separation from the mother will cause a sense of loss in children will be the closest to him and the environment are known to him, which in turn will give rise to feelings of insecurity and anxiety.

According to Wong⁽⁶⁾ as a result of separation anxiety in children that protest phase, the phase of despair and refuse phase.

Berberapa cause of anxiety before surgery in school age children appears tied to imagine the existence of injury on the body after surgery, This is in line with the opinions kathleen Speer⁽⁷⁾, which revealed that the hospital environment were strangers and surgery that will be undertaken, resulting in children will feel anxious during the preoperative period.

This study is in line with research conducted on 25-30 July 2016 in Room Children's Hematology Oncology Hospital Ulin Banjarmasin with sample 4 pre-school age children who will undergo chemotherapy, showed 2 of 4 anakmengalami anxiety while the other 2 did not experience anxiety.⁽⁸⁾

The role of hospital health workers (doctors, nurses), which are expected health workers, especially nurses should respect the child's attitude because in addition to the elderly nurse is the person closest to the child during hospitalization. Even if the child refuses strangers (nurse), but the nurse must still provide support by taking time to physically close to the child invited to

play by the stages of child development for the benefit of the therapy.

According to researchers the anxiety shown by the children in the room Kemuning of whom were children who experience anxiety responses characterized by crying, asking out of the wards, looking for a parent with a child's eyes and inactive. Based on the response of researchers to minimize anxiety by providing play therapy.

Preoperative anxiety in patients after therapy, play Rubik average anxiety scores of respondents was 52.10 with a standard deviation (SD) 10.380 and the lowest anxiety score was 31 (mild anxiety) and the highest anxiety scores was 65 (moderate anxiety). It showed a decrease in anxiety in children after playing Rubik's therapy.

Anxiety in children of the state becomes a matter of concern by parents causes anxiety may result in disruption of the growth process and can affect a child's behavior as it becomes difficult to eat, not calm, fear, anxiety and revolt when will do the nursing actions that can interfere in the process healing itself.⁽⁹⁾ For that according to (Huwari 2006) needs to minimize the anxiety by preventing or reducing the effects of anxiety. One way to minimize anxiety is by giving therapy.

Supartini⁽¹⁰⁾ explains that the play as an activity that can be done as a child and its development and growth stimulation plays for children in the hospital becomes a medium for children to express their feelings, relaxation and distraction feeling uncomfortable. Play activities carried out voluntarily to gain pleasure or satisfaction. By doing fun games can make children happy. According Nursalam et al.⁽¹¹⁾ with play will affect the health of a child.

This study is in line with research Septi⁽⁵⁾, entitled influence puzzles therapy against anxiety levels in

children who underwent hospitalization Medina hospital room Siti Khadijah Islam Palembang. In this study, data analysis results obtained using test marginal homogeneity test p-value of 0.000. And research shows that of all respondents totaling 35 children, which decreased anxiety after therapy puzzles are severe anxiety 19 children to 0 child anxiety were 12 children to 11 children, mild anxiety 4 children increased to 19 children, while do not experience anxiety children 0 to 5 children.

According to the researchers concluded that there are differences in anxiety scores before and after therapy play rubik, There is a difference between anxiety scores before and after therapy play rubik may be caused because the game rubik can train finger dexterity, hand-eye coordination, sharpen the brain, match the shape, the concept of cognitive, practice patience of children in developing rubik and relationships between parts of Rubik thus becoming rubik color shape intact.

Based on the statistical test anxiety scores before and after treatment with t-test playing rubik dependent with p-value of 0.000, it can be concluded that there pengaruh against child preoperative anxiety levels before and after rubik play therapy.

Anxiety is a major force in driving behavior. Good behavior normal and aberrant behavior, or impaired, both an expression, appearance, incarnation of defense against anxiety that.⁽¹²⁾ According Supartini 2004 while the reaction of preschool children who showed anxiety as the child refuses to eat, cry, often inquired about his situation, have trouble sleeping, uncooperative towards health workers when done nursing actions. The level of anxiety in the preoperative phase high enough children around 50-70% then diperluka way to prevent the child's emotional stress can be done in couple of ways including preoperative psychological preparation at the time (a day before the operation) where children and parents are given an explanation of the anesthetic and surgical techniques that will be undertaken the next day.

Playing is one way to reduce anxiety by playing children's anxiety is expected to decline. Small children generally respond better to the game and the kids are bigger respond better to a peer movie yangdlihatnya.⁽¹³⁾

Play therapy is an attempt to change problematic behavior, by placing children in situations of play. Play is a reflection of the physical, intellectual, emotional and social. Playing a good medium for learning because the

children's playground will speak (communicate), learn to adapt to the environment, doing what they can do and about the time of the distance and the sound.⁽⁴⁾

Play therapy is expected to break down the barriers, obstacles in esteem, stress, frustration and have an emotional problem with the aim of changing the behavior of children who do not fit into the behavior expected and the children were often invited to play will be more cooperative and easy to cooperation during the treatment period. Playing also be a good therapeutic media for children to develop their creative potential of children themselves, To reduce anxiety in children undergoing such hospitalization to do with relaxation, music therapy, physical activity, art therapy and play therapy.

In line with its growth and development, pre-school age children have gross and fine motor skills are more mature than the toddler age children. Children are more active, creative and imaginative. Similarly, the ability to speak and relate socially with friends is increasing. To that end, the right kind of plaything given to children for example, play puzzles / Rubik, read a story / fairy tale, drawing tools and massive beams game.

Rubik game selection in these games as rubik therapy is one of the educational games that can optimize the ability and intelligence of children. Rubik play teaches children to be patient and practice the skills of children in developing Rubik's color into the color Rubik's back intact. The benefits of playing puzzles / Rubik according to Beaty⁽¹⁴⁾ can train finger dexterity, hand-eye coordination, sharpen the brain, match the shape, the concept of cognitive, practice patience of children in developing puzzle / rubik and relationships between parts of a puzzle / rubik so as to form a puzzle / rubik intact

According Soebachman⁽¹⁵⁾ play Rubik is a game that consists of the colors from one side to train certain concentration levels. Play rubik can be done by children up to teenagers, but of course the degree of difficulty should be adjusted memainkanya child. Play Rubik child will try to solve the problem which is preparing colors.

This research is in line with the results of research conducted Kaluas⁽¹⁶⁾ shows the puzzle play therapy had a significant effect to reduce anxiety responses of preschool children during hospitalization which is obtained after therapy the mean value of a puzzle that is 28.71.

Conclusion

There are differences in anxiety scores before therapy and after receiving the play rubikrubik play therapy in pediatric patients pre-operatively.

Ethical Clearance-Yes

Source of Funding-Authors

Conflict of Interest-No

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The Surgical Outcome of Distal Pancreatectomy for Distal Pancreatic Tumors

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Abstract

Pancreatic cancer is still associated with poor prognosis and remains a therapeutic challenge and the fourth leading cause of cancer related mortality. Overall long-term survival is about 1–5%, and in only 10–20% of pancreatic cancer patients is potentially curative surgery possible, increasing five-year survival rates to approximately 20–25%.

Thirty two patients' data files were reviewed; those who underwent left sided pancreatectomy for tumor lesions in their pancreatic body or tail in Gastroenterology and Hepatology Hospital & Baghdad Teaching Hospital ,Baghdad, Iraq. for the period

from December 2013 up to April 2018. demographics , dates of presentation , ad-mission , presentation features , biochemical investigations , radiological findings , operative findings,histological reports of excised samples and clinical notes regarding postoperative hospitalization period with the postoperative biochemical and radiological findings were analyzed.

The result shows most of the resected lesions were benign premalignant tumors with female preponderance and lower mean age of presentation than found in other studies. No significant complications were documented and neither mortality nor recurrence were registered with thrombocytosis was the complication in one case . Successful celiac axis resection done in one case . Most of the cases operated in the 2015 with the non specific abdominal pain being the presenting symptom in more than 30 % of cases . Tumor site was in the tail in about 60 %, and the most common surgical option was distal pancreatectomy with splenectomy . Mucinous cystic neoplasia was the most common tissue diagnosis . Hospital stay was around 5 days in about 33 % of cases .

Key Words: *Pancreatic cancer, Gastroenterology, thrombocytosis, Tumor site.*

Introduction

Tumors of the body and tail of the pancreas comprise 33% of the pancreatic neoplasms. They have consistently been related with a pauper prognosis because of the late presentation, and subsequently, progress phase of the ailment. Be that as it may ,this pattern is continuously on the decay with the attention to the presence of these lesions, better radiologic imaging modalities for

analysis, and the more forceful treatment techniques received in these patients⁽¹⁾. Acinar neoplasms from pancreatic acini are uncommon , the ductal component of the pancreas is responsible for most of the neoplasms, with the invasive ductal adenocarcinoma as the most common neoplasm of the pancreas⁽²⁾. Pancreatic ductal adenocarcinoma accounts for 6% of all cancers in the United States. It is the fourth leading cause of cancer death in men, after lung, prostate, and colorectal cancer, and the fifth leading cause of cancer death in women, following lung, breast, colorectal, and ovarian cancer⁽²⁾. More than 42,000 incident cases of pancreas cancer are predicted annually, with about 35,240 deaths⁽³⁾. In the United States, the peak incidence of pancreas

cancer occurs in the seventh and eighth decades of life (3). Most pancreatic adenocarcinomas are solid, ill defined masses. They have a remarkable tendency for fast dissemination and insidious permeation. Ordinarily, it spreads in the abdomen in a multinodular design (intraabdominalcarcinomatosis) or is as of now broadly widely metastatic by the time the primary tumor grows to 5 to 6 cm in size. This feature is such characteristic that a larger solitary pancreatic mass is unlikely to be ductal adenocarcinoma (2).

Patients & Method

The data taken from the Gastroenterology and Hepatology Hospital & Baghdad Teaching Hospital registration unit & theatre unit were reviewed regarding patients who had underwent surgery for tumors involving pancreatic body or tail for the period from December 2013 upto April 2018, which included 32 patients, 4 of them were excluded because of missing data from

one of the data storage units The available informations were checked for demographics, dates of presentation, admission, presentation features, biochemical investigations, radiological findings, operative findings, histological reports of excised samples and clinical notes regarding postoperative hospitalization period with the postoperative biochemical and radiological findings. The data were studied by the statistical package for social sciencesprogram (SPSS).

Results

Study period

The data of patients with previous left pancreatic resection for distal pancreatic tumors retrospectively were collected For the period from April 2013 till April 2018 and the results showed 32 patients were explored, 6 of them with incomplete data who were excluded from the study, As shown in the figure (1).

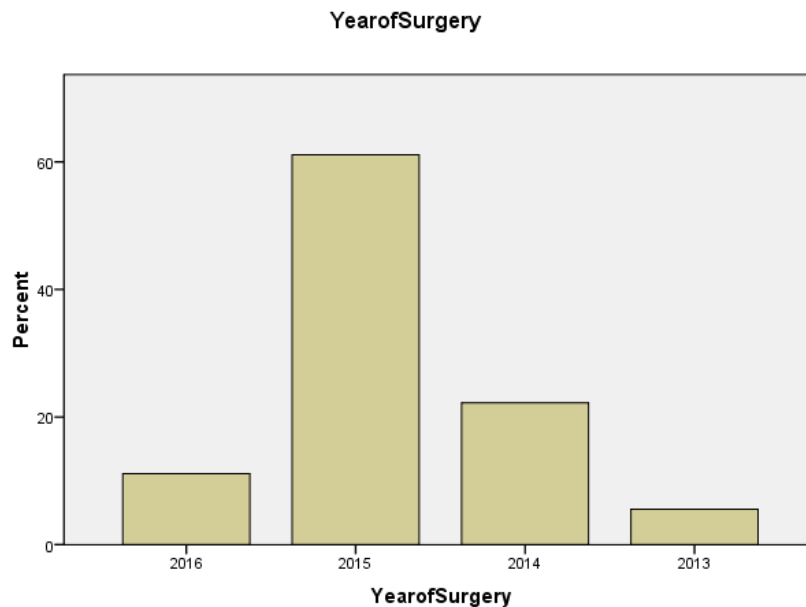


Fig. (1): The annual resection rate for pancreatic body masses.

Demographic data

The demographic study shown the median age was 37.5 year and the mean age was 39 years. The maximum age was 57 years and the minimum was 17 years. And females were 66.7% and male were 33.3%.

Diagnosis

The most common symptom was abdominal pain that had been recognized in about 66.7% of the cases, followed by mass in 16.7% of the cases. (Figure 2 shows the presenting sympto

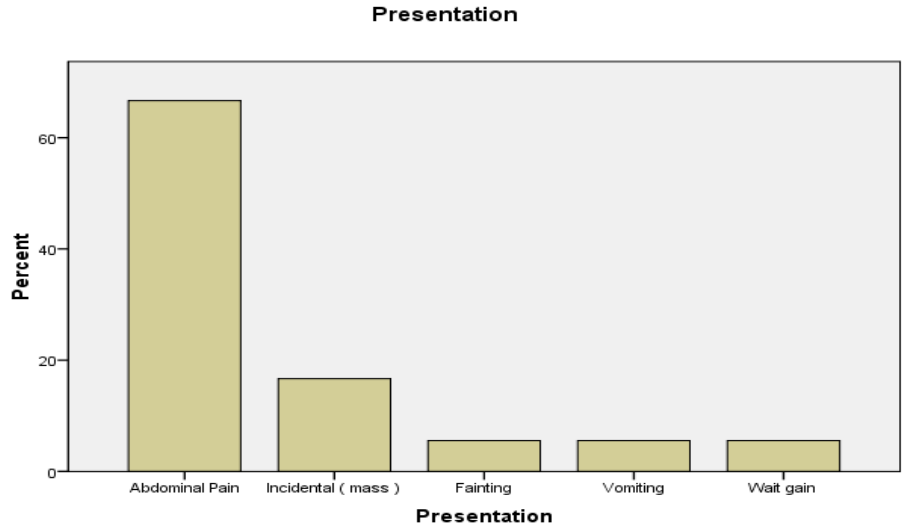


Fig. (2): The presenting symptoms.

Surgical option

There are many types of surgery, but the most frequently practiced surgery was distal pancreatectomy with concomitant splenectomy in the rate of 77.8%, followed by distal pancreatectomy with splenectomy and other organ manipulation. (as shown in figure 3).

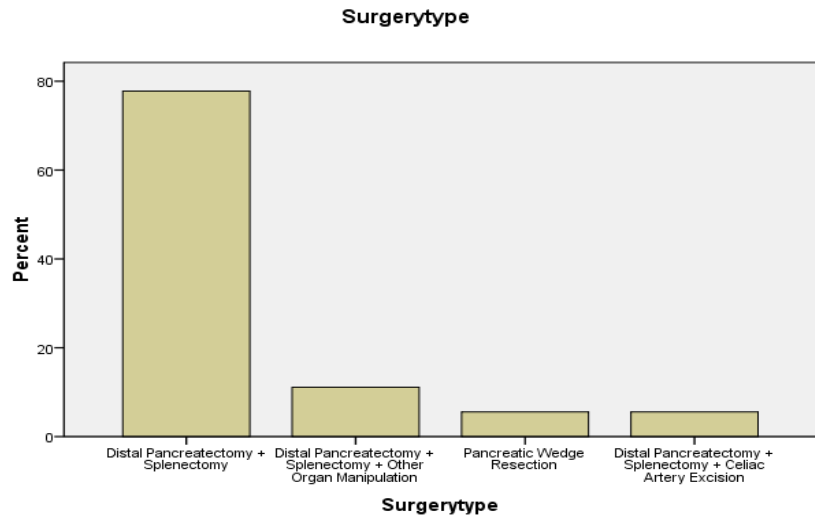


Figure (3) :Types of surgery used for resection.

Tissue diagnosis

According to the results of diagnosis the resected tissues, pancreatic cystic lesions percentage around 49.7 %, and 77.77 % were benign (adenomas without dysplasia). while mucinous cystadenoma was encountered as the most common diagnosis with the frequency of 33.3% (figure 4).

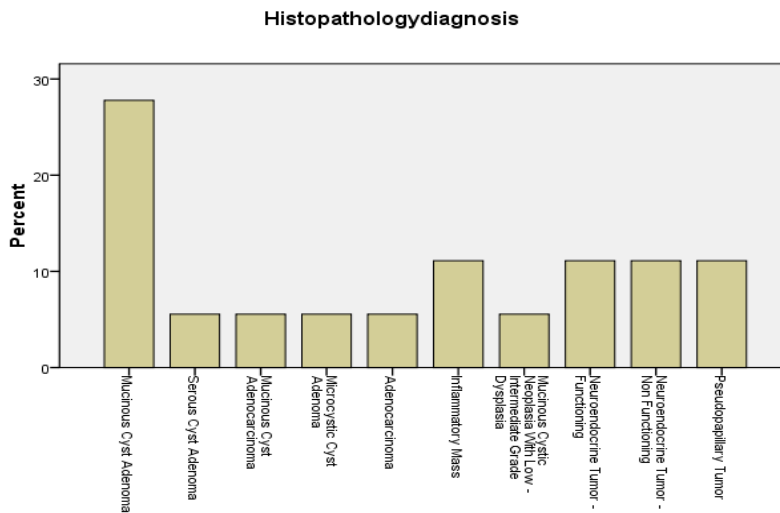


Figure (4): Tissue diagnoses of the resected masses.

Complications

Regarding the postoperative complications’ rate which shown less than (30%), The group that managed without surgery by percutaneous drainage under local anesthesia whether by single or multiple attempts and with the use of injectable antibiotics with or without somatostatin inhibitors showed the highest frequency. (see figure 5). One case was complicated by thrombocytosis and gastrointestinal bleeding which was managed conservatively.

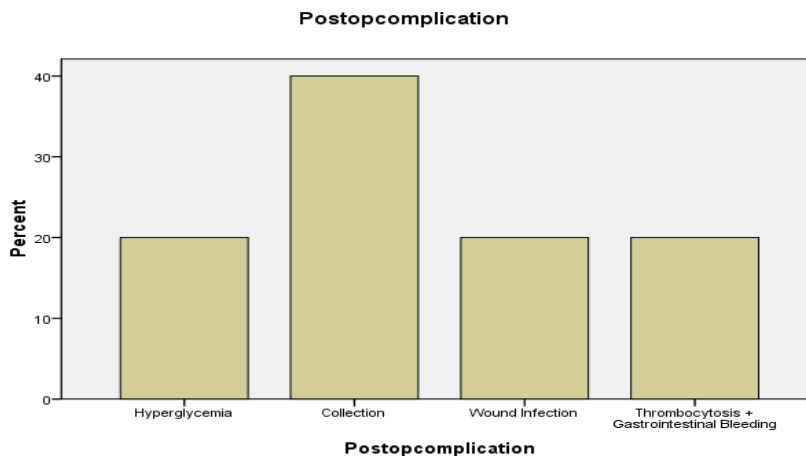


Figure (5): Postoperative complication .

Discussion

Perioperative morbidity and mortality rates are usually done after Pancreatic (4) and that’s why there is familiar idea that pancreatic resection for pancreatic cancer be abandoned. Many centers have developed recently and that’s had led to significant improvement in the short term outcomes after pancreaticoduodenectomy, these results were also extended to distal pancreatic resection

as evidenced by Fernandez-del Castillo et al (5). The data collected in this study showed zero percent of mortality and that’s could be explained by younger – middle aged population that was involved and also due to the less aggressively surgical options those were applied for carefully selected individual patients.

The figure (1) represents the increment of the annual rate of pancreatic surgical resection tumor we can noticed that the rate in 2015 year increased in 2-fold over that of 2014 (as mentioned previously in methodology this study did not cover the data of whole months of the years 2013 and 2018).

After calculating the median age of patients and appeared around 35 years and that's age lower than that found in another study held by Fabio Madureira et al (6) which was 57 years, And this controversy result can be explained by the fact that 34.1% of the cases are mucinous cystic adenomas and neoplasia of low - intermediate grade dysplasia which are commonly seen in perimenopausal women (7), which is the same cause for the female preponderance .

There were two recognizable periods by which the patients highly present to our center, the first in the 3 weeks' time and the second in the two years' time. The second period was affected by one case of metastatic tumor (carcinoma peritonei) who was already clinically diagnosed to have an advanced pancreatic tumor.

As excision thought to be the only chance of cure for the aggressive pancreatic cancer, and the survival highly improved by changing the operation to an extended distal pancreatectomy (DP) including resection of regional lymph nodes, retroperitoneal structures, surrounding vessels, and adjacent organs (stomach, spleen, colon, adrenal gland) cited by Matthias Glanemann et al (8).

This study has shown pancreatic cystic neoplasia as the most familiar diagnosis and this different to what was found by other reviews like in Keith D. Lillemoe et al (9) where the lesions due to chronic pancreatitis were the most common diagnosis representing about 24 % of the cases.

While postoperative complications rates were similar to or lower than those rates of Keith D. Lillemoe et al (9). 31% developed complications, in decreasing order, new onset insulin dependent diabetes, fistula, intraabdominal abscess, small bowel obstruction and hemorrhage , and this complication (the fistula) can be explained by the relatively high percent of distal pancreatectomies for chronic pancreatitis' associated lesions

Finally the length of postoperative hospital stay (with the cost that it carries) was generally lower in our review as compared with the results from Traian Dumitrascu (10)

where the mean was 9 days and the range from 6-45 days, while in Keith D. Lillemoe (9) the mean was 14 days, reflecting the time the complications needed to resolve within it .

Conclusion

Pancreatic tumors still representing a difficult medical problem for doctors in diagnosis , confirmation and treatment , but since distal pancreatectomy is relatively an easy surgery with an acceptable outcomes , the surgical oncological principles that limit the applicability of resection options should be over-come by both the detection of tumors at an earlier stages and the proper selection of the suitable surgical option for each individual case. Our results showed that the conventionally used procedure (distal pancreatectomy) is safe with an acceptable complications rate when used for benign or premalignant tumors with one modification need to be addressed that is spleen preservation. For malignant tumors this technique alone or with other modifications like (anterior or posterior) RAMPS or modified Appleby procedures may need to be part of the available options for the treatment of distal pancreatic malignancies.

Conflict of Interest: There is no conflict of interest among the authors.

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Ethical Clearance: This study is ethically approved by the Institutional ethical Committee.

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Condition of Houses with Smoking Habits in Patients with Pulmonary Tuberculosis

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Abstract

Tuberculosis (TB) is one of the direct infectious diseases caused by the bacteria *Mycobacterium tuberculosis* which can attack various organs, especially the lungs. Pulmonary TB can be transmitted through the air, the longer and nearer a person contacts with the source of transmission, the greater the chance of contracting it. This study aims to describe the factors that can influence the incidence of pulmonary TB in patients at Undata Hospital, Palu. This study used a cross-sectional study design to describe the factors that influence the incidence of pulmonary TB in 15 patients with pulmonary TB MDR (Multi-Drug Resistant). The results showed that patients who had the most pulmonary TB were male (53.3%), aged or more than 40 years (53.3%), high school education level (46.7%), damaged house condition (73.3%), and have smoking habits (53.3%). Patients of the male sex, old age, high school education level, damaged housing conditions, and smoking habits are the most common factors for MDR pulmonary TB patients.

Keywords: tuberculosis, house condition, smoking habits

Introduction

Indonesia is included in the HBC (High Burden Countries) country because it has major problems in dealing with TB, countries with a high burden for TB are based on indicators of TB, TB / HIV, and MDR-TB (Multi-Drug Resistant). The 2014 tuberculosis prevalence survey showed that Indonesia was ranked second in the world as the largest contributor to TB patients after India. The prevalence of TB with bacteriological confirmation is 759 per 100,000 population aged 15 years and over, while the Palu area is 338 per 100,000 population⁽¹⁾.

The pandemic of Human Immunodeficiency Virus (HIV) / Acquired Immunodeficiency Syndrome (AIDS) in the world adds to the problem of pulmonary TB disease, co-infection with HIV will significantly increase the risk of the incidence of pulmonary TB disease. At the

same time the double immunity of tuberculosis germs against anti-tuberculosis drugs (MDR), is increasingly becoming a problem due to cases that have not been successfully cured⁽²⁾. TB drugs are a major public health problem threatening progress in TB care and control. Drug resistance arises due to antibiotic abuse in chemotherapy TB patients who are susceptible to drugs. This improper use is the result of a number of actions including the provision of improper treatment and failure to ensure that the patient completes all treatment. Basically, drug resistance appears in areas with weak TB control programs. A patient who develops the active disease with a type of drug-resistant TB can reduce TB to others.

In 2014-2016 around 89% of the world's population suffered from TB and 14 countries in the world experienced a double burden of TB such as sensitive TB, MDR-TB, and TB / HIV. WHO estimates around 480,000 cases of MDR-TB in 2013 with a mortality rate of around 150,000 cases each year⁽³⁾. TB is ranked fifth in the disease that causes death after stroke, heart disease, diabetes, and hypertension. In 2002-2020 an estimated 2 billion people will be infected with tuberculosis, 5-10% among infections will develop into disease, 40% among

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those who are sick can end up with death. The spread of tuberculosis is increasing in accordance with the increase and spread of HIV/AIDS and the emergence of MDR TB cases resistant to various drugs⁽⁴⁾.

The concept of the epidemiological triangle in TB cases, namely the factors of the host, agent and environment. Host factors consist of gender, age, education level, occupation, and smoking habits. The agent factor is mycobacterium tuberculosis. Factor environment conditions of the house, occupancy density and the presence of home ventilation. TB is an environment-based disease, influenced by environmental and behavioral factors. Environmental factors include ventilation, occupancy density, temperature, lighting, and humidity, while behavioral factors include the habit of smoking, spitting or removing phlegm in any place, coughing or sneezing does not cover the mouth and the habit of not opening the window^{(5),(6)}.

TB disease is exacerbated by poor housing sanitation conditions, especially in densely populated settlements. Transmission of TB can be through germs into the air in the form of droplet nuclei when coughing or sneezing, these sparks can survive in the air at room temperature for several hours and are inhaled through the respiratory tract. This survey aims to look at the condition of the home and smoking habits in patients with MDR pulmonary TB.

Method

This survey used a cross-sectional study design, which was to observe risk factors for tuberculosis in 15 patients with MDR pulmonary TB in the same time span in patients in Undata Hospital, Palu in 2019. Data collection was done by obtaining medical record data, conducting interviews and observing site habits and conditions live patients with MDR Pulmonary TB. The TB risk factors observed included: sex, age, education level, occupation, smoking habits, housing conditions, occupancy density, and the presence of home ventilation. The collected categorical data were presented in the form of frequency and percentage.⁽⁷⁾

Findings

The results of the research conducted at the Undata Hospital, Palu from January to June 2019, the number of patients with MDR pulmonary TB was 15 patients, the following results were obtained:

Table 1. Description of risk factors for MDR Pulmonary TB

Variable	f	%
Sex		
Male	8	53.3
Female	7	46.7
Age		
Old	8	53.3
Young	7	46.7
Education		
Elementary	4	26.7
Junior high school	2	13.3
Senior high school	7	46.7
Univeristy	2	13.3
Job		
Housewife	5	33.3
Civil Cervant	4	26.7
Private sector	6	40.0
House Condition		
bad	11	73.3
good	4	26.7
Smoking Habit		
Smoking	8	53.3
Not smoking	7	46.7
Total	15	100

Patients with MDR pulmonary TB who were male were 8 patients (53.3%) while female patients were 7 (46.7%). The age of the patient is as old as 8 patients (53.3%), while in young age there are 7 patients (46.7%). The highest level of education in pulmonary TB patients is high school as many as 7 patients (46.7%) and the least amount of higher education is 2 patients (13.3%). Most MDR pulmonary TB patients have private-sector jobs as many as 6 patients (40%), Housewives 5 patients (33.3%), and PNS 4 patients (26.7%). The home conditions of MDR pulmonary TB patients were the most, namely the condition of damaged homes by 73.3% and patients who had smoking habits as many as 8 patients (53.3%). All MDR Pulmonary TB patients live in homes that are densely populated and have ventilation.

Figure 1. Risk factors for MDR Pulmonary TB

Table 2. Cross Tabulation between Home Conditions and Smoking Habits of Patients with MDR Pulmonary TB

House Condition	Smoking habit			
	Smoking		Not smoking	
	n	%	n	%
Bad	5	45.5	6	54.5
Good	3	75.0	1	25.0
Total	8	53.3	7	46.7

Patients with MDR Pulmonary TB who have damaged home conditions and have smoking habits as many as 5 patients (45.5%) compared with MDR pulmonary TB patients who have good home conditions and do not smoke as much as 1 patient (25.5%)

Discussion

TB problems in the world are caused by poverty, malnutrition, endurance, slum settlement conditions, insufficient health facilities, late or lack of TB program costs, in Indonesia it is still difficult to control because it is related to social and economic problems. TB is related to poverty and population density. Densely populated and poor areas, meetings and not meeting the requirements of healthy homes, public awareness of environmental health is less. TB events are the result of interactions between environmental components, namely air containing tuberculosis bacilli with people who have habits and smoking behavior, contacts, with TB patients, immunization history, and occupancy density and other influences such as gender, age, nutritional status, socio-economic conditions and the condition of the house, namely the floor of the house, ventilation, lighting and humidity^{(8),(9)}.

MDR pulmonary TB patients are more male than female, this is because men have a greater risk than female patients. Male patients have smoking habits compared to women, thus worsening health conditions, especially lung conditions. TB attacks many productive ages and increases mortality in the community, especially in developing countries. productive age is the age at which someone is at the stage to work/produce something both for themselves and others. MDR pulmonary TB

patients aged over 40 years, at that age if they experience pulmonary TB, they can cause unproductive individuals to become a burden on their families.

Population density is one of the risk factors for TB, the denser the house is, the more difficult and faster the transmission of diseases, especially infectious diseases through the air. If there are family members who suffer from TB with positive smear who accidentally coughs. Mycobacterium tuberculosis bacteria will remain in the air for approximately 2 hours so that it has the possibility to transmit the disease to members who have not been exposed to tuberculosis bacteria⁽¹⁰⁾. The size of the house to occupants is closely related to the incidence of pulmonary TB, the denser the occupants of the house the faster the air inside the house is contaminated. The increasing number of residents will affect the oxygen level in the room, including humidity and air temperature. Increased oxygen in the home will provide an opportunity for mycobacterium tuberculosis to multiply and support transmission between occupants and sufferers.

Some countries such as Bangladesh, Vietnam, and Thailand have different pulmonary TB notifications for men and women, this occurs because of the stigma in the disease. Women do not seek treatment in health services because they are worried about the wrong assessment from the community. Pulmonary TB occurs in men because men have a smoking habit that makes it easy to contract pulmonary TB. Smoking habits can worsen TB symptoms, as well as passive smokers who smoke cigarette smoke, it will be easier to get infected with TB germs because cigarette smoke has a negative impact on lung resistance to bacteria⁽¹¹⁾. Africa, America, Southeast Asia, and the Western Pacific, most pulmonary TB patients are over 65 years old, while in Europe most TB patients are 45-54 years old. Factors contributing to the incidence of pulmonary TB are population factors (gender, age, socio-economic conditions) and environmental factors (density, floor of the house, walls, ceiling roofs, types of building houses, and fuel used in homes).⁽¹²⁾

The home condition has a major influence on the health status of its inhabitants, tuberculosis germs can live 1-2 hours and can even live for several weeks depending on ultraviolet light, good ventilation, humidity, home temperature and density of occupants of the house⁽¹³⁾. All MDR Pulmonary TB patients have homes that are densely populated and densely populated,

even though they are equipped with ventilation, but have not fulfilled the requirements of a healthy home, so that sunlight, air circulation, and house humidity support the life and transmission of tuberculosis germs.

Healthy homes are residential buildings that meet health requirements consisting of components of the house, sanitation facilities, have healthy latrines, landfills, clean water facilities, wastewater disposal facilities, good ventilation, residential density and the floor of the house not from the ground. Home is one of the basic human needs that functions as a place to live and a means of family development. Houses with environmental conditions that do not meet health requirements are risk factors for transmission of various types of diseases, such as tuberculosis. The tuberculosis germs live in moist conditions. Home conditions that do not meet health requirements, such as lack of lighting and inadequate ventilation, make germs easy to breed. The presence of tuberculosis bacteria in the house can trigger tuberculosis infection⁽¹⁴⁾.

Population density has a positive influence on the number of tuberculosis cases, the dense condition of the population will accelerate the spread of tuberculosis bacteria, which is one of the transmission media through the air. Population density will result in poor environmental conditions, poor nutrition, and low socio-economic conditions that increase the risk of tuberculosis⁽¹⁵⁾.

Conclusions and Recommendations

Patients with MDR Pulmonary TB in Undata Hospital, Palu the majority of the male sex, old age with high school education level, have the most damaged house conditions and have smoking habits. Patients with MDR Pulmonary TB need to pay attention to the conditions of their residence, especially their homes and stop smoking.

Conflict of Interest- None

Source of Funding- Authors

Ethical Clearance- Yes

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Diode Laser & Conventional Surgery Treatment, A Comparative Study in Anal Diseases

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Abstract

Anal pain is a common complaint, mostly of benign etiology but with psychological impact & interferes with life activities. The causes of anal pain usually can be easily diagnosed & treated with over the counter pain relievers & hot water soaks.

Aim of the Study: To compare the effectiveness of treatment with laser surgery to the traditional type of surgery.

Patients & Method: A prospective study was conducted on patients admitted to Samarra General Hospital & a private hospital from first of October 2017 to thirty one of May 2018. Ninety eight patients underwent different traditional & laser surgical procedures for hemorrhoids, anal fissure & fistula in ano. Of them, 68 patients (69.3%) were males & 30 patients (30.7%) were females with age range from 20-55 years (mean age of 32 year). The patients were divided into 2 groups:

Group A (49 patients) were treated by traditional method & Group B (49 patients) were treated by laser surgery.

Results: The laser surgery was less than traditional surgery in duration of operation by 17 minutes. For the intraoperative blood loss the laser surgery was less than traditional surgery. The infection rate was 1 of 49 cases in laser surgery while it was 7 of 49 cases in traditional surgery. The healing duration in laser surgery was less than traditional surgery. Duration of return to work was 22 days & 23 days in laser & traditional surgeries respectively. Finally the pain score according to numeric pain scale was mild for laser surgery & moderate for traditional one.

Conclusion: Laser surgery was better than traditional surgery in treatment of anal disease.

Key words: Laser surgery, Diode laser surgery, conventional surgery treatment, hemorrhoid, anal fissure, Fistula in ano

Introduction

Anorectal diseases are a group of medical disorders that occur at the junction of the anal canal & the rectum, these diseases are commonly encountered in general surgical practice. Patients with diseases of the anus & rectum are some of the most miserable people in the

world. These patients are usually in pain, often anxious & frequently embarrassed by the examination. Doctors need to be reassuring & explain clearly what is to be. Anorectal diseases are common, & their prevalence in general population is probably much higher than that seen in clinical practice as most patients do not seek medical attention¹. These affect men & women of all ages. The spectrum of anorectal disorders ranges from benign & irritating (pruritis ani) to potentially life threatening (anorectal cancer). The evaluation of patients is sometimes made difficult by nonspecific symptoms². The evaluation of anorectal diseases comprises of a careful history & physical examination before the patient

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can be subjected to various investigations.

The scalpel and conventional electro-surgery unit are the instruments of choice for anorectal surgery. In addition, lasers are an alternative to conventional surgical systems. Scalpels have been used for many years because of their ease of use, accuracy, and minimal damage to the surrounding tissue. On the other hand, scalpels cannot provide the hemostasis that is helpful for use on highly vascular tissue³. One characteristic difference between a laser and scalpel cut is the generation of coagulated tissue layer along the walls of the laser incision⁴. All laser tissue interaction produce some degree of tissue vaporization and surrounding zone of thermal necrosis⁵.

This zone of thermal damage should ideally be kept to a minimum, as it may impede wound healing and graft take, and reduce tensile strength⁴. Advantages of this tool include greater precision, a relatively bloodless surgical and postsurgical course, sterilization, vaporization, and cutting, minimal or no suturing, and much less or no postsurgical pain⁶⁻⁸. The factors that determine the initial tissue effect include the laser wavelength, laser powder, the available laser waveform (continuous wave, chopped, and pulsed beams), and tissue thermal properties⁹.

Laser beams can burn or destroy healthy tissue, cause injuries that are painful and sometimes permanent. All of the above risks, precautions, and potential complications should be discussed by the doctor with the patient. The nature and severity of the problem, the skill of the surgeon performing the procedure, and the patient's general health and realistic expectations are among the factors that influence the outcome of laser surgery¹¹.

Patients and Method

A prospective study was conducted upon patients admitted into Tikrit Teaching Hospital and a private hospital from 1st of October 2013 to 31th of May 2014. Ninety eight patient underwent different traditional and laser surgical procedures for hemorrhoid, anal fissure, fistula in ano. Patients were divided randomly in to two groups: Group A (49 patients) were treated by traditional (scalpel) method, and Group B (49 patients) were treated by laser surgery. Different types of operations with different levels of complexity are done for example:

For hemorrhoids:

One pile are removed, two piles, three piles.

For anal fissure:

- Lateral internal sphincterotomy.
- anal dilation and skin tag removal.

For fistula in ano:

Fistulotomy, fistulotomy for low anal fistula and seton for high anal fistula.

All these operations are done after full preparation of the patients which include detailed history bright red painless bleeding mucus discharge, prolapse and pain. Examination and digital rectal examination (DRE), proctoscopy and sigmoidoscopy were performed. Full investigations are send (complete blood picture, renal function test, liver function test, viral cardiography for elderly patients. The operations are done under general anesthesia, spinal anesthesia, local anesthesia and the patients in the lithotomy position, patients were discharge within 4 to 12 hours, and were followed for 3 to 4 weeks for healing progress and complications.

Inclusion and exclusion criteria

Inclusion Criteria

1. Patients with hemorrhoid.
2. Patients with anal fissure.
3. Patients with fistula in ano.
4. Patients with anal fissure or fistula in ano associated with inflammatory bowel

Exclusion Criteria

1. Patients diagnosed with these diseases and associated with malignancy.

Preparation of the Diode Laser device

First, we have to check the device by observation of the continued type of electricity and the device should be loaded by load system, then when the device opened, we should put the program suitable for the type of the anal pathology. If the pathology is anal fissure or fistula we should press on the option of continues cutting as shown by program (1) and if the pathology is hemorrhoid we use either (continuous cutting) and we should ligate the pedicle with No. 0-1 vicry1, or in case of giving (impulse type) we should give each pile (7) Jull, the total power given is (21) if three piles removed which is the

maximum power you can give. Finally, the procedure is like the conventional surgery but with the use of laser instead of scalpel.

Results

In this series of 98 patients, the patients presented with hemorrhoid anal fissure, fistula in ano are operated on. The frequency distribution of cases in each group are according to gender and as shown in the table (1)

Table (1) Male and Female distribution of cases

Disease	Traditional Surgery			Laser Surgery		
	Male	Female	Total	Male	Female	Total
hemorrhoid	21	5	26	23	3	26
Anal fissure	10	6	16	6	11	17
Fistula in ano	4	3	7	4	2	6
Total	35	14	49	33	16	49

In hemorrhoid traditional surgery the range of time from (15-25) min. with mean time of surgery 20 minute while laser surgery the range of time from (12-18) min. with mean time 15 minute.

In anal fissure traditional surgery the range of time from (12-17) min. with mean time 15 minute while in laser surgery the range of time from (8-13) min. and mean time 9 minute.

In fistula in ano traditional surgery the range of time from (13-27) min. with mean time 18 minute while the laser surgery the range of time from (10-22) min. with mean time 12 minute.

Table (2) Intraoperative amount of blood loss/ ml

Disease	Traditional Surgery		Laser Surgery		Difference
	Range of blood loss	SD	Range of blood loss	SD	
hemorrhoid	(10-25) ml	20 ml	(8-17) ml	12 ml	8 ml
Anal fissure	(6-20) ml	10 ml	(4-11) ml	5 ml	5 ml
Fistula in ano	(7-20) ml	12 ml	(5-13) ml	7 ml	5 ml
Total		42 ml		24 ml	18 ml

It can noticed from table (2) the following observations:

- The amount of intraoperative blood loss was measured by weighing of the gauze. In which every 1gm= 1ml.

- In traditional hemorrhoid surgery the range of amount of blood loss from (10-25) ml, with mean amount of 20 ml. while the range of amount of blood loss from (8-17) ml with mean amount of 8ml in laser surgery.

- In traditional anal fissure surgery the range of amount of blood loss from (6-20) ml, with mean amount of 10 ml. while the range of amount of blood loss from (4-11) ml with mean amount of 5ml in laser surgery.

- In traditional fistula surgery the range of amount of blood loss from (7-20) ml, with mean amount of 12 ml. while the range of amount of blood loss from (5-13) ml with mean amount of 7ml in laser surgery.

Table (3) Rate of infection

Disease	Traditional Surgery			Laser Surgery		
	No. of infected cases	No. of operated cases	%	No. of infected cases	No. of operated cases	%
hemorrhoid	2	26	7.6	0	26	0
Anal fissure	2	16	12.55	0	17	0
Fistula in ano	3	7	42.8	1	6	16.6
Total	7	49	14.2	1	49	2.04

Figure (1) infection rate in traditional anal surgery

Figure (2) infection rate in Laser anal surgery

It can be notice from table (3) and Figure 1 and 2 the following observations:

- In traditional hemorrhoid surgery the number of infected cases were 2 of 26 (7.6%), while in laser surgery the number of infected cases were 0 of 26 (0%).
- In traditional anal fissure surgery the number of infected cases were 2 of 16 (12.55%), while in laser surgery the number of infected cases were 0 of 17 (0%).
- In traditional fistula surgery the number of infected cases were 3 of 7 (42.8%), while in laser surgery the number of infected cases were 2 of 6 (16.6%).

Finally the total number of infected cases in traditional surgery were 7 of 49 (14.2%), while the total number of infected cases in laser surgery were 1 of 49 (2.04%).

Table (4) Mean healing duration/Day

Disease	Traditional Surgery		Laser Surgery		Difference
	Range of Time	SD	Range of Time	SD	
hemorrhoid	(18-30) day	25day	(15-24) day	19day	6day
Anal fissure	(14-24) day	20day	(10-15) day	11day	9day
Fistula in ano	(14-27) day	21day	(12-18) day	14day	7day
Total		66day		44day	22day

It can be notice from table (4) the following observations:

- In traditional hemorrhoid surgery the range of healing from (18-30) day with mean time 25 day, while in laser hemorrhoid surgery the range of healing from (15-24) day with mean time 19 day.

- In traditional anal fissure surgery the range of healing from (14-24) day with mean time 25 day, while in laser anal fissure surgery the range of healing from (10-15) day with mean time 11 day.

- In traditional fistula surgery the range of healing from (14-27) day with mean time 21 day, while in laser fistula in ano surgery the range of healing from (12-18)

day with mean time 14 day.

Discussion

When the people think of surgery the first thing that comes to mind is the knife. The thought of being cut can turn many people off from getting much needed medical procedures. With the advancements in medical technology and the advent of laser surgery, more people can feel at ease when contemplating major surgery or simple cosmetic procedure. This may be used to seal off blood vessels to help reduce blood loss during surgery along with being able to help seal off infected areas. This is all done with minimal damage to the surrounding area¹².

The other advantage of laser surgery is that it may be used to seal nerve endings. This is especially helpful in reducing pain in areas that have undergone recent surgery. This makes it great alternative to pain medications and their side effects although this type of surgery is not without its own side effects¹².

There are several studies that were done for comparison between laser and traditional methods in anal diseases, but these studies are different either in laser type used such as CO₂ ⁽¹³⁾ or difference in the procedure itself ⁽¹⁴⁾. There is no similar of our work to compare with it for diode laser results, so we will compare just for traditional surgery results.

The present study revealed that total difference in duration time between the two methods was less in laser surgery by 17 minute for the three operations. The traditional surgical hemorrhoidectomy agreed with Towlait K. SM. (2012) ¹⁵.

For postoperative infection the difference was 6 patients less in diode laser surgery. Seven patients for traditional surgery (14.2%), and 1 patients for laser surgery (2.04%). The traditional hemorrhoidectomy method agreed with Uba A.F. (2004) ¹⁶. This decrease in rate of infection because production of an eschar layer¹⁷.

In our study we documented that the postoperative pain for traditional surgery was moderate according to (numeric pain scale), In our research in spite of differences that shown in duration of operation, intraoperative blood loss, wound infection rate, duration of healing, duration of return to work, and postoperative pain. The P value was more than 0.05 by SD.

By the analysis of our work we have found that the cause of being (not significant) because:-

1. Small sample size selection in comparison to this common conditions, because of short time for collection of data.

2. We compare the two procedure with three type of disease so the results more sub-divided that lead to be not significant.

3. In spite of decrease in blood loss with the laser surgery, the blood loss in traditional surgery is not large amount (collected procedure), so the difference is not sufficient to make the amount significant in this study.

4. In spite of the difference in the results of healing time and time to return to work but the small sample size and multiple diseases lead to be not significant.

5. As we mentioned, the postoperative pain is subjective experience, and measured by numeric pain score, so it was not examined by SD.

Conclusions

1. Decrease in duration of operation that is important for the patient and surgeon, which is also important in decreasing of time exposure to anesthesia.

2. In spite of small amount of blood loss in these operations the laser made it almost bloodless field.

3. The postoperative pain is very important for the patients, which also decrease the need for postoperative analgesia.

4. Decreasing the postoperative infection rate is very important for the patient early healing, early return to work and economically very effective.

Conflict of Interest - (nil – There are “No Conflict of Interest”).

Source of Funding - By all

Ethical Clearance: Committee members are approved to perform a study about:

“Diode laser & conventional surgery treatment, a comparative study in anal diseases”

After discussion of study plan with researchers:

Researchers:

1. Dr. Basim Ghaib Hussein
2. Dr. Jameel I. Azzawi
3. Dr. Rabah Ali Hussein

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Hypertension Control in Diabetic Patients

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Abstract

Background: Diabetes mellitus is one of the commonest diseases world wide and can cause multi-systemic complications, hypertension can co-exist with diabetes and predispose to diabetes complications, both micro and macro-vascular.

Objectives: The objectives of this study are to assess the incidence of hypertension in diabetic patients and whether they are controlled or not.

Subjects and Method: This is a community-based descriptive cross-sectional study done in Azadi teaching hospital in Kirkuk city from the period of September 2014 until February 2016, 240 diabetic patients were collected using a questionnaire, containing details of his condition.

Results: The study had showed that in which 57% of patients were with high blood pressure, 32% with normal blood pressure and 11% with low blood pressure, most of the hypertensive patients were uncontrolled, and most of the diabetic patients were non-smokers and 55% of them were with non-sedentary life style, but the majority of them were overweight and obese.

Conclusions: The study agrees with a lot of studies that hypertension is more common in diabetic patients, especially in those who are obese and smokers and most of them are uncontrolled hypertensive.

Key Words: *Diabetes mellitus, hypertension, smoking, BMI*

Introduction

Diabetes mellitus is one of the most common a clinical syndromes in which hyperglycaemia happens as a result of absolute or relative deficiency of insulin. Carbohydrate, protein and fat, water and electrolyte metabolism all are affected due to insulin deficiency. Functional and structural changes in many organs particularly those of the vascular system, which lead to the clinical complications of diabetes. These characteristically affects the nervous system, the eye, vascular system and kidney.⁽¹⁾

There are two main types of diabetes mellitus, type 1, occur as a result of extensive damage to pancreatic

beta-cells and will affect the pancreatic insulin secretory capacity and the patient will depend on exogenous insulin. Type 2, which is much more common than type 1, there is some endogenous insulin secretory capacity; however their insulin secretion levels are low relative to their ambient glucose levels and magnitude of insulin resistance.⁽²⁾

Many factors contribute to the diabetes mellitus complication, e.g : diabetes control, smoking, hypertension.

Hypertension is a condition in which arterial blood pressure is chronically elevated. Blood pressure occurs within continues range ,so cut off levels are defined according to their effect on patients' risk.⁽³⁾

Diabetes mellitus and hypertension are interrelated diseases that strongly predispose an individual to atherosclerotic cardiovascular disease. Hypertension is about twice as frequent in individuals with diabetes as in

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those without.(4)

Hypertension and diabetes are a critical combination for the development of both micro- and macro vascular disease.

Cardiovascular diseases is the major cause of mortality in diabetes mellitus. (4)

The prevalence of coexisting hypertension and diabetes appears to be increasing in industrialized nations because populations are aging and both hypertension and NIDDM incidence increases with age. (5)

An estimated 35% to 75% of diabetic cardiovascular and renal complications can be attributed to hypertension. For all these reasons, hypertension and diabetes should be recognized and treated early and aggressively. (1)

Subjects and Methods

This is a community-based descriptive cross-sectional study done in Azadi teaching hospital in Kirkuk city from the period of September 2014 until February 2016.

Data were collected from total number of 240 diabetic patients using structured questionnaires; the questionnaires were prepared in English and local languages questions were prepared (Arabic, Kurdish and Turkish).

The questionnaire contains important questions, type of diabetes, type of treatment, duration of diabetes, his diabetes is controlled or not, whether he is hypertensive or not, type of treatment, smoking history, sedentary lifestyle, body mass index (BMI) was measured for each patient.

Hypertension in diabetic patients was confirmed if systolic BP was equal or more than 130 mmHg and or diastolic BP equal or more than 80 mmHg on 2 occasions separated by at least 1 day or more, or on medications for hypertension.

Results

The study ended by collecting information from 240 patients have diabetes mellitus with its both types, 57% of which were females and 43% were males and the age for them was above 61 years old with a percentage of 42% of complete 240 patients.

Most of them (43%) had gained diabetes since 5 years ago, 23% were diabetic since 5-10 years, 22% since 10-15 years, and 12% were diabetic since >15 years.

90% of the patients are type two diabetes mellitus. the large population of them 73% are not controlling their diabetes also 54% of them don't have a family history of the disease.

Blood pressure measurements of the diabetic patients showed that 57% of them were with high blood pressure, 32% with normal blood pressure, and 11% with low blood pressure.

Table 1 shows the Distribution of study subjects according to age and diabetic patient with hypertension, diabetic patients < 30 years old were 6, non of them were hypertensive, patients aged (31-40): 9, 3 patients hypertensive, patients aged (41-50): 39, 16 patients were hypertensive, patients aged (51-60): 86, 40 patients were hypertensive, patients aged > 60 years old : 100, 70 patients were hypertensive.

Table 2 shows the distribution of study subjects according to hypertension and blood pressure measurement, high blood pressure was recorded in 83 patients (from total 128) of those who have diabetes and hypertension, and in 24 patients (from total 112) who have diabetes without hypertension.

206 patients (86%) were nonsmokers and 34 (14%) were smokers, 108 patients (45%) were with sedentary lifestyle and 132 (55%) with non sedentary life style.

The percentage of patients with controlled DM : 66 (27%) and uncontrolled DM : 173 (73%).

The ratio between the diabetic patients who are hypertensive : 129 (54%) and the others who don't : 111 (46%).

66 DM patients were controlled, in which 32 of them were hypertensive and 34 not hypertensive. 174 patients were uncontrolled DM, in which 97 were hypertensive and 77 not hypertensive.

According to these findings, relation between diabetic patients with or without hypertension and control of diabetes is not significant. Chi square =0.971, d.f=2, p>0.05

Table 4 shows the Distribution of study subjects according to hypertension and body mass index (BMI) measurements, low BMI (< 18.5) only 2 patients, both of them were just diabetic without hypertension.

Normal BMI (18.5 – 25), 48 patients, 20 of them were diabetics and hypertensives and 28 were just diabetics without hypertension.

Overweight (BMI 25 – 30), 90 patients, 49 were diabetic and hypertensives and 41 just diabetic without hypertension.

Obese (BMI > 30), 100 patients, 61 were diabetic and hypertensives and 39 just diabetic without hypertension.

Table 1 shows the Distribution of study subjects according to age and diabetic patient with hypertension.

Age	Diabetic & hypertensive	Diabetic only	Total
<31	0	6	6
31-40	3	6	9
41-50	16	23	39
51-60	40	46	86
>61	70	30	100
Total	129	111	240

Chi square =23.19 d.f=4

P<0.05

Table 2: shows the Distribution of study subjects according to hypertension and blood pressure measurements.

	Low	Normal	High	Total
Diabetic+hypertensive	2	43	83	128
diabetic only	20	68	24	112
total	22	111	107	240

Chi square =52.01

d.f=2

p<0.05

Table 3: shows the Distribution of study subjects according to hypertension and sedentary lifestyle

	Sedentary life style	Non sedentary life style	Total
Diabetic + hypertensive	64	65	129
Diabetic only	70	41	111
Total	134	106	240

According to the table relation between diabetic patients with or without hypertension and sedentary life style is significant.

Chi square =4.2 , d.f=1 , p<0.05

Table 4: shows the Distribution of study subjects according to hypertension and body mass index measurements.

Body mass index	Diabetic and hypertensive	Only diabetic	Total
Low BMI <18.5	0	2	2
Normal BMI 18-25	20	28	48
Overweighed >25	49	41	90
Obese >30	61	39	100
total	130	110	240

According to the table relation between diabetic patients with or without hypertension and body mass index is not significant.

Chi square =7.17

d.f=3

p>0.05

Discussion

As diabetes mellitus is a common metabolic disease and can cause multi-systemic complications, an important factor that can precipitate diabetes complications is hypertension. ⁽⁶⁾

This study has found that hypertension was more common in diabetic patients (p <0.05) especially in old age diabetics (>60 years).(6,7,8,9,10)

Most of the diabetic patients had uncontrolled hypertension (57%), just 32% had controlled blood pressure, (8, 9)

As there are a lot of factors that can predispose to hypertension like smoking and sedentary life style and obesity so these important factors were screened in this study, 86% were non-smoker and 14% smoker, 45% were with sedentary life style and 55% with non sedentary life style. ^(11,12,13,14,15)

Of the 100 obese diabetic patients 61 were hypertensive and 90 patients were overweight of which 49 were hypertensive. ^(12,13,14)

Of the 129 diabetic and hypertensive patients, only 32 (27%) were controlled hypertensive and 97 (73%) were uncontrolled hypertensive.(16,17,18,19,20)

Hypertension was more common in diabetic patients, 129 (54%) diabetic patients were hypertensive and 111 (46%) were non-hypertensive. ^(21,22,23)

Conclusion

Hypertension is more common diabetic patients especially in old aged patients (> 60 years old), and most of the diabetics have uncontrolled high blood pressure.

Factors, such as: smoking, sedentary life style and obesity can all predispose diabetic patients to hypertension.

Recommendations:

Early diagnosis of hypertension and proper treatment with good control to reach ideal blood pressure in diabetic patients.

Educating diabetic patients to avoid smoking and sedentary life style, encouraging them to have regular exercise and eating healthy diet rich in fibers appropriate for diabetes, and have ideal body weight, as this can decrease risk of obesity which is also important risk factor for hypertension.

Avoid alcohol or advise patients to limit alcohol intake to a maximum of two standard drinks per day (men) or one standard drink per day (women) and have at least two alcohol-free days per week.

Ethical Clearance: Official agreement were obtained from the local ethical committee of

Kirkuk health directorate. Informed signed consent was obtained from each participant, data of the patients were collected in accordance with World Medical Association declaration of Helsinki, 2013 as a statement of ethical principles for medical research involving human.

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The importance of Post-Mortem Computed Tomography (PMCT) as a Complementary Diagnostic Technique to Traditional Autopsy in a Case of Asphyxia Related-Death

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Abstract

Although asphyxia related-death is a common occurrence in forensic setting, traditional autopsy with neck dissection is not always sufficient to gain information about potential injuries of the deep structures of the neck.

In this case a 40 years-old white female was found unresponsive on the floor of her living room, in supine position with a widespread brownish area on her neck.

A preliminary PMCT examination showed a fracture line within the hyoid bone.

This finding was confirmed by the autopsy, which revealed soft tissue's haemorrhage of the sternocleidomastoid and sternohyoid muscles and a fracture of the right horn of the hyoid bone.

A 3D reconstruction of the event showed the aggressor standing behind the victim while holding his arm around her neck.

Our study demonstrates that, PMCT represent an effective aid to traditional examination techniques in order to visualize fractures. The former always requires to be associated with autoptic examination.

Keywords: *asphyxia, CT, autopsy, legal medicine, forensic medicine*

Introduction

Asphyxia related-death is a common occurrence in forensic setting. Indeed, this event can be related to suicide, homicide and accident.

Traditional neck dissection is not always sufficient to gain information about potential injuries of the deep structures of the neck¹.

Moreover, in these forensic cases, the external and internal examination aren't useful to obtain any sign which could help to distinguish between different mechanism of asphyctic death.

Since imaging could be better than autopsy in detecting some fractures, intracranial pathologies, and pneumothorax, the introduction of the post-mortem CT (PMCT) has given a great contribute to the field of postmortem diagnostics (e.g. gunshot wounds², sharp and blunt forces, etc.)^{3,4}. Because imaging alone cannot diagnose biochemical and toxicological causes, this technique should always be associated with a traditional post-mortem examination^{5,6}.

In particular, PMCT with 3D documentation can be very helpful in revealing injuries on the small structures of the neck, that can be masked by soft tissues and

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surrounding bleedings and provides a useful guide for the pathologist in order to choose the right dissecting technique and avoid artifacts or iatrogenic injury to delicate structures, such as hyoid bone or thyroid cartilage¹.

Case Presentation

A 40 years-old white female was found unresponsive on the floor of her living room, in supine position. On the neck there was a widespread brownish area, that was more evident on the right side. During the investigation no mean was found that what compatible with an asphyxia dynamic.

Preliminary to the autopsy examination a PMCT was carried out. The 3D reconstructions were rendered using the software OsiriX® on a MacOSX® device. The CT was able to identify different features such as: fracture of the right horn of the hyoid bone with the fracture line running oblique. (Fig. 1).

External examination was carried out showing a well-developed body in an early stage of decomposition

(initial skin marbling).

Multiple lesions were found on different sites of the body surface consistent with blunt-force injuries.

Afterwards at the internal examination, a hemorrhage was revealed at the opening of the neck soft tissues. This infiltration was located on the right sternocleidomastoid muscle and right sternohyoid muscle. Neck *in situ* dissection, as previously detected by the post-mortem CT, showed a fracture of the right horn of the hyoid bone (Fig.2). Further investigations were conducted, comprehensive of histological and toxicological analysis. Whereas histological hyoid's bone specimens highlighted the presence of several markers of vitality, toxicological ones were negative. All these findings were consistent with an asphyxia-related death.

According to these evidences, a 3D reconstruction of the event was performed using the Poser Debut Software. It showed the aggressor standing behind the victim and holding his arm around the victim's neck (Fig.3). After the autopsy, this reconstruction was confirmed by the victim's husband (the aggressor).

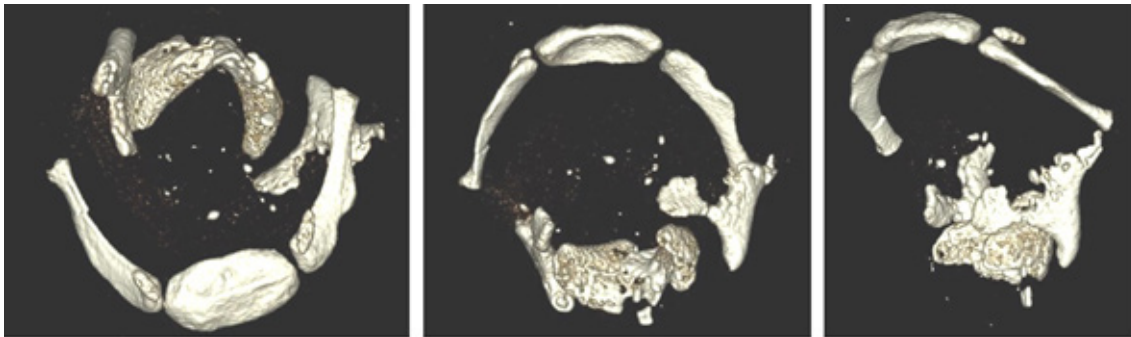


Fig.1: PMCT reconstruction: hyoid fracture was detectable on the right horn with the fracture line running oblique.



Fig.2: Fracture of the right horn of the hyoid bone after layered *in situ* dissection of the neck structures.



Fig. 3: PMCT 3D reconstruction, using the Poser Debut Software, showed that the aggressor was standing behind the victim while holding his arm around the victim's neck.

Discussion

In forensic medicine, the term asphyxia describes a situation where there has been a physical obstruction between the mouth and nose to the alveoli, although other 'asphyxial mechanisms' exist, in which there is an inability to utilize oxygen at the cellular level without any physical airway obstruction⁷. Until this day, it has been proved that asphyxias' classification and the definition of various sub-types is not uniform⁸. Asphyxial deaths can be grouped into three categories: suffocation, strangulation and chemical asphyxia. These deaths might be accidental, suicidal or homicidal in manner.

Strangulation is a form of asphyxia which is caused from constriction of the blood vessels and the airways in the neck^{9,10}. Furthermore, according to the literature, strangulation can be classified as ligature strangulation (garroting) or manual strangulation (throttling) based on the mechanism used to commit it^{11,12}.

Manual strangulation is produced by pressure of the hand, forearm, or other limb against the neck, compressing the internal structures of the neck. The death is due to the occlusion of the blood vessels

supplying blood to the brain whereas occlusion of the airway plays a minor role in causing death. Virtually, all cases of manual strangulation are homicide¹³. In the forensic practice, autopsy with dissection of the larynx is the gold-standard to evaluate the presence of specific injuries, which are associated with strangulation. Nevertheless, such features are not always detectable at autopsy¹⁴.

PMCT is routinely used in forensic death investigations but its role is often limited to the assessment of skeletal injury, gas collections and foreign bodies^{15,16}. Thus, an imaging technique such as post-mortem TC could be useful to display characteristic findings, including a ligature mark, deviation of the hyoid bone, fracture of the hyoid bone, and fracture of the superior horn of the thyroid cartilage. Even though PMCT may not detect soft tissue injuries in decomposed remains or subtle internal hemorrhages in neck injury, it is more sensitive than autopsy in detecting subtle fractures¹⁷.

Moreover, the radiological documentation acquired before the autopsy allows the pathologist to choose the right dissecting technique and avoid artifacts or

iatrogenic injury to delicate structures, such as hyoid bone or thyroid cartilage¹⁸.

Conclusions

Our study demonstrates that, in the evaluation of strangulation deaths, PMCT is able to elucidate the essential internal injuries of the bony neck structures and may be equivalent to autopsy-only examinations in the detection of small and difficult to visualize fractures.

In this context, it is of utmost importance for forensic radiologists and forensic pathologists to know how to interpret discrepancies between PMCT and forensic autopsy. The judgment of discrepancies between PMCT and autopsy may influence the interpretation of relevant forensic findings, especially in case of medical liability¹⁹ and when a forensic case is issued in court.

Nevertheless, PMCT should not be performed alone. In fact, since PMCT remains only a support for forensic medicine practice, it always requires to be associated with autoptic examination.

Specifically, results from our experience and scientific evidence, suggest that PMCT scanning should be proposed in all cases of suspected asphyxia, as the screening approach of first instance to obtain preliminary information useful to rapidly develop the successive autopsy procedure, but it cannot represent an alternative way to the usual autopsy examination²⁰.

Ethical Clearance: Taken from Sapienza University of Rome Ethical Committee

Source of Funding: Self

Conflict of Interest: Nil

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The Effect of Soot Particulate towards MAPK Expression in the Mechanism of Cardiovascular System Disruption

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Abstract

Background: Air pollution is associated with cardiovascular morbidity and mortality. An oxidative stress arising from particulate matter has been shown to activate a number of redox responsive signaling pathways in target cells. This pathway is involved in gene expression that plays a role in the response to inflammation and pathological changes including the expression of mitogen-activated protein kinase (MAPK).

Objective: To describe the effect of soot particulate exposure towards MAPK expression in the mechanism of cardiovascular disruption.

Design: This research was an experimental research by using “post test only control group design” approach.

Subjects: The experiment was conducted in laboratory female rats (*Rattus novergicus*) and consisted of 3 groups:

Methods: Control group -exposed by soot particulate with the concentration of 532 mg/m³ an hour each day for 30 days, without soot particulate exposure- (n=10); Treatment 1 group (n=2); Treatment 2 group -exposed by soot particulate with the concentration of 1064 mg/m³ an hour each day for 30 days- (n=12).

Results: The soot particulate significantly induced an increase in MAPK expression in the treatment 1 group (the number of immunoreactive cells: 51 (31-216) vs 2 (0-50), p=0.001; immunoreactive score (IRS) index: 2 (1-4) vs 1 (0-2), p=0.048) and in treatment 2 group (the number of immunoreactive cells: 73 (17-203) vs 2 (0-50), p=0.000; IRS: 2 (1-4) vs 1 (0-2), p=0.01) compared to control group. There was a significant increase in MAPK expression which was measured from the total number of immunoreactive cells in Treatment 1 (p=0.001) and Treatment 2 group (p=0.000) compared to Control group.

Conclusion: The Exposure to soot particulates significantly increased MAPK expression in experimental rats.

Keywords: soot particulate, mitogen-activated protein kinase (MAPK), oxidative stress, air pollution

Background

The particulate material in the air comprises a heterogeneous mixture of suspended solid and liquid

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particles. These particulate material has various sizes and chemical compositions. The primary particles are released directly into the air like soot from a diesel engine ⁽¹⁾. The secondary particles are created through the psychochemical transformation of gases such as the formation of nitrate and sulfate from nitric acid gas and sulfur dioxide (SO₂) ⁽²⁾. Sources of particulate materials can be natural and man-made including motor vehicle emissions, tire fragmentation and resuspension of road dust, power plants and other combustion industries, smelting and processing of metals, agriculture, construction and combustion activities, household

wood burning, pollen, forest fires and agricultural waste, volcanic emissions and etc ⁽³⁾. Although there are thousands of chemicals that have been detected in particulate matter in different locations, there are more commonly found compositions such as nitric, sulfuric, carbon and organic carbon materials, organic compounds, biological compounds and various metals (for instance iron, copper, nickel, zinc, and vanadium) ⁽⁴⁾.

Soot is a carbon element (C) combustion product of an imperfect hydrocarbon. The perfect combustion will only produce water and carbon dioxide. Carbon is a chemical element which has the following characteristics: has atomic number 6, atomic mass 12.0107 nanomoles, classified as non metal with hexagonal chemical structure. Carbon has 6 electrons, 6 protons with isotope C-11, C-12, C-13, C14, C-15 and formed in combustion with low oxygen level. The sources of the soot producers are from inside and outside the room. The use of firewood as a fuel also produces considerable soot ⁽⁵⁾.

The soot exposure derived from the remnants of combustion products can affect health through various mechanisms. One of the mechanisms suspected to play a role is the occurrence of oxidative stress resulting in increased reactive oxygen species (ROS) or free radicals in the body. Soot exposure stimulates the release of inflammatory cytokines in addition to macrophages and leukocytes. The stimulation of soot to produce cytokines is associated with the activation of mitogen-activated protein kinase (MAPK) in cells which responds to inflammation ⁽⁶⁾. The occurrence of activation of MAPK will trigger the release of proinflammatory cytokines which will eventually result in extensive tissue damage in blood vessels. This condition can cause disruption of

the cardiovascular system ⁽⁷⁾.

Based on the elaboration above, the researchers are encouraged to conduct further studies in the effect of exposure to air pollutant particles, especially soot particulate on MAPK expression in the cardiovascular system through an experimental study using experimental rats.

Method

The experimental unit of this study was female white rats (*Rattus novergicus*) which fulfilled the research criteria of female rats (*Rattus novergicus*), aged 4 months (16 weeks), weight 100-200 grams, and healthy. The research was conducted at Biochemical Laboratory of Faculty of Medicine, Universitas Airlangga and Department of Veterinary Anatomy Faculty of Veterinary Medicine, Universitas Airlangga.

This research was an experimental research by using “post test only control group design” approach. It was conducted for 6 months with the stages included: giving particulate exposure for 30 days, laboratory animal surgery after the treatment, MAPK expression examination with immunohistochemical methods ⁽⁸⁾. The study protocol was approved by the Ethical Commission of Dr. Soetomo General Hospital Surabaya. The primary data which were immunoreactive cell quantities were tested for data distribution using Shapiro-Wilk test or One Way ANOVA parametric statistical test, followed by Post Hoc (Tukey HSD) statistical test. On the other hand, the abnormal data was examined by non-parametric statistical Kruskal-Wallis test and followed by Mann-Whitney U statistical test. The data analysis was processed by using SPSS software version 20 (SPSS, Inc., Chicago, IL) ⁽⁹⁾.

Results

Tabel. 1 The total number of immunoreactive cells

	Control n = 10	Treatment 1 (T1) n = 12	Treatment 2 (T2) n = 12
The Total Number of Immunoreactive Cells	8.20±15.25	77.08±79.63	83 . 33±59.40
The IRS index	1.10± 0.738	1.83±0.835	2 .33±1.073

Table above shows that there were two data of MAPK expression on rats' heart tissue examined with immunohistochemical technique which were: 1. The total number of immunoreactive cells in five fields of view in the form of ratio data, 2. The immunoreactive cell assessed with immunoreactive score (IRS) index in the form of ordinal data. The measurement results

of the average number of immunoreactive cells in the Control, Treatment 1 and Treatment 2 groups showed differences among groups [2 (0-50), 51 (3-216) , 83 (17-203)]. This immunoreactive score (IRS) index or Remmele scale was the result of multiplication between immunoreactive cell percentage score and color intensity score in immunoreactive cell ($\Sigma = A \times B$), with the score of 0-12.

Table 2. The Evaluation of MAPK Expression Using the Semi-quantitative Scale of according to Remmele and Stegner

	A (Percentage of positive cells)	B (Color reaction intensity)
Score 0	: No cells with positive reaction	No color reaction
Score 1	: ≤ 10% cells with positive reaction	low color reaction intensity
Score 2	: 11 – 50 % cells with positive reaction	Medium color reaction intensity
Score 3	: 51 – 80 % cells with positive reaction	Strong color reaction intensity
Score 4	: > 80% cells with positive reaction	

Table 2 shows that the brighter color reaction, the higher the score. When cells with positive reaction surpassed more than 80%, the color will be strong to indicate the level of positive reaction.

Table 3 The results of the number of immunoreactive cells and MAPK expression (IRS index) using Mann-Whitney test

	Control-Treatment 1	Control-Treatment 2	Treatment 1-Treatment 2
The results of the number of immunoreactive cells using Mann-Whitney test	0.001	0.000	0.507
The results of MAPK expression (IRS index) using Mann-Whitney test	0.048	0.010	0.217

The data in table 3 above is analyzed using Mann-Whitney test. There was a significant difference in the number of immunoreactive cells between control group and Treatment 1 (p = 0.001), and between control group and Treatment 2 (p = 0.000). However, there was no significant difference between treatment group 1 and Treatment 2 (p = 0.507) (table 3). The data analysis was

continued by using Mann-Whitney test. There was a significant difference in the MAPK expression between control group and Treatment 1 (p=0.048), and between control group and Treatment 2 (p = 0.010). However, there was no significant difference between treatment group 1 and Treatment 2 (p = 0.217).

Table 4. The results of Kruskal-Wallis test from the number of immunoreactive cells and MAPK expression (IRS index)

	Chi-Square	df	Asymp. Sig.
The results of Kruskal-Wallis test from the number of immunoreactive cells	15.849	2	0.000
The results of Kruskal-Wallis test in MAPK expression (IRS index)	8.003	2	0.018

Table 4 above shows that the total number of immunoreactive cells in five fields of view was a numerical variable; thus, the normality test was performed. The normality test used was the Shapiro-Wilk test because the number of samples in all three groups <50. The result showed that immunoreactive cell data had abnormal distribution ($p < 0.05$); therefore, the transformation and normality test were re-performed. The Normality test also showed abnormal distribution ($p < 0.05$) so that for analysis of difference of mean number of immunoreactive cell between group used Kruskal-Wallis test. There was a significant difference of the average number of immunoreactive cells among groups with the significance value of $p=0.000$.

The MAPK expression which was assessed by IRS index was in a form of ordinal data; therefore, the normality test was not performed. The data analysis applied was non parametric statistic Kruskal-Wallis test. There was a significant difference of MAPK expression among groups with significance value $p = 0.018$.

Discussion

The current evidence suggests that particulate matter (PM) has oxidative properties and induces oxidation-dependent changes in inflammatory cells, such as alveolar macrophages, which are involved in the formation of ROS. The continuous formation of ROS results in oxidative damage towards cellular components and can alter its function. Oxidative stress induced through translocated particulates or released materials has atherogenic effects directly ⁽¹⁰⁾.

These effects include the oxidation of lipoproteins, which are involved in the process of atherosclerosis. The oxidative stress in blood vessel walls can disrupt endothelial function through the consumption of nitric oxide (NO) or cofactors. The oxidation and nitration of

proteins and DNA are also associated with the progression of atherosclerosis ⁽¹¹⁾. The phagocytosis of air suspended particles activates the transduction pathway that triggers the MAPK cascade and the transcription factors. The exposure to particulate materials will activate Jun N-Terminal Kinase (JNK) and p38 MAPK on different cells. Exposure to bronchial epithelial cells by diesel exhaust particle (DEP) will activate JNK and IL-8 production induced by p38 MAPK ⁽¹²⁾.

The activation of p38 MAPK will cause the activation of NF- κ B. JNK MAPK is often involved in c-Jun phosphorylation and subsequent activation of the AP-1 transcription factor. Another study reported that the activation of these transcription factors (NF- κ B and AP-1) occurred after the exposure to airborne particles. NF- κ B is a major transcription factor that controls apoptotic processes and regulates the transcription of various gene products ⁽¹³⁾. Thurston on his research (2008) shows that inhalation of PM2.5 in rats caused the upregulation of several NF- κ B-mediated genes, including TNF- α , IL-6, and transforming growth factor β (TGF- β). Ultrafine carbon black (a compound of the PM10 ultrafine fraction) will induce greater oxidative stress in lung cells than fine carbon and can stimulate transcriptional activation of NF- κ B21. Pourazar et al. in his study showed that high-dose DEP exposure (high doses (300 μ g / m³ for 1 hour) can activate both NF- κ B and AP-1. In the most recent study, DEP exposure increased EGF-R expression and phosphorylation of tyrosine residues (Tyr 1173), activated JNK, AP-1, p38 MAPK, NF- κ B pathways and downstream signals as well as stimulated cytokine production ⁽¹⁴⁾.

In this study, there was a significant increase in MAPK expression which was measured from the number of immunoreactive cells in Treatment 1 group ($p=0.001$) and Treatment 2 group ($p=0,000$) compared to Control group. This finding is in accordance with

previous research data that particulate matter has the ability to generate oxidative stress and activate the MAPK cascade. The analysis of MAPK expression between treatment group 1 and treatment 2 showed no significant difference ($p = 0,507$).

The measurement of MAPK expression based on the IRS index also obtained similar results. There was a significant increase in MAPK expression in the Treatment 1 group ($p = 0.048$) and Treatment 2 ($p = 0.01$) compared to the control group. However, there was no significant difference between treatment group 1 and 2 ($p = 0.217$). Thus, there was a significant increase in MAPK expression in the Treatment 1 and Treatment 2 groups compared to Control group based on the number of immunoreactive cells as well as the IRS index⁽⁷⁾. The results of this study are in accordance with the previous studies. These findings support the hypothesis that exposure to soot particulates can increase MAPK expression in the mechanism of cardiovascular disruption⁽⁶⁾.

An interesting result was obtained between the Treatment 1 and Treatment 2 groups that showed an insignificant difference based on the number of immunoreactive cells and the IRS index. This was likely due to an increase in non-linear MAPK expression with an increased dose of soot particulate exposure⁽¹⁵⁾. Another possibility is that it took longer exposure time to elicit a significant difference MAPK expression at the dose of exposure to particulate substance as in this study. Therefore, a further study is required to be conducted with various exposure dosage and exposure time of particulate materials.

Conclusion

Based on data analysis, there was a significant increase of MAPK expression in rats' heart tissue as the result of exposure to soot particulate. However, this increase in MAPK expression was not linear with an increased dose of exposure to the given particulate material. These findings suggest the possibility of an important role of oxidative stress and pro-inflammatory line activation as a response to soot particulate exposure. The findings in our study are important in explaining how particulate matter, especially soot, can contribute to cardiovascular cases.

Ethical Clearance: The research process involves animals as subject of research that was accordant with the ethical research principle based on the regulation of

research ethic committee. The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, nonmaleficence, and justice.

Conflict of Interest: There is no report of conflict of interest involved with this study so far.

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Synergy of Government and Regional Government Authority in Providing Health Guarantee for Communities in Indonesia

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Abstract

The main idea of the government was to form a special institution to handle social security for the community in 2004, which was through the Social Security System Act. With the provisions of this law, in 2011, the Republic of Indonesia Law No. 24 of 2011 concerning the Social Security Organizing Agency (BPJS) and implementing regulations. On another aspect, the social security system is certainly difficult to implement if the system is not integrated between the central government and regional governments. With an integrated system, a social security system in the health sector will be built, this is in line with Law No. 23 of 2014 concerning Regional Government, where one of the concurrent affairs in the health sector. The purpose of this research is to analyze the synergy of the authority of the government and regional governments in implementing social security in the health sector by using qualitative methods and normative juridical approaches.

Keywords: *Health Insurance, Synergy, Government*

Introduction

Social and economic development as one of the implementation of national development policies has produced a lot of progress, including increasing the welfare of the people. The welfare must be enjoyed sustainably, fairly and equally to reach all people. ⁽¹⁾ In opening the 1945 Constitution of the Republic of Indonesia it was mandated that the aim of the state was to improve the welfare of the people. In the Fourth Amendment to the 1945 Constitution of the Republic of Indonesia, the objective was further emphasized by developing a social security system for the welfare of all people. ⁽²⁾ One form of social security provided in the health sector.

In order to improve health protection for the people of Indonesia, it is necessary to review the health service system, where health services are a mandatory part of responsibility Country given to the community. Health service is one of the fundamental rights of the

community whose provision must be carried out by the government as mandated in the 1945 Constitution article 28 H paragraph (1) Every person has the right to live in physical and spiritual prosperity, to live and have a good and healthy living environment and has the right to receive health services. Service is an activity that is invisible (cannot be touched) that occurs as a result of interactions between consumers and caricatures or other things provided by service providers that are intended to solve the problems of consumers or customers. ⁽³⁾ In the administration of government, which is based on the provisions of Law No. 21, 2014 regarding Regional Government, in general, the administration of health in the field of health is carried out jointly between the government and regional government, then jointly between the government and regional government, making the obligation for the government and local governments to fulfill the health of every citizen, especially for the poor.

In the provisions of Chapter II Determination of Criteria and Data Collection of the Poor and Poor People.

Section 2:

(1) The criteria for the poor and disadvantaged are determined by the Minister after coordinating with the

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minister and / or leaders of the relevant institutions.

(2) Criteria for the Poor and Poor People as referred to in paragraph (1) shall be the basis for the institutions conducting government affairs in the field of statistics to conduct data collection.”

Section 3

“The results of the data collection of the poor and disadvantaged people carried out by institutions that carry out government affairs in the field of statistics are verified and validated by the Minister to be integrated data.”

With an integrated system, it is expected that the management of the health service system can be carried out significantly by the State.

Research Methodology

In research, the object of research is one of the instruments that needs to be the basis for efforts to determine the research method to be carried out by a researcher. In general, the research method used is doctrinal with normative juridical approaches.

Findings and Discussion

Fulfillment of the constitutional rights of every State in the field of health is an attempt by the State to carry out its obligations. Law Number 24 of 2011 which stipulates that social security is administered by the Social Security Assistance Agency (BPJS) consisting of BPJS Health, which is implemented from January 1, 2014, the National Health Insurance (JKN) as a health insurance system for all Indonesian citizens is carried out throughout health service agents ranging from hospitals to puskesmas aimed at all levels of society.⁽⁴⁾ With this institution, it is expected to be able to provide maximum health services to the community,⁽⁵⁾ so that the level of community welfare can be achieved.

The existence of BPJS Health as an Implementing Body is a public legal entity formed to organize a health insurance program for all Indonesians. The purpose of the implementation of the National Health Insurance program is to meet the proper public health needs provided to everyone who has paid contributions or whose contributions have been paid by the Government. With the Law No. 40 of 2004 concerning the National Social Security System, in 2011 PT Askes (Persero) was officially appointed as the Health Social Security

Administering Board (BPJS) which covers the health insurance of all Indonesians as stipulated in Law No. 24 of 2011 concerning BPJS. The National Health Insurance Program (JKN) organized by BPJS Health has started to be implemented since January 1, 2014.⁽⁶⁾ This period is the period of integration of the health system in Indonesia organized by the government through the Social Security Management Agency (BPJS) and the Regional Government through its Regional Stuan Organization Organization, namely the Health Office.

In the period of 2015 the implementation of the National Health Insurance Program in Indonesia has been carried out, but for 1 Year 3 months the implementation of JKN there are still a lot of homework that must continue to be addressed by the government and all parties involved. To achieve the National Social Health Insurance (JKSN / AKN) for all residents a comprehensive mapping is needed covering aspects of regulation, membership, health services, benefit packages, service networks, funding, management, and other resources. In the end, the progress of the JKN program will highly depend on public confidence in the performance of the BPJS as the main implementer of the JKN program. Complaints from participants, doctors, and other health facilities must also be accommodated.⁽⁶⁾ By accommodating the interests of all, it is expected to be able to provide health services based on public service standards and synergize government and local government policies.⁽⁷⁾

Law No. 40 of 2004 concerning the National Social Security System (SJSN) is the effort of the Republic of Indonesia in the field of legislation in ensuring the fulfillment of the right to health for the entire population. The law states that the government is responsible for the availability of services, the availability of access to both facilities and information, the availability of equal resources, and the seeking of feasibility and affordability in the health sector. Furthermore, the government is also responsible for administering health insurance through the national social health insurance system for each of its citizens. Sustainability of Law No. 40 of 2004 concerning SJSN is the issuance of Law of the Republic of Indonesia No. 24 of 2011 concerning the Social Security Organizing Agency (BPJS). The law explains BPJS consists of BPJS Health and BPJS Employment. BPJS Health is a government policy program to organize National Health Insurance. BPJS Health has been implemented since January 1, 2014. In the implementation of the BPJS program, there are many

obstacles faced by one of them the potential funding deficit which increases every year. Based on data from the Health BPJS in 2014 the BPJS experienced a deficit of 1.94 Trillion, at the end of 2015 the BPJS had a deficit of 5.85 Trillion and according to the Director of Development Planning BPJS Mundiharno the potential for deficit in 2016 was around 9.2 Trillion.⁽⁸⁾

In implementing the SJSN Law and the BPJS Law, the government implemented its policies through Government Regulations and Presidential Regulations, one of which is Presidential Regulation No.12 / 2013 on Health Insurance which experienced three changes, the first change being Presidential Regulation No. 111 of 2013, the second amendment to Presidential Regulation No. 19 of 2016 concerning Health Insurance and the third amendment to Presidential Regulation No. 28 of 2016 concerning Health Insurance. The second amendment to Presidential Regulation No. 19 of 2016 was carried out with the spirit to improve the conditions of the implementation of the National Health Insurance, among others, to meet the adequacy of contributions, regulate membership, regulate fines, regulate fraud prevention. However, in its implementation only within a period of not more than thirty days the Presidential Regulation was changed to Presidential Regulation No. 28 of 2016. Presidential Regulation No.19 of 2016 concerning Health Insurance has not yet had time to be implemented, it has been changed to Presidential Regulation No.19 of 2016 concerning Health Insurance. In the system theory described by Easton, a policy-making process begins with an input process that describes all requests that require a problem-solving solution, resources and support from the existing environment, all variables in the input process will be processed in a process to make a policy where in the process there will be dynamics of the policy making process and the interaction of the various actors involved² and produce its output in the form of a solution that becomes public policy. A policy analysis needs to be done to be able to see why the output of the policy change is happening so fast, because this process can perfect these National Health Insurance policies and can be implemented properly and in accordance with the constitutional and statutory mandates. The purpose of this study is to analyze the rapid changes in JKN policy; Presidential Regulation No. 19 of 2016 concerning Health Insurance becomes Presidential Regulation No. 28 of 2016 concerning Health Insurance.⁽⁸⁾

In essence, social security in the health sector, began to be developed. Countries in the world through

international health agencies WHO has agreed to achieve Universal Health Coverage (UHC) in 2014. UHC is a health system that ensures every citizen in the population has fair access to services quality promotive, preventive, curative and rehabilitative health at an affordable cost that includes two core elements in it namely access to fair and quality health services for every citizen, and protection of financial risks when citizens use health services where the Indonesian state is currently located in the transition to coverage of universal health services.⁽⁹⁾ With this system, public health can be achieved.

In Indonesia the understanding and capability of the regions in managing Jamkesda are still different from one another, especially in the framework of achieving Universal Health Coverage, as evidenced by only 4 provinces that have achieved Universal Health Coverage (UHC). The number of provinces that only guarantee non-Jamkesmas poor participants reached 27 provinces (81.81%), and 2 provinces (6.06%) using SKTM (Certificate of Disability).⁽¹⁰⁾

In order to provide health protection to the community through the Indonesia Health Card-Health Insurance Program (JKN-KIS), the role of the Regional Government is expected to be present in efforts to improve the quality of the JKN-KIS program in accordance with the mandate of Law Number 40 of 2004 concerning the National Social Security System. At present the Regional Government integrating the regional health insurance program (Jamkesda) into the JKN-KIS Program has increased and it is hoped that all Regional Governments can do the same, in addition to many other things that can be done by the Regional Government in supporting the implementation of the JKN-KIS Program continuous. "BPJS Health together with local and regional governments and other stakeholders can work together to achieve 100% participation or targeted universal coverage to be realized on January 1, 2019. At present the coverage of JKN-KIS participants in Indonesia has reached 170.9 million or around 70%. The local government can optimize the Jamkesda budget and be integrated with the JKN-KIS Program. The legal basis or Jamkesda integration policy (population registered by the Regional Government) is clear, in accordance with, Presidential Regulation No. 12 Number 111 of 2013, Presidential Regulation Number 74 of 2014 concerning Guidelines for the Preparation of a Social Security and Employment Sector Road Map, Perpres Number 19 Year 2016 jo. Perpres 28 of 2016 concerning Health Insurance, Letter of the Minister of

Home Affairs number 440/3890 / SJ dated October 19, 2016.

The number of Jamkesda integration participants as of November 2016 is 15,151,350 people. Of the 34 provinces 32 provinces have integrated part or all of the District / City Jamkesda in their regions. There are 15 provinces that contribute through sharing of contributions / participants in Jamkesda integration financing with varying patterns, for example 40% of contributions are paid by the provincial government, 60% by Pemkab / Pemkot. The 15 provinces are Aceh, North Sumatra, Riau, West Sumatra, Bengkulu, Bangka Belitung, Jakarta, Banten, Central Java, West Java, Central Kalimantan, NTB, West Sulawesi, Gorontalo, South Sulawesi. Referring to BPJS Health data, 378 Jamkesda districts / cities have been integrated into the JKN-KIS program. Then, there are 4 provinces which can be categorized as Universal Health Coverage (UHC) or JKN-KIS membership of the population > 95%, namely DKI Jakarta Province, Aceh Province, West Papua Province, Gorontalo Province.⁽¹¹⁾ A good management system for social security institutions in the form of BPJS Health is as an effort to provide protection to the community in the health sector.

Conclusion

The social security system established is to provide social protection to the community. Law No. 40 of 2004 concerning SJSN is the issuance of Law of the Republic of Indonesia No. 24 of 2011 concerning the Social Security Organizing Agency (BPJS). The law explains BPJS consists of BPJS Health and BPJS Employment. BPJS Health is a government policy program to organize National Health Insurance. Being an effort to create a social security system in the health sector, synergy efforts are needed, therefore concurrent affairs in the health sector can be carried out jointly between the government and the regional government and the Health Social Security institutions formed based on legislation. In this case, there are certainly many elements that must be addressed, so that in order to realize effective and efficient improvements, it may be necessary to take action steps based on scientifically determined priority sequences, for example based on difficulty and usefulness.⁽¹²⁾

Ethical Clearance: Yes

Conflict of Interest: No

Source of Funding: Author

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Evaluation the Relation between School Bag Weight and Backache among Primary School Pupils in Tikrit City

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Abstract

Background: The weight of Schoolbag in childrens school is an important issue within education and general health . Schoolbag overweight can cause back pain in children, which may lead to chronic back problems in adulthood.

The aim of this study is to evaluate the relation between the weight of school bag and backache among primary school pupils in Tikrit city.

Subject and method: A cross sectional study is conducted in Tikrit primary schools from the first of November 2018 to the end of March 2019 among primary school pupils .

Sample size included 252 pupils, 130 were females and 122 were males. Two school chosen by cluster sampling , the pupils were chosen by stratified then simple random sampling methods ,the data collected by using a questionnaire which was administered by the interviewers the students were examined to exclude any present congenital anomalies.

Results: From the total sample of 252 pupils 74 (29.4%) pupils report backache from those 43 (58%) were females and 31 (42%) were males . The sequence of the location of back pain was upper as (59.4%) backache then middle (33.6%) and very few pupils have lower backache (7%) . The relation between bag weight/pupil weight percentage and positive backache in primary school pupils from the total 74 pupils suffering from backache 41 (55.4%) has the percentage of bag weight / pupil weight more than 15% , 26 (35.1%) pupils had it between 10%-15% and only 7 pupils (9.5%) had it below 10%.The back pain is most commonly reported among those who come walking to the school.

Conclusion :The study concluded that 74 (29.4%) of primary school pupils complained from backache among those 43 (58%) were females and 31 (42%) were males.

Key Words: Kilogram (Kg), Tikrit University College Of Medicine (TUCOM), Back ache, primary school pupils.

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Introduction

School is one of the important institutions , when it provides healthy environment it gives children's the capability to grow and flourish . The bag is the most common way used to take books , equipments and other things students need at school ,which stays with the

student along their study^[1] . .

The usage of computer based learning and online learning by dissemination the learning material to the students are policies used by countries to reduce the usage of bags to reduce its harmful effect on school children's^[2]. On the contrary, in Iraq, the risk factors for back pain caused by heavy school bags are increasing rather than decreasing , due to lack of studies on this important issue^[2].

The National Institute of Occupational Safety and Health reports shows that there are different limits of bag weight between countries . The mean carrying weight for children's in schools below the age of 16 years old are 14kg for boys and 8 kg for girls^[2] . Health centers all over the world agreed that children should not carry bags not more than 10%-15% of their total body weight^[3]. The American Occupational Therapy recommends a limit of 15% of body weight^[3] . National Back Pain Association makes a guidelines which recommend that schoolbags must be under the weight of 10% of children body weight^[4] .

In a recent study, prevalence of musculoskeletal disorders was 63.4% of students of mean age 10.6, the schoolbag affects the shoulders (27.3%) than on the back (15%) and the time was an important factor that affect the symptoms^[5] . Students that carry heavy loads (bags) well develop pain in shoulders and neck which might cause musculoskeletal symptoms in early age^[6] .

An important factor the student learn how to carry his bag to avoid and decrease the postural problems, backache and musculoskeletal diseases. Carrying a load a backpack position can cause less problems than carrying in a lateral position^[7] .

When Carrying the school bag on the shoulders rather on the back this well increase heart rate and oxygen consumption ,so carrying the bag on the back is accepted method due to usage of large muscle groups rather than small muscle groups in order to reduce muscle fatigue and pain^[8]. In Indian schools a study shows that children's between the age 10-15 years to maintain good body posture^[9, 10, 11].

Subjects and Method

Study population and sampling

Sample: two primary schools was chosen by cluster sampling , the pupils were chosen by stratified then simple random sampling methods and this study included 252 pupils, 130 were females and 122 were males all student were examined for presence of back congenital anomalies.

Presentation and data analysis:

All data management and analyses was done by manual statistical methods schoolbag weight/body weight percentage was calculated by the equation:

Statistical test (chi square) applied to test the significance of the results , chi square test achieved by manual calculation.

Results

The current study shows reported backache and its location in different stages in both male and females from the total sample of 252 pupils most of pupils do not report any backache 178 (70.6%) and only 74 (29.3%) pupils report backache from those 43 (58%) were females and 31 (42%) were males as in figure (1).

From the total sample of 252 pupils in 74 (29.4%) pupils report backache from those 43 (58%) were females among those females 36 (83.7%) had upper backache , 6 (14%) had middle backache and only 1 (2.3%) had lower backache .While in males 31 (42%) had backache among those 8 (25.8%) had upper backache , 19 (61.2%) had middle backache and 4 (13 %) had lower backache.

From the total of 130 females 87 (67%) have no backache and 43 (33%) report backache. While in males from the total 122 pupils 91 (74.5%) have no backache and 31 (25.5%) had backache .

An interesting finding that in those who have backache the sequence of the location was upper as (59.4%) backache then middle (33.6%) and very few pupils have lower backache (7%). Figure (1) show no significant association between backache and gender in primary school pupils at p-value less than 0.05.

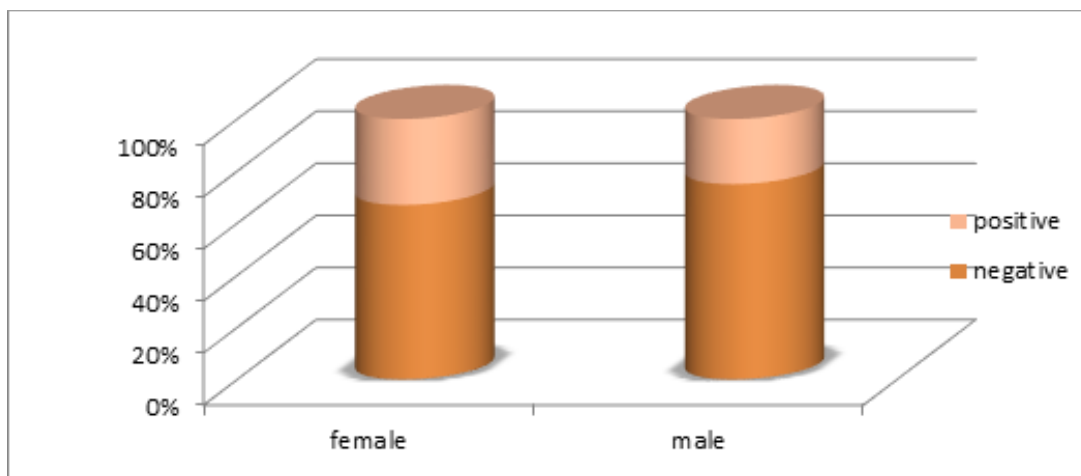


Figure (1) : Reported backache in primary school pupils

Figure (2) shows the bag weight/ pupil weight percentage which was 7 (5.3 %) female pupils have it below 10 % , 43 (33%) female pupils have the percentage between 10 -15% and 80 (61.7%) were more than 15% . While in male 14 (11.4%) pupils has it below 10 % , 46 (37.8%) between 10% - 15% and 62 (50.8%) above 15% . There is no significant association between gender and bag weight/ pupil weight percentage in primary school pupils at p-value less than 0.05.

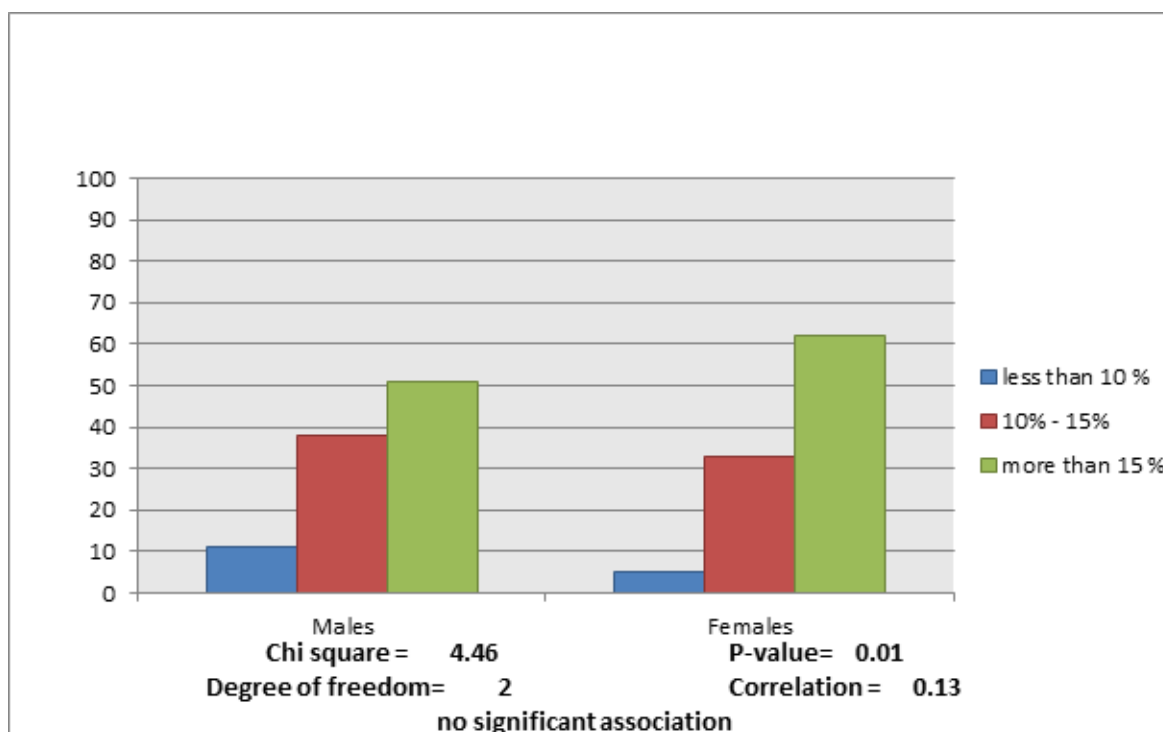


Figure (2) : percentage of bag weight / pupil weight in primary school pupils

Table (1) demonstrate the relation between the bag weight/pupil weight percentage and positive backache in primary school pupils from the total 74 pupils suffering from backache 41 (55.4%) has the percentage of bag weight / pupil weight more than 15% , 26 (35.1%) of pupils had it between 10%-15% and only 7 pupils (9.5%) had it below 10%

As we can notice in the table (1) that there is no pupil in first and second grades has the percentage below 10% that mainly due to their low body weight in relation to their heavy bags .There is no significant association between bag weight/ pupil weight percentage and positive backache in primary school pupils at p-value less than 0.05.

Table (1) The relation between the bag weight/ pupil weight percentage and positive backache in primary school pupils

Percentage Grade	Less than 10%	10% -15%	More than 15%	Total Number of pupils with +ve backache
First grade	0	5 (50%)	5 (50%)	10 (13.5%)
Second grade	0	3 (25%)	9 (75%)	12 (16.2%)
Third grade	2 (9.5%)	8 (38%)	11 (52.5%)	21 (28.4%)
Fourth grade	1 (10%)	2 (20%)	7 (70%)	10 (13.5%)
Fifth grade	1 (8.3%)	3 (25%)	8 (66.7%)	12 (16.2%)
Sixth grade	3 (33.3%)	5 (55.5%)	1 (11.2%)	9 (12.2%)
Total	7 (9.5%)	26 (35.1%)	41 (55.4%)	74 (100%)
Chi square = 15.39 P-value = 0.01 Degree of freedom= 10 Correlation = 0.41 Not significant association				

Table (2) show the relation between the bag weight/ pupil weight percentage and negative backache in primary school pupils from the total 178 pupils who has no backache 101 (56.7%) has percentage of bag weight / pupil weight more than 15% , 63 (35.3%) of pupils had it between 10% - 15% and only 14 pupils (8%) had it below 10 % .

As we can notice in table (2) in the first 4 classes the highest number of pupil has the percentage above 15% while in the last two classes the higher number were between 10% - 15% . There is very strong association between bag weight/ pupil weight percentage and negative backache in primary school pupilsat p-value less than 0.05.

Table (2) The relation between the bag weight/ pupil weight percentage and negative backache in primary school pupils

Percentage Grade	Less than 10%	10% -15%	More than 15%	Total number of pupils with -ve backache
First grade	0	6 (16.2%)	31 (83.8%)	37 (20.7%)
Second grade	1 (3.2%)	7 (21.8%)	24 (75%)	32 (18%)
Third grade	2 (13.3%)	4 (26.7%)	9 (60%)	15 (8.5%)
Fourth grade	4 (11.7%)	13 (38.3%)	17 (50%)	34 (19%)
Fifth grade	3 (10.3%)	17 (58.7%)	9 (31%)	29 (16.4%)
Sixth grade	4 (13%)	16 (51.6%)	11 (35.4%)	31 (17.4%)
Total	14 (8%)	63 (35.3%)	101 (56.7%)	178 (100%)
Chi square = 31.69 P-value = 0.001 Degree of freedom= 10 Correlation = 0.38, Very strong association				

Considering the way of transport regarding pupils with positive backache explain in figure (3) as the following : approximately the number of pupils going by vehicle is the same as for those who walk in the third and fourth grades while in the first and sixth grades the number of pupils who walk is less than those using vehicles and opposite to this is in the second and fifth grades. There is no significant association between stage and way of transport among pupils with positive backache p-value less than 0.05.

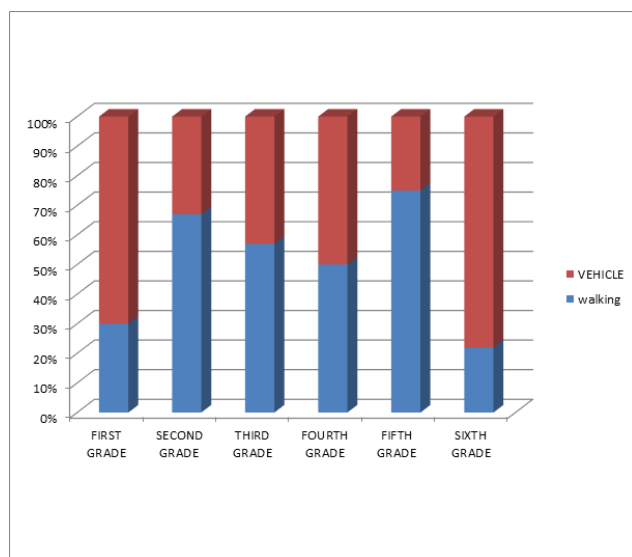


Figure (3) :Way of transport in primary school pupils with positive backache

In the current study , comparing positive with negative backache regarding examination results the study shows that most of the pupils who had an abnormal examination result had a backache .

Discussion

The weight of schoolbag in schools is an important issue within the educational and health sector. Chronic backache in adults may be caused by excessive schoolbag weight in childhood. This study is the first of its kind in Iraq to evaluate this situation and encourage the population to pay more attention for this problem.

A number of 74 (29.3%) of students suffer from the backache among the total of 252 students in comparison to a study in King Faisal University, Saudi Arabia in which it was 1170 (42%) student suffer from the backache among the total of 2567 students this study has a higher pupil number than our study ^[12] .

This study shows that third grade shows the highest percentage of backache 21 (58%) while in university Tenaga National (UNITEN) ,Malaysia fifth grade show

the highest percentage as 285 (87%) due to different daily schedule in each grade and each day of the week ^[13].

The majority of pupils are using the double strap bag whether they have positive(91.8%) or negative (94.3%) backache this corresponds with a study in Brazil which shows that the most popular style of schoolbag was found to be a backpack-style bag with two straps (95%) ^[14].

In this study pupils show abnormal examination result in the following percentages in positive backache (20.3%) , in negative backache (4%)while a study in university of Novi Pazar, Serbia show relatively high frequency of postural deformities ^[15] .

Conclusion

The study is concluded the followings:

1. The majority of pupils do not report any backache 178 (70.6%) and only 74 (29.4%) report backache.
2. Among pupils with positive backache (58%) were females and (42%) were males.
3. The location of backache in primary school mostly reported as upper back pain (83.7%) in females and as middle back pain (61.2%) in males
4. The percentage of bag weight/ pupil weight percentage in (61.7%) of females and (50.8%) males were above 15% .
5. The majority of pupils are using the double strap bag whether they have positive or negative backache.
6. Examination result in student with positive backache shows that (79.7 %) of pupils were normal and (20.3 %) of them were abnormal .

There are “**No Conflict of Interest**”.

Source of Funding: (them self).

Ethical Clearance: Committee members are approved to perform a study about:

After discussion of study plan with researchers:

- Dr. Firas Tariq Ismaeel**
- Dr.Wheab Faraj Dawood**

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Helicobacter Pylori Can Cause Vitamin B12 Deficiency

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Abstract

Several studies have indicated that H. pylori treatment causes an impact on the status or absorption of B12 vitamin. When talking about malabsorption of B12 vitamin, H. pylori is a big risk, especially for adults and older people who have suffered bacteria related diseases for a long time. A literature review of more than 25 papers have found inconclusive results due to the methodological differences in them. This paper assesses the relationship among the deficiency of vitamin B12 and H. pylori.

This study involved hundred patients in total, having deficient B12 serum vitamin. The study conducted Upper G I Endoscopy and obtained gastric biopsies for histological evidence and histopathological examination of H. pylori infection.

The results of the tissue biopsy pointed out chronic antral gastritis in thirty patients and chronic atrophic gastritis in sixty-two patients. It was found that the H. pylori infection by histology is positive in eight-six patients. A significant relation was found among H. pylori and atrophic gastritis and also between B12 deficiency and H. pylori. This study concluded that, the deficiency of B12 Vitamin is predominant in the Helicobacter pylori infection.

Key words: *Helicobacter pylori; pernicious anemia; Vitamin B12*

Introduction

The relation of H. pylori infection is significant with a lot of micronutrient deficiencies. H. pylori and the deficient B12 vitamin have a significant positive relation with each other. Researchers have found that the presence of H. pylori bacteria in many patients having pernicious anemia because of not well treated B12 vitamin deficiency, even in people without any digestive problem or gastritis.⁽¹⁾

H. pylori infection and chronic gastritis of the antrum of the abdominal have a strong relation between them. This causes impairment in the secretion of pepsin and gastric acid and is therefore related to malabsorption of B12 vitamin. The infection H. pylori is the source of B12 vitamin deficiency. It is also called as the supporter of gastritis ulcers and has the capacity to stop the stomach from absorbing B12 vitamin and thus leads to its deficiency.⁽²⁾

Pernicious anemia can characterise the ending stage of a procedure that starts with H. pylori linked gastritis and origins from progressive atrophy levels till the complete loss of parietal cell mass occurs. Many pieces of research have indicated that the B12 vitamin deficiency and H. pylori have a strong relation. This relation exists even in patients without any gastrointestinal issues or gastritis. H. pylori bacteria have been found in more than 50 percent of patients having pernicious anemia, specifically due to not well-treated deficiency of B12 vitamin.⁽³⁾

Method

This study involved 100 patients in total who had the level of B12 vitamin lower than 200 pg/ml. All of the patients had the age of 19 years or more than that. The patients having hepatic or renal failure, postgastrectomy status, patients who had received prior H. pylori eradication therapy and pregnant ladies were omitted from this experiment. The study also did not include immunocompromised states, for example,

diabetes mellitus and HIV infection because of more than one factors involved in these diseases. Peripheral smear was conducted for all of the involved patients. (4)

The gastrointestinal endoscopy was experimented in all of the patients to get biopsy specimens from the gastric antrum, fundus and body and to study the microscopic appearances of the gastric mucosa. The samples were gathered using individual sterile forceps. The samples of biopsy were forwarded for histopathology investigation and further processing, involving staining for H. pylori infection. (5)

Statistical analysis

The data of the experiment was analyzed using SPSS software. This helped to calculate the percentage of B12 vitamin deficiency and frequency in the patients of Helicobacter pylori infection. The standard deviation and the mean value were also calculated. To find out the statistical difference among the patients, the Chi-square method was applied. The value of p was taken as 0.05.

Results

In total, 100 patients were gathered having a B12 vitamin deficiency. From them, 65 were men and 35 were women, having the average age of 43.75± 19.44 yrs. 86 patients had positive results of Helicobacter pylori infection (Table 1). In the histopathology assessment, 62 percent of patients were found to have chronic atrophic gastritis. Normal Histology was found in approximately 3 percent of patients (Table 2). The distribution of B12

vitamin in connection with H. pylori revealed that there is a considerable correlation among H. pylori status and B12 value. Table 3 indicates that 31 patients infected by H. pylori had normal B12 vitamin level, while 55 patients had deficient B12 vitamin level. The patients were infected by H. pylori with a considerable difference (P value less than 0.05).

Table 1: H. Pylori status among patients.

H. pylori infection	Frequency	Percent
Negative	14	14%
Positive	86	86%
Total	100	100.0%

Table 2: Distribution of biopsy findings among patients.

Endoscopic findings	Frequency	Percent
Chronic antral gastritis	30	30%
Chronic atrophic gastritis	62	62%
Peptic ulcer	5	5%
Normal	3	3%
Total	100	100.0%

Table 3: The deficiency of Vitamin B₁₂ in H. pylori infected patients

Normal Deficiency			Vitamin B ₁₂		Total
H. pylori	Negative	Count	11	3	14
		%	78.6%	21.4%	100.0%
	Positive	Count	31	55	86
		%	36.0%	64.0%	100.0%
Total		Count	42	58	100
		%	42.0%	58.0%	100.0%

P value < 0.05

Discussion

This is a standard experiment for treating the lack of B12Vitamin, therefore it is vital to create the cause for B12vitamin shortage as it can be linked with disorders of ilium causing reduced absorption, inadequate dietary intake, intrinsic factor from practical cells, and disorders linked with gastric pepsin secretion. Helicobacter pylori has been found as an etiological factor in the shortage of B12Vitamin ^(1, 2). The clinical importance of this aspect is not very clear ⁽³⁾. It is also not clear if the calcium supplements have the capacity to reverse B12 vitamin malabsorption. The previous reports are not supported which indicates that megadoses of Vitamin C destroy B12 vitamin ⁽⁴⁾.

Nitrous oxide is an anesthetic component and it inactivates and oxidizes vitamin B12. That is the reason that both of the enzymes on which vitamin B12 is dependent become inhibited and able to create several characteristics. Over the counter or OTC availability is the reason for enhanced Omeprazole utilization and that is the reason that it is used without the recommendation of healthcare professionals. Although the drug is beneficial for GERD and PUD, its usage is full of risks with complications. This involves B12 vitamin deficiency complications, for example, macrocytic anemia, hyperhomocysteinemia and/or neuropathies, drug-drug interactions and enhanced aspiration pneumonia risk for some patients ⁽⁵⁾. Before the arrival of mouth ingested free B12 vitamin in the duodenum 2ndsection in small intestine, it stays in the bound state in addition with and R-binder⁽⁵⁾

Conclusion

This study concluded that Helicobacter pylori is an etiologic aspect of the deficiency of B12 vitamin. Therefore, this condition is predominantly found in Helicobacter pylori infected patients

Conflict of Interest – Nil

Source of Funding- Self

Ethical Clearance – Not required

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Detection of Parvovirus B19 Infection in Thalasemic Patients in Tikrit City, Serological Study

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Abstract

Background:-Parvovirus B19, a member of the genus Erythrovirus virus of the Parvoviridae family, causes several clinical diseases including infectious erythematosis, joints, fetalis hydrops or chronic hemolytic anemia like thalassemia syndrome, transient aplastic crises. B19 can be transmitted through respiratory secretions, blood products, and blood transfusions.

Objective: To identify the seroprevalence of Human Parvovirus B19 virus in Patients with thalassemia major in Tikrit city.

Material and method:- This lessons is a cross-sectional case control study that included 130 Patients infection with beta thalassemia attendance the Tikrit Military Hospital Department of Blood Diseases Unit as of 1/7 /2018 to 1/12/2018 major age ranging from 1-60 years and 50 healthy patients as control grouping. Blood sample were obtain for determination of specific antibodies IgG and IgM for HPV-B19 by enzyme linked immunoassay (ELISA).

Results:- HPV B19 IgM antibodies were detected in 15 of 130 thalassemic patient(11.5%),and not detected in any patient of control group, P value (0.02).While anti-HPV B19 IgG antibodies were detected in 50 of 130 of thalassemic patient (38.5 %)and 2(4%) of 50 in control group(5%), P value(0.003).. the range age of the thalassemia patient was (2 –58 years) and B19 infection was highest in the 20-to-40 year range. And the result show the highest percentage to infected to virus during the blood transfusions once a month per month was 30(100%) anti-B19IgG and 8(26.7%) anti-B19IgM.

Conclusion:-In this study, acute B19 infections were detect in patients with beta thalassemia major. showing of such high-risk groups can significantly reduce the incidence and prevalence of B19 infection; thus, screening is required for epidemiologic surveillance and disease-prevention measures.

Keyword: *Detection, Parvovirus B19, Infection, Thalasemic, Patients, Tikrit, serological, study.*

Background

Human Parvovirus B19(HPV B19)is a small, naked virus belonging to the family Paravaviridae¹. Parvovirus B19 (Latin means small) is a newly emerging DNA virus discovery in Austarlain, When the giver sera tested for HBV, but found the B19 virus in the sera, 19 in row 19B (bank donation number) and labeled B19, later the B19 virus was implanted in the Erthrovirus genus of the Parvovirade family².

Infection with this virus is very frequent and can lead to a broad range of scientific lesions depended on the immunity and hematological state of the patients, in immunologically qualified individuals, B19 infection can be symptomatic or benign and may cause Erythema infection (V disease), and arthritis³. However, in patients reduced production or increased loss of erythrocytes, such as syndrome Thalassemia and other chronic hemolytic anemia, B19 infection lead to lower drops of hemoglobin level and anemia that can threaten life⁴.

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Parvovirus B19 is common throughout the world, and 15% of children aged 15 years have IgG positive

and is spread in late coldness and early spring. The virus is transmit through contact to drops or infected blood that is minimum and vertically from mother to fetus cause Congenital anemia and fetalis hydrosis.⁵

The Infection incubation period is 4-14 days but can be up to 21 days, but viremia can persist for up to a week, after which the IgM Abs suddenly rises to the peak and at 21 days, IgG Abs virus then rises and remains high.⁵

Major thalassemia patients with beta-thalassemia, due to chronic hemolytic disease, have an excessive blood transfusion system and are thus at elevated risk of obtaining B19 transmission, but contain rarely been study by detect Abs to B19.^{6,7} A rapid decline of anemia, reticulocytopenia, and cessation of erythropoiesis in the bone marrow describe the transient aplastic crisis. It is probable that the non-induced crisis that occurs in B19 is often diagnosed as complicating the underlying disease.⁸

In addition, these patient are at elevated risk for transfusion-borne disease. Similarly, the B19 infection was also report from multiple hemorrhagic transfusions patients, recipient of Factor VIII concentrate, and children with congenital malformation.^{9,10} In addition, the B19 transmission problem is compounded by repeated contamination of the coagulation centers. B19 transmission leads to non-spitting of red cells, neutrophils, and thrombocytopenia.¹¹

HPV B19 had a strong predominance of the hematopoietic stem cell¹². The virus is integrated into a specific location in the human genome. The infected cell fails to divide, weakening the production of new red blood cells, and the retic number is often reduced to less than 0.1 to 0.5% of the 6-20% routine values in the patient with hemolytic anemia. HPV B19 infects mature erythroid progenitor (CFU.E), preventing further reproduction and maturity, and the most primitive precursors (BFU.E) are affected as a minimum¹³.

Objective

To identify the seroprevalence of Human Parvovirus B19 virus in Patients with thalassemia major in Tikrit city

Material and Method

This study is a cross-sectional case control study that included 130 Patients infection with beta thalassemia attending the Tikrit Military Hospital Department of Blood Diseases Unit from 1/7 /2018 to 1/12/2018 major age ranging from 1-60 years and 50 healthy patients as control group. Demographics Obtained from the patient group such as age, gender, duration of disease, Numbers of blood transfusion units, Serological status of HBs Ag , H CV, HIV. Anti-HPV B19 IgM and Anti- HPV B19 IgG has also been obtained by Using the ELISA test

kits.(DRG International, Inc. United States, Catalog Number EIA-3504 IgM ELISA and Catalog Number EIA-3503 directed IgG). the control set included 50 non Thalassemia occurs at the same hospital for a different reason with a negative history of transfusions. Anti-HPV B19 IgM and Anti-HPVB19 IgG were also done. IgM refers to a recent infection while IgG refers to the previous infection.

Data Analysis

Implemented using the SAPPs program Version 14.0. Chi-Square and Fisher's exact test were used to determine the statistical significance of the differences between the patient control group (case) according to Anti-HPVB19 IgM and IgG. The value of P <0.05 was considered to significant .

Results

In this study, we found only 15 Out of 130 patients have positive thalassemia Anti-HPVB19 IgM (11.5%), while no any positive case of anti-HPVB19 IgM was detected in the control group with the value of P (0.02). We also found 50 patients Out of 130 in the thalassemia patient positive for anti-HPVB19 IgG (30.4%), while only 2 out of 50 patients in control group it is positive to anti-HPVB19 IgG (4%) with P value (0.003) As shown in Table (1)

Table (1) Distribution of serological markers from IgG Abs HPVB19 and IgG in Thalassim patients and Control Group

Patients group	No of sample	Ab HPVB19 IgM	Ab HPVB19 IgG
thalassemic group(130)	130(72.2%)	15(11.5%)	50(38.5)
Control groups (50)	50(27.8)	(0) (0)	2(4%)
Total	180(100)	15	52
P value	-	0.02	0.003

Also we found only 1 cases in thalassemic group (6.7%) were positive for Anti-HPVB19 IgM had number of blood transfusion once every two month, 30 cases (60%) had number of blood transfusion once mouth were positive for Anti-HPVB19 IgG and 8 cases (53.3%) were positive Anti-HPVB19 IgM. while cases number blood transfusion two times per mouth were 15(30%) positive for Anti-HPVB19 IgG and 5 cases(33.3%) were positive Anti-HPVB19 IgM and we found 5 cases (10%) were positive for Anti-HPVB19 IgG had number of blood transfusion Three times per mouth and 1 cases (6.67%) were positive Anti-HPVB19 IgM as shown in table (2).

Table (2) Anti-B19 Abs and total number of transfusion received by thalassaemia

Number of transfusion	Positive % Anti-B19 IgG	Positive % Anti-B19 IgM
Once every two monthly	0 (0)	1(6.7%)
Once a month	30(60%)	8(53.3%)
Two times per month	15(30%)	5(33.3%)
Three times per month	5(10%)	1(6.7%)

Total 65 thalassaemia major patients test by in-house ELISA, anti-B19 IgM antibodies were detect in 15(23%) thalassaemia patients and 50 (77%) test seropositive for anti-B19 IgG antibodies. According to gender, 66.7% (10 of 15) males and 33.3% (5 of 15) females were positive for anti-B19 IgM antibodies, while 80% (40 of 50) males and 20% (10 of 50) female tested positive for anti-B19 IgG. The frequency of IgG antibodies was 75, 87.5, 72.2, 71.4 and 50 % in males and 100, 75, 100, 66.7 and 100% in females of age groups 1 –20, 20–30, 30–40, 40-50 and 50 – 60 yrs, respectively. The anti-B19 IgM antibody positivity were 25, 18.8, 16.7, 14.3 and 25% in males and 50, 25, 50, 33.3 and 100% in female in the age group shown in table (3).

Table(3) frequency of anti-B19 Abs in thalassaemia major patients according to age and gender

Age group in years	Sex			Positive % anti-B19 IgG			Positive % anti-B19 IgM		
	Total	Male	female	Male	female	Total	Male	female	Total
1-20	10	8	2	6(75)	2(100)	8	2(25)	1(50)	3
20-30	20	16	4	14(87.5)	3(75)	17	3(18.8)	1(25)	4
30-40	20	18	2	13(72.2)	2(100)	15	3(16.7)	1(50)	4
40-50	10	7	3	5(71.4)	2(66.7)	7	1(14.3)	1(33.3)	2
50-60	5	4	1	2(50)	1(100)	3	1(25)	1(100)	2
Total	65	53	12	40	10	50	10	5	15

Discussion

Parvo virus B19 infection is distributed in humans throughout the world. Epidemiological studies of several countries show that the frequency of HPV B19 infection vary among many country and populations and increases with age ¹⁴. Unfortunately, we do not have data on the exact prevalence of HPV B19 infection in our country.

In this study, a higher prevalence of HPV B19 specific IgM indicative of recent infection (11.5%) was found in thalassemic group compared to control (zero) with significant statistical difference (P value 0.02). The prevalence of HPV B19 specific IgG (38.5 %) in thalassemic group compared to control group(4%) with significant statistical difference (P value 0.003), and this is similar to results obtained by Adnan ,2013 ¹⁵.from Babylon, of 60 thalassemic major patient (Anti-B19 IgG is 38.4% and IgM 13%). Siritant korn *et al* ; ¹⁶ in Thailand , of 60 thalassemic major patient (Anti-B19 IgG is 38% and IgM 4%) . In Kishore *et al* . in serological study on 90 indian patient with thalassemia reported much higher rate of Anti-HPV B19 IgM and IgG (41.1% and 81% respectively) ¹⁷. The difference perhaps associated to geographical difference in prevalence of HPV B19 infection ¹⁴.

Conclusion

In this study, acute B19 infections were detect in patients with beta thalassemia major. showing of such high-risk groups can significantly reduce the incidence and prevalence of B19 infection; thus, screening is required for epidemiologic surveillance and disease-prevention measures.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: None

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Evaluation of Titanium di oxide Nano-fillers Incorporation on Mechanical Properties of Heat Cured Acrylic Resin

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Abstract

The persistence of this revision was to assess the outcome of adding of surface cured titanium dioxide Nano stuffing (TiO₂) on Impact strength, Transvers strength and tensile strength. Titanium oxide Nano fillers were merged into (PMMA) denture base by allowed essential majority. The nanoparticles were coated by a film of trimethoxysilypropylmethacrylate (TMSPM). A controlled group and three different percentages 3%, 5% and 7%, of TiO₂ dust was added to PMMA powder by weigh up and mixed by probe sonication appliance. 120 samples were built and distributed into 3 clusters rendering to the test (40 specimens for each group) and each cluster was split into 4 sub-groups conferring to the ratio of auxiliary TiO₂ (10 specimens for each subgroup). The tests piloted were impact strength (charpy tester), transverse strength test and tensile strength test. Extremely significant rise in charpy tester and transverse strength was detected associated with the increase of the addition of TiO₂ powder to (PMMA) at the ratio of 3% and 5%; despite the fact a significant drop happened in both tests at the ratio of 7%. Alternatively, there were non-significant progresses in the tensile strength through the enforcement of (TiO₂).

Conclusion: the result of this revision presented that treated TiO₂ Nano-fillers is nominal in altering impact strength and Transvers strength while it was non nominal in successful altering the tensile strength, the extreme rise in impact strength and Transvers strength pragmatic in denture base containing 5% wt. of treated TiO₂ Nano-particles.

Keywords: heat cures acrylic, Titanium dioxide Nano-filler (TiO₂), Nano technology.

Introduction

Till now a day acrylic still used widely whatever the poor mechanical properties of it because it considered as material of choice for denture base [1]. To solve this problem acrylic might be treated by different enforced materials in order to enhance its properties these enforcement materials include metallic strengtheners, carbon-graphite fiber, aramid fiber and glass fibers [2].

One of the best materials used to altering the properties of acrylic is the use of Nano particles through the Nano technology [3]. In the chemical engineering, during the past 10 years, study has been enthusiastic to the advance of a new manufacturing procedure that includes nanoparticles into acrylic resin given that a new class of acrylic resin that proposals the strength of the Nano-oxides, with the elasticity of PMMA [4].

Metal Nano oxide as TiO₂, and SiO₂ are branded by their minor extent, great surface area and strong interfacial contact with the polymer matrix [5]. So that, they can advance the physical, thermal and optical properties of the polymer matrix denture base [6].

Augmented bond strength by operation of silanes is a consequence of a multipart set of issues such as wet out, surface energy, border layer captivation, polar adsorption, acid-base communication, interpenetrating grid development and covalent response [7]. Titanium oxide Nano-particles mechanically underline the polymers and allow for high impact strength, breakage toughness, rigidity and solidity of the armored PMMA matrix [8].

External surface alteration of a mineral particle with an organic substance is a valuable method to decrease its superficial energy and raise its compatibility with

polymer matrix and dispersalsameness and thus recover the assets of the polymer-inorganic subdivisions [9].

The non-competitive Nanoparticles were experiencedsuperficialconduct with saline link agent and entrenched into PMMA [10].

Handling the superficial aspect ofTiO2 nanoparticles using trimethoxysilypropyl methacrylate (TMSPM) could reducecombination of TiO2 particles and improve its compatibility with organic polymer [11].

Materials and Method

Titanium dioxide already coated with trimethoxysilypropylmethacrylate (TMSPM), heat cured resin polymer and monomer, yellow dental stone (III) and could mold seal were prepared to be used. (120) samples were organized for this revision. The samples were distributed to three groups according to the type of the examination. Each group involved 40 samples and these were segmented according to the attentiveness of Titanium di oxide Nano particles into four sub groups as follow:

- a. Group (A) control group (0% TiO2) 30 samples
- b. Group (B) 3% modified group (3% weight TiO2) 30 samples
- c. Group (C) 5%modified group of (5% TiO2) 30 samples
- d. Group (D) 7% modified group of (7% TiO2). samples

Table (1): Involvement Proportion of TiO₂ with PMMA according to the manufacturer instruction

cod	TiO ₂	Polymer	monomer
0%	0	100g	40ml
3%	3g	97g	40ml
5%	5g	95g	40ml
7%	7g	93g	40ml

Plastic model preparation:

By using of CNC laser cutting machine plastic models were made on deferent plastic sheet: .a. for Compressive or Transverse strength test bar designedsample with

measurement of (65mm x 10 mm x 2.5 ± 0.1 mm) length, width, thickness respectively.

b. for charpy or Impact strength test: bar designedsample with measurement of (80 mm x10 mm x 4 mm) length, width and thickness respectively.

c. Tensile strength test: Dumbbell- Shaped samples with measurement of (75mm × 12.75mm × 2.5mm) length, width, thickness respectively. As shown in Fig (1)

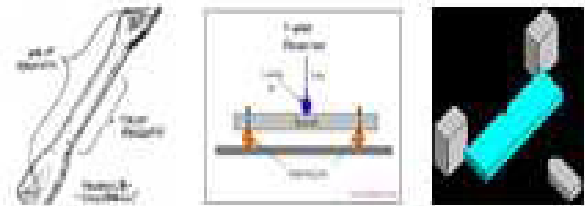


Fig (1) Tensile strength specimen (A), Transverse strength specimen (B) and Impact strength specimen(C)

Preparation of the mold

By using metal dental flask, denture processing method were used to prepared the samples, at the beginning paint the flask by separating medium allowed to dry then paint the samples by separating medium weight to be dry mix the stone according to manufacturer instruction then filed the first half of the flask by the stone put the samples in which half of it appeared to be removed easily after the set of the stone put the other half of the flask on the first one fill the flask by dental stoneweighted to the dry and open the tow half of the flask paint them by separating medium and pack the acrylic and cure

Titanium di oxide Nano fillers incorporation

TiO₂ Nano filler powder was added by weightiness in four clutches; 0%, 3%, 5%, and 7% to acrylic monomer. digital automaticweighing scale with exactness of (0.001g) was used, Next the totaling mixed by probe ultra-sonicater (140W, 65KHz) for several min to destroy the coated particles intospecific crystals of Nano TiO₂.The postponement of monomer with TiO₂ Nano crystals was instantlydiverse with polymer to decrease the opportunity of crystals accumulation and segmentparting.

1. Charpy test (Impact strength test)

A- Test samples

The samples were equipped with measurement (8cm

x 1cm x 0.4 cm) for unnotched Charpy Impact test. For each concentration ten samples were equipped make an overall of (40) samples. PMMA samples were kept in distilled water at 37°C for 48 hours on the incubator before the test.

B-Testing equipment and procedure

The test was assessed subsequent the technique recommended by the use of Charpy device. The samples were sustained horizontally at each end and hit by free fluctuating pendulum of two Joules and digital paradigm to show the impact energy fig (5). The measurement analysis provides the impact energy in Joules. The amount of the strength at unnotched specimens was intended in kilo Joules per square meter (KJ/M²)



Fig (2) impact testing device

2. Transverse strength test

A- Specimen design:

The samples were equipped with measurements of (6.5cm x 1cm x 0.25cm) for each concentration. Ten samples were equipped make an overall of (40) samples. Samples were kept in distilled water at 37°C for 48 hours on the incubator before the test.

B-Testing equipment procedure:

The test was assessed subsequent the technique recommended by the use of universal Instron testing machine, the sample was situated on the bending fixture which consists of two parallel supports 5cm apart, the full scale was 50 Kg, and the weight was pragmatic with a cross head quickness of 1mm/min by a rod placed centrally between the supports making bend until break happens.

3. Tensile strength testing:

A- Specimen design:

The specimens used were dumbbell-shaped specimens with dimension of (75mm x 12.75mm x 2.5mm). Ten specimens for each concentration plus the control will make a total of (40) specimen for the measurement of transverse strength. All the specimens were immersed in distilled water on the incubator at 37°C for (48) hours before testing.

B-Testing procedure:

Tensile strength was assessed via Jian Qiao testing apparatus for determining tensile strength. (Fig7). The sample was detained at each two ends and the force at the disappointment was recorded in Newton (N) and the tensile strength standards were intended from the following equation:

$$TS = A/F$$

Where

TS: Tensile Strength.

F: The Force

A: Minimum cross-sectional area

Revision results

1. Impact strength

Statistical values listed in the table 2 appear the effect of adding different concentration of

TiO₂ Nano particles to heat cured acrylic on the impact strength of PMMA

Table (2) distractive data of Impact strength parameters analysis (Kj/m²)

	Group A	Group B	Group C	Group D	
N	10	10	10	10	
Mean	8.22	9.111	9.625	7.19	
SD	0.254	0.111	0.145	0.32	
SE	0.822	0.334	0.544	0.11	
range	Min.	8.133	9.001	9.321	7.222
	Max.	8.945	9.422	9.934	8.133

Maximum mean value seemed in group C with a mean of 9.617 Kj/m² and the last mean was in group D which was 7.77 Kj/m².

Rise of impact strength because of interfacial crop strength between Nano filler and matrix was high because of creation of cross-links or supra molecular attachments which shelter the Nano plaster and avoid crashes. Also the crash broadcast can be altered by good attachment

between Nano filler and matrix.

2. Transverse Strength

Statistical values listed in the table 3 appears the effect of adding different concentration of TiO₂Nano particles to heat cured acrylic on the transverse strength of PMMA

Table (3) descriptive data of Transverse strength parameters (N/mm²)

		Group A	Group B	Group C	Group D
N		10	10	10	10
Mean		114.945	120.135	124.533	111.633
SD		1.423	0.845	1.566	0.50
SE		0.834	0.367	0.587	0.111
range	Min.	112.433	118.992	121.996	110.994
	Max.	116.686	122.122	127.111	112.082

Maximum mean seemed in group C which was 124.562 compared to group D with mean of 111.6 which presented the last mean.

Rise in transverse strength that happen with adding of 3%TiO₂ Nano particles because of decent spreading of the greater than 150nm size of Nano subdivisions allow them to entomb between lining macromolecules chains. Segmental motion of the macromolecular chains were limited and prime to rise strength and firmness of the risen so this enhanced the fractural confrontation and lead to progress transverse strength.

3. Tensile strength test:

Statistical values listed in the table 4 appears the effect of adding different concentration of TiO₂Nano particles to heat cured acrylic on the tensile strength of PMMA

Table-4 Show that the same mean appeared in-group A, B, C and D, which was between 43.220 to 43.261

		Group A	Group B	Group C	Group D
No.		10	10	10	10
Mean		43.222	43.233	43.224	43.226
SD		1.656	1.356	1.378	1.343
SE		0.533	0.555	0.555	0.555
range	min	39.77	39.24	39.53	39.89
	max	45.16	45.25	45.15	45.16

Discussion

The adding of coated TiO₂ Nano-filler powder to PMMA amplified the value of impact strength related to 0% concentration group, 5% group has the peak impact strength and 7% group has the last impact strength.

The increase of impact strength due to interfacial shear strength between Nano filler and matrix was high due to formation of cross-links or supra molecular bonding which cover the Nano filler and prevent sudden cracks. Also the crack propagation can be changed by good bonding between Nano filler and matrix [12].

Increase the concentration of smaller size Nano particles increase inter facial surface area so that the force need to destroy the samples also increased, adding TiO₂ Nano filler will form a network of 3D dimension of PMMA and TiO₂ Nano particles. PMMA, matrix powder chain shifted in to 3D-network like chains at 5% of Nano filler accordingly lead to decrease the segment motion and rise the impact strength [13].

At the 7%, the drop in impact strength as compared with 5% may be due to high external expanse of the collected Nano filler which may reach to micro filler TiO₂ within the matrix causing stress concentration around the collection of the Nano material which lead to fissure spread. The increase in transverse strength that occur with addition of 3% TiO₂ Nano particles due to good distribution of the <100nm size of Nano particles enable them to inter between liner macromolecules chains. Segmental motion of the macromolecular chains was restricted and lead to increase strength and rigidity of the risen so this improved the fractural resistance and lead to improve transverse strength [13&14].

Rise clarified on the roots of alteration strengthening when adequate stress progresses and fissure instigates to spread, an alteration of TiO₂ from the steady crystal phase to the steady monocyclic phase happens which reduces the energy of fissure spread, at this procedure growth of TiO₂ crystals happens and seats the fissure under a state of compressive stress and fissure spread was blocked [15].

At the 7%, drop in transverse strength may be because of spaces between the acrylic cuffs were occupied with Nano filler produced filler among this cuffs and because of frail attachments between them producing drop on transverse strength, as well as because it was stop stress transformation [16].

Conclusion

Within the limits of this study, the following conclusion was drawn:

1- Incorporating Nano titanium di oxide Nano filler into conventional heat-cured denture base resin results in an increase in impact strength and transverse strength. The magnitude of the increase is depending on the percentage of TiO₂ added into the resin (3%,5%). However, as the percentage increased to 7% there was significant decreased in impact and transverse strength.

2- No significant change in tensile strength was seen when acrylic resin was mixed with TiO₂ percentages 3% and 5% but there was highly significant decrease in tensile strength with 7% TiO₂.

Source of Funding- Self

Ethical Clearance – Not required

Conflict of Interest: None

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The Effectiveness of *Garcinia Mangostana* L. Rind extract in Reducing Total Cholesterol Levels in Hypercholesterolemic Male White Mice

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Hypercholesterolemia contributes to the incidence of coronary heart disease which is the leading cause of death in the world ¹. Diet modification and hypolipidemic drugs, including herba, one of which is *Garcinia mangostana* L. will effectively reduce total cholesterol ³.

A research a posttest control group design ²⁰, type of research was a laboratory experimental research ¹⁵. The population was male white mice aged 3 - 4 weeks weighing 100-200 grams ¹². Hypercholesterolemia in male white rats was with MDLT induction (high - fat diet food) ⁷. Data collection of total cholesterol levels measurement used enzymatic spectrophotometer method, data analysis used Variant Analysis statistical test (ANOVA) with significance level $\alpha < 0.05$ ¹⁵.

The effect of *Garcinia mangostana* L. rind extract on total cholesterol reduction in white rats was grouped into a negative control group, positive control group and four dose treatment groups ⁴. Identification of hypercholesterolaemia in white rats was examined for total cholesterol on day 8 ¹⁶. The effect of *Garcinia Mangostana* L rind extract on reducing total cholesterol was examined on day 22 ^{3,16}.

The results of the examination showed the administration of *Garcinia mangostana* L. rind extract in all dosage groups effectively reduced total cholesterol levels with a significance level of $p < 0.05$.

Keywords : *Garcinia mangostana* L, total cholesterol and hypercholesterolemia

Introduction

In 2004 World Health Organization (WHO) stated that hypercholesterolemia had a contribution of 56% of coronary heart disease which resulted in the deaths of around 4.4 million every year worldwide. The data was predicted to increase continuously to 20 million per year until 2030 to 24 million per year ¹. In Indonesia deaths from heart and blood vessel disease amounted to 16.7% ¹².

Hypercholesterolemia occurred because of an increase in the transport of acylglycerol from the liver to blood circulation in the form of VLDL ^{4,10}. In the blood circulation VLDL was hydrolyzed by lipoprotein lipase become free fatty acids and glycerol ^{9,10}. Then,

they were transported to the tissues and became IDL which was an LDL particle precursor ⁶, remained in the blood circulation. LDL in the blood circulation was then taken by LDL receptors and translocated to cell membranes, past endosomes and lysosomes ²⁰. The increased lipoprotein containing cholesterol by LDL receptors results in high cholesterol concentrations in cells. the lipoproteins concentration enhancement which containing cholesterol in cells resulted in an increase of total cholesterol ^{9,10}.

At high LDL concentrations in the blood circulation there would be saturation in the process of taking lipoprotein containing cholesterol through LDL receptors ^{8,10}. Therefore LDL containing cholesterol was converted to oxidized LDL ⁴ which was not recognized by LDL receptors ^{9,10}. The oxidized LDL could not be taken by LDL receptors, so it was translocated to the cell membrane through scavenger receptors that had macrophage properties. Taking oxidized LDL which containing cholesterol by scavenger receptors for a

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long time resulted in the formation of foam cells in atherosclerotic lesions².

Decreasing LDL concentrations containing cholesterol in blood circulation is carried out through exercise and diet modification containing unsaturated fatty acids. Regular exercise can increase lipoprotein lipase expression due to increased insulin sensitivity. Diets of unsaturated fatty acids can increase the catabolic rate of LDL containing cholesterol due to the addition of the number of LDL receptors. If exercises and dietary modifications of unsaturated fatty acids fail to reduce cholesterol, it can be done by management of a plasma lipid-lowering drug (hypolipidemic)^{9,10}.

Hypolipidemic drugs could reduce cholesterol by mechanisms including; inhibiting enterohepatic circulation of bile acid, inhibiting cholesterol absorption from gastrointestinal^{9,10}, decreasing plasma triacylglycerol, inhibiting HMG-CoA reductase, and increasing lipoprotein lipase activity. However consuming hypolipidemic drugs had an impact in the form of gastrointestinal disorders, skin rashes, liver function disorders and the existence of contra-indications of use that resulting in not everyone can consume¹³.

The management of herbal-derived hypolipidemic was highly recommended. Herbs were a source of compounds that had potential as a drug base, one of which was mangosteen rind (*Garcinia mangostana* L). In the pericarp, it contained mangostin compounds, reaching 75 mg / 100 mg¹⁸. Mangostin had inhibitory activity for inhibiting the release of prostaglandin E¹¹, that resulted in a decrease in lipolysis of adipose tissue^{9,10} and was thought to increase the activity of the lipoprotein lipase enzyme³.

The decrease in lipolysis of adipose tissue results in a decrease of free fatty acids in the blood and liver circulation. So that the esterification of free fatty acids becomes acylglycerol in the form of VLDL containing cholesterol which is transported from the liver blood circulation to decrease. Decreasing VLDL production results in decreasing IDL levels. The decrease in IDL which was an LDL-forming precursor containing cholesterol in the blood circulation resulted in a decrease of total cholesterol in the blood^{9,10}.

Metode

This research was an experimental laboratory with a posttest control group design²⁰ as a study design between

the independent variable of *Garcinia mangostana* L. Rind extract and the dependent variable of total cholesterol levels. The population was male white mice (*Ratus norvegicus*) aged 3-4 weeks with a weight of 100-200 grams¹⁶. Samples numbers were 6 for each group⁵. Data collection of measurement of total cholesterol levels used enzymatic method with a spectrophotometer, the data analysis used Variant Analysis statistical test (ANOVA) with a significance level of $\alpha < 0.05$ ¹⁵.

The Result of Study

1. The results of the total cholesterol concentration tests between the non-induced MDTL group and induced MDTL groups (High-Fat Diet Foods)

Tabel 1. The results of the total cholesterol concentration tests between the non-induced MDTL group and induced MDTL groups (High-Fat Diet Foods)

Dependent Variable	Group		Sig. (p)
	the non-induced MDTL group N = 6	induced MDTL groups N = 6	
Total Cholesterol (Mean \pm SD)	56,17 \pm 4,53	68,17 \pm 8,61	0,010

The results of the study in table 1 showed that total cholesterol levels induced by MDTL had a significant increase compared to the group before MDTL was induced with $p = 0.010$

2. Data on body weight, the total cholesterol levels variable in the control group and treatment group

The analysis results of initial body weight, final weight, changes in body weight, total cholesterol levels between the control group and the treatment group which treated by mangosteen pericarp rind extract (*Garcinia mangostana* L.) at a dose of 50 mg / kgBB, 150 mg / kg BW, 250 mg / kg BB and 350 mg / kg BB.

Table 2. Mean and standard deviation of initial body weight, final body weight, change in body weight and variable total cholesterol in the control and treatment groups

Group		Initial weight (gram)	Final weight (gram)	Change in body weight (gram)	Total cholesterol (mg/dl)
Control group (K 3) n = 6	Mean	165.00	188.33	23.33	95.17
	Standard deviation	30.65	29.26	8.16	10.81
Extract group of 50mg (K 4) n = 6	Mean	155.83	172.50	16.67	79.17
	Standard deviation	28,70	28,41	6,05	7,58
Extract group of 150 mg (K 5) n = 6	Mean	160.50	177.50	17.00	80.67
	Standard deviation	34,11	32,36	5,09	7,17
Extract group of 250 mg (K 6) n = 6	Mean	155.83	173.50	17.67	73.83
	Standard deviation	25.96	26.48	5.35	13.04
Extract group of 350 mg (K 7) n = 6	Mean	155.83	178.50	22.67	67.00
	Standard deviation	18.00	14.68	5.35	8.31

3. The normality test of the control group and the treatment group

The results of the Kolmogorov-Smirnov normality test for one sample which administered to the changes of total cholesterol levels in the control group and the treatment group by giving mangosteen pericarp rind extract (*Garcinia mangostana L.*) $p = 0.955$. The cholesterol change data obtained $p > 0.05$ so that the data were normally distributed.

Table 3. The normality test of the control group and the treatment group

Variable	Sig.
The total cholesterol levels	0.955

4. The Result of Variant Analysis

Table 4. The test results were different from the ANOVA total cholesterol variable in the control group and the handling of *Garcinia mangostana L* skin extract

The results of the t-test with the total cholesterol variables anova in the control and treatment group of *Garcinia mangostana L* skin extract

Dependent Variable	F-count	Sig.
total cholesterol	7,009	0,001*

Sig * to show significant meaningfulness

From the table above based on the average total cholesterol level between the control group and the treatment group given *Garcinia mangostana L.* rind extract showed a significant difference ($p < 0.05$) $p = 0.001$

5. The result of LSD test

Table 5. The result of t-test using LSD total cholesterol variables in the control and treatment group of mangosteen pericarp rind extract (*Garcinia mangostana* L.

Dependent Variable	Group (I)	Group (J)	Difference average	Std. Error	Sig.
total cholesterol	(Control Group 3) N = 6	Extract of 50 mg	16.000*	5.569	.008
		Extract of 150 mg	14.500*	5.569	.015
		Extract of 250 mg	21.333*	5.569	.001
		Extract of 350 mg	28.167*	5.569	.000
	Extract of 50 mg (Group 4) N = 6	Control	-16.000*	5.569	.008
		Extract of 150 mg	-1.500	5.569	.790
		Extract of 250 mg	5.333	5.569	.347
		Extract of 350 mg	12.167*	5.569	.038
	Extract of 150 mg (Group 5) N = 6	Control	-14.500*	5.569	.015
		Extract of 50 mg	1.500	5.569	.790
		Extract of 250 mg	6.833	5.569	.231
		Extract of 350 mg	13.667*	5.569	.021
	Extract of 250 mg (Group 6) N = 6	Control	-21.333*	5.569	.001
		Extract of 50 mg	-5.333	5.569	.347
		Extract of 150 mg	-6.833	5.569	.231
		Extract of 350 mg	6.833	5.569	.231
	Extract of 350 mg (Group 7) N = 6	Control	-28.167*	5.569	.000
		Extract of 50 mg	-12.167*	5.569	.038
		Extract of 150 mg	-13.667*	5.569	.021
		Extract of 250 mg	-6.833	5.569	.231

In table 5 showed that there was a decrease in total cholesterol with a significant difference ($p < 0.05$) between the control group and the mangosteen pericarp rind extract group (*Garcinia mangostana* L.). extract dose of 50 mg / kg BB ($p = 0,008$), extract dose of 150 mg / kg BW ($p = 0,015$) and extract dose of 250 mg / kg BW ($p = 0,001$), while group of extract dose 350 mg / kgBB ($p = 0,000$)

In Table 5 showed that there was a significant decrease ($p < 0.05$) compared to total cholesterol between the dose groups of mangosteen pericarp rind extract (*Garcinia mangostana* L.) 50 mg / kgBB and the control group ($p = 0.008$) and group extract 350 mg / kgBB ($p = 0.038$). However there was no significant difference of the extract dose of 150 mg / kgBB ($p = 0.790$) and extract dose of 250 mg / kgBB ($p = 0.347$).

For the total cholesterol in the dose group of mangosteen pericarp rind extract (*Garcinia mangostana* L.) of 150 mg / kgBB, there was a significant decrease ($p < 0.05$) between the mangosteen pericarp rind extract group (*Garcinia mangostana* L.). dose of 150 mg / kgBB with control ($p = 0.15$) and extract dose of 350 mg / kg

BB ($p = 0.021$), meanwhile administering the extract dose of 50 mg / kgBB ($p = 0.015$) and extract dose of 250 mg / kgBB ($p = 0.001$) there was a significant decrease ($p > 0.05$).

For the total cholesterol in the dose group of mangosteen pericarp rind extract (*Garcinia mangostana* L.) 250 mg / kgBB, the ratio of significant decrease was only on the control group ($p = 0.01$), whereas on the group dose of 50 mg / kgBB, 150 mg / kgBB and 350 mg / kgBB there was no significant differences with $p > 0.05$. In comparison with the dose group of mangosteen pericarp rind extract (*Garcinia mangostana* L.) 350 mg / kgBB for the total cholesterol there was a significant decrease with the control group ($p = 0,000$), dose of 50 mg / kgBB ($p = 0.038$), and dose of 150 mg / kgBB (0.021). For the extract dose of 250 mg / kgBB there was no significant difference ($p = 0.231$).

Discussion

Food induction of a high-fat diet (MDTL) in white rats consisting of a mixture of beef fat and palm oil in a ratio of 1: 5 as much as 2% of body weight for 7 days

aimed to optimize rat blood cholesterol levels⁷. The induction of MDTL containing sterols and triglycerides was estimated to reduce LDL receptors and the formation of VLDL particles of smaller size and contained more cholesterol^{9,10}. The enhancement of LDL containing cholesterol resulted in the taking through LDL receptors experienced saturation. Therefore it changed into modified LDL with oxidation which was not recognized by LDL receptors^{9,10}. Oxidized LDL interacts well and is absorbed by lower affinity systems in macrophages and other cells called *scavenger receptors*. However not all oxidized LDL were taken by macrophages. This was due to the availability of fatty acyl substrates by the enzyme Acyl-CoA; cholesterol transferase (ACAT) which was limited to macrophages which were loaded by oxidized LDL². Oxidized LDL was not taken by macrophages that were in the membrane as far as it was unable to inhibit the HMG-CoA reductase enzyme, so cholesterol synthesis in the cell itself continues. This situation caused an increase of cholesterol in the blood^{9,10}.

The variance analysis test showed that there was a significant effect ($p < 0.05$) on total cholesterol levels between the control group and the treatment group dosing *Garcinia mangostana L.* rind extract. This decrease was consistent with the results of previous studies conducted by Dachriyanus by giving as suspension of pure mangostin in mice showed a decrease in serum total cholesterol reaching 24%³.

This decrease was due to mangosteen pericarp rind extract (*Garcinia mangostana L.*) which containing mangostin had an inhibitory activity against the inhibition of prostaglandin E release¹¹. Prostaglandin E could cause resistance to the activity of the enzyme adenylyl cyclase, an enzyme that converted ATP to cAMP. cAMP synthesis Obstacles resulted in inactive conversion of hormone-sensitive lipase enzymes into the active form of the lipase enzyme through protein kinase¹⁷ to be disrupted. As a result the lipolysis process decreased^{9,10}. The lipolysis reduction in adipose tissue resulted in a decrease in free fatty acids in the blood circulation. In this condition free fatty acids will enter the liver with low concentration. Decreasing the esterification concentration of free fatty acids to acylglycerol which transported from the liver in the form of VLDL decreased. Decreasing VLDL production resulted in a decrease of IDL levels which was the LDL former containing cholesterol. Therefore cholesterol in the blood circulation decreased^{9,10}.

The total cholesterol reduction also occurred because of *Garcinia mangostana L.* rind extract containing mangostin is very effective in saving the use of α -tocopherols which are antioxidants and play a role in breaking the chain. α -tocopherols plays a role as donors of hydrogen phenolic and a less reactive radical tocopheroxyl substitutes (α -TO•) or as direct reactants with radical initiation to prevent the formation of LOO• to form non radical products (NRP)¹⁴, one of which is *Malondialdehyde*¹⁹. Decreasing Malondialdehyde reduces *adducts* with amino acid side chains from apolipoprotein B-100^{9,10}, resulting in reduced oxidation interaction and absorption of LDL by a lower affinity system called scavenger receptor which results in LDL oxidation containing cholesterol decreases^{9,10}. Decreasing or damaging malondialdehyde resulted in reducing *adducts* between malondialdehyde and amino acid side chains of apolipoprotein B-100 and reducing the interaction and absorption of oxidized LDL by a lower affinity system called scavenger receptor^{9,10}. As a result of reduced interaction and absorption of oxidized LDL, oxidized LDL was also reduced by macrophages resulting in fatty acyl substrates by the enzyme Acyl-CoA; cholesterol transferase (ACAT) in macrophages that were filled with oxidized LDL was sufficient and would be able to inhibit the HMG-CoA reductase enzyme in cell membranes², so that cholesterol synthesis was reduced^{9,10}.

Conclusion

Giving rind extract of *Garcinia mangostana L.* with a dose of 50 mg / kgBB, 150 mg / kgBB, 250 mg / kgBB and a dose of 350 mg / kgBB can significantly reduce total cholesterol levels of male hypercholesterolemic white mice with a significance level of $p < 0.05$.

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Role of MnSOD Val16Ala Gene Polymorphism in Changing the Level of Serum Metals in Workers Exposed to Heavy Metals in Al-Nasiriyah City

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Abstract

Low activity of antioxidant enzymes due to polymorphism in antioxidant genes and differences in mineral and metal levels creates oxidative stress that may play a role in advancing many diseases. The aim of this study was to determine the role of Manganese superoxide dismutase (MnSOD) gene polymorphism [rs4880 Val16Ala] in exposed workers and to compare the levels of metals and minerals among its various genotypes in control group. A total of 80 individuals including age and gender matched workers and control group were genotyped. Detection of rs4880 polymorphism was done using sequencing technique. The blood serum were tested for determination of metals and minerals using Atomic absorption spectrophotometer (AA 6600 Shimadzu). This study indicate that the frequency of T allele was higher than that of C allele in control group as well as in workers. Our results indicate no association between all genotypes in study subjects. The results of present study indicates that Pb and Cd concentration differ significantly between TT genotypes of MnSOD (rs4880) gene polymorphism as compared to CC genotypes in workers and control group ($p < 0.05$). Control group with TT, TC and CC genotypes have high concentration of Fe, Cu and Zn as compared to workers group.

Key Words: Heavy Metals, MnSOD, Polymorphism, PCR, Workers.

Introduction

Oxidative stress is responsible for a number of pathological and physiological circumstances, including atherosclerosis, diabetes, aging, osteoarthritis, types of cancer, inflammatory bowel diseases, and more^(1,2). Oxidative stress is a word used to demonstrate the cell imbalance between prooxidant manufacturing and cell antioxidant defense. It happens either owing to deficiencies in antioxidant protection structures or due to excessive reactive nitrogen species (RNS) and reactive oxygen species (ROS) manufacturing⁽³⁾.

ROS may result from inherent variables such as mitochondria, peroxisomes and inflammatory cell activation, and contact with extrinsic variables including environmental, pharmaceutical and industrial chemicals^(4,5). Oxidative stress caused by ROS which are typically balanced by antioxidant defenses of the cell⁽⁴⁾. Oxidative stress may cause protein, DNA and lipid damage, leading to an arisen chance of chromosomal aberrations, genetic mutation and alteration of cell growth that may happen in cancer⁽⁶⁾.

In the human body, numerous mechanisms protect cellular systems against oxidative damage. These processes include some intracellular enzymes such as superoxide dismutase(SOD), catalase(CAT), glutathione peroxidases(GPX), reductase of thioredoxin, and peroxidases. Some of the antioxidant enzymes which defense against oxidative damage are polymorphic⁽⁷⁾.

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Manganese superoxide dismutase(MnSOD), is one of the essential antioxidant enzymes which convert superoxide radicals to H_2O_2 and O_2 in mitochondria, and thus represents a first line defense in mitochondria against ROS (8). Therefore, the polymorphisms of the MnSOD gene have crucial role on the maintenance of ROS levels in cells^(8,9). The structure of the MnSOD gene comprises of five exons interrupted by four introns and the promoter. Several polymorphisms in distinct regions of the MnSOD gene have been recognized⁽¹⁰⁾. These polymorphisms were correlated with various illnesses. MnSOD is encoded by the nuclear MnSOD gene situated on the human chromosome 6q25 and the exon 2 of the human MnSOD gene identifies the Val16Ala polymorphism. Val16Ala (47T > C) is a commonly researched SOD2 single nucleotide polymorphism (SNP) on the MnSOD gene^(10,11). MnSOD Val16Ala polymorphism is found in the mitochondrial targeting sequence and was suggested to alter the peptide structure, affecting protein translocation and maturation in the mitochondrial matrix⁽¹²⁾. This polymorphism was linked to various pathologies including asthma⁽¹³⁾, diabetes⁽¹⁴⁾, aging⁽¹⁵⁾, cardiomyopathy⁽¹⁶⁾ and cancer⁽¹⁷⁾.

ROS production is not only influenced by polymorphism in antioxidant genes but it is also affected due to exposure of heavy metals. Heavy metals like lead (Pb), cadmium (Cd), chromium (Cr) and nickel (Ni) creates oxidative stress and contributes in the development of many human diseases which includes degenerative lung and heart conditions, Alzheimer disease and rheumatoid arthritis⁽¹⁸⁾.

To our knowledge, there were no study conducted to study the association between heavy metal concentration and Val16Ala Ala16Val polymorphism in exposed workers. Therefore, in the present study, the aim was to investigate the association between the genetic polymorphism MnSOD Val16Ala and exposed workers to heavy metals in Al-Nasiriyah city.

Materials and Method

This research was conducted in laboratories for the period from November 2018 to the end of April 2019 (Science College, College of Education for Pure Sciences, Mazaya Private College and Technical Institute in Al-Shatrah). 80 people (60 workers and 20 controls) were included in the present research. Worker groups were selected randomly from three industrial foundations in Al-Nasiriyah town center (1- Oil Refinery, 2- Car

Repair Workshops, and 3- Brick Factories). It included from each organisation 20 workers. The control group included people working in institutions that were far from being directly exposed to pollutants.

Sample collection

Approximately 7.5 ml of venous blood specimens were gathered from study group people. 2.5 ml were placed in the EDTA vacutainer tubes for genomic DNA extraction, while the remainder of the 5 ml blood was placed in a sterile plane tube and permitted to coagulate to distinguish the serum at 4000 rpm for 15 minutes by centrifugation. The genomic DNA and serum were stored at -20 c freezing , then used to amplification of MnSOD genes and estimation of heavy elements.

Metal analysis

The serum sample was used to analyze metals. The samples were processed by acid digestion method described by Ji & Ren,⁽¹⁹⁾. After acid digestion, the blood serum was evaluated by the atomic absorption spectrophotometer(FAAS.- Phoenix 986 AA. United kingdomUK.) to determine Pb, Cd, Fe, Cu and Zn.

Genetic analysis

DNA isolation and Genotyping.

Whole DNA was obtained through the use of gSYNCTMDNA Mini kit from white blood cells. MnSOD Val16Ala polymorphism was examined using sequencing method. Forward and reverse primers of MnSOD gene amplification were as follow: CAG CCC AGC CTG CGT AGA CGG -3' and reverse 5'- CTT GGC CAA CGC CTC CTG GTACTT -3') as defined by Souiden et al.⁽²⁰⁾ to amplify a 267 bp fragment as shown in Fig.1. The PCR program was initial denaturation at 95°C for 5 min followed by 30 cycles of 95°C for 40 sec. min, 59°C for 35 sec. (annealing) and 72°C for 35 sec. (extension). The reaction was completed by a final extension cycle at 72°C for 7 min. Amplified product was sent to a Macrogen Company to analyze the nucleotide sequence using a Genetic analyser device.

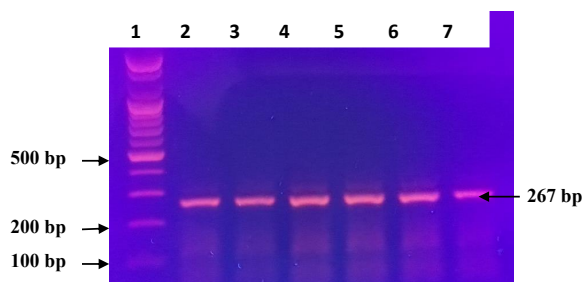


Fig.1. PCR products of MnSOD gene which analyzed on 2% agarose gel.

Statistical Analysis

All statistical analysis was conducted using version 17 of SPSS. Chi square test was used to compare the frequencies of genotype between workers and control group. Mean \pm standard deviation (Mean \pm SD) was used to explore the important distinctions between the metal values of the research groups. $P < 0.05$ were considered

statistically significant.

Results

The current study showed a high frequency of (TT) alleles compared to the frequency of other alleles (TC and CC) in other study groups, with no significant differences between the frequency of each allele in different groups. In the control group, 13 (65%) had TT genotype, 4 (20%) were heterozygote and had TC genotype and 3 (15%) had CC genotype. Among oil refinery workers, 12 (60%) items had TT genotype, 6 (30%) had TC genotype and 2 (10%) had CC genotype. The highest alleles frequency for group of car repair workers was TT genotype 14 (70%), while the other genotypes (TC and CC) were repeated at an equal rate of 15%. Out of 20 workers of brick factories, 10 (50%) had TT genotype, while 4 (20%) had TC genotype. The rest (30%) had CC genotype.

Table 1: Allele frequencies of the Ala16Val polymorphism among study groups

Study groups	TT n (%)	TC n (%)	CC n(%)	Total
Control	13 (65.00%)	4 (20.00%)	3 (15.00%)	20 (100.00%)
Oil Refinery	12 (60.00%)	6 (30.00%)	2 (10.00%)	20 (100.00%)
Car Repair Workshops	14 (70.00%)	3(15.00%)	3 (15.00%)	20 (100.00%)
Brick factories	10 (50.00%)	4 (20.00%)	6 (30.00%)	20 (100.00%)
Total	49 (61.25%)	17 (21.25%)	14 (17.50%)	80 (100.00%)
P.Value	0.870	0.327	0.319	

P.value \leq 0.05 means significant

This study was also intended to determine the concentration of distinct metals and minerals in separate MnSOD gene polymorphism genotypes. in workers exposed to heavy metals as compared to control. The mean concentration of Pb in TT genotype was 20 μ g/L and 17 μ g/L, in TC it was 18 μ g/L and 16 μ g/L, and in CC it was 18 μ g/L and 16 μ g/L respectively in workers and control group (Fig. 2). There was significant difference between TT and CC in exposed workers ($P < 0.05$). No significant difference was present between CC and

TC genotypes of MnSOD gene [rs4880 (Val16Ala)] polymorphism in control group as compared to exposed workers ($P > 0.05$).

The mean concentration of Cd was found to be 5 μ g/L, 4 μ g/L and 3 μ g/L in TT, TC and CC genotypes in workers and 4 μ g/L, 3 μ g/L and 3 μ g/L in TT, TC and CC genotypes in control group. Present finding indicated that significant difference occurred for Cd concentration between TT and other genotypes in workers and control group ($P < 0.05$). Control group with TT, TC and CC genotypes have high concentration of Fe, Cu and Zn as compared to workers group.

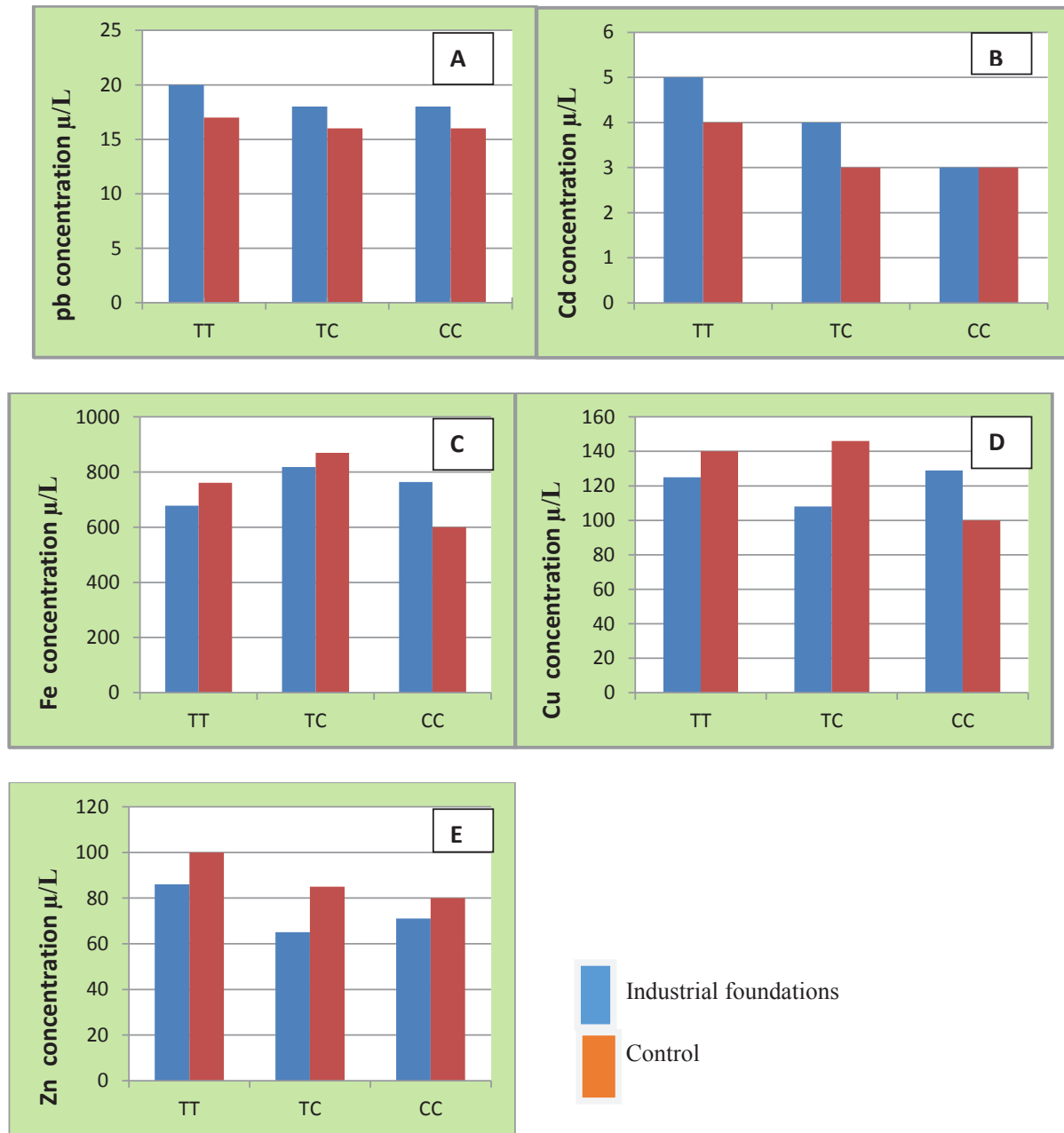


Fig. 2. Concentration comparison of A, Pb; B, Cd; C, Fe; D, Cu and E, Zn in different genotype carrier of MnSOD gene [rs4880 Val16Ala] polymorphism in workers and control group.

Discussion

Until now, no study has been revealed for study of association between MnSOD Val16Ala polymorphism and concentration of heavy metals. The findings of this research show that T allele frequency is greater than that of C allele in control group as well as in workers. Our results indicate no association between all genotypes in study subjects. Metal ion toxicity mechanism is partly

known, but it is obvious that they can generate ROS that involves nitrogen oxide (NO), superoxide ions (O₂⁻), hydroxyl (OH) and H₂O₂ with the assistance of Fenton / Haber-Weiss response⁽²¹⁾. No one has studied the association between MnSOD gene polymorphism and heavy metals in exposed workers. It is not fully understood the role of genetic variations in the MnSOD gene in altering the concentration of heavy metals. This aspect has also been attempted by the present research.

Concentration of Pb has been observed to change due to genotypes. In TT carriers in the workers and control group, the concentration of Pb was significantly high compared to the CC genotype. Similarly the finding of this study indicates that Cd concentration differ significantly between TT and CC genotypes of MnSOD1 gene [rs4880 (Val16Ala)] polymorphism in study subjects. A significant difference of Cd was present between TT and TC genotypes carriers in workers and control group as compared to CC genotype. These results indicate a complicated interaction of polymorphism of the MnSOD gene [rs4880 (Val16Ala)] with the concentration of Pb and Cd in the human body homeostasis. Although the result was observed that Fe, Cu and Zn concentration changed in all genotypes carriers in control group and workers but this difference was non-significant ($P>0.05$).

There is a gap in understanding of how metals and minerals interact in the antioxidant gene with MnSOD1 Val16Ala polymorphism (rs4880) which may affect progress of oxidative stress and development different diseases. Present information can assist to understand this polymorphism interaction with concentration of ion metals. Detailed study of exposure to minerals and metals will assist to confirm the relationship between genotypes and oxidative stress. In order to create the real picture of the association of MnSOD1 Val16Ala polymorphism (rs4880) and heavy metal concentration, further investigation is needed.

Conclusion

The present finding indicates that level of Pb and Cd increase in individual with TT genotypes. Regarding of Fe, Cu and Zn, this study suggested that the concentration of these mineral was changed slightly in all genotypes carriers in control group and workers but this difference was non-significant.

Ethical Clearance: The research and laboratory tests were approved by the Ethics Committee of the College of science for Pure Sciences / Thi-Qar University.

Source of Funding : Self

Conflict of Interest : Nil

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Seroprevalence of Hepatitis A Virus (HAV) in Mosul City

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Abstract

Background: Globally, there are about 1.5 million cases showing symptoms each year, with tens of millions likely to become infected. It is more common in areas of the world with poor sanitation and inadequate drinking water. The aim of the study is to identify percentage of the prevalence and distribution of hepatitis A (HAV) among the gender, age group.

Methods: Prospective study was applied in Mosul City for the period between July 2017 to June 2019. A seroepidemiologic survey about hepatitis A virus (HAV) infection was carried out in a group comprising 312 patients, ranging in age from 1 year to 60 years, from in the Mosul city. Three ml of blood were taken from the patients and Serum was separated and stored at -200C for the test.

Results: The results of the present study indicate that the total prevalence of type A virus in Mosul was (21.7%) and was distributed between males and females (14.4%) (7.3%), respectively. The infection rate was the highest in the age group (16-21 years).

Conclusion: According to the results of this study, the city of Mosul may be considered a settlement area for the hepatitis virus infection. So people responsible for health in the city must monitor programs to prevent transmission of the virus, which can be carried out in several ways.

Key Words: HVA, Prevalence, Mosul .

Introduction

Hepatitis A one of the viral disease that attack the liver and cause symptoms ranging from mild/severe.⁽¹⁻³⁾ By polluting Food, water or by direct contact with a person who is infected, the infection virus is transmitted.⁽⁴⁻⁵⁾ Very few people with hepatitis A may die from hepatitis and others can be recovering completely by life time immunity. Unsafe water and poor sanitation and personal hygiene e.g. contaminated hands is considered a major risk of hepatitis A.⁽⁶⁻⁸⁾ Hepatitis A infection does not cause chronic liver disease and is rarely fatal, as it can cause symptoms of debilitating hepatitis and

acute hepatitis (HP), which result in high mortality. A infection occurs in isolated somebody causa and in epidemics around the world and tends to occur periodically.⁽⁹⁾ The epidemic disease caused by food or water contamination can be very widespread, such as the epidemiological billet that swept China-Shanghai in 1988 and infected Three hundred thousand people. Hepatitis A viruses are prevalent in the environment and can resist the production and processing of food commonly used to disrupt and / or control bacterial pathogens.⁽¹⁰⁾ The disease can cause serious economic and social damage to local communities. It may take weeks or months for a patient to recover from his or her work, school, or daily life. It can have serious effects on food establishments that are identified as harboring the virus and their overall domestic productivity.⁽¹¹⁾ Geographical areas can be classified as high, moderate or low levels of hepatitis A infection. The symptoms of hepatitis are similar to the viruses that cause it, and the symptoms of hepatitis in children are similar to the symptoms of influenza,

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including: ⁽¹²⁾ fever. Nausea. Vomiting. Anorexia. General fatigue. Sten in the upper right of the abdomen or pain, where the liver is located. Jaundice, this occurs due to the swelling of the liver, in addition to increased backup of the blood in the blood and clogged, leading to change the color of the urine to dark orange, and stool to light yellow or similar to clay color.⁽¹³⁻¹⁵⁾ With the possibility of previous symptoms, many children with hepatitis do not have any symptoms, and the absence of symptoms with age is inversely proportional to the increase in the risk of infection without symptoms as the age is smaller.⁽¹⁶⁾ Studies show that only 30% of children with symptoms younger than 6 are present, most of who appear mildly, and symptoms persist for several weeks in older children.⁽¹⁷⁻²⁰⁾ Hence, this study was designed to determine the sero-prevalence of antibodies to HAV among HCWs at National Institute for Pharmaceutical Research and Development (NIPRD) in Mosul City, Republic of Iraq.

Method

A prospective design was applied in the current study. Data were collected for the period between 1st of January 2018- 31 of December, 2018 in Mosul City-Iraq. A questionnaire was prepared to gather information related to patients who infected with the virus such as their drinking water quality and sources, toilets used and food preparation as well as the some information related to the family socio economic status and educational level. Agreement of the patient were gathered before they enrolled in the study.

Sample collection

For serological analysis for HAV (3mls) of venous blood was collected from each participant into standard sample bottles. The blood samples were collected

by well-trained phlebotomists. The samples were centrifuged at 4,452g for 10minutes and the recovered plasma were aliquoted into the well-labeled cryovials, and kept into -400C freeze until ready for the screening.

Serological Screening

Serological diagnosis was done using Rapid diagnostic tests (RDTs), for HAV infection the SD BIOLINE (Standard Diagnostic (SD) Inc., Korea) one step HAV test kit was used for detection of HAV infection and HAV antibodies was done using the SD BIOLINE HCV test kit. This is an immunochromatographic rapid test for the qualitative detection of antibodies specific to HAV in blood with a sensitivity of 100% and specificity of 99.4% according to manufacturer's instructions found on the standard operation procedure insert. The seropositive samples to HASAg detected by RDTs screening were further confirmed by Wesstern blot (Trinity Biotech, Bray, Ireland) according to manufacturer's specifications.

Data analysis

The data obtained from the study was analyzed using (SPSS) (version 20.0), descriptive statistics were presented in Tables. The Chi-square (X²) test was applied to determine the level of association of the prevalence of HAV among study samples with respect to sex and age distribution associations. Values of $P \leq 0.05$ were considered statistically significant.

Results

The results of the present study indicate that the total prevalence of type A virus in Mosul was (21.7%) and was distributed between males and females (14.4%) (7.3%), respectively. The infection rate was the highest in the age group (16-21 years).

Table (1) HAV Sero-positivity & Gender difference

Gender	Total	* No. Positive (%)	No. Negative (%)
Male	59	29 (47.4)	30 (50.8)
Female	70	14 (20)	56 (80)
Total	129	43 (33.3)	86 (66.7)
Male	53	6 (11.3)	47 (88.6)
Female	60	9 (15)	51 (85)
Total	113	15 (9.3)	98 (86.7)

Table (1) HAV Sero-positivity & Gender difference

Male	27	3 (11.2)	24 (88.8)
Female	43	7 (16.2)	36 (83.7)
Total	70	10 (14.2)	60 (85.7)
All total	312	68 (21.7)	244 (78.3)

Table 2 : Sero-prevalence of Anti – HAV (all markers) and gender difference

Gender	Total	IgG – ve	IgG + ve	* IgG + ve	* IgG - ve
		IgM – ve	IgM - ve	IgM + ve	IgM + ve
		Negative non reactive %	Reaction or Vaccination %	Positive or reaction %	Positive or reaction %
Male	59	19 (32.2)	17 (28.8)	16 (27.2)	7 (11.8)
Female	70	38 (54.2)	13 (18.5)	15 (21.4)	4 (5.9)
Total	129	57 (44.1)	30 (23.2)	31 (24.2)	11 (8.5)
Male	53	27 (50.9)	21 (39.6)	2 (3.7)	3 (5.8)
Female	60	13 (21.6)	38 (63.3)	5 (8.3)	4 (6.8)
Total	113	40 (35.4)	59 (52.2)	7 (6.2)	7 (6.2)
Male	27	18 (66.6)	5 (18.5)	2 (7.4)	2 (7.4)
Female	43	25 (58.2)	10 (23.3)	5 (11.6)	3 (6.9)
Total	70	43 (6.1)	15 (21.4)	7 (10)	5 (7.1)
Total	312	140 (44.8)	104 (33.3)	45 (14.4)	23 (7.3)

Table (3) : Age groups distribution of Sero-positivity anti–HAV antibodies

Age	Total	Anti – HAV antibodies	Anti – HAV antibodies
	No. Of case	Positive IgM , IgG (%)	Negative IgM , IgG (%)
5-Jan	30	9 (30)	21 (70)
10-Jun	36	10 (27.7)	26 (72.3)
15-Nov	25	6 (24)	19 (76)
16 - 20	52	17 (32.6)	35 (67.4)
>20	169	26 (15.3)	143 (84.7)
All total	312	68 (21.7)	244 (78.3)

Discussion

According to world Health Organization, about more four million people infected with HAV are in the middle east region. Due to the armies and political conflicted in these countries the accurate data about HAV Sero-prevalence are very imperfect.⁽²¹⁾ One of the these country is Iraq and Especially City of Mosul which attacked by for more than three years and the health care system was breakdown. The aim of the present study is to estimate the sero-prevalence of HAV in Mosul City the Capital city of Nineveh Governorate among specific age group. The finding of current study shows that, among 312 patients with a clinical presentation of viral hepatitis, (21.7%) had positive serum anti-HAV antibodies. These results mirrors of three years of the poor sanitation ,and unsafe water supply as well as bad hygienic situation of the City. According to Turkey et.al.⁽¹⁵⁾ the HAV infection is hyper endemic in Iraq with a national estimate of IgG sero-prevalence rate of 98% in the 5th decade and older age group (41+). The result is higher rate than finding of previous studies that conducted in recent years in other Iraqi Province like Basrah, Dehouk and Kirkuk.⁽²²⁾ Safiabadi et.al⁽²³⁾ stated that Hepatitis A is strongly associated with hygiene factors and has increased rates of infection during periods of war and conflict, according to recent statistics of infection in countries such as Iraq, Afghanistan, Yemen and Syria. Similarly to previous studies in Iraq and Kingdom Saudi Arabia, the gender has no significant differences were found between male and female infected.⁽¹⁶⁾

Recommendation: According to the results of this study, the city of Mosul may be considered a endemic area for the hepatitis virus infection. So the stakeholders in the city must monitor programs to prevent transmission of the virus, which can be carried out in several ways.

Conflicts of Interest: None declared.

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Prostate Health Index in a sample of Iraqi patients with Prostate Cancer and Benign Prostatic Hyperplasia

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Abstract

There is widespread of PSA using as a Prostate Cancer biomarker (threshold of 4ng/ml),but there is no single PSA value that avoids missing serious cancers at a treatable phase, avoids false-positives and unnecessary prostate biopsies. The evaluation of the clinical significant of [-2]proPSA and the Prostate Health Index (PHI) in diagnosis of Prostate Cancer was done in this research to enhance the correct prediction of the prostate cancer. The aim, of this study is to improve the method of testing by using newer PSA biomarkers in the subject sera for evaluating the diagnostic significance of [-2]proPSA and Prostate Health Index (PHI) in the detect of prostate cancer in early stages. A case-control research comprising 54 patients over 50 years old age having Prostate Cancer and Benign Prostatic Hyperplasia recruited from Iraqi urological clinics unit and AL-Amal National Hospital for Cancer Management during the period from July 2018 to March 2019. There was a significantly high difference ($P < 0.001$) of serum PSA, P2PSA and PHI levels among all the study groups. The cut-off values of [-2]proPSA and Prostate Health Index (PHI) based on the ROC curve results in current study were >322 pg/ml and >578 respectively for Prostate cancer patients, while their values range between 322-89 pg/ml, and 578-209 respectively for BPH patients, and <89 pg/ml and <209 for apparently healthy men respectively, the area under curve (AUC) of (P2PSA) and PHI were 0.968, 0.960 for PCa group against noncancerous group respectively, 0.85 and 0.796 for BPH group against control group respectively. Their levels show significant increase in PCa patients in comparison with noncancerous group and in BPH patients when compared with control group.

Keywords: (-2)proPSA; prostate cancer; Prostate Health Index; prostate-specific antigen.

Introduction

Prostate-Specific Antigen (PSA) is well-known prostate cancer (PCa) detection serum biomarker in its early presence⁽¹⁾. According to recent studies, PSA fails to be considered as an accurate PCa predictor biomarker (limited by poor specificity)⁽²⁾.

A considerable effort has been made as a consequence in order to find new biomarkers for the accurate diagnosis of PCa⁽³⁾.

The bound forms of PSA found in serum account 80%–95% and the other minor form found as an unbound (free) state, which involves 3 isoforms: benign PSA (BPSA), proPSA and intact PSA. In addition, a number of truncated proPSA isoforms, involving (-2) proPSA, (-5) proPSA, and (-7) proPSA are present.

Main prostate cancer-specific isoform is [-2]proPSA isoform and it has been concentrated preferentially on immunohistochemical staining in prostate cancer tissue also it has been highly increased in the serum of Prostate Cancer patients⁽⁴⁾.

A test called the Prostatic Health Index (PHI) is a recent equation which joins the PSA, free PSA and [-2]proPSA as one formula which can be applied in order to assist making the correct diagnosis⁽⁵⁾.

In addition, the equation is also effective in discriminating BPH patients from PCa patients in males, especially those with prostate cancer⁽⁶⁾. The score of PHI was validated⁽⁵⁾, then replication of this validity through many multicenter follow-up clinical trials in various countries⁽⁷⁾. The majority of the researches' objectives are

to evaluate the detection significance of PHI in the PSA values between 2-10 ng/ml, as well termed as the detection “gray zone” and little researches have been reported regarding the PHI efficacy even when the patients PSA value exceeds 10 ng/ml. There is a non-negligible rate of males with PSA values higher than 10 ng/ml that possibly who non-cancerous and the rise in PSA values might be a consequence of asymptomatic prostatic inflammation or a result of prostate enlargement⁽³⁾. So we aimed in this study: To improve a method of testing by using newer PSA markers in the subjects sera for evaluate diagnostic significance of [-2]proPSA and PHI in detection of PCa in early stage.

Materials and Method

A case-control research was executed from August 2018 till February 2019. A sample of Iraqi patients >50 years old was diagnosed as Prostate Cancer or Benign Prostate Hyperplasia patient in: AL-Imamain AL-Kadhimain Medical City, Al-Shahid Ghazi Al-Hariri Specialized Surgery Hospital/Urology Consultation Unit, Al-Amal National Hospital for cancer management in Baghdad city. The study includes 84 samples consist of 3 groups: 24 prostate cancer cases, 30 benign prostatic hyperplasia cases and 30 apparently healthy subjects as control.

The current study comprised patients who undergo prostate biopsy for assumed PCa depending on physicians instructions. The patients >50 years old age with prostate cancer and benign prostatic hyperplasia were included in the study; while patients with acute bacterial prostatitis, sexually transmitted infections, patients with chronic renal failure and Patients on finasteride or dutasteride therapy for prostatic disease were excluded. Blood sample were aspirated using disposable syringes in the sitting position. Serum PSA, free PSA and [-2]proPSA estimated by using ELISA technique. PHI was calculated

by applying the equation: $(p2PSA/fPSA) \times \sqrt{PSA}$ ⁽⁵⁾.

Results

There was a significantly high difference ($P < 0.001$) among the all study groups regarding serum PSA and fPSA/PSA% levels. When PSA results were compared between each two groups, a very highly significant increase ($P1 < 0.001$); ($P3 < 0.001$) was found between Prostate Cancer group in comparison with both control group and Benign Prostatic Hyperplasia group respectively, while there was no significant difference ($P2 = 0.859$) between Benign Prostatic Hyperplasia group versus control group.

Regarding fPSA/PSA% results; comparison between each two groups; There was a very significantly high decrease ($P1 < 0.001$) ($P3 < 0.001$) between Prostate Cancer group in comparison with control group and Benign Prostatic Hyperplasia group respectively; in contrast, no significant decrease ($P2 = 0.416$) was found between Benign Prostatic Hyperplasia group against control group (Table 1).

As well as, when the comparison applied for Prostate Specific Antigen PSA derivatives P2PSA and PHI the findings were as listed in table 1: There was a very significantly high increase ($P < 0.001$) among all study groups. When [-2]proPSA and Prostate Health Index PHI results were compared between each two groups, a very highly significant increase ($P1 < 0.001$), ($P3 < 0.001$) was found between Prostate Cancer group in comparison with both control group and Benign Prostatic Hyperplasia group respectively. Also, concerning [-2]proPSA and Prostate Health Index PHI results; a very highly significant increase ($P2 = 0.005$), ($P2 < 0.001$) was found between Benign Prostatic Hyperplasia group versus control group respectively (Table 1).

Table 1: Statistical analysis of Biochemical measurements related to prostatic specific antigen (PSA)

Characteristic	Prostatic carcinoma n=24	BPH n=30	Control n=30	P	P1	P2	P3
	Mean±SEM	Mean±SEM	Mean±SEM				
PSA (ng/ml)	124.12±21.19	5.12 ±0.50	2.57±0.11	<0.001 † HS	<0.001 € HS	0.859 € NS	<0.001 € HS
fPSA/PSA%	11.00 ±1.39	26.71±2.42	24.45±1.90	<0.001 † HS	<0.001 € HS	0.416 € NS	<0.001 € HS

Cont... Table1:Statistical analysis of Biochemical measurements related to prostatic specific antigen(PSA)

P2PSA (pg/ml)	684.75±73.20	236.81±26.40	74.48 ±17.58	<0.001 † HS	<0.001 € HS	0.005 € HS	<0.001 € HS
Prostate health index (P.H.I)	801.39±54.42	440.64±26.86	164.95±17.98	<0.001 † HS	<0.001 € HS	<0.001 € HS	<0.001 € HS

n:number of cases;data were presented as either mean±standard error of mean(SEM);†:One way ANOVA;€: post hoc LSD test;HS:highly significant at P≤ 0.01;NS: not significant at P≤ 0.05; S:significant at P≤ 0.05;P1:P-value for Control vs carcinoma;P2:P-value for Control vs BPH;P3:P-value for Carcinoma vs BPH,PSA: prostate specific antigen,fPSA/PSA%:free prostate specific antigen/prostate specific antigen%;P2PSA:-2pro prostate specific antigen.

The validity indicators such as sensitivity,specificity and AUC for the present diagnostic biomarkers;serum PSA and fPSA/PSA%based on receiver operation characteristic (ROC) curve(Figure1A) were calculated as illustrated in table 2.

Regarding to PCa group versus noncancerous subjects;according toROC curve of serum PSA level,the cut-off value≥9.57ng/ml optimally identified the patients with Prostate Cancer from those who are noncancerous;at this cut-off value the sensitivity was87.5% , specificity

was 100% and the AUC was 0.983.A very highly significant increase (P<0.001) was found between Prostate Cancer versus noncancerous groups .

Regarding serum fPSA/PSA% level; the cut-off value≤11.1optimally identified the patients with Prostate Cancer from those who are noncancerous; at this cut-off value the sensitivity was 75%,specificity was 98.33% and the AUC was0.888.Very high significant decrease(P<0.001)was found between Prostate Cancer group versus noncancerous group(Table 2).

Table 2:Cut-off value, Sensitivity, Specificity and Area Under Curve of Receiver Operation Characteristic(ROC)Curve of Prostate-Specific Antigen(PSA) and its related biomarkers between Prostate Cancer versus group noncancerous group:

Characteristic	PSA(ng/ml)	fPSA/PSA%	P2(pg/ml)	PHI
Cut-off	>9.57	≤11.1	>322	>578
AUC	0.983	0.888	0.968	0.960
Sensitivity	87.5	75	100	91.67
Specificity	100	98.33	91.67	93.33
P-value	<0.001	<0.001	<0.001	<0.001

PSA:Prostate Specific Antigen,fPSA/PSA%:free Prostate Specific Antigen/Prostate Specific Antigen % ,P2PSA:-2Pro Prostate Specific Antigen PHI:Prostate Health Index.P -value:very highly significant at P≤ 0.001;significant atP≤ 0.05.

As shown in table 3; regarding BPH group versus control groupbased on ROC curveof serum PSA level(Figure1B);the cut-off value≥3.17ng/ml ideally established the patients with BPH from those who are apparently healthy men;at this cut-off value the sensitivity was77.78%,specificity was88.1% and the AUC was0.789.A very highly significant increase(P<0.001) was established between BPH category versus control

category.

Regarding,serum fPSA/PSA% level,the cut-off value≤31optimally identified the patients with BPH from those who are apparently healthy men;at this cut-off value the sensitivity was38.89%,specificity was88.1%,and the AUC was0.57.There was no significant difference(P= 0.436)between BPH group

versus control group(Table3).

Thus,in a sample of Iraqi patients;The cut-off values of PSA based on the ROC curve results in current study was ≥ 9.57 ng/ml for Prostate cancer patients,while its value range between 9.57-3.17ng/ml for BPH

patients,and < 3.17 ng/ml for apparently healthy men respectively,and the cut-off value of serum fPSA/PSA% level was $\leq 11.1\%$ for Prostate cancer patients,range between 11.1%-31% for BPH patients and $> 31\%$ for apparently healthy men respectively.

Table 3: Cut off value,Sensitivity,Specificity and Area Under Curve of Receiver Operation Characteristic(ROC)Curve of Prostate-Specific Antigen(PSA)and its related biomarkers between BPH group versus control group:

Characteristic	PSA(ng/ml)	fPSA/PSA%	P2(pg/ml)	PHI
Cut-off	> 3.17	< 31	> 89	> 209
AUC	0.789	0.57	0.85	0.796
Sensitivity	77.78	38.89	100	94.44
Specificity	88.1	88.1	64.29	64.29
P-value	0.001	0.436	< 0.001	< 0.001

PSA: Prostate Specific Antigen fPSA/PSA%: free Prostate Specific Antigen/Prostate Specific Antigen %
 P2PSA: 2-Prostate Specific Antigen PHI: Prostate Health Index P -value: very highly significant at $P \leq 0.001$; significant at $P \leq 0.05$.

The sensitivity,specificity,Area Under Curve and the cut-off thresholds of serum[-2]proPSA and PHI based on ROC curve were obtained to evaluate to what extent the level of possibility of these new chemical biomarkers is contributing and supporting strongly the accurate diagnosis side by side with other chemical biomarkers formerly present (Table2) and (Table3).

The finding of serum The[-2]proPSA level for Prostate Cancer group compared with non-cancerous groups were as following: The cut-off value ≥ 322 pg/ml ideally established the Prostate Cancer patients from those who are noncancerous;at this cut-off value the sensitivity was 100%,specificity was 91.67%and the AUC was 0.968.Regarding these findings;A very highly significant increase($P < 0.001$)was found between these two groups.

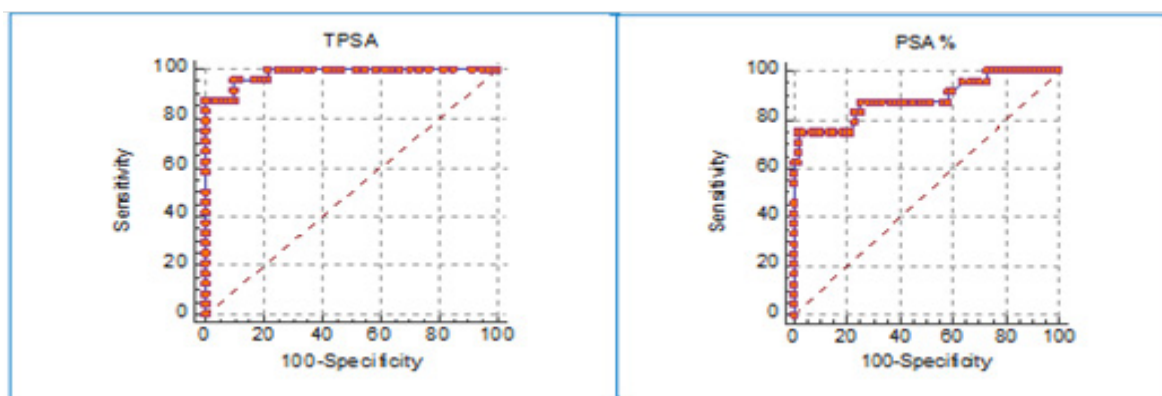


Figure 1: Receiver operation characteristic curve of PSA and fPSA/PSA% between Prostate Cancer versus noncancerous group.

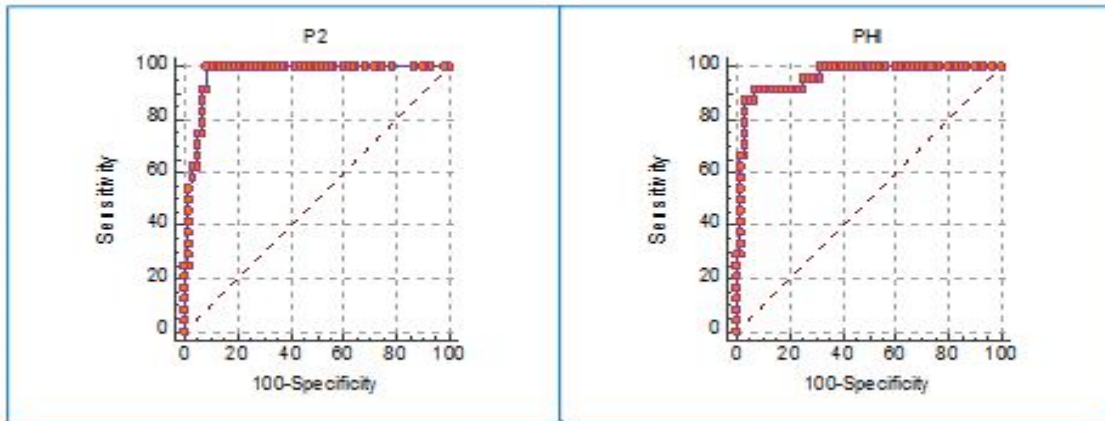
Concerning serum Prostate Health Index(PHI) results for Prostate Cancer group compared with non-cancerous group;the cut-off value ≥ 578 optimally identified the patients with Prostate Cancer from

those who were noncancerous;at this cut-off value the sensitivity was 91.67%,specificity was 93.33%and the AUC was 0.960.A very highly significant increase($P < 0.001$) was found between these two

groups(Table2),(Figure2A).

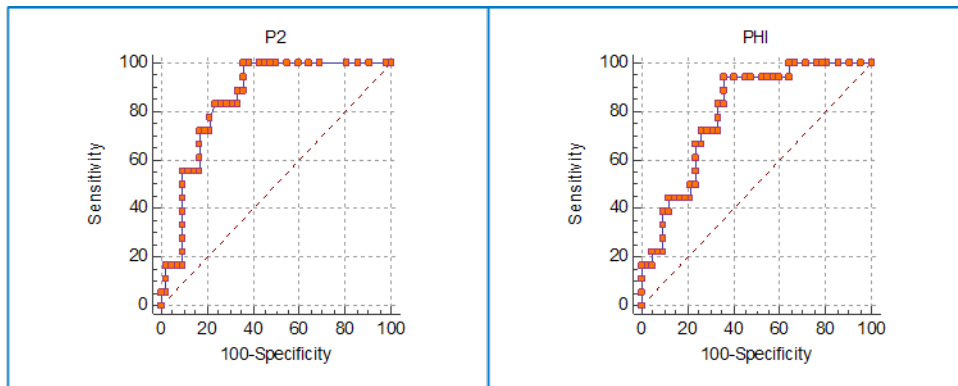
Regarding serum[-2]proPSA level for BPH group versus control group;the cut-off value ≥ 89 pg/ml ideally established the patients with BPH from those who are apparently healthy men;at this cut-off value the sensitivity was100%,specificity was64.29% and the AUC was0.85.

Figure 2:Receiver operation characteristic curve of P2PSA and PHI between Prostate Cancer group and non-cancerous group.



Concerning serum Prostate Health Index(PHI)results for BPH group against control group;the cut-off value ≥ 209 optimally identified the patients with BPH from those whom apparently healthy men;at this cut-off value the sensitivity was 94.44,specificity was 64.29%,and the AUC was0.796.A highly significant increase was found($P<0.001$) between BPH group and control group(Table3)(Figure2).

Figure 3:Receiver operation characteristic curve of P2PSA and PHI between Benign Prostatic Hyperplasia group and control group.



Thus,in a sample of Iraqi patients;this finding means that the cut-off values of(P2PSA) and Prostate Health Index(PHI)based on the ROC curve results in current study were ≥ 322 pg/ml and ≥ 578 respectively for Prostate cancer patients,while their values range between322-89pg/ml,and578-209respectively for BPH patients,and < 89 pg/ml and < 209 for apparently healthy men respectively.

Discussion

In Iraq,Iraqi Cancer Registry in 2016 exhibited that the highest incidence of cancer was among the breast cancer and the lowest was among the Prostate cancer,also the incidence rate(Per100,000Population)of Top Ten Cancer in Males in Iraq in 2016 for Prostate Cancer was 4.13⁽⁸⁾.

The current study findings may be useful for research in future, and our attempt to evaluate new Prostate Cancer diagnostic biomarkers may assist in diagnosis of Prostate Cancer in Iraq. The validity indicators of these new biomarkers have been determined all to be appropriate for that objective.

Prostate specific antigen PSA inaccuracy was established in our study because of false-positive and false-negative indications, whereas Prostate Cancer detection when PSA value 4 ng/ml accepted as a cut-off value; induced in a rate of (15 patients from 39) false positive which accounts 38.46%. It represents that from 39 patients who predictable Prostate Cancer, just 24 cases from them have been proved to be with the disease which account (61.54%). Also, only low percentage (15 patients out of 54) which accounts 27.77% of true negative rate when the value of prostate specific antigen (PSA) levels lower than 4 ng/ml showed no pathological characteristics of Prostate Cancer. A Study for Prostate Cancer (ERSPC) including 162,387 men in European Randomized reported that the PSA test resulted in 75.9% false-positive rate⁽⁹⁾. This false rate was clarified by many factors, such as prostate enlargement like BPH that can elevate PSA value, and without presence of cancer⁽¹⁰⁾ further more, high BMI lowers PSA level⁽¹¹⁾, in addition, the age of males can alter PSA values⁽¹²⁾.

However PSA is regarded as the better prostate cancer diagnostic tumor marker, it is indeed stay a long way from being optimal since there is no ideal value which confirmed Prostate Cancer diagnosis.

In addition, many studies use the fPSA/PSA percent in order to enhance specificity of prostate cancer diagnosis. The lack of absolute data which can demonstrating the ideal fPSA/PSA percent that must be used⁽¹³⁾, in present study; in a sample of Iraqi patients: The cut-off value of fPSA/PSA percent based on ROC curve results finding was $\leq 11.1\%$ for Prostate cancer patients. In 2011, SM Asafudullah et al, concluded that despite various cut-off values for fPSA/PSA percent interval from $<10\%$ to 25% that used via different researchers with difference but satisfactory specificity and sensitivity but the highest rate of prostate cancer cases (approximately 95%) was present to be combined with cut-off value less than 25% in various researches⁽¹⁴⁾, and the findings of our study were well confirmed with them.

Several novel serum biomarkers including [-2] proPSA and Prostate Health Index (PHI) have been developed and significantly increased the prediction potential of detecting Prostate Cancer⁽⁶⁾.

In this work, in order to evaluate these new biomarkers contributing in PCa diagnosis; a sample of Iraqi patients with Prostate Cancer and BPH patients according to Receiver Operation Characteristic (ROC) Curve results of serum (-2) pro Prostate-specific antigen [-2] proPSA and Prostate Health Index (PHI) levels show significant increase in PCa patients comparing with noncancerous group and in BPH group comparing with control group. The results were specific, simple and inexpensive blood tests with additional increase in PCa predictive value that could be used as part of a multivariable approach consisting of PSA and fPSA% biomarkers.

The study results were in harmony with that of Catalona et al. who concluded that results from a separate multi-site study supported the role of p2PSA and PHI as new useful predictors biomarkers of PCa in combination with PSA and fPSA% in reducing unnecessary biopsies⁽⁵⁾, also agreed with Massimo Lazzeri, et al and Heavner, Matt, et al in supporting the diagnostic significance of PHI even when PSA values exceeds 10ng/ml^(3,15) but disagreed with Mariyam Akizhanova et al. who reported that the correlation which found between PHI and the prediction of Prostate cancers poor⁽¹⁰⁾.

Conclusions

Finally, we concluded that: P2PSA and PHI levels have significantly improved validity indicators and diagnostic accuracy in diagnosis and differentiation between men with and without PCa as part of a multivariable approach to PSA and fPSA% tests.

Conflict of Interest – Nil

Source of Funding- Self

Ethical Clearance – Not required

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The Effect of Buzz Group Modification Method on Exclusive Breastfeeding Against Self Efficacy in Pregnant Women: A Quasi Experiment

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Abstract

Background: Exclusive breastfeeding for six months is an effort to increase the breastfeeding benefits and reduce infant mortality rate. Self efficacy is one of the factors that can influence the level of confidence exclusive in breastfeeding.

Aim: This study aimed to identify the level of self efficacy before and after given modified buzz group method and to the influence of modified buzz group method about exclusive breastfeeding against self efficacy in pregnant mother

Method: This study was designed using quasi-experimental design. The study was conducted in the working area of the health center. The total population used in this study was 42 pregnant women. A total sample of 38 respondents was taken according to purposive sampling. BSES-SF (Breastfeeding Self Efficacy Scale Short Form) questionnaire was administered at pre-test and post-test. Data analysis was performed using the Wilcoxon Signed Rank test and the Mann Whitney test.

Results: The results showed that the Wilcoxon Signed Rank statistical test obtained p value of 0,000 in the treatment group and p value of 0.355 in the control group. The Mann Whitney statistical test obtained a significant value of p = 0,000 at the post-test. The modification of the buzz group method took effect to increased self efficacy about exclusive breastfeeding for pregnant mother because this method was organized by four sources of self efficacy that was direct experience, indirect experience, verbal persuasion, and emotional condition.

Conclusion: With the modification of the buzz group method and self efficacy for pregnant mother can increase of value for breastfeeding exclusive coverage.

Keywords: *Buzz Group Modification, Buzz Group Method, Self-Efficacy, Breastfeeding Self-Efficacy*

Introduction

Breast milk can help infants to start life well, the content in breast milk can meet all food needs such as nutrition and immunology. Giving exclusive breastfeeding for 6 months and continued with breastfeeding for 2 years can enhance spiritual (SQ) and emotional (EQ) abilities¹. Problems that cause mothers not to exclusively breastfeed are lack of knowledge about the breastfeeding benefits, proper breastfeeding, lack of lactation counseling services and support from health workers, socio-cultural perceptions against

breastfeeding, and lack of motivation to breastfeed. Psychological factors are one of the factors that influence one's level of confidence. Self efficacy is a person's belief to do a specific task or behavior².

Self-efficacy or self-confidence is one important factor in the success of giving exclusive breastfeeding. There was study examined that the lower the self-efficacy of a person, the lower the success rate. Until now there are still mothers who are worried that the production of breast milk is a little, thus, the reality that occurs mothers really experience disruptions in the production

of breastfeeding^{3,4}. Many ways have been done by the government to socialize exclusive breastfeeding, namely the formation of government regulation number 33 of 2012 concerning exclusive breastfeeding and various kinds of study on exclusive breastfeeding have been done, but until now Indonesia has not been able to achieve the target that was set by the government in 2010, namely coverage exclusive breastfeeding for infants aged 0-6 months is around 80%. This can be seen from the results of a health service survey in 2015, the coverage of exclusive breastfeeding in Indonesia from 0-6 months of infants was 55.7% with an increase of 3.4% from the previous year which was 52.3%^{5,6}. Self-efficacy for breastfeeding is an action that cannot be separated by the mother's belief in giving breastfeeding to her infant. There are various factors that make up self-efficacy such as direct experience, the experience of others, verbal persuasion, physical, and emotional state⁷.

Pucang Sewu Public Health Center is one of the public health centers in the Surabaya city area of Indonesia that has low breastfeeding coverage rates. Pucang Sewu public health center has a class of pregnant women which is held once a month. The number of pregnant women in attendance is not proportional to the number of pregnant women recorded in the public health center. This happens because of many factors, one of which is the absence of a companion during a class of pregnant women, the lack of motivation of mothers to come, and less varied learning methods. The use of the buzz group method is considered as appropriate way to eliminate these factors because this method has never been used during a class of pregnant women and considered as an update way of teaching material. The results of the study mentioned the role of the buzz group method in an effort to improve learning outcomes in fiqh material can be stated sufficient or moderate. Other study results revealed that there was an influence of the buzz group discussion method with the uno card game on student collaboration and the ability to solve student problems.

Based on this background the writers intended to provide a buzz group method modification in the class of pregnant women aimed at increasing the self-efficacy of pregnant women related to exclusive breastfeeding, hence it is expected that after giving birth mothers will exclusively give breast milk.

Method

This study used a quasi-experimental design. The independent variable in this study was the buzz group on the dependent variable, namely the self-efficacy of pregnant women in exclusive breastfeeding. Buzz group was a large group which was divided into several small groups, consisting of 4-5 people. An impromptu group consisting of no more than five people will make all group members actively involved in the discussion. The place was arranged so that participants can have their faces covered and exchange ideas easily. Buzz groups also assigned each large group member and group leader. The next stage, small groups gathered and discussed, then returned to the large group, which then conveyed ideas that arise in the group. At the end of the session, the facilitator asked each group to actively participate in delivering the results of the discussion. This method can build an atmosphere of mutual respect for differences of opinion and also increase the participation of participants who still did not talk much in broader discussions and can develop a common opinion or agreement to find a best formulation of an issue.

The population in this study was pregnant women in the working area of the Pucang Sewu Public Health Center. The population in this study was 42 pregnant women. Based on the formula, the minimum sample size used was 38 respondents. The 38 sample results were divided into 2 groups: 19 for the control group and 19 for the experimental group, with inclusion criteria: (1) Mothers can read, write and hear (2) Late trimester pregnant women recorded in the Pucang Sewu Puskesmas. Furthermore, the exclusion criteria are: (1) Pregnant women with chronic or infectious diseases (HIV, TB, cancer, hepatitis). (2) Pregnant women who did not have permanent residences.

The sampling used by writers was nonprobability sampling that was purposive sampling. Data collection instruments used in this study were in the form of informed consent, questionnaire sheets, stationery, booklets and turning sheets about exclusive breastfeeding, and respondents. The instrument in this study used the Breastfeeding Self Efficacy Scale Short Form (BSES-SF) containing 14 questions about confidence and confidence in breastfeeding. Each question has a 5-point Likert scale and summed. This instrument was compiled by Dennis in 2003 and has been declared valid and reliable⁸.

The data collected was analyzed the differences in self-efficacy changes before and after the intervention was given, such as buzz group method modification with the Wilcoxon Signed Rank Test. The Mann Whitney test was carried out to analyze the differences between the two

groups, the treatment group and the control group, with significance level $p \leq 0.05$ meaning that if the statistical test showed the value of $p \leq$ then H_1 is accepted. This study has been through a review and has been declared “Eligible Ethics” with a Certificate of Ethical Feasibility from the Faculty of Nursing, Universitas Airlangga, Surabaya Indonesia.

Results

Characteristics of Respondents

The following is the respondent’s characteristic data.

Table 1: Characteristics of Respondents

Control Group			Treatment Group	
	F	%	f	%
Age				
20-30	15	78,9	9	47,4
31-40	4	21,1	9	47,4
>40 years old	0	0	1	5,3
Last Education				
Elementary School	2	10,5	5	26,3
JHS	7	36,8	5	26,3
SHS	6	31,6	9	47,4
Fresh graduate	4	21,1	0	0
Pregnant				
1st	8	42,1	2	10,5
2nd	7	36,8	9	47,4
3rd	3	15,8	5	26,3
4th	1	5,3	1	5,3
5th	0	0	2	10,5
Work				
House maid	14	73,7	13	68,4
Staff	3	15,8	6	31,6
Public servant	2	10,5	0	0

Self Efficacy

Herewith the result of self-efficacy in the treatment and control group

Table 2 : Self efficacy before and after given buzz group method modification

Self efficacy	Control Group				Treatment Group				
	Pre-test		Post-test		Pre-test		Post-test		
	f	%	f	%	f	%	F	%	
High	3	15,8	5		26,3	3	15,8	18	94,7
Medium	13	68,4	14		73,7	15	78,9	1	5,3
Low	3	15,8	0		0	1	5,3	0	0
Total	19	100	19		100	19	100	19	100

The Effect of *buzz group* method modification of exclusive breastfeeding against *self efficacy* in pregnant women

Herewith the result of the differences between self-efficacy of exclusive breastfeeding before and after given the intervention such as buzz group method modification

Table 3 : The Effect of *buzz group* method modification of exclusive breastfeeding against *self efficacy* in pregnant women

No.	Self efficacy					
	Control Group			Treatment Group		
	Pre-Test	Post-Test	Deviation	Pre-Test	Post-Test	Deviation
1.	51	49	2	46	53	7
2.	50	48	2	43	54	11
3.	49	50	1	44	53	9
4.	47	48	1	40	55	15
5.	39	41	2	51	58	7
6.	38	40	2	44	51	7
7.	38	38	0	51	51	0
8.	39	39	0	45	54	9
9.	44	44	0	39	52	13
10.	35	37	2	43	47	4
11.	36	43	7	44	55	11
12.	46	40	6	45	55	10
13.	46	44	2	39	53	14
14.	47	48	1	38	54	16
15.	39	39	0	48	53	5
16.	40	41	1	36	60	24
17.	41	42	1	44	52	8
18.	35	37	2	46	54	8
19.	40	41	1	40	50	10
Average Score	42.11	42.58	1,74	43,47	53,37	9,89
Wilcoxon	p = 0,355			p = 0,000		
Mann Whitney Pre-Test	p = 0,412					
Mann Whitney Post-Test	p = 0,000					
Mann Whitney Selisih	p = 0,000					

Discussion

The results examined that self-efficacy of the control group and the treatment group before getting the intervention got the same score that was moderate. Self-efficacy was a person's belief to do positive things, thus it affected motivation, thought processes, emotional conditions, and social environment that shows a habit. Self-efficacy for mothers was considered as important for breastfeeding activities and can provide an illustration, especially for health workers about mothers' readiness in providing nutrition with breast milk for their babies. The level of self-efficacy of a person in each task varies greatly. This arises due to factors that influence the perception of an individual's abilities such as gender, age, level of education and experience⁹.

Based on the results of the study, respondents with primary education have low to moderate self-efficacy, such as control group respondents number 10 who have low self-efficacy because mothers cannot read fluently and also lack of knowledge about breastfeeding. Control group respondent no. 1 and 2 were respondents with a high education level, namely tertiary institutions with high self-efficacy scores, this was due to the large amount of information that mothers have obtained from various books and internet sources. Individuals who have higher levels have higher self-efficacy, because basically they learnt more and receive more formal education, besides individuals who have higher education levels will get more opportunities to learn in overcoming problems¹⁰.

The number of children was one thing that influenced the practice of breastfeeding. Most respondents were mothers with more than one child. This will increase the experience of mothers in breastfeeding. The number of children influenced the mother's knowledge because the practice of nursing mothers was closely related to the learning process of the practice of the previous child. The results revealed that self-efficacy after intervention in the treatment and control groups were different. These results were reinforced by the post-test conducted 1 week after the intervention. This referred to a theory that explained that the effective time to carry out a post-test should be within a week after the intervention. The treatment group, which initially had an average level of self-efficacy after being intervened, became a high average, in contrast to the control group which had no significant changes after the intervention^{4,11}.

The experience of success or direct experience can increase the confidence and strong desire of the

respondent. A sense of success can also increase the persistence and persistence of respondents during the process, so as to reduce failure. Mothers who have direct breastfeeding experience tend to be more confident to continue breastfeeding. There were 6 respondents who gave non-exclusive breastfeeding to their children, and the six respondents had a moderate level of self-efficacy. There were 3 respondents who had successfully provided exclusive breastfeeding and the three people had high self-efficacy. The learning pyramid theory Edgar Dale explains that a person's learning outcomes were obtained by direct experience (concrete). Learning that referred to Edgar Dale's pyramid theory reinforced direct experience, through direct experience practice will provide information and ideas contained in that experience, because it involved the sense of sight, hearing, feeling, smell, and touch⁸.

Someone's self-efficacy can increase especially if she believes she can do the action because she sees that other people have succeeded in doing so. Individuals will have a tendency to increase motivation and confidence to take action if they see that those who have already been able to succeed through the problem. Small groups when implementing the buzz group modification get problems that were discussed in groups, this allowed for mothers who have experience in giving breastfeeding to tell the inexperienced, thus it can bring self-efficacy to inexperienced mothers^{3,12}.

Buzz group modification activities can encourage shy individuals to contribute thoughts to participate in discussions and create a pleasant atmosphere so that pregnant women can receive information with happy feelings^{12,13}. Respondents from the treatment group got an increase with high self-efficacy values, there was only 1 respondent did not experience it. This was because respondent number 10 was in a hurry to go home soon because her first child was sick. In terms of age, the respondent was 34 years old enough, in terms of the experience of the respondent she also has 2 children and now his third pregnancy, the first child was not exclusively breastfed because of work and the second child was exclusively breastfed, in terms of education.

The control group did not experience a significant increase in self efficacy about exclusive breastfeeding. The increase in self efficacy about exclusive breastfeeding in the control group only slightly increased, it happened because after the pre-test the control group followed the class of pregnant women who also coincided

with discussing the material of breast milk, namely understanding breastfeeding, understanding exclusive breastfeeding, and how to express milk. The activity was one form of verbal persuasion, where verbal persuasion was one source of self-efficacy. Another factor that made the increase in the control group was that the writers gave a handbook on pregnancy to respondents as souvenirs during the pre-test and every Monday and Thursday there was an examination of pregnant women, meaning that there were pregnant women who received additional information when attending examination. Therefore, after a post-test one week later there was still a shadow about breast milk making a slight increase in the control group.

Conclusion

Submitting material with a modification of the buzz group method was a powerful way to increase self-efficacy about exclusive breastfeeding to pregnant women, because at home pregnant women can re-study the material discussed.

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The Discovery of Comorbidity Deviation in the Cervical Cancer Patients Treated by the *Intravenous Pyelography* Examination and Clinical Examination (Based on *Federation Internationale de Gynecologie et d'Obstetrique*)

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Abstract

Objective: The cervical cancer is the most found cancer in the gynecological malignancy. Several cervical cancer cases sometimes are found the result of *Intravenous Pyelography* examination that is not suitable with the clinical stage that has been examined according to *Federation Internationale de Gynecologie et d'Obstetrique*. Another deviation that accompanies the cervical cancer cases is very important for clinicians and the patients because of the distinct deviation managements. The utilization of other modalities in supporting the other deviations needs to be considered so that the patient service will be better and more accurate as it is expected by the clinicians and the patients.

Aim: This study aims to identify comorbid abnormalities in cervical cancer patients undergoing *Intravenous Pyelography* examinations and clinical examinations according to FIGO.

Method: The retrospective research is applied from the medical records of the cervical cancer patients in stage IA IVB on January until December 2014 and it is analyzed statistically.

Result: From 131 samples, it is obtained 77 samples which are qualified the inclusion criteria. There are 48 samples (62,3%) which are resulted to normal IVP and 29 abnormal samples (37,7%). It is also revealed that there are comorbidity deviation in 14 patients (18,2%).

Conclusion: From the result of *intravenous pyelography* examination, it is found that several comorbidity deviations based on the result of BUN/creatinine and clinical examination of *Federation Internationale de Gynecologie et d'Obstetrique* should not be found any deviation. Regarding these results, the clinicians therefore can consider the next management for the patients.

Keywords: *Intravenous Pyelography, Federation Internationale de Gynecologie et d'Obstetrique, cervical cancer*

Background of the Study

Cervical cancer is still the main health problem in the

world, ranks third most after breast cancer (1.38 million cases) and colorectal cancer (0.57 million cases), and is the fourth leading cause of death after breast cancer (458,000 deaths), lung cancer (427,000 deaths), and colorectal cancer (288,000 deaths) ¹. An estimated 740 cases of death occur due to cervical cancer ². Cervical cancer is a leading cause of death for women throughout the world ³. In ASEAN, the mortality rates of several countries that still have high cervical cancer rates include Cambodia, Myanmar and Laos ⁴. In Indonesia, cervical

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cancer still occupies the first position, followed by breast cancer and skin cancer, while in gynecological cancer, cervical cancer is the most frequent cancer, followed by ovarian cancer, endometrial cancer, vulva and vagina.

According to FIGO, cervical cancer can spread into the parametrium, vagina, uterus and other surrounding organs ⁵. In some cases of cervical cancer that is found with a certain stage accompanied by concomitant diseases causing impairment of kidney function not in accordance with the clinical stage so that it will change the management of therapy in patients. For example cervical cancer with ureteral stones, cervical cancer with diabetic nephropathy or cancer with other disorders. These abnormalities can be detected by conducting an Intravenous Pyelography (IVP) examination. IVP examination is carried out as one of the investigations to detect various disorders of the urinary tract caused by infiltration from cervical cancer. Abnormalities in the urinary tract that are found after IVP examination still require another radiological examination to confirm the diagnosis.

Some studies suggest that the survival rate in cervical cancer patients who have comorbidities is low, although the mechanism is unknown ⁶. This study aims to identify comorbid abnormalities in cervical cancer patients undergoing Intravenous Pyelography examinations and clinical examinations according to FIGO.

Method

This study employed the retrospective and descriptive research and used the medical record as the secondary data. This study used the samples of the cervical cancer patients who were treated in the POSA Obsgyn RSUD Dr. Soetomo and the polyclinic of Obstetrics and Gynecology Graha Amerta Surabaya, who were also examined by the cervical cancer histopathology and creatinine serum and underwent the Intravenous Pyelography examination in the radiology section in the Centre Diagnosis Building and the Emergency Department in Dr. Soetomo General Hospital starting January 2014 until December 2014. The sample collection technique employed the total sampling method.

These are the research criteria:

Inclusion criteria:

- a. The cervical cancer patients stage IA-IVB
- b. The cervical cancer patients stage IA-IVB with

comorbidity diseases

- c. Have done the examination of cervical tumor tissue histopathology
- d. Have done the examination of creatinine and urea
- e. Have done the examination of *Intravenous Pyelography*

The exclusion criteria: patients who are and have been doing the chemo radiation

This study enrolled two variables research, which are the clinical stage that is written by clinicians based on FIGO as an independent variable, and the result of *Intravenous Pyelography* examination as dependent variable.

This study is started with the data collection that is taken from the IVP examination result and the clinical stages based on FIGO. All the records is submitted to be processed in the data tabulation and statistical analysis. The statistic assessment is processed with the SPSS software. Ethically, the researcher has given the ethical clearance permission from ethics commission of medical research of Dr. Soetomo general hospital.

The Result of the Study

In this study, it is found that there are 77 people but 54 people are excluded. The patients who were excluded are because 41 persons have not done the histopathology examination and 13 persons have done chemotherapy.

Table 1. Demographic data of respondents

	Frequency	Percentage (%)
Age (year)		
<30	1	1.3
31-40	8	10.4
41-50	41	53.2
51-60	24	31.2
61-70	2	2.6
>70	1	1.3
Stadium		
IA	8	10.4
IB	20	26.0
IIA	14	18.2
IIB	18	23.4
IIIA	1	1.3

Cont... Table 1. Demographic data of respondents

IIIB	15	19.5
IVA	1	1.3
Cervical cancer stadium		
Early	42	54.5
Advanced	35	45.5

The Sample Distribution Based on Ages

In this study, the patients who are used as the research samples have the age range between 29 – 74 years old with the average age between 48.92 ± 8.07 years old. These are the data distributions based on ages: under 30 years old is 1 person (1,3 %); 31-40 years old are 8 persons (10,4%); 41- 50 years old are 41 people (53,2 %); 51-60 years old are 24 persons (31,2 %); 61-70 years old are 2 persons (2,6%); above 70 years old is 1 person (1,3%). However, the samples that are used are the patients between 41- 50 years old. The patient distributions that are used as the samples based on ages can be seen in Table 1.

The Profile of the Samples Based on the Disease Stages

Based on the result of data analysis, it is found that the cervical cancer patients stage IA are 8 persons (10,4%), stage IB are 20 persons (26 %), stage IIA are 14 persons (18,2 %), stage IIB are 18 people (23,4 %), stage IIIA is 1 person (1,3 %), stage IIIB are 15 persons (19,5%) and stage IVA is 1 person (1,3%). The most frequent cervical cancer patient is on their stage IB. The data distribution of the patients based on the stages can be seen in Table 1.

The cervical cancer stages can be distinguished into the early stage and advanced stage. The early stage consists of stage IA, IB and IIA whereas the advanced stage consists of stage IIA, IIIA, IIIB, IVA, and IVB. Based on the above criteria, the most frequent sample of the early stage cervical cancer are 42 persons (54,5 %) and the rest is the advanced stage cervical cancer patients that are 35 persons (45,4 %). The data distribution of patients based on the two stages can be seen in Table 1.

The Sample Profile Based on the Histopathology Conception

Based on the histopathology profile of cervical cancer patients that is used as the sample is the most frequent conception is Squamous cell carcinoma

which are 54 persons (70,1%). The conception of Adenocarcinoma histopathology in carcinoma cell are 17 persons (22,1%). The conception of combination histopathology is Adenosquamous carcinoma cell are 6 persons (7,8 %) (Table 2).

Table 2. The Sample Profile Based on the Histopathology Conception

Hispathology	Frequency	Percentage
Squamous cell carcinoma	54	70,1
Adeno cell carcinoma	17	22,1
Adenosquamous cell carcinoma	6	7,8
Total	77	100

The Sample Profile Based on the Intravenous Pyelography Examination Result

The data profile of the *intravenous pyelography* examination (IVP) result based on the normality of the histopathology conception is found that the most normal IVP examination results are 48 persons (62,3 %). The result of IVP examination that are not normal are 29 persons (37,7%).

On the other hand, the result that is obtained in the IVP profile based on the IVP result conception in detail stated if the most IVP examination result is normal that are 47 persons (61 %), while one person is indicated with bladder indentation. The results of IVP examination which are not normal with the hydronephrosis conception are 9 persons (11.7 %). The results of IVP examination that are not normal with the delay function conception are 5 persons (6.5 %). The results of IVP examination which are not normal with non-visualized conception are 4 persons (5.2 %).

The results of the abnormal IVP examination with bladder nuisance are 2 persons (2.6 %) The results of the abnormal IVP examination with the hydronephrosis and hydroureter are 3 persons (3.9 %). The abnormal result of IVP examination with hydronephrosis and non-visualized conception is 1 person (1.3 %). The abnormal result of the IVP examination with hydronephrosis, delay function, and hydroureter is 1 person (1.3 %).

The abnormal results of the IVP examination with hydronephrosis, delay function, and non-visualized conceptions are 2 persons (2.6 %). The abnormal result of

the IVP examination with hydronephrosis, hydroureter, and non-visualized is 1 person (1.3 %). The abnormal result of the IVO examination with the hydronephrosis, hydroureter conception and bladder nuisance is 1 person (1.3 %).

The Descriptive Analysis of the Relation among the Examination Results

Based on the data analysis, it is revealed that the result of IVP examination that is suitable with the clinical stages according to FIGO are 63 (81,8%), while those that are unsuitable are 14 (18,2%). The result of the descriptive analysis is suitable with the result of the IVP examination result with clinical stages of FIGO (Table 3).

Table 3. The Compatible Result of IVP Examination with the Clinical Stages Based on FIGO

No	Clinical Stages	BUN/ Creatinine serum	IVP result	Comorbidity Deviations	Information
1	IB	Normal	Normal	-	Compatible
2	IB	Normal	Normal	-	Compatible
3	IB	Normal	Normal	-	Compatible
4	IIIB	Normal	Non Visualized Right Non Visualized	-	Compatible
5	IIIB	Normal	Delay Function left	-	Compatible
6-	IIIB	Normal	Right Hydronephrosis grade 3	-	Compatible
7	IIIB	Normal	Left Hydronephrosis grade 1	-	Compatible
8	IIIB	Normal	Right delay function	-	Compatible
9	IIIB	Normal	Right Delay function	-	Compatible
10	IB	Normal	Normal	-	Compatible
11	IB	Normal	Normal	-	Compatible
12	IB	Normal	Normal	-	Compatible
13	IIB	Normal	Normal	-	Compatible
14	IIB	Normal	Normal	-	Compatible
15	IIB	Normal	Normal	-	Compatible
17	IIA	Normal	Normal	-	Compatible
18	IIA	Normal	Normal	-	Compatible
19	IIIB	Normal	Normal	-	Compatible
20	IIIB	Normal	Right Hydronephrosis grade 2	-	Compatible
21	IIIB	Normal	Hydronephrosis + Delay function + left Hydroureter	-	Compatible
22	IIIB	Normal	Hydronephrosis + Delay function + left Non visualized	Stone Bladder	Compatible
23	IIIB	Normal	Hydronephrosis + Right Hydroureter	-	Compatible
24	IIIB	Normal	Left non visualized	-	Compatible
25	IIA	Normal	Normal	-	Compatible
26	IIA	Normal	Normal	-	Compatible
27	IIA	Normal	Normal	-	Compatible
28	IIB	Normal	Normal	-	Compatible
29	IIB	Normal	Normal	-	Compatible
30	IIB	Normal	Normal	-	Compatible
31	IIB	Normal	Normal	-	Compatible
32	IIA	Normal	Normal	-	Compatible
33	IIA	Normal	Normal	-	Compatible

Cont... Table 3. The Compatible Result of IVP Examination with the Clinical Stages Based on FIGO

34	IIA	Normal	Normal	-	Compatible
35	IIB	Normal	Normal	-	Compatible
36	IIIB	Normal	Hydronephrosis grade 2 + Hydroureter + Right non visualized	-	Compatible
37	IIIB	Normal	right Hydronephrosis grade 2	Multiple stone kidney,	Compatible
38	IIIB	Normal	Right non-visualized	-	Compatible
39	IIA	Normal	Normal	-	Compatible

In this study, it is found that there is an incompatibility between the IVP examinations compared to the clinical stages of FIGO. It happened because there is the comorbidity deviation so the IVP examination which must be on the early stage, it resulted in the normal IVP result. The examination of IVP with abnormal result on the early stage of cervical cancer in this study is caused by the emergence of comorbidity deviations such as: ureteral stone, uterine myomas, ovarian cystoma, Non Hodgkin Lymphoma, adenomyosis uteri, endometritis, Gastro-Intestinal stromal tumor, and bilateral ovarian cysts.

Discussion

The results of the IVP examination showed normal results in most samples. In detail, the results of the patient's IVP examination show compliance with the clinical stage based on FIGO. In the results of IVP examinations that are not in accordance with the clinical stage of FIGO, there are accompanying abnormalities as mentioned previously.

In general, the results of IVP examination in patients with early stage cervical cancer are normal, and will only show an abnormal picture at an advanced stage^{5,7}. The picture can be in the form of non-visualized, delay function, hydronephrosis, hydroureter or bladder disorders. There are two possibilities of abnormal but still appropriate stadium; and not normal but not according to stage if cervical cancer is accompanied by accompanying abnormalities.

Based on FIGO, IVP abnormalities can be found in advanced cervical cancer stage III and IV. This is because at that stage cancer cells begin to invade the lower third of the vagina and / or spread to the pelvic wall, and / or cause hydronephrosis or impaired kidney function. In stage IV, cancer cells spread beyond the pelvis or have invaded the bladder and rectum mucosa^{5,7}.

Accompanying disorders that are found based on IVP examination are abnormalities that should not be found on BUN / Creatinine examination and FIGO clinical stage including early stage cervical cancer (I-II)^{5,7}. With the discovery of comorbid disorders, clinicians are expected to be able to adjust the treatment regimen to these comorbidities. In addition, the use of IVP as an option for supporting examinations can be done if the facilities in the hospital are inadequate.

Conclusion

From the result of *intravenous pyelography* examination, it revealed that the comorbidity deviations are found in 14 patients (18,2 %). However, seeing the result of BUN/creatinine and clinical examination based on *Federation Internationale de Gynecologie et d'Obstetrique*, there must not be any abnormalities.

Conflict of Interest: The author reports no conflict of interest of this work.

Source of Funding: This study is done with individual funding.

Ethical Clearence: The research process involves participants in the survey using a questionnaire that was accordant with the ethical research principle based on the regulation of research ethic committee. The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, non-maleficence, and justice.

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Analysis of Breastfeeding Factors: The Sunrise Model Approach

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Abstract

Background: Breast milk is the main food of infant in the sixth month of life. The behavior of exclusive breastfeeding in infants aged 0 - 6 months is still low. Variety of factors affected the behavior of breastfeeding. Based on Sunrise Model a lot of components affect health behaviors.

Objective: To analyze the factors behavior of breastfeeding based on Sunrise Model at Kenjeran Public Health Center

Method: The design used was cross sectional with total sampling method and 28 respondents. The independent variables were the kinship and social factors; cultural values and ways of life; niketutalitarmini@gmail.com economic factors, and educational factors. The dependent variable was the behavior of breastfeeding included exclusive, predominant and partial breastfeeding. Instruments used in the data collection were questionnaires. Data were analyzed using the Spearman test with the level of significance level was $\alpha < 0.05$.

Results: The results showed that kinship and social factors along with cultural values and ways of life were significantly related to breastfeeding behavior ($p_{\text{social}} = 0,000$, $p_{\text{cultural}} = 0,000$). Economic factors along with educational factors were not significantly related to breastfeeding behavior ($p_{\text{economic}} = 0.460$, $p_{\text{educational}} = 1,000$).

Conclusion: Kinship and social factors, cultural values and ways of life can improve the behavior of exclusive breastfeeding. Differences in economic and educational levels do not lead to differences in breastfeeding behavior. The results of this research can be used as the design of a model program of interventions on breastfeeding behavior in the community in further research.

Keywords: *Breastfeeding, Sunrise Model Approach*

Introduction

Breastfeed (ASI) is the baby's main food. WHO and UNICEF recommend exclusive breastfeeding be given to infants from birth to six months without additional food and drinks, except medicines and vitamins. Exclusive breastfeeding reduces infant mortality due to various common diseases affecting children and accelerates recovery when sick. Breastfeed has succeeded in preventing 1.4 million under-five deaths

in developing countries^{1,2}. Breastfeeding behavior and knowledge in maternal who have infants, especially exclusive breastfeeding, is still lacking. Many people still appreciate the beliefs, traditions, and culture that infants who are breastfed still need water and food other than breastfeed^{2,3}.

The Sunrise model was developed to provide a comprehensive and conceptual overview as an important factor for the theory of culture care diversity and universality. This model is a conceptual visual guide that illustrates several factors thought to influence cultural care⁴. There are various factors that can influence the behavior of breastfeeding, including mothers who give exclusive breastfeeding understand and receive

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information about exclusive breastfeeding and the benefits of counseling given. Although there are some mothers who give exclusive breastfeeding, but there are still some other mothers who give breastfeed with additional food and drinks. This can happen for several reasons, including infants who only get breastfeed just look less full and fussy, mothers are tired after work, mothers are embarrassed to breastfeed in public, mothers are sick, breastfeed does not come out or a little^{5,6}.

Based on the Sunrise Model approach, this theory is important for health workers to realize cross-cultural knowledge and their needs. Culture is not just a way of life for someone but to connect someone with others, so they can know the needs or desires of that person. A person's cultural background needs to be studied in order to know beliefs about values and behavior in dealing with one another⁴. There are cultures that can support exclusive breastfeeding but there are also those that do not support exclusive breastfeeding. Family support is a supporting factor which, in principle, is an emotional and psychological activity given to breastfeeding mothers in breastfeeding. A positive mother's mind will stimulate muscle contraction around the alveoli glands to flow milk into the lactiferous ducts and then inhale by the baby⁷. In the Sunrise Model approach, there are several components that can influence health behavior. Based on the previous explanation, writers analyzed social factors and family attachments, cultural values and way of life, economic factors and educational factors in the Sunrise Model approach for further analysis in identifying behavioral factors in breastfeeding.

Method

This study used a cross sectional approach. The independent variables were social factors and family attachment, cultural values and ways of life, economic factors and educational factors and the dependent

variable is the behavior of breastfeeding including exclusive, predominant, and partial breastfeeding.

The target population in this study was breastfeeding mothers with infants aged 0-6 months in the work area of the public health center in Surabaya Indonesia as many as 90 people. The sampling technique used in this study was total sampling. Samples representing this study were 28 people with inclusive criteria: (1) Mothers who have children aged 0-6 months (2) Mothers who can read and write (3) Mothers who give breast milk. Furthermore, the exclusion criteria are: (1) At the time of the study, it was not in the area for a difficult period to determine (2) mothers with HIV/AIDS, hepatitis, and diseases that could be transmitted through breastfeeding.

Data collection instruments used in this study was questionnaires, namely a number of questions and written statements that were used to obtain demographic data, independent variables, and dependent variables. The instrument validity test was carried out with the SPSS 21 application with valid results on all questionnaires. The reliability test was performed using the Cronbach alpha method and declared reliable.

After the data was collected, the data was presented and analyzed by using Spearman's correlation statistical test to find out the relationship between the dependent and independent variables. The Spearman Test's significance level was determined $\alpha < 0.05$. This study has been through a review and has been declared "Eligible Ethics" with a Certificate of Ethical Feasibility from the Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia.

Result

Respondent Characteristics

Herewith the data of respondent characteristic and respondents' infants.

Table 1 : Respondent Characteristic

No.	Respondent Characteristic	%
1.	Mom's Age	
	20-35 years old	92,8
	>35 years old	7,2
	Total	100
2.	Children Number	
	1	25
	2	60,7
	3	10,7
	>3	3,6
	Total	100
3.	Mom's work	
	Entrepreneur	7,2
	House Wife	64,3
	Teacher	10,7
	Staff	17,8
	Total	100
4.	Live with	
	Husband and children only	28,5
	Husband, children, and parents in law	7,2
	Husband, children, and parents	35,8
	Big Family	28,5
	Total	100
	Infant Data	
5.	Infants Age	
	<1 month	10,7
	1-3 months	21,5
	4-6 months	67,8
	Total	100
6.	Child Number	
	1st	25
	2nd	60,7
	>2	14,3
	Total	100
7.	Sex	
	Female	46,4
	Male	53,6
	Total	100

The Relationship between Social Factor and Big Family Involvement in Breastfeeding

All respondent has good relationship in the social factor and big family involvement.

Table 2 : The Relationship between Social Factor and Big Family Involvement in Breastfeeding

Social Factor and Big Family Involvement	Breastfeeding			Total
	Exclusive Breast-feeding	Predominant Breast-feeding	Partial Breast-feeding	
	%	%	%	%
Good	100	0	0	100
Moderate	44,4	0	55,6	100
Bad	0	9,1	90,9	100

The Relationship between one and another Factors

The result of Rho Spearman Statistic was got a value of $p = 0,000$ ($\alpha < 0,05$) so H1 accepted.

Table 3 : The Relationship between one and another Factors

Factors	Breastfeeding						Total	
	Exclusive Breastfeeding		Predominant Breastfeeding		Partial Breastfeeding			
	F	%	f	%	f	%	Σ	%
Factor of Culture Value and health Lifestyle								
Strong	6	85,7	0	0	1	14,3	7	100
Moderate	6	75	0	0	2	25	8	100
Weak	0	0	1	7,7	12	92,3	13	100
Rho Spearman Test contingent coefficient ($r = 0,749$ $p = 0,000$)								
Factor of Economy								
Moderate	4	57,1	0	0	3	42,9	7	100
Low	8	38,1	1	4,8	12	57,1	21	100
Rho Spearman Test contingent coefficient ($r = 0,146$ $p = 0,460$)								
Factor of Education								
High	2	50	0	0	2	50	4	100
Moderate	8	40	1	5	11	55	20	100
Low	2	50	0	0	2	50	4	100
Rho Spearman Test contingent coefficient ($r = 0,000$ $p = 1,000$)								

Discussion

The results showed that the behavior of breastfeeding included partial breastfeeding 53%, breastfeeding 3.6%, and exclusive breastfeeding 42.8%. According to WHO, the behavior of breastfeeding was categorized into 3, namely the behavior of exclusive breastfeeding, the giving of predominant and partial breastfeeding. Internal factors that influenced breastfeeding behavior included age, maternal knowledge, level of education, perception, psychological, maternal physical and emotional mother. Meanwhile, external factors that influenced breastfeeding behavior were the role of the husband, socio-cultural changes, mother's work, information by health workers, and lactation management in the delivery room (IMD practice). Other factors were maternal health which made it impossible to give breastfeeding^{2,8,9}.

The results examined that there was a statistically significant relationship between the factors of cultural value and way of life with breastfeeding behavior. This can be seen from the majority of mothers with a factor of cultural value and a healthy way of life that provides strong exclusive breastfeeding (85.7%). Mothers with weak cultural values and a healthy lifestyle gave 100% non-exclusive breastfeeding (Partial breastfeeding 92.3% and Predominant breastfeeding 7.7%).

The results of other studies indicated that there were cultures that can support exclusive breastfeeding but there were also those that did not support exclusive breastfeeding. Mothers who have strong cultural values and healthy ways of life and weak healthy ways of life tend to choose non-exclusive breastfeeding. There was one respondent whose factor of cultural value and way of life was strong that respondent 1 gave partial breastfeeding because the mother works. Many people did not know how to pump and store breastfeed, hence they chose to give formula milk during the day when they work^{10,11}.

The results showed that there was no statistically significant relationship between educational factors and economic factors of mothers with breastfeeding behavior. This can be seen from the data of mothers who gave exclusive breastfeeding as much as 42.8% of 28 respondents consisting of educated mothers (high, medium and low) as well as middle and lower economic levels. The Kenjeran Community Health Center has provided counseling about breastfeeding so getting information about ASI was not a problem. The level of education was one of the social aspects that generally

affected the level of family income as well as economic factors. In this case high knowledge, the effort to find information will be broader, because people who have a higher education base are easier to understand and understand the information they receive when compared to those with lower education^{1,12}. That means that mothers with high levels of education will produce good knowledge and from good knowledge will influence good behavior (exclusive breastfeeding behavior) such as respondents 11 and 19.

12 respondents with lower economic factors and lower secondary education factors provided non-exclusive breastfeeding. Low-educated mothers need information or information media about breastfeed that was easier to understand. This information must be conveyed in ordinary language through lay forums such as social gathering and PKK meetings. Respondents 7 with lower economic factors and low education factors exclusively breastfed. The higher per capita household income, the lower the exclusive breastfeeding, both in the group of infants aged 0-1 months, 2-3 months, and 4-5 months.

There was one respondent, 28 respondents who have secondary economic factors and secondary education factors but provide partial breastfeeding. In this respondent, social factors and family attachments were weak as well as cultural values and healthy ways of living are weak. Sunrise model stated that a health behavior was formed by various factors that work together. If there was an imbalance of factors such as the respondent number 28, the health behavior became less. That caused someone to be educated and have a good economic status, their health behavior was still lacking, whereas respondents 4 and 26 with higher education and middle economic factors gave partial breastfeeding because of work. Working mothers were actually not a reason to not give exclusive breastfeeding if they knew how to pump and store the right milk. Health workers should provide this information after the mother gives birth. In addition, the delivery of information was conveyed by her husband and family in order to support the mother in providing exclusive breastfeeding. Mothers with secondary economics and tertiary education should be more active in finding information about breastfeeding because they were better able to understand and easily access information¹³⁻¹⁵.

Conclusion

Social factors and family attachments as well as cultural values and ways of life enhance the behavior of exclusive breastfeeding. Furthermore, at the economic level and education level did not determine the behavior of breastfeeding.

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Conflict of Interest: There is no conflict of interest

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Comparative Study to Evaluate the Antimicrobial Effect of MTAD, 17% EDTA, and 3% NaOCl- Against *Enterococcus faecalis* in Primary Teeth for Root Canals Therapy (in Vitro Study)

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Abstract

Aim: This study presented to compare the antimicrobial effect of MTAD, 17% EDTA, and 3% NaOCl, against *Enterococcus faecalis* (*E. faecalis*).

Methodology: The study utilized 40 extracted human primary teeth with single root canal. The samples were instrumented and sterilized, and then, these teeth were infected with *E. faecalis* for 2 weeks, after that tooth were divided randomly into 2 groups according to the irrigants used. All the samples were incubated in brain heart infusion (BHI) broth. Irrigation processes were completed according to each material instruction. The effectiveness of irrigants was evaluated by comparison between the pre-irrigation and post- irrigation samples using serial dilution (CFU/ml).

Statistical analysis was done using one-way anova with dunnett t3 post hoc test.

Results: all samples treated with MTAD showed nearly complete absence of bacteria. the samples treated 3% NaOCl and 17% EDTA showed similar result to the first group, Statistical analysis of the data using dunnett t3 test showed there is no significant difference between the groups ($P > 0.05$).

Conclusion: The study concluded that MTAD was effective as 3% NaOCl -17% EDTA against *E. faecalis*.

Keywords: BHI broth, *Enterococcus faecalis*, 17% EDTA, MTAD, 3% NaOCl, Primary teeth.

Introduction

Microorganisms are playing a fundamental role in etiology of pulp and periradicular lesions [1]. Successful therapy of root canal relies on triad of instrumentation, disinfection and obturation [2]. The major determinant in the healing of periapical tissues is the disinfection of the root canal [1]. This is happen though the use of antimicrobials and chemo mechanical preparation, which are effective in reducing the bacterial load, some bacteria can still persist [3]. One among the facultative organism

is *Enterococcus faecalis*, which is persistently found in failures of root canal treatment [4], and is resistant to various intracanal medicaments [5]. The microorganisms, which found in the root canals of permanent teeth are similar to those in the root canals of deciduous teeth [6, 7]. Though, a commonly used root canal irrigant, is sodium hypochlorite (NaOCl), it has an unpleasant taste and odor it does not consistently system for disinfect the root canal [8], and is toxic, when extruded into the periradicular tissues [9]. So, a search for better root canal irrigant continues, because of these limitations.

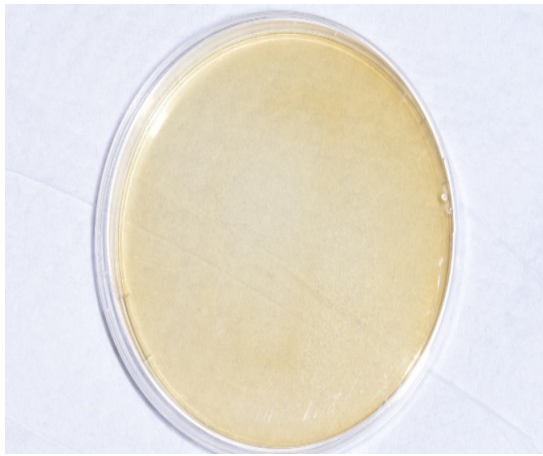


Figure 1: bile esculin blood agar plate.

Torbinejad in 2003 introduced, a new irrigant, such as MTAD which is a mixture of Doxycycline, citric acid, and detergent (Tween-80)^[7], which is capable of safely removing the smear layer^[10], and eliminating *E.faecalis*^[11]. The present study sought to compare the antimicrobial efficacy of MTAD, 3% NaOCl, and 17% EDTA against *E.faecalis*.

Methodology

Material and Method

Forty extracted single rooted of human primary teeth, were collected from children, aged 6-7 years, (Tow-third of the root length, at least should be presented). Crowns of teeth, were cut leaving only the roots. Determination of working length should be completed by radiograph. Instrumentation of the roots, to size 30 K-type file. Then cleaning the samples with normal saline, and sterilized by ^[12].

E.faecalis, should be isolated from infected root canals. Many samples were taken from chronic infected roots that suspected to be inhabitant with *E.faecalis*. there was a special test called bile esculin test (selective test for *E.faecalis*) used for first identification of bacteria (figure 1) where, such a black deposit appears after 24 hours of samples culturing (figure 2). Then *E.faecalis*, further detecting by another way called vitek2 system for more accuracy (figure 3).

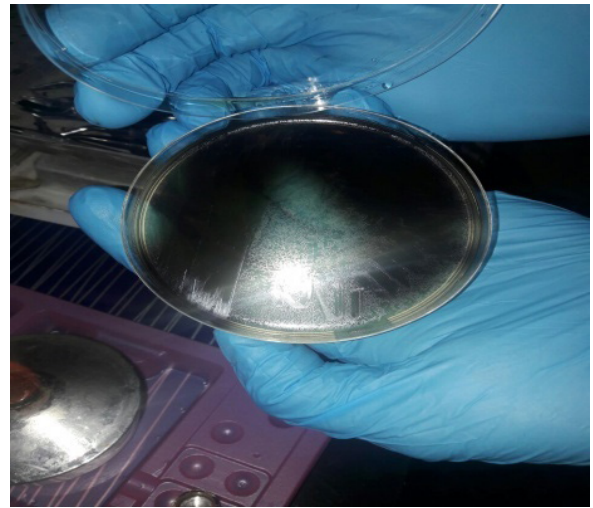


Figure 2: E.faecalis (black deposit) in bile esculin agar



Figure 3: vitek 2 system

The tooth specimens sterilized and then inoculated with *E.faecalis* that, after that was cultured in Brain-Heart Infusion (BHI) broth at 37°C. In order to inject the broth suspension inside root canal, 30 gauge needle was used. All specimens tooth must be immersed in broth at 37°C to allow bacterial growth (figure 4). Medium in this process should be changed once a week for each 4 respectively weeks. Two weeks' period was chosen for inoculation of bacteria, as recognizable number of colonies of bacteria has been produced after it. After this process, teeth were removed from the bacterial culture. Then we covered the root apices with Cavit™. After that, the end of each tooth specimen was wiped with 3% sodium hypochlorite in order to disinfect the outside of the tooth before irrigation treatment ^[13].

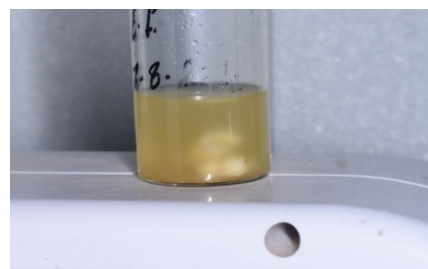


Figure 4: teeth specimens in brain heart infusion broth.

Figure6: colonies of *E.faecalis* in the blood agar plate.

Then, all samples were divided randomly in to 2 groups, for experimental procedure of irrigation materials. Paper point that used for taking swap should be sterile, this swap from root canal (pre samples) before irrigation procedures. Importantly, we must be irrigated the root canal with normal saline and then preoperative swap was taken; normal saline here acts as good media for inoculation the content of canal.

Irrigation procedure:

Group 1: In this group, 20 roots samples, each root canal was irrigated firstly with 2ml 3% NaOCl, then normal saline cleaning, followed by irrigation with 17% EDTA, and final irrigation with normal saline^[14].

Group 2: In this group, 20 samples irrigated with MTAD, 2 ml of MTAD used for root canal irrigation, followed by irrigation with normal saline ^[15].

Sterile paper point, used for taking post irrigation samples from the root canal. Both pre and post sample, are kept in Eppendorf tubes, special tubes, which containing 1ml of normal saline, (figure 5) and then transferred to the laboratory, for serial dilution, and bacterial count by using cfu/ml procedure (figure6).

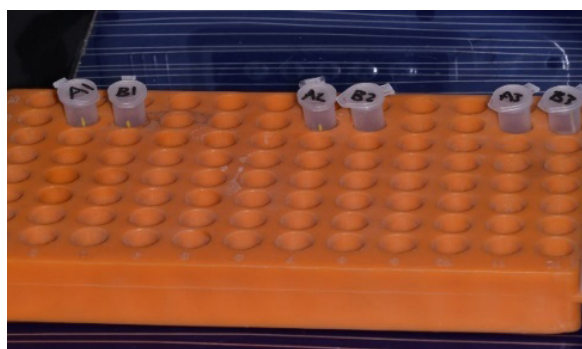


Figure 5: pre and post irrigation samples.



Figure6: colonies of *E.faecalis* in the blood agar plate.

Results

In this study the number of bacterial colonies in both irrigation regimens are reduction as in table (1).

Table 1: The values of antibacterial effect of the Tow irrigant methods used in the study

Groups	Mean	Std. Deviation	Minimum	Maximum
MTAD	98.037	1.029	95.45	100.00
NAOCL&EDTA	99.187	1.975	94.00	100.00

Result of one way anova revealed that there is no significant difference between antibacterial efficacy of both groups $p > 0.05$ shown in (table 2).

Table 2: Statistical values of one wayanova analysis for both Groups

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5832.821	2	2916.410	240.724	.161
Within Groups	508.837	42	12.115		
Total	6341.658	44			

Levene statistics=17.993, df=2, p value=0.161.

Table 3: The antibacterial effect of the irrigant methods by Dunnett t3 post hoc test, Comparison Study.

Comparisons between groups using Dunnett T3					
(I) Group	(J) Group	Mean Difference (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
MTAD	NaOCL&EDTA	-1.151	.161 [NS]	-2.636	.335

There is no significant difference showed in comparisons between MTAD and 3% NaOCL – 17% EDTA group, the p value = 0.161 ($p > 0.05$).

Table 4: The antibacterial effect for pre and post samples for both groups

Groups	Paired Samples Statistics				T value	P value	Effect size
	PRE		Post				
	Mean	SD	Mean	SD			
MTAD	3.675	1.251	.067	.032	11.202	.000[HS]	2.892
NaOCL& EDTA	2.041	.626	.014	.034	12.394	.000[HS]	3.200

Df = 14

In this study, result showed the reduction in the means percentage of the post samples of bacterial colonies for both methods, as in table 4, but the large effect size is 2.892 in the MTAD group, and (3% NaOCL-17% EDTA) group is 3.200 effect size, as in table 4.

Discussion

In order to eliminate the bacteria and their products, and the substrate from the root canal system of teeth, doing root canal treatment^[16], so this process is the main aims for our study. In this process, the use of irrigation solution is essential to ensure bacterial elimination, and removal of organic tissue pieces^[17]. Maximum tissue dissolving effect on the necrotic tissues, when we have maximum anti-bacterial effect of irrigant, and the least toxic effect on the peripheral tissues are some important features of an ideal root canal irrigant^[18]. Primary teeth have the complex morphology, and the irregularity of the root canals, which of negatively affect the success of chemo-mechanical endodontic treatment^[19]. The most commonly employed root canal irrigant is sodium hypochlorite, till now^[20], the antimicrobial activity of NaOCl is by the release of hypochlorous acid (HOCl), oxidative action of this acid on sulfhydryl

groups of bacterial enzymes, by the action of (HOCl) will disrupted the metabolism of the microorganism^[20]. Sodium hypochlorite, it is an effective antibacterial agent, but NaOCl is toxic when extruded to the periradicular tissue^[18]. Many primary teeth needed treatment for root canal, permanent tooth follicles can be damaged by NaOCl during treatment, and also peripheral tissues and oral mucosa. Therefore, a new irrigants should be found, research for that must be continues. MTAD, new material introduced in 2003, it was subjected to various test procedures, in order to evaluate its efficacy, it was compared with various commonly used irrigants. The antimicrobial activity of both MTAD over 3% NaOCl seen in this study are in conformity with the findings of Shabahang, and Torabinejad's study^[11, 21].

The most important organism in this study was *E. faecalis*. Therefore, it was selected, because it is most commonly isolated in endodontic retreatment of apical periodontitis^[4], sodium hypochlorite^[20], potassium iodide^[22] or calcium hydroxide^[23] chemical material irrigants had been identified to have a resistant currently when used, and has been found to survive as a mono-infection in root canals^[2]. There is many previous in vitro studies, which have shown a high level of susceptibility

of *E. faecalis* to MTAD, this solution was diluted 200 times and still has the same efficacy of, while NaOCl loses its antibacterial activity against the *E. faecalis* beyond 32 times dilution^[11].

MTAD, its acting by removing the smear layer of bacteria with significantly less erosion of the dentinal tubules in comparison with EDTA(10). MTAD, when was evaluated for biocompatibility, it was prove to be less cytotoxic, and more safer than Eugenol, Ca(OH)₂ paste, 5.25% NaOCl, 3% H₂O₂, 0.12% Chlorhexidine gluconate^[24]. The antimicrobial effectiveness of MTAD, by anticollagenase activity of Doxycycline, which it causes low Ph and have ability to be released gradually over time^[10], also its action by citric acid was facilitated the removing the organic and inorganic substances. Surface tension of solution reduces on the dentinal tubule by Tween-80, therefore, allows Doxycycline to penetrated more deeper into the tubules. Capacity of MTAD to kill *E. faecalis* after a mere exposure of 5 minutes, which is one of the significant features of this material, making it useful in the clinical situation. However, this effect was not seen with NaOCl^[25]. Newberry et al. showed that MTAD killed most strains of *E. faecalis* when diluted 1:512 times and inhibited most strains of *E. faecalis* growth when diluted 1:8192 times^[26]. Thus MTAD has ideal properties for root canal irrigant. The results of the our study was identical to the findings of Portenier et al^[27], Ghoddsi et al^[28, 29], and Davis et al^[30], while studies done by Dunavant et al^[29], Baumgartner et al^[30], Krause et al^[31] are differences with these results. These differences in the results due to differences in our methodology and variance in strains tested, and the modification in our processing.

Conclusion

Conclusion based on the data of the present study, biopure MTAD has an effectiveness as 3%NaOCl- 17% EDTA. However, more in vitro and in vivo studies are important to prove the using of MTAD as good irrigant against *E. faecalis*.

Conflict of Interest – Nil

Source of Funding- Self

Ethical Clearance – Not required

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Iron Oxide Nanoparticles Reduced Biofilm Formation and Detection of *lmb* Genes in *Streptococcus agalactiae* Isolated From Patients with Diabetes Mellitus

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Abstract

Fifty eight isolates of *Streptococcus agalactiae* were obtained from wound and urine specimens among one hundred thirty six from patients with diabetes mellitus and identified through cultural, morphological, and biochemical examinations in addition to VITEK 2 Compact System. All of the isolates were tested regarding their sensitivity to 18 antibiotics and the results showed that all of the isolates were resist to clindamycin, and sensitive to teicoplanin. The current study was carried out to use two methods (i.e. microtiter biofilm and Congo red agar) so as to provide and extend insight into bacterial colonization and biofilm formation among diabetic patients. The two methods were compared and the results revealed that microtiter was the best method for biofilm detection, and two chemical materials (i.e. silver oxide, and iron oxide) were used as anti-biofilms for all isolates, one of the best concentration and kind of chemical materials was Iron oxide at 75 mg/ml for reducing biofilm formation. PCR system was employed in order to detect the virulence genes (i.e *lmb* gene), the results that 30(51.72%) were positive for *lmb* genes.

Keywords: Biofilm, Diabetes mellitus, Nanoparticles, *Streptococcus agalactiae*, Virulence genes

Introduction

The term diabetes commonly used by public refers to a series of metabolic disorders that involve increased levels of blood sugar for long periods of time, which are collectively labeled Diabetes mellitus (DM) ¹.

It is a widely accepted phenomenon that diabetic patients are more likely to develop bacterial infections ².

Proteases break the peptide bonds in protein chains through hydrolysis³. Microorganisms perform their hemolysis using a substance called hemolysin ⁴.

The VITEK 2 system has advanced the technology to the level where it can identify and perform Antibiotic Sensitivity Test (AST) on bacteria, once the initial inoculations are performed and brought to its standards⁵.

Microbial organisms have developed various mechanisms in order to survive against the stressful conditions of the environment. One of these defensive mechanisms is their capability of developing a layer of slimy bio-film, which can be defined as a self-secreted polysaccharide aggregate matrix attached to their surface in a certain direction ⁶.

The isolated bacteria colonies were grown on the polystyrene layer of the microtiter plates' flat bottomed wells ⁷.

The Congo Red Assay (CRA) is a simple qualitative test method that has the additional benefit of leaving the colonies open for further testing ⁸.

Forming antibiofilm through the use of nanoparticles like a silver oxide leads to a decrease in resistance within biofilm because silver oxide interferes with most bacterial cell structures and functions ⁹. Various chemical techniques like co-precipitation, hydrothermal, and laser pyrolysis have proposed synthesis of iron oxide

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nanoparticles ¹⁰.

PCR products are usually analyzed within agarose gel electrophoresis, where the DNA products can be put into an order based on their size and electric charge ¹¹. Detection of the *lmb* genes using conventional PCR .

Materials and Method

Bacteriology

Fifty eight *S. agalactiae* isolates (urine and wound) were obtained from 136 diabetic mellitus patients were depending on cultural, morphological and biochemical tests in addition to Vitek 2 compact system. Sensitivity test kit for gram positive bacteria which included several antibiotics such as clindamycin , erythromycin , tetracycline , inducible clindamycin , vancomycine , ceftriaxine , cefotaxime , benzympenicillin , ampicillin , trimethoprim , linezolid , tigecycline , nitrofurantoin , moxifloxacin , ciprofloxacin , imipenem , levofloxacin , and teicoplanin and VITEK 2 Compact System were employed. Enzyme assays like protease test, and hemolysin, were used for all isolates, and biofilm formation was performed by two methods of the microtiter plate method and Congo red method.

In microtiter plate assay test, the strains are inoculated in 10 ml of LB broth for 18 hours at 37 °C. Then a mixture of 50 µl inoculum and 50 µl fresh of LB broth is placed in a microplate (96 cells), and left for incubation overnight, once again at 37 °C. The cells are then emptied and washed with PBS thoroughly. 100 µl of 1% crystal violet solution is then added to the cells, and the microplate is left to rest at room temperature for half an hour. The plate is then washed once again with PBS, then the cells are introduced 200 µl 95% ethyl alcohol each. Finally, 125 µl of this solution is collected from each cell to measure under 540 nm using a microplate reader ¹².

The Congo red stain was obtained from Research lab fine chem. Industries, India, and was prepared as a 0.8 g/200 ml distilled water solution. Appearance of black dry crystalline colonies on the CRA plates indicated biofilm production while the colonies of biofilm non-producer remained pink or red colored ¹³.

MIC of nanoparticles on DM isolates

Two nanoparticles were used as antibiofilm agents against *S. agalactiae* including silver oxide, and iron oxide. The MIC Ago-np on 58(42.64%) isolates were 100 µg/ml from varies concentration (25, 50, 100, and 150 µg/ml), Also the MIC Io-np on 58 (42.64%) isolates were 75 mg/ml among different concentration were used as (20, 35, 50, 75, and 100 mg/ml).

DNA extraction

To obtain a pure culture, all of the *S.agalactiae* strains were streaked twice on blood agar (Oxoid, UK), and the single colony was inoculated into a 50 ml flask containing 10 ml Luria Bertani (LB) broth made of 10 g(w/v) NaCl2 5g (w/v) yeast extract (Oxoid, the UK) and 1 L distilled water. The flasks were kept in the incubator shaking at 110 rpm for a night. Isolation of DNA from bacterial cells was performed by using Presto™ Mini gDNA bacterial kit.

The DNA were extracted from the bacteria that had grown in the pure culture.

PCR amplification

Following the instruction of the manufacture of the PCR primers (Gene work, Australia). The primer sets were utilized to promote the invasion of the damaged epithelium(*lmb*) gene codes for *lmb* (laminine-binding protein). (Table 1).

Table 1. Primer sets used for the detection of virulence genes in *Streptococcus agalactiae*

Putative function	Target gene	Primer Sequence (5-3)	Amplicon size (bp)	Annealing temp. (C)	Reference
Promotes invasion of the damaged epithelium	<i>lmb</i>	ACCGTCTGAAATGATGTGG GATTGACGTTGTCTTCTGC	572	54	Spellerberg <i>et al.</i> , (1999)

AccuPower PCR PreMix is the powerful technology and easy to perform DNA amplification. It contains DNA polymerase, dNTPs, a tracking dye and reaction buffer in a premixed format, freeze-dried into a pellet. Primer (1.3 µl) of each forward and reverse, (2.5µl) of DNA

template were added to AccuPower PCR tube then 20µl of distilled water added to AccuPower PCR tubes. After that lyophilized blue pellet dissolved by vortexing. PCR performed for samples, proceeds in the thermal cycler for 30 cycles as mentioned in table (2).

Table 2. PCR protocol and thermocycling conditions.

Gene name	Initial denaturation	Cycles	Denaturation	Annealing	Elongation	Final elongation
lmb	95°C/5min	30	94°C/1min	54°C/1min	72°C/2min	72°C/5min then 4°C→∞

The most common way to separate DNA molecules according to size is electrophoresis technique in agarose gel ¹⁴.

a. Agarose preparation

A 1.5% was made by adding 1.5 gm agarose to 1X TBE buffer. The agarose solution was boiled until all the agarose was dissolved in a microwave oven for 1 minutes and left to cool at 50°C then an appropriate comb was placed in a sealed mould, and agarose was poured into the mould. The gel was allowed to cool for at least 20 minutes before the seal and the comb was removed ¹⁴.

b. Preparation of sample

Before electrophoresis each well was loaded with 5µl of PCR product and 5 µl of ladder DNA marker (100bp) was loaded into the well flanking the samples.

Result

In current study 58 isolates of *S. agalactiae* were

obtained from 136 diabetic mellitus patients. According to the results of enzyme assay, it was observed that all isolates produced hemolysin about 100% except for the protease test which indicated a percentage of about 60%.

Fifty eight isolates of *S. agalactiae* were tested for their sensitivity and resistance to 18 antimicrobial agents by using VITEK 2 Compact System, which revealed that their resistance to the antibiotics varied. The results indicated that the highest percentages of resistance of the isolates were respectively related to clindamycin 58 (100%), erythromycin 42 (72.4%), tetracycline 40 (68.9%), inducible clindamycin Resistance 38 (65.5%), vancomycine 36 (62.0%), ceftriaxcine 34 (58.6%), Cefotaxime 30 (51.7%), Benzylpenicillin 27 (46.5%), Ampicillin 25(43.1%), trimethoprim 20 (34.4%), linezolid 15 (25.8%), tigecycline 13 (22.4%), nitrofurantoin 11 (18.9%), moxifloxacin 9 (15.5%), ciprofloxacin 6 (10.3%), imipenem 5 (8.6%), and levofloxacin 4 (6.8%), and all isolates were susceptible to teicoplanin (Table 3).

Table 3. Antibiotic susceptibility test and degree of resistance of all isolates

No. of antibiotics	Antimicrobial agent	Symbol	R	S	Percentage (%)
1	Clindamycin	Clind.	58	0	100%
2	Erythromycin	Eryth.	42	16	72.4%
3	Tetracycline	Tetra.	40	18	68.9%
4	Inducible clindamycin Resistance	I.C.R.	38	20	65.5%
5	Vancomycine	Vanc.	36	22	62.0%
6	Ceftriaxcine	Ceft.	34	24	58.6%
7	Cefotaxime	Cefo.	30	28	51.7%
8	Benzylpenicillin	Benzy.	27	31	46.5%
9	Ampicillin	Amp.	25	33	43.1%

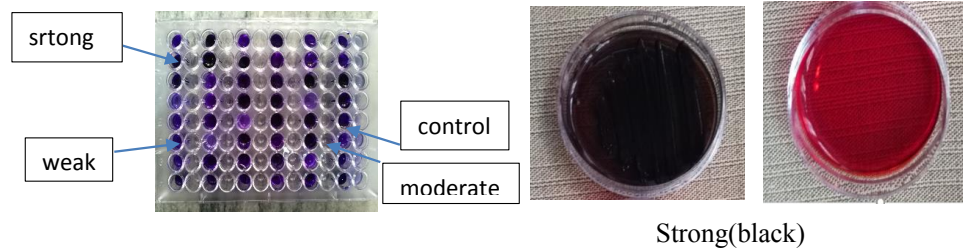
Cont... Table 3. Antibiotic susceptibility test and degree of resistance of all isolates

10	Trimethoprim	Trim.	20	38	34.4%
11	Linezolid	Line.	15	43	25.8%
12	Tigecycline	Tig.	13	45	22.4%
13	Nitrofurantoin	Nitr.	11	47	18.9%
14	Moxifloxacin	Moxi.	9	49	15.5%
15	Ciprofloxacin	Cip.	6	52	10.3%
16	Imipenem	Imip.	5	53	8.6%
17	Levofloxacin	Levo.	4	54	6.8%
18	Teicoplanin	Teico.	0	58	0%

Biofilm was carried out for all isolates by two methods including microtiter plate method and Congo red method, and it was observed that microtiter plate method led to the highest level of biofilm formation of 53 (91.37%), and the least biofilm formation was related to the congo red agar method 25(43.10%). Moreover, (figure 1a) indicates the results of biofilm formation by using microtiter plate assay and the control without

bacteria isolate. While , figure (1b) presents the results of biofilm formation by Congo red method.

Two nanoparticles of iron oxide, and silver oxide were utilized to reduce biofilm formation from all of the isolates, and the results revealed that the Iron oxide nanoparticles lead to a reduction of 43(74.13%) in the biofilm formation, and silver oxide 35(60.34%) (figure 2).



control(red)

Fig. 1. Biofilm formation with microtiter plate assay (a). Biofilm formation by using Congo red method(b)

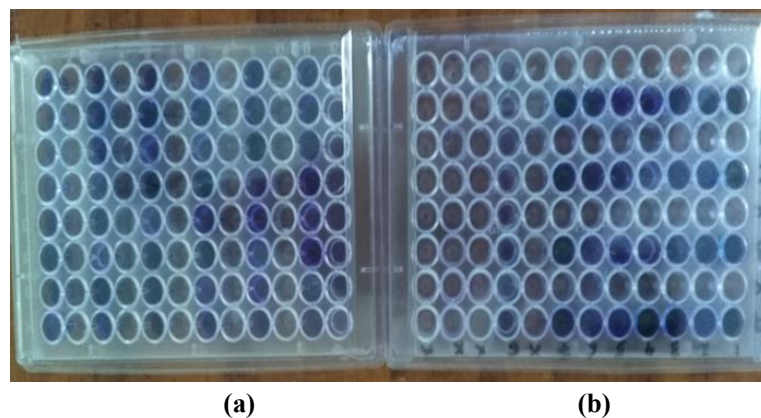


Fig. 2. Reducing biofilm formation using (a) Nanopartecles of Iron Oxide, and (b) Nanopartecles of Silver oxide.

The detection of virulence genes was performed by using PCR technique, which led to detection of *lmb* gene with product size 572bp. Indeed, the results of PCR found that the *lmb* genes (Figure 3) .

Discussion

Out of the 136 specimens obtained from the patients with diabetes mellitus, 58 isolates were diagnosed to be *S. agalactiae*, this results is similar with those reported by Farely¹⁵ who stated that *S. agalactiae* is more prevalent among diabetic patients and the increased number of *S. agalactiae* infections is associated with diabetes. Moreover, Batista and Ferreira¹⁶ also concluded that *S. agalactiae* is quite common among diabetic patients.

The results obtained from VITEK 2 Compact System and Gram positive Kit indicated that all obtained isolates of *S. agalactiae* were 100% resistant to clindamycin, this finding is in line with the reports of the studies conducted by wang *et al.*,¹⁷ who concluded that clindamycin resistance rate is extremely high among pregnant women, also Rawat *et al.*,¹⁸ reported that resistance to clindamycin is high among diabetic patients. However, it was also observed that other antibiotics were used for *S. agalactiae* isolates gave variable resistant, while teicoplanin was susceptible for all isolates. This results similar with the results reported by Barberis *et al.*,¹⁹.

The current results indicated that the highest and lowest amounts of biofilm production were respectively related to microtiter plate method (91.37%) and congo red agar method (51.72%). This finding was almost in line with those of the studies reported by Azeredo *et al.*,²⁰.

Fifty three (91.37%) isolates were biofilm producers by using microtiter plates assay, and this method was the better screening test for biofilm production than Congo red agar because it was easy to perform both qualitatively and quantitatively²¹. Also, Mathur *et al.*,¹² reported that the microtiter assay was an accurate and reproducible method than Congo red agar, and this method can serve as a reliable quantitative tool for determining biofilm formation by clinical isolates of microorganism²².

With regard to the effect of the studied nanoparticles on reduction of biofilm, our results found that the Iron oxide nanoparticles resulted in a decrease of 43 (74.13%) in biofilm formation, and also, silver oxide nanoparticles were found to reduce biofilm formation by 35 (60.34%). This finding is closed to results of Ueno *et al.*,²³.

The *lmb* gene (laminin binding protein) plays an important role in the adherence of *S. agalactiae* 30 (51.72%) isolates were found to contain the *lmb* gene in the present study. According to Spellerberg *et al.*,²⁴, the *lmb* gene was presenting the common serotypes of *S. agalactiae*.

Conclusion

In current work it was indicated that *S. agalactiae* was quite common among the patients with diabetes mellitus, which could be reduced through, iron, and silver oxide nanoparticles. Since *S. agalactiae* can lead to result in severe invasive diseases, diabetic patients and medical experts are recommended to utilize such nanoparticle in order to inhibit or reduce biofilm formation as a result of *S. agalactiae*.

Conflict of Interest: Nil

Ethical Clearance: The study was approved by the ethical committee of the Salahaddin University University of Sulaimani/ College of Education

Source of Funding: Not

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Correlation of Nitric Oxide (NO) Sputum Level and Lung Physiology of Indoor Parking Attendant

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Abstract

Background: Air contamination inside the building causes respiratory inflammation and increases NO sputum levels that cause changes in parking staffs' lung physiology.

Objective: To analyze the correlation between NO sputum level and lung physiology of indoor parking attendant.

Method: This research was conducted at the Toserba oceans in Tasikmalaya West Java, Indonesia with a sample of 40 people. Twenty indoor parking attendants as an exposed group and 20 administrative officers as a control group. Sputum NO and lung physiology were examined in both groups. The measurement of NO sputum level was using Griess method and lung physiology was by spirometry of brand of Fukuda.

Results: The mean of NO sputum level in the exposed group was 4689.75 ± 6778.452 and in the control group was 485.25 ± 307 , the mean of NO level was obtained a significant difference between exposed group and control group ($p = 0.009$). The results of lung physiology examination in both exposure and control group from % FEV1, % FEV1 / FVC showed significant differences ($p < 0.05$). While % FVC did not show a significant difference ($p > 0.05$). The result of the Pearson correlation test showed a strong positive correlation between NO sputum level and lung physiology of indoor parking attendant ($r = 0.461$ with $p < 0.041$).

Conclusion: There was a correlation between NO sputum level and lung physiology of indoor parking attendant.

Keywords: Indoor parking attendant, NO level, Lung function, Vehicle emission level

Introduction

The World Health Organization (WHO) estimates that urban air pollution contributes about 800,000 deaths each year and disability of around 4.6 million every year worldwide. The burden is uneven that about two-thirds of the deaths/years occur in developing countries in Asia¹.

In the 1990s, many epidemiological studies reported the adverse effects of air pollution on health². Environmental factors play an important role in the development of respiratory diseases. The presence of various particles and gases from vehicle emissions such as carbon dioxide, carbon monoxide, sulfur, benzene, lead, nitrogen dioxide and black smoke have a role in the pathogenesis of the respiratory disease. Toxic chemicals and non-combustible gases resulting from motor vehicle emissions might cause respiratory tract irritation. In the long run, exposure to pollutants possibility leads to the occurrence of diseases such as asthma and bronchitis as well as the occurrence of lung physiological changes³.

The results of research in several cities (Jakarta, Bandung, Semarang, and Surabaya) showed that motor

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vehicles were the main source of air pollution. The problem of air pollution due to vehicle emissions has reached a worrying point, especially in big cities. Motor traffic is quite dense that could affect air quality, traffic density not only occur on the highway but also can occur in the parking lot due to increased motor vehicle users which ultimately affect the air quality in the parking lot ⁴.

Based on several studies, air pollution might affect respiratory distress through reactive oxygen species (ROS) pathways. ROS could lead to respiratory tract cell to damage by inducing apoptosis (cell programmed cell death) and cell necrosis that will enhance the proinflammatory cytokine mediator and some chemokines including tumor necrosis factor alpha (TNF- α) and interleukin-8 (IL-8). This process could ultimately lead to decreased lung physiology function ⁵, and plays an important role in various lung diseases, including asthma and chronic obstructive pulmonary disease (COPD) ⁶.

Nitric Oxide (NO) is a short-lived intercellular material that has been shown to be important in many biological functions including neurotransmission, defense systems, immune function, and inflammation. Pathophysiology of lung disease associated with NO. Previous research has shown that measurement of NO expiratory air concentration can represent non-invasive measurements of inflammation in the airways. In particular, NO expiratory air has been shown to be a marker associated with chronic cough symptoms, COPD, and asthma. Several studies have examined the effects of air pollution on subclinical inflammatory markers such as NO. In a longitudinal study in elementary school students aged 8-13 years found that exposure to black smoke, nitrogen dioxide (NO₂), and particles smaller than 10 μ m (PM₁₀) was associated with an increase in NO expiratory air. Pollutants are also associated with decreased peak expiratory currents and increased inflammatory markers in nasal lavage samples ⁶.

Based on some evidence that mention of NO plays an important role in respiratory tract physiology and become an indicator of inflammation. Previous research examined levels of NO sputum of asthma patients whose results were higher compared with controls ⁷. Normal NO value of sputum was 502 μ m / L with standard deviation 414 ⁸. The half-life of NO in the tissue is very short (about 1-5 seconds), the direct NO test is not easy to do so the examination was performed indirectly using

Griess reaction ⁹.

The parking attendant, especially those working in closed rooms (Indoor) that are not equipped or not functioning air ducts so the vehicle exhaust gas will accumulate in the parking space, consequently affect the respiratory system. In research conducted by Almaditya to the parking attendant, the obstruction was obtained 80% and restriction 85%. Based on the above background, this research will be examined about the correlation of NO sputum level with lung physique of an indoor parking attendant.

Method

The subjects of this research were indoor parking attendants and the Tasikmalaya Ocean General Store administration officers who fulfill the inclusion and exclusion criteria. The inclusion criteria consisted of ages 18 to 55 years, have worked at least 1 year, able and cooperative undergo the procedure of induction of sputum and examination of lung physiology. Exclusion criteria were subjects with a history of bronchial asthma, heart disease, diabetes mellitus, rheumatoid arthritis, pulmonary tuberculosis, lung tumors, Chronic Obstructive Pulmonary Disease, and pneumonia. Allergic rhinitis. Free from drugs that affect the levels of NO (antioxidant, vitamin C). Subjects who are willing to participate by fill out the informed consent sheet and sign it.

This research was conducted in the parking area of the indigenous seashores of Tasikmalaya oceans using cross-sectional design. The data were collected using questionnaires and physical examination, subject demographic factors (sex, age, height, weight, duration of work), thoracic photos, vehicle emission measurements, NO-induced sputum and lung physiology. Sputum was obtained by inhalation induction using 2 ml of NaCl solution 2 ml with ultrasonic nebulizer device until the solution was exhausted then subjects were told to cough sputum on the sterile pot which had been prepared. Sputum NO concentration using Sputum was centrifuged for 15 minutes at a rate of 3000 g, cell culture supernates obtained were included in an eppendorf tube and stored at -20°C.

The pulmonary physiological examination was performed at the agreed time with a portable spirometer device of Fukuda Sangyo ST 75 brand. The examination was performed three times and the highest result was taken as the data to be analyzed. The values recorded are

FVC, FEV1 and FEV1 / FVC ratios. The measurement of vehicle emissions was performed by Air Quality Measurement System (AQMS). Measurements were made for at least 1 hour then recorded in report form. Automated monitoring equipment (AQMS), this equipment continuously monitor ambient air quality and produce the data that could set as needed. Parameters measured by this tool were carbon monoxide (CO), O₃, PM₁₀, NO₂, and Sulfur dioxide (SO₂).

The collected data were processed using SPSS (SPSS, Inc., Chicago, IL) with $p < 0.05$. To analyze the correlation of NO sputum level with lung physiology used correlation statistic functioned to describe the relationship of NO content-induced sputum with indoor lung parking attendant physique. The test used was Pearson test and Spearman test.

Results

Characteristics of Respondents

Based on the length of the working period less than or equal to 10 years dominated by exposure group was 90.00% and in the control group was 65.00 %. Based on smoking status in this study was dominated by smoking habit. In the exposure group, it consisted of 16 people smoking and in the control group consisted of 12 people smoking. Based on the abnormalities of lung physiology in this study was obtained more abnormal obstruction in the exposure group by 50%. While in the control group was 10%. Restriction and mixed abnormalities were not obtained in both groups of both exposed and control groups. Viewed from the abnormalities of lung physiology, there was a significant difference between the exposed group and the control group ($p = 0.005$) (Table 1).

Table 1. Measurement data of research subjects

Characteristics	Exposed group (%) or Mean±SD	Control (%) or Mean±SD
Sex		
Male	20 (100.00)	17 (85.00)
Female	0 (0.00)	3 (15.00)
Job durations		
≤ 10 year	18 (90.00)	13 (65.00)
> 10 year	2 (10.00)	7 (35.00)
Habit		
Smoking	16 (80.00)	12 (60.00)
Un-smoking	4 (20.00)	8 (40.00)
Lung physiology abnormalities		
Normal	10 (50.00)	18 (90.00)
Obstruction	10 (50.00)	2 (10.00)
Age	39.50±12.20	33.95±9.25
Years of service	6.40±2.43	9.95±6.97
NO Level	4689.75±6778.45	485.25±307.08

In the exposure group, it was obtained the youngest age was 21 years and the oldest was 55 years, while the control group obtained the youngest age at the age of 20 years and the oldest age at the age of 53 years. Judging from age there was no significant difference between

the exposed group and the control group ($p = 0.113$). In the exposed group, the shortest working period was 3 years and the longest working period was 11 years, while in the control group, the shortest working period was the age of 2 years and the longest working period

of 28 years. The mean of the subjects was obtained a significant difference between the exposed group and the control group (p = 0.038; Table 1).

Comparison of Lung Physiology

The comparison of % FVC based on the smoking status of the exposed group was The mean FVC% of the non-smoking group was higher than the smoking group, but the t-test at % FVC has obtained a p-value of 0.262.

The comparison of % FEV1 based on the smoking status of the exposed group. The mean of % FEV1 group that was not smoking is higher than a smoking group but, the T-test at % FEV1 yielded p-value = 0.454. Comparison of % FEV1/FVC based on the smoking status of the exposed group. The mean FEV1/FVC% of the non-smoking group was higher than the smoking group, but, the t-test at % FEV1/FVC yielded a p-value of 0.944 (Table 2).

Table 2. Comparison of lung physiology based on smoking and group status

	Groups		P	Smoking status		P
	Exposed	Control		Non-smoking	Smoking	
%FVC	121.40±13.17	129.30±11.96	0.054	126.50±7.93	120.13±14.09	0.262
% FEV1	106.45±15.99	118.35±12.84	0.013	111.75±14.17	105.13±16.57	0.454
%FEV1/FVC	75.15±5.43	83.45±6.25	0.000	75.25±1.70	75.13±6.06	0.944

Discussion

The average age of subjects was 37.56 years, but no significant correlation was obtained between age and lung function impairment ¹⁰. Based on smoking status dominated by smoking habits. In the exposure group, it consisted of 16 people smoking and 4 people did not smoke, while in the control group consisted of 12 people smoking and 8 people did not smoke. This was in accordance with previous research consisting of 57 people who smoke and 46 people who do not smoke ¹⁰.

There were abnormal lung abnormalities in the exposure group by 50% and in the control group by 10%. The results of previous research have obtained the decreased vital capacity of lung parking attendant in closed parking with r = 0.518 ¹¹. This study was inconsistent with previous research that only obtained 7.9% of the subjects lung abnormalities and the rest of normal lung physiology ¹⁰. Based on the smoking status in this study, more obstruction abnormalities were obtained in the exposed group (50%). While restriction and mixed abnormalities were unfound in both study and exposure groups ¹².

The results of this study according to Regulation of Minister of Manpower and Transmigration No.Per.13 / MEN / X / 2011 About Threshold Value Physical and Chemical factors in the workplace and the public health

guidelines of the city of Illinois on indoor air quality parameters that do not meet the required quality standards are high levels of Sulfur Dioxide (SO₂) by 0.68 mg/Nm³ and PM₁₀ 0.05µg/Nm³ in the indoor parking lot ¹³. The result of measurement of vehicle emission level in the indoor parking lot in this study above the air quality standard. Sputum NO concentration can be used as a marker of inflammatory processes in the airways such as asthma ¹². Inflammatory processes can also be caused by pollutants such as vehicle emissions (CO, SO₂, NO₂, O₃, PM₁₀) being inhaled ¹³.

There was a decrease in both FEV1 in case group (3.1 L/sec) and FVC in case group (2.7 L/sec) than the control group (3.2 L / sec) ¹⁴. The changes in FEV1 and FVC were not related to prolonged exposure to pollutants from vehicles after they were correlated with age, height, and level of cigarette consumption ¹⁵.

Currently, there no research that has been done to find the correlation between NO sputum and lung physiology of indoor parking attendant. In this study obtained NO sputum indoor parking officer significantly higher level than administrative officers. The result of ratio measurement (% FEV1/FVC) of indoor parking officer significantly lower than the administrative officer. We obtain 50% obstruction in indoor parking attendant and 10% in administration officer. This indicates that the higher the NO sputum level, the lower the ratio (% FEV1/

FVC). The results were in accordance with the results of measurements of vehicle emission levels (SO₂) of 0.68 mg/Nm³ and PM₁₀ 0.05 µg/Nm³ in indoor parking above the quality standard causing irritation and inflammation of the respiratory tract, resulting in increased levels of NO sputum. Airway inflammation results in edema of the respiratory tract resulting in impaired pulmonary physiological disorders in the indoor parking attendant. Sputum NO level with APE value (Flow Peak Expiration) showed a decreasing trend so that the decrease of sputum NO concentration followed by an increase of APE value¹⁶. This means that the higher the NO sputum level, the lower the value of APE. In Osaka Japan, where there was a strong negative correlation between NO sputum level and airway obstruction (FEV₁/FVC ratio) with $r = -0.62$ and $p < 0.001$ ¹⁷.

The obstacle of this study was the time required to examine all research subjects. The check should take at least 1 hour for each sample. In addition, data collection conducted on working hours of research subjects resulted in each research subject must alternately be served on the field when his colleagues underwent examination in this study. These barriers complicate the process of collecting research data, but the efforts undertaken to deal with it considered able to overcome the problem so that the data collection process can run well.

Conclusion

There was a correlation between NO sputum level and lung physique of indoor parking officer in Tasikmalaya oceanfront of West Java Province.

Conflict of Interest: The author reports no conflict of interest of this work.

Source of Funding: This study is done with individual funding.

Ethical Clearence: The research process involves participants in the survey using a questionnaire that was accordant with the ethical research principle based on the regulation of research ethic committee. The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, non-maleficence, and justice.

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Indications and Adverse Outcomes of Emergency Lower Segment Cesarean Section at 1st and 2nd Stages of Labor at Al-Elwiya Maternity Teaching Hospital

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Abstract

Background: globally that about 6.2 million unnecessary cesarean sections were done yearly. Oldest surgical operation and it is considered as one of the most commonly performed surgical operations. **Objective:** To assess the indications and adverse outcomes of emergency lower segment caesarean section at 1st and 2nd stages emergency Caesarean at Al-Elwiya maternity teaching hospital. **Patients and method:** A prospective cross sectional study conducted for 1 year duration in Al-Elwyia Teaching hospital in the period from the first of Jan. 2018 to the end of Dec. 2018, when 1229 of the women were enrolled. **Results:** A total of 1229 cesarean sections operations were done in the period of the study, 836 (68%) were 1st stage emergency Caesarean and 393(32%) were in 2nd stage. The most common indications of the caesarean section were the malposition (64.5%). Meconium aspiration Syndrome is the most common perinatal outcome (n=34).

Conclusion: The 2nd stage emergency Caesarean shows more maternal and neonatal complications in comparison with 1st stage

Keyword: lower segment caesarean section, maternal complication, neonatal complication, 1st and 2nd stage emergency Caesarean.

Introduction

It was estimated globally that about 6.2 million unnecessary cesarean sections (CS) were done yearly. ⁽¹⁾ The CS rate were found in about 19% in data included from 194 countries and it's associated with higher mortality rate in both maternal and neonate. ⁽²⁾ While in a study done in 159 countries revealed that the rate of maternal and neonatal mortality was more than 10%. ⁽³⁾

Among the primary caesarean deliveries the most common indication for an elective procedure is breech presentation and for an emergency procedure includes labor dystocia and 6 non- reassuring fetal heart rate tracings. ⁽⁴⁾

In 1985, the World Health Organization (WHO) proposed that, of all births, the percentage of caesarean

sections should be between 5 and 15%; a percentage lower than 5% would suggest a limitation in the performance of caesarean sections, while a higher percentage of caesarean sections would not represent additional benefits. ⁽⁵⁾

Currently there are two concerns: while emerging countries seek to implement actions that allow greater accessibility to this procedure, in more developed countries or in sectors of populations with better economic conditions there is a growing increase in the percentage of caesarean sections performed. Only in the United States of America (USA), in 2006 a historical record of caesarean sections was reached. In that year, the percentage of births by abdominal route was 31.1%, with an increase of 50% in the last decade. In emerging countries such as China, caesarean section represents a percentage close to 40% of births, similar to South Korea. Belizan and collaborators ⁽⁶⁾ reported that in Latin American countries there is a well-documented phenomenon, in which the rate of caesarean section in 12 of 19 countries examined exceeded the maximum

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percentage recommended by the WHO.

There is a marked difference in the recommendations on the indication of cesarean section among the different associations of obstetricians: The American College of Gynecology and Obstetrics (ACOG) ⁽⁷⁾ states that “in the absence of significant information on the risks and benefits of cesarean section [if the doctor believes that cesarean section promotes the health and well-being of the patient and her fetus more than vaginal delivery is ethically justified to perform it]. “ In contrast, the International Federation of Gynecology and Obstetrics (FIGO) ⁽⁸⁾ state that “at present, there is not enough evidence without medical reasons of a net benefit to perform a cesarean section, so it is not ethically justified.”

Maternal Characteristics

Of the maternal conditions that determine the way of birth, the maternal age and the reduction in the number of desired children stand out. ⁽⁹⁾ Gestational age less than 38 weeks of gestation or greater than 40 weeks increases the probability of having a cesarean birth. ⁽¹⁰⁾ Births at gestational ages between 29 and 36 weeks have a probability close to 57% of occurrence by cesarean section, compared to 33% in births with a gestational age between 37 and 42 weeks. ⁽¹¹⁾ Primi women have a higher proportion of cesarean deliveries (43.3%) compared to women who have a previous child’s history (34.9%), or two or more children (27.5%).

Among women of medium and high socioeconomic status there is a great preference for surgical delivery, ⁽¹²⁾ having determined that there is a relationship between socioeconomic indicators and the number of cesarean sections. ⁽¹³⁾

Another maternal factor is the fear of labor pain, as it has been described that up to a quarter of women prefer a cesarean section after having a vaginal delivery. ⁽¹⁴⁾

Obstetric Practice

Obstetricians of the female gender are those who perform a greater number of cesarean sections. In this regard, it has been estimated that there is a 12% higher probability that a woman will perform a cesarean than a man. ⁽¹⁵⁾

Social Factors

The behavior of human beings, the cultural

environment and beliefs are associated with the preference of cesarean births, although it is currently unknown how this preference affects. ⁽¹⁶⁾

Institutional Factors

In private hospitals it is more frequent to perform cesarean sections than in public institutions. ⁽¹⁷⁾

Economic Factors

The economic variables have to be taken into consideration. Multiple studies have been conducted to evaluate the cost and cost benefit of performing cesarean sections. ⁽¹⁸⁾

Aim of the study

To assess the Indications and adverse outcomes of emergency lower segment cesarean section at 1st and 2nd stages of emergency Caesarean at Al-Elwiya maternity teaching hospital.

Patients and method:

A prospective cross sectional study conducted for 1 year duration in Al-Elwyia Teaching hospital in the period from the first of Jan. 2018 to the end of Dec. 2018, when 1229 of the women were enrolled. Information was obtained from theater room and from gynecological and obstetrical labor ward records. The patients were evaluated separately on designed performed.

Inclusion criteria: All primi and multiparous women (with term pregnancy) in active labor (with cervical dilation) with cephalic presentation were included.

Exclusion criteria:

1. All delivering women with previous scar
2. Patients with history of medical disorders (HT, DM, thyroid,etc)
3. Mal-presentation
4. Twin and other high order pregnancy
5. Preterm labor
6. Congenital anomalies

Results

A total of 1229 CS operation were done in the period

of the study, 836 (68%) were in 1st stage of labor and 393(32%) were in 2nd stage emergency Caesarean (figure 1).

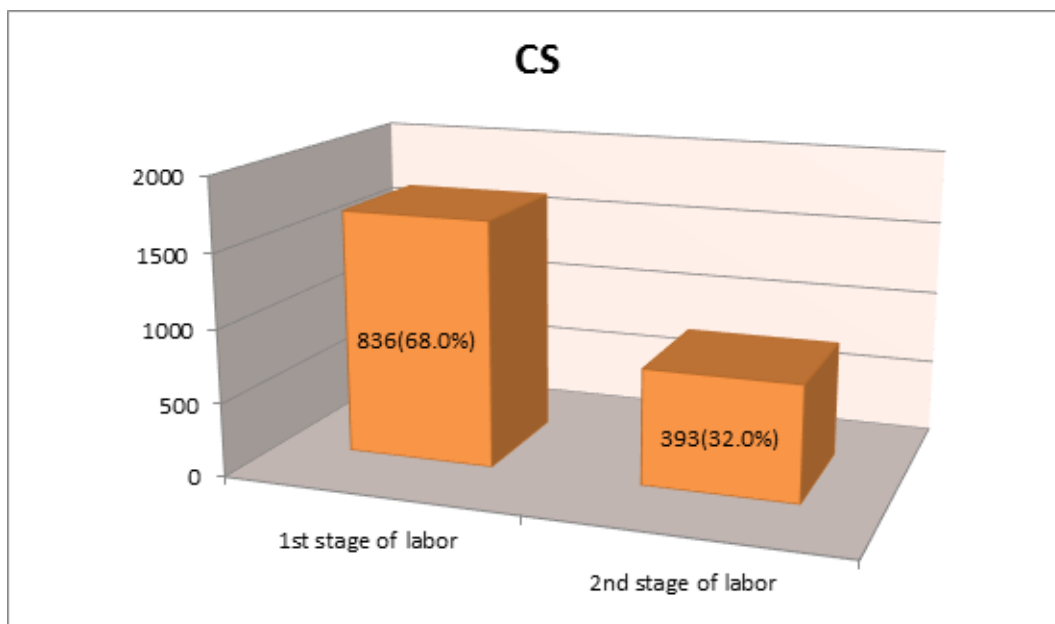


Figure 1: Distribution of CS in the studied group

As shown in table 1 the most common indications of the caesarean section were the malpresentation (64.5%), then fetal distress (20.8%), (10.7%) were failure to progress of labor, (4.4%) were APH and then cervical dystocia (3.9%).

	No.	%
Fetal distress	256	20.8
Mal position	739	64.5
Failure to progress of labor	132	10.7
Cervical dystocia	48	3.9
APH (abruption) at time of labor	54	4.4
Total	1229	100.0

Table 2, revealed that 74 patients have intraoperative complications, (48) of them were haemorrhage 13 patients with bladder injury, 10 were represent with extension of uterine and only 3 patients with caesarean hysterectomy complication.

The postoperative maternal complications of the studied patients were found in 466 (37.9%). The most common complications was UTI 183 (39.3%), then spinal headache which is found in 157/466, chest infection in 56/466, wound infection in 39 and 31 were in pelvic and genital infection. The 2nd stages were having more complications than 1st stage did.

Table 2: Intraoperative and postoperative maternal complications

Intraoperative maternal complications						
	2nd stage		1st stage		Total(n=184)	
	No.	%	No.	%	No.	%
Haemorrhage	31	66.0	17	34.0	48	100.0
Bladder injury	8	61.5	5	38.5	13	100.0
Caesarean hysterectomy	2	66.7	1	33.3	3	100.0
Extension of uterine Incision/tear	7	70.0	3	30.0	10	100.0
Total	48		26		74	
Postoperative maternal complications						
	2nd stage		1st stage		Total (n=466)	
	No.					
Spinal headache	89	56.7	68	43.3	157	100.0
UTI	102	55.7	81	44.3	183	100.0
Chest infection	33	58.9	23	41.1	56	100.0
Wound infection	23	59.0	16	41.0	39	100.0
Pelvic and genital infection	18	58.1	13	41.9	31	100.0
Total	265		201		466	

MAS is the most common perinatal outcome (n=34), then birth asphyxia, perinatal death (n=12), prematurity (n=10), difficulty in delivering the fetus breech (n=7) and INCU (n=17). The 2nd stages of labor have more complications than 1st stage (table 3).

Table 3: Perinatal outcome

	1st stage (n=40)		2nd stage (73)		Total	
	N.	%	N.	%	N.	%
Birth asphyxia	12	36.4	31	53.6	33	100.0
MAS	11	32.4	23	67.6	34	100.0
Prematurity	7	70	3	30	10	100.0
Difficulty in delivering the fetus	2		5		7	100.0
INCUB admission	7	41.2	10	58.8	17	100.0
Neonatal death	1	50.0	1	50.0	2	100.0

MAS= Meconium aspiration Syndrome

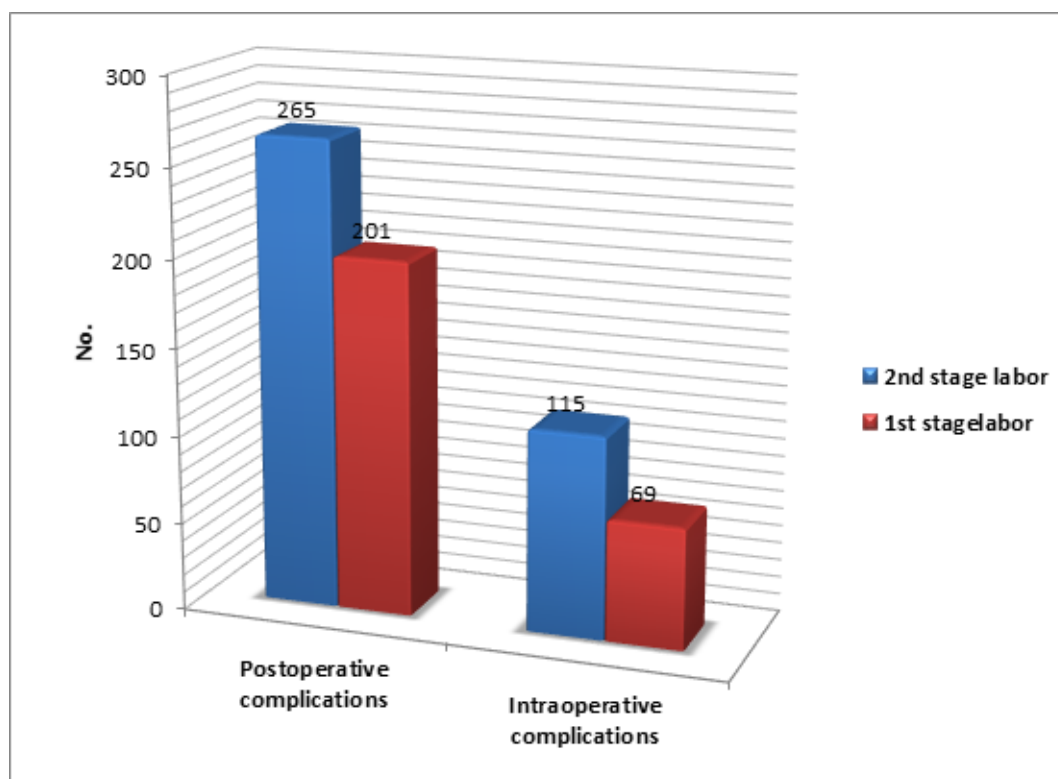


Figure 2: post & intra operative complications in both stages of labor

Discussion

In the present study the most common maternal indications for CS operation were mal position (64.5%), then fetal distress (20.8%), which is in agreement with that mentioned by Gulfareen H et al⁽¹⁹⁾ when reported that female in Pakistan show that the most common indications for CS in addition to repeated CS the labor dystocia, fetal distress, APH.

While in Mussarat N et al,⁽²⁰⁾ the most important maternal Caesarean section indications were previous one (34%), then (6%) severe preeclampsia, and (6%) for post-date& failed labor induction, this may be due to difference in antenatal care provided.

There is increase in the prevalence in 2nd stage CS which associated significantly with long term maternal physical and psychological morbidity. This problem significantly needs good skill and knowledge to decrease the possible adverse events. It's probable to stay as a regular problem for obstetricians in the estimative future with continuing burdens to decrease elective CS rates.⁽²¹⁾

Moreover it is similar to that found by Rabiou et al,⁽²²⁾ when mentioned that there is a higher blood loss, caesarean hysterectomy, wound infection in women

performed CS in the 2nd stage of labor in comparison with the 1st stage. Also same that found by Bashir A et al study.⁽²³⁾

The present study revealed that CS in 2nd stage labor operation was particularly the risk for neonatal birth asphyxia; this neonatal outcome was debatable in earlier studies. Which is not similar to Alexander JM⁽²⁴⁾ and Selo- Ojeme et al.⁽²⁵⁾ found no difference in the risk of fetal asphyxia.

Conclusion

The 2nd stage of labor shows more maternal and neonatal complications in comparison with 1st stage.

Conflict of Interest: No

Source of Funding: Self

Ethical Clearance: Was taken from the scientific committee of the Iraqi Ministry of health

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The Determinants of the Occupational Diseases in Al-Nasiriyah Province at 2018

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Abstract

Background: The occupational diseases are the major epidemic problem in the field of public health in developing countries (WHO). It does not arise haphazardly among the workers, but happens only when an appropriate accumulation of determinants or risk factors. .

The Aims of the study were to assess the general workers' health. and to explore the determinants) risk factors and causes (of the occupational disease within selected fields of work in Al-Nasiriyah province at 2018.

Method and material: An analytical cross-sectional study was conducted in Al Nasiriyah thermal electrical plant, cable plant and oil refinery in the Al Nasiriyah -province at 2018. A multistage cluster sampling method was conducted to recruit 369 (workers. The data gathered by survey questionnaire and processed by statistical analysis.

Result: The extent of occupational exposure was about 89.7% with exposed to the non-exposed ratio) 8.7:1 (. About 31.8 % of the workers exposed to the respiratory hazards (thinner, PVF, PVC, Ammonia and acoustic agents). About exposed cases with RADS (41 cases) had about 0.000 (P. value. The Noise exposure had 71.5 %)264(. of the workers The exposed cases with NIHL (23 cases) had about 0.015(. P. value. An odds ratio of the occupationally exposed to the non-exposed worker was equal to 19.1. Binary Logistic Regression was done to adjust the confounder factors for systematically classified occupational diseases which augments the significance of the association for occupational exposure, age and work duration.

Recommendations: Introducing the speciality of the occupational physician in primary health care with preparing for the establishment of the Thi-Qar occupational medical centre to promote the optimal occupational medical care.

Keywords: Determinants, Occupational diseases, Occupational exposure, Injury, Al-Nasiriyah.

Introduction

Work may have an annoying or hazardous exposure. [1,2] Each occupation has its hazard which is the potential harm workplace substances [3,4] These are including chemical, physical, biological and ergonomic hazards [5,6] The risk for the occupational disease and work related disease was covered by two aspects **First:** General risk for the chronic and workplace-related diseases. [7] **Second:** Specific risk for occupational diseases. The dose, frequency and duration of the occupational exposure determine the extent of the work-related and occupational diseases [8] This trigger a workplace health risk by acute and chronic (accumulated) effects

which lead to the emergence of occupational diseases [9] for example, Asbestosis from the asbestos exposure. Currently occupational health services coverage account about 24.8% only of the workers worldwide including the Health surveillance, occupational risk prevention, first aid, advising and training programs in workplace safety. [10] The negative influences of the workplace environment on worker health can be summarized in the form of the exacerbation of current illnesses, certain occupational diseases causality, undesirable influences on productivity. [11] The workers have In AL Nasiriyah City and as an inductive look for the medical occupational reality, some points could have been

being formulated: 1) There is no available in integral, considerations about the nature, extent and It was planned to highlight occupational diseases in the three locally effective, vital, hazardous with 24 hours task and richly in manpower enterprises. These are including: **Electrical generation** employees operate in the risky workplace and exposure to live power, magnetic field, Chemical exhaust hard official duties in the potentially hazardous workplace^[12] National Institute for Occupational Health NIOH and WHO 19,^[13] are building a Global Plan of Action on Workers' Health **GPAWH** which involve

1. Notifying and Registry of occupational risk factors and diseases and
2. Estimating capacities for the occupational burden of diseases.
3. Diagnosis improvement.
4. And categorized it as preventable diseases.

Hazard identification and risk assessments were needing to be identified^[9] Preventive measures have other important entity to eliminate or reduce the emerging of the occupational diseases.^[14] Occupational health and occupational hygiene have an overlapped role in risk assessment^[15] ILO recommended that there is a causal relationship with a specific exposure or work process in a specific work environment concerned with an epidemiological determinants and frequency which exceeds within the rest of the population.^[16] In Iraq and other developing countries, the rate of the occupational illnesses and accidents are assumed to be greater than that in developed countries. However, the described rates in these countries are much lower than the existent number^[17] determinants of the work and work-related disease in Al Nasiriyah industrial institutes. 2) The poverty of the medical occupational services. and physical waste to can lead to serious illnesses, injury or death^[18] It is worth noting that petroleum refining and distribution perceived to be respiratory, MSK, CNS hazardous effects where complex hydrocarbon compounds are separated and conversion.^[19]

Cable industry dealing with adversely health impact compounds include (lead, cadmium, halogenated flame-retardants.^[20] Also, **Aluminium industry** has a toxic effect on the respiratory tract as pulmonary fibrosis, asthma and chronic bronchitis with acute related symptoms were significantly more prevalent among the

aluminium exposed worker^[21].

By academic standpoint, it is necessary to conduct an observational descriptive analytical study to be a step in the way of answering the questions of this problem. There are many labour enterprises in this city. The largest and most vital institutes are selected to be as a paradigm of the accessible institutionalized population. To investigate a snapshot study about the extent and determinants of the work and workplace- related diseases. These enterprises are:

- UR State Company
- **Al-Nasiriya Thermal Power Station.**
- **Thi- Qar Oil Refinery. Preventive occupational measures**

Primary prevention is achieved by the methods of exposure reduction of hazardous substances to decrease the risk of disease.

Secondary prevention This involves the occupational disease surveillance achieved by recognising diseases before they become symptomatic.^[22]

Tertiary Prevention: This achieves by limiting the discomfort or symptoms, reduce body injury to the and boost the operational capacity.^[23]

Methodology

Profile of Study Area

- **Al-Nasiriya city** The study was conducted in Al- Nasiriyah city - the capital of Thi-Qar governorate- which is the 4th most inhabited city in Iraq^[15]. It is located along the lines of the Euphrates River, about)**370 km**(southeast of Baghdad, close to an ancient city of Ur. According to the Iraqi central statistic organization, there is about)**2,040,126**(calculated population in **2014**^[16]. Al Nasiriya City population estimated in **2017**)**793472** individuals(by Thi-Qar Statistics Directorate with a male to female ratio 1: 1 approxemaitly^[17].

- **UR State Company.** Ur Company is one of the companies of the Ministry of Industry and Minerals of Iraq It is located in the southeast of Nasiriyah city. The company was established in **1988**. Specializes in the production of all types of cables, electrical and telephone wires in addition to aluminium products. It includes 17 organizational unit contain about (**3108**)workers.^[24]

- **Al-Nasiriya Thermal Power Station.** It is one of the formations of the Iraqi Ministry of Electricity. It had been founded in 1979. The plant consists of four generating units. The first and second units produce 350 MW while the third produces 175 MW after completion of maintenance and the fourth 165 MW. The station operates a hot steam system to move the giant turbines. It is located on the right bank of the Euphrates in the west AL- Nasiriyah. It has more than **1,600** members working in the alternating system^[25]

Thi- Qar Oil Refinery One of the formations of the Ministry of Oil, South Refineries Company located south of the AL- Nasiriyah city of. It is receiving a crude oil for refining and contains several units for the separation, isolation and storage of oil products .it contain about**1337**(workers^[24]

Population of study: Field and office employees in the enterprises of the interest who responded to participate in the study. About **6200**(of the candidate employees were involved and identify in the sampling frame. **Study Design:** An analytical cross-sectional study for exploring the extent occupational diseases which was conducted in Al Nasiriyah thermal electrical plant, cable plant and oil refinery in the - City from the 1st of November 2017 to the 1st of the November 2018 .

Sample size: HSE statistics report)2017)^[18,19] for various work-related ill health was accredited and the highest prevalence rate **40%**(was obtained for extracting the sample size according to the Dobson’s formula^[20] to recruit **369**(workers.

Data Analysis carried out by SPSS version **25**^[21]

Table 1 Occupational exposure Distribution According to the demographic information of the workers in AL –Nasiriyah Province at 2018

Exposed		Occupational Exposure					
		Non- Exp.		Total			
Age	18 - 30 years	46	13.9%	3	7.9%	49	13.3%
	31 -40 years	66	19.9%	6	15.8%	72	19.5%
	41 - 50 years	150	45.3%	22	57.9%	172	46.6%
	51 - 60 years	58	17.5%	6	15.8%	64	17.4%
	More than 60 years	11	3.4%	1	2.6%	12	3.2%
Sex	Male	295	89.1%	13	34.3%	308	83.4%
	Female	36	10.9%	25	65.7%	61	16.6%

Results

Total extent of the occupational exposure was 89.7%of the workers with exposed to non- exposed ratio about 8.7:1. The highest extent of the occupational exposure was 98.8% within (18-30 years) age group. Males and female>s percentages of occupational exposure were 89.1% and 10.9% respectively with. The married accounted for the highest extent 92.4% of the exposed workers

Occupational respiratory risk factors Respiratory irritant chemicals consisted of (thinner, PVF, PVC, Ammonia and acoustic agents had a percentage of 31.8 % of the totals)118(. Exposed with RADS had P. value)0.000(with the 32.206) Fisher Exact test value41).Figure 1.

Occupational hearing loss risk factors

The Noise exposure had a percentage of 71.5 % of the totals)264(. The diseased workers with NIHL were accounting 5.1%)19 cases(of the total and non-diseased were accounting for 94.9% (350 cases). Exposed cases with NIHL)23(had a P. value)0.015(with the 10.173) Fisher Exact test value. Figure2. Noise percentage was the highest frequency among the occupational exposure with 71.5 %)264(workers. Most of them presented with a daily pattern of frequency one or two times per day. Ammonia and the acoustic agent had about)22.8%(exposure percentage with)84(workers for both with only daily frequency. The lesser exposure percentage was for the welding fumes and dust with 1.9 %and 1.1% respectively. Table 2.

Cont... Table 1 Occupational exposure Distribution According to the demographic information of the workers in AL –Nasiriyah Province at 2018

Marital Status	Single	24	7.3%	2	5.3%	26	7.1%
	Married	306	92.4%	33	86.8%	339	91.9%
	Divorced	0	0%	2	5.3%	2	0.5%
	Widowed	1	0.3%	1	2.6%	2	0.5%
Residency	urban	231	69.7%	20	52.6%	251	68%
	Semi- urban	60	18.2%	15	39.5%	75	20.4%
	Rural	40	12.1%	3	7.9%	43	11.6%
Level of the Education	Illiterate	4	1.2%	0	0%	4	1.2%
	Primary	45	13.7%	6	15.8%	51	13.9%
	Intermediate	8	2.4%	3	7.9%	11	2.9%
	Secondary	136	41.1%	13	34.2%	149	40.3%
	Tertiary	138	41.6%	16	42.1%	154	41.7%
Total		331	89.7%	38	10.3%		369

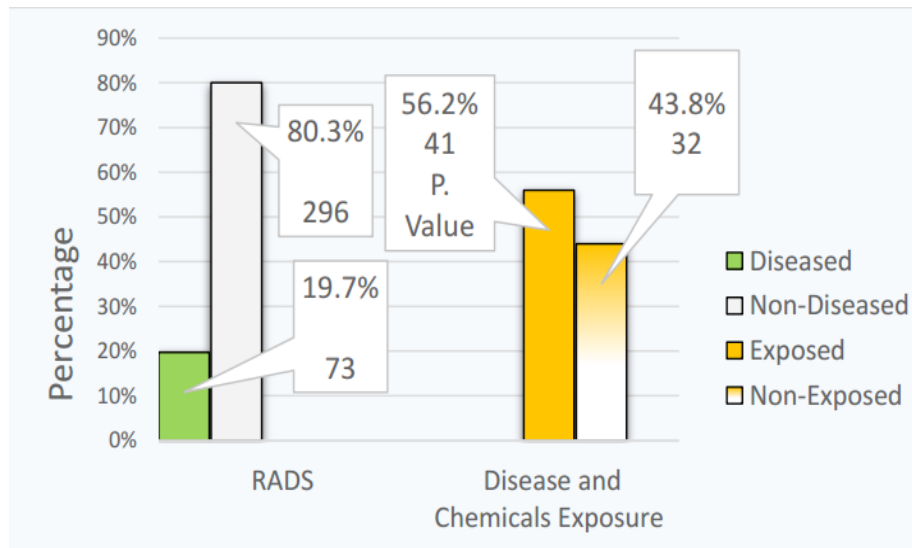


Figure 1. Association between the RADS and Respiratory Irritant Chemicals Exposure among the workers in AL-Nasiriyah city at 2018

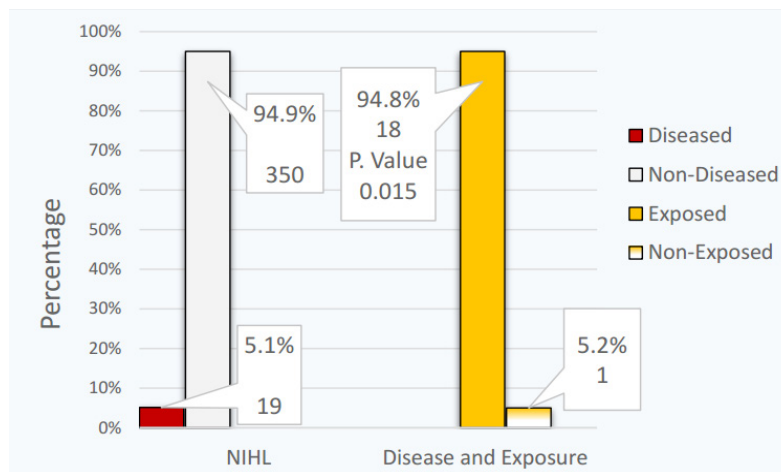


Figure 2. Association between the NIHL with the Noise Exposure among the workers in AL-Nasiriyha city at 2018

Table 2 Occupational exposure and frequency in the institutes of the interest in Al –Nasiriyah Province at 2018

Substances	Exposure Frequency					
	Usually	Normally	Often	Sometime	Total	Per cent
Noise	1	247	15	1	264	71.5 %
Heat		224	10	2	235	64 %
Gases		138	5	1	138	39 %1
Heavy Lifting		103	9		112	30.4 %
Ammonia		84			84	22.8 %
Acoustic Agents		84			84	22.8 %
Unstable posture	8	66	1	1	76	20.6 %
Chemicals		56			56	12.2 %
Exhaust Combustion		43			43	1.7 %1
Polyvinylchloride		28	11	3	42	11.4 %
Benzene		99	1		40	24.4 %
Thinner	2	25	7		34	9.2 %
Polyvinyl Formaldehyde	2	24	7		33	8.9 %
cooling oil Vapor		22	6		28	7.6 %
Non-Ionic Rad		20			19	5.4 %
Aluminum Vapor		15			15	4.1 %
Sawdust		7	1		8	2.2 %
Welding Fumes		4	2	1	4	1.9 %
Dust		1	2	1	4	1.1 %
Repetitive movement		3	1		4	1.1 %

Discussion

The highly extent)89.7%(of the occupational exposure implies poor local health protective strategy ^[7] with more expected adverse accumulative effect among 45.3% of the)41-50 ys(age group of the sampled workers by this study. The hazards exposure passing through a latent period of years to emerge the related disease symptoms ^[31], this study cannot be evaluated it due to the)cross- sectional(design.

Occupational respiratory risk factors

There is a very highly significant statistical correlation)P. value 0.000(between the respiratory

irritant exposure with RADS that pushed toward reject the null hypotheses with positive relation by)32.206(Fisher Exact. There is low petroleum-derived hydrocarbons associated with RADS and Nasal symptoms by the study of)Sekkal, Samira, Haddam, Nahida, Scheers, Hans, Poels, Katrien L, Bouhacina, Linda, Nawrot, Tim S, Veulemans, Hendrik A, Taleb, Abdesselam, Nemery, Benoit 2014(^[32]

Occupational hearing loss risk factors

About 5.1%)19(cases of the partial reducing hearing ability who diagnosed by otolaryngologist diagnosis via the audiogram. About)16(cases of them had their chronic occupational noise exposure with highly significant

statistical association P . value (0.015) that rejects the null hypotheses with a strong positive relation (Fisher Exact 10.173. About 42% of the workers with the noise exposure, all of those with the more than 10 years noise exposure were presenting with NIHL by Feder, Katya, Michaud, David, McNamee, James (while in this study, about 66% of the workers with the noise exposure, only 9 % of them of the more than 10 years noise exposure were presenting with NIHL The highly noise exposure 89.7% of the sampled workers implies hazards impact increasing with poverty of ear protective strategy. Noise has adverse hearing psychological cardiac and vascular impacts.^[32]

Recommendations

1. Introducing the speciality of the occupational doctor in primary health maintenance by the highest governmental authority on health maintenance.

2. Requesting from the medical committees in Thi Qar Governorate Council of Nasiriyah for the establishment of the occupational medical Centre to promote the optimal occupational medical care.

3. Providing of the essential medical care for the local workforces by activating of work fitness strategy through preplacement medical examination or periodic examination during employment and after injury or direct from sick leave.

Conflict of Interest: The author has no disclosures to report.

Source of Funding: Self.

Ethical Clearance: Not required.

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Model of Women Participation in Supporting Government Policies Reducing Neonatal Mortality in Kupang District

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Abstract

Background: Women are the main actors in reducing infant mortality. **Objective:** To develop suitable models of woman's participation to support government policy reducing infant mortality in Kupang District. **Methods:** qualitative method was used and 14 informants and 3 triangulations were selected by purposive sampling technique, followed by snowball sampling. Interviewers consists of 5 midwives, 5 cadres, and 3 chiefs of the village. **Findings:** The degree of women's participations in this study were low. Forms of participations showed that one Timorese has been given birth at home. Most of the East Timorese informants late reported their pregnancy, gave the porridge sun for babies after 6 months. TIHERO model of woman participation has been created in this study. **Recommendation:** It is expected that Government to open childbirth education class and model of women participation must be conduct in terms of reducing neonatal and infant mortality rate.

Keywords: *Women, Policy, Participation, Neonatal and infant mortality*

Introduction

Neonatal, infant and child mortality rate remain the third target of the second goal of the Sustain Development Goals (SDGs) to reduce neonatal mortality by at least 12 Per 1,000 live births and under-five years mortality 25 Per 1,000 live births. There was a decrease in IMR of 22.23 per 1000 live births^{(1),(2)} in Indonesia. However, the target of SDGs for reducing neonatal deaths has not been achieved yet⁽³⁾ throughout Indonesia especially in NTT Province, despite Governor Regulation No.42-2009 concerning Revolution of Maternal and Child Health has been launched and implemented.⁽¹⁾

The target of the MCH revolution was to reduce the infant mortality rate from 62/1000 live births in 2004 to 27/1000 live births in 2013. However, the number of infant deaths still very fluctuated between 1,272-1350 deaths when evaluated in 2015.⁽⁴⁾ Government has re-launched the Technical Guidelines for Leap to Decrease

Infant Mortality in 2015 with the target of reducing the Neonatal Mortality Rate (NMR) 14 per 1000 lives birth, Infant Mortality Rate (IMR) 23 per 1000 lives birth and Under five Mortality Rate 32 per 1000 lives birth at the end of 2015. The results showed that infant mortality rate also fluctuated, there were 1,388 cases in 2015, 1091 cases from 86,126 in 2016 and 874 cases out of 86,085 live births in 2017.⁽⁵⁾ However, the program was not fully successful in reducing infant mortality yet.

MCH is a topdown policy that should be government and community work together when formulating policies.⁽⁶⁾ The involvement of women as the main actors in the event of pregnancy, childbirth and caring for a baby is not yet apparent in the model of MCH Revolution. In fact, the role of mothers in the family on pregnancy, childbirth, postpartum period can be maximized. Bang, et al.⁽⁷⁾ stated that neonatal morbidity can be reduced by training mothers to care for neonates at home and providing maternal health education. Therefore, the aim of the study were to identify women's degree of participation, analysis the form of women participation and build the model of women participation in reducing infant mortality in Kupang regency.

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Method

Qualitative research was used which phenomenology study design to explore women's participation in supporting government policies reducing neonatal mortality in Kupang District. This study was conducted in Kupang Regency, Middle Kupang District and West Kupang from January to March 2019. The District was chosen because the majority of the Helong Tribe is domiciled in Bolok Village, Batakte Sub-district, East Timorese are domiciled in the Penfui village of East Timor Kupang; and the majority of the Rote tribe domiciled in Mata Air village, Middle Kupang Tengah⁽⁸⁾

Participants were selected by using non-random purposive sampling to determine inclusive criteria including childbearing age women whose pregnant, postnatal, breastfeeding period until the infant was one year old; at least has an Elementary School degree, could read and write, and was willing to be an informant. Furthermore, snowball was used to obtain the subject until data saturation have been achieved. Seventeen main informant participated in this study including 3 triangulation. They were 7 Timorese people, 5 Rote tribes, and 5 Helong tribes. There were also 13 interviewees consisted of 3 chiefs village, 5 midwives and 3 health cadres.

Data were collected by interviews and FGDs. Structured interviews was chosen because each informant got the same question that had been prepared previously by the researcher. Interviews were conducted approximately 40-90 minutes and all conversations were recorded on tape. FGD is carried out for 4-5 hours. Data were analyzed using analysis of themes. There were 3 stages of data analysis consisting of: data reduction, display, and drawing conclusions.^{(9),(10)}

Findings and Discussion

Degree of Women's Participation

Following questions describe community exposure: "Have you ever heard the MCH program? Almost all informants and the village head answered that they were not exposed to information and never heard about policies. Meanwhile, midwives recognize the MCH Policy from books and the Head of the health center (FGD-March, 13).

....All pregnant women have to give birth in health facilities and be helped by midwives. During counseling we explained that each delivery must be in the health

facilities and every pregnant woman must check the ANC regularly at least 4 times (Mrs.E, 03-13/2019).

However, the technical guidelines for the Leap to Reduce Infant Death book launched in July 2015 were not yet known by midwives as well as the main informant and village head. Following is the statement of midwives: "to be honest, Madame, we don't know too much about this book (Mrs.R, 13/03/2019). Documentary evidence supported the midwife statement because the neonatal visit and postpartum columns are not filled by health worker. Meanwhile, Government emphasized that the supply side must visit a neonate three times consist of: 6-48 hours; 3-7 days and 8-28 days after birth. Postpartum visits three times including: 6 hours to 3 days; 8-28 days and 29-42 days after delivery. Satries⁽¹¹⁾ stated that lack of information from the government to the community illustrated that the communication was poorly built. A ladder of Citizens Participation⁽¹²⁾ was used to measure the degree of participation. The result of this study indicated that the level of participation was at a low level namely manipulation and therapy. Informants were used as an objects in the policies that have been set so that the target is achieved.

Form of Participation

1. Planning

Prenatal Plan

Most Timorese informants, reported their pregnancies at more than 2-6 months of gestation.

...."I have only reported five months of pregnancy because I did not plan.....from a last birth I want to take family planning injections.....hen I want to inject, my daughter asked me that I had to wait for my period but it did not happen until 5 months (Ny.PN, 01/29/2019)".

One of the government's policy in the MCH book is that women should report their pregnancy immediately when amenorrhoe. It seems that the results of this study did not support the policies. As a result, people who implement policies behave indifferently and passively because they feel the program do not belong to them.⁽¹³⁾

The following questions were asked to get information about maintaining the health of the fetus and the baby: "Did you plan check your health when you got pregnant?" Almost all informants said that they planned to go regularly to health facilities base on midwife's advice which refers to the policies.^{(1),(5),(14)}

This is contrary to the basic principles of The New Public Service proposed by Denhardt & Denhardt⁽⁶⁾ and Mikkelsen.⁽¹⁵⁾

The focus of attention in the implementation of public policy is the involvement of citizens since identifying problems, planning, implementing until monitoring and evaluating. However, the reality faced is focused at the application of old public administration character where policies are top-down.

Delivery plan

All informants planned to deliver at the health facilities and were helped by health workers. But there was one Timorese informant who had given birth at home helped by his mother-in-law.

.....At the beginning the birth was planned to be in the hospital and to get sterilization immediately. But my mother in law came and said that I have to give birth at home and so it happened. The reason is because my mother in law is a shaman so she knows to handle the birth (Mrs.MT, 01/30/2019).

Mother in-law is considered a helper and has power over pregnancy and childbirth in Timorese culture. These results supported the research of Khairunnisa et al.⁽¹⁶⁾ that the role of the family is very important in determining the place of delivery and birth attendance. Form of efforts to accelerate the decline in infant mortality is through delivery at an adequate health facilities and assisted by competent health personnel.^{(1),(14)}

Care plans for babies

All informants in this study planned to give exclusive breastfeeding for 6 months followed by complementary food such as sun porridge (most Timorese) and cooked, blended porridge mixed with vegetable (Rote and Helong) and immunization.

“Exclusive breastfeeding is 6 months. After that sun porridge was given (Mrs.BD, 28/01/2019)”.

This result contradicted with the information contain in the MCH book.⁽¹⁴⁾ Mother is recommended to prioritize the provision of complementary food from local food ingredients. Unfortunately, almost all informan did not read the pink book of MCH, even if they read many terms and procedures that were not understood.⁽¹⁴⁾ They did not get the information either from health workers.

The results of this study did not support the government policies about childbirth education at least 4 times. In this study all informants said that there had been no classes of pregnant women.

2. Implementation

Prenatal and breastfeeding period

All informants said that they would and had put everything they had planned such as checking themself regularly.

.....After knowing that I had been pregnant, I reported to the Health Centre and got the pink book, then my blood pressure was checked and was given folic acid and vitamin B-complex. Fetal heart rate, my height, and weight, laboratory tests for Hepatitis, HIV AIDS and HBSAg was taken (Mrs.ACT, 01/02/2019).

The form of community participation according to Andreeyan⁽¹⁷⁾ is the form of taking part in working together and donations of money or material, meanwhile Azhar⁽¹⁸⁾ is the ideas forwarded in development planning deliberation forum. Participation were a form of individual, family and a form of public involvement.⁽¹⁹⁾ In this study the forms of participation were part of the community and family members activities during pregnancy, and postnatal phase which are carried out according to plan.

3. Monitoring and Evaluation during prenatal and post natal.

Informants in this study said that fetal development and maternal health were checked regularly.

.....Because from the moment I became pregnant, my blood pressure was low so midwife said I had to rest a lot because I was afraid of bleeding during delivery. So I went to the hospital to check blood for Haemoglobin. From the village office, I once got rice, cooking oil, 1 pack of eggs, 510.000 rupees for my baby to buy side dishes. (Mrs.MLS, 01/29/2019).

All informants visited health workers to weighing babies and immunization eventhough the type and benefit of immunization are not understood.

“I gave birth in the morning, and back home in the afternoon. One week later I came to the clinic for immunization and control the baby”.

However, almost all informant did not make neonatal and puerperal visits 1,2,3.^{(1),(14),(20)} eventhough this visit is highly recommended in government policy because the death event occur during this period.^{(1),(14),(20)}

Firdaus⁽²¹⁾ stated that ways to identify whether activities has been deliver as close as possible to the plan called monitoring. While the assessment of the course of the program is called evaluation.⁽²¹⁾ Evaluations and monitors carried out in this study aimed more at monitoring fetal growth and development in the womb and evaluating the health of the mother. Postnatal women was evaluated on maternal health to monitor whether there were problems. For instance, there were a Timor tribe's informant planned to give birth at a health centre but eventually gave birth at Leona Hospital because she got pre-eclampsia since 8 months of gestation.

Women Participation Model Namely TIHERO

Proposition in this study is that the higher the knowledge of women the higher their participation in supporting government policies to reduce infant mortality. The citizens participation used in this study referred to "The Ladder of Participation Theory.⁽¹²⁾ Arnstein⁽¹²⁾ introduced 3 degrees of community participation consist of eight ladder of participation including: the highest degree is the power of citizens (control of citizens, delegated power, and partnerships); the second degree with 3 steps (placation, consultation and informing), the lowest degree is non-participation (therapy and manipulation). Overall, Arnstein's level of participation⁽¹²⁾ places more emphasis on the power of citizens, being objective conceptions. Arnstein discussed the level of participation structurally without taking into account the subjectivity of the women who participated in this study. Whereas in this study the subjective experience of a woman is more emphasized.

In this study women were not exposed to government policies even though they were experiencing prenatal, natal , and postnatal periods. The advice of health workers to success the government programs is passively accepted, because they have not been involved in the process of problem identification, planning, and policy formulation; and also they have cultural and hereditary values that must be adhered. Therefore women need to be encouraged to get into the public domain so that they can recognize the reality faced in relation to women's reproduction. The public domain is a place where people can express their aspirations as public opinion which

can be conveyed to the government for consideration in policy formulation.^{(22),(23)} According to Habermas^{(22),(23)} in the public sphere communication will be created in an open and equal public space from experts, bureaucracies, legislative commissions and the public in the forum. Habermas's view is very objective and structural without taking into account the subjective aspects as in this study. How about the women in this study who were considered as housewives those who were marginalized in development? How can they express their aspirations if they themselves do not know about the topic to be discussed?

The new ladder of participation from TIHERO woman has been proposed in this study based on Arnstein's theory. There were three degree of participation namely ladder of quality information; partnership; and independent in self-maintenance. Women need quality information so that they are aware that they have a great responsibility for the survival of a human child. This awareness will encourage them to learn about all things related to woman reproduction. Then partnership with health workers in gaining knowledge is needed. Women can be involved in the public sphere that is related to their baby's life and health, if they are knowledgable. They can regulate and control all their behavior and attitudes in maintaining themselves and their fetuses. So that the third degree is self-maintenance independently during prenatal, natal or childbirth, and postnatal.

Conclusion

The degree of participation is low which means that actually the community does not participate. Form of participations including: reported the pregnancy on time although there were several Timorese women who report late, gave sun porridge as complementary food by Timorese; determined to delivery at hospital by health worker eventhough one Timorese has been given birth at home, and took their children to be immunized although the types and benefits of immunization are poorly understood.

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Precision of 3D MSCT Scan Diagnostocs on Maxillofacial Trauma Compared to Stabilization and Instrumentation Operation Results

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Abstract

Handling standardized radiological readings of patients with maxillofacial trauma, particularly in radiology are currently absent. Appropriate and accurate of radiological reading results could be as the guideline for surgeons in determining surgical procedures. This study aimed to evaluate the diagnostic accuracy of maxillofacial fracture patients with head 3D CT scan compared to stabilization and instrumentation results as gold standard. Secondary data that derived from medical records were used as 29 patients with clinical maxillofacial trauma enrolled in this study at Radiology Section of Dr. Soetomo General Hospital from November 2012 to March 2013. The Mc Nemar test showed that there was no significant difference between the 3D CT scan results and the stabilization also instrumentation results with $p = 1.000$ ($p > 0.05$). While, the result was by calculating Kappa coefficient that a high suitability between head 3D CT scans and stabilization also instrumentation result with $\kappa = 1.000$, $p = 0.000$ ($p < 0.05$). There were several complications in the form of Cranium Bone Fraktur (25%), intracranial complication (15.24%), Haematosinus (52.38%) and Soft tissue haematoma (32.38%) with most intracranial complications ICH (31.25%), then, most soft tissue complications were in the Orbita region (26.47%) and the most common Haematosinus complications regarding Sinus Ethmoid and Maksilaris (29.09%). It concluded that the 3D CT scan results were in accordance with the results of stabilization and instrumentation operations.

Keywords: Maxillofacial Trauma, Head Ct Scan, Head 3D Scan, Stabilization Operation

Introduction

Handling standardized radiological readings of patients with maxillofacial trauma, particularly in radiology are currently absent. This standardization is of crucial importance because it affects the diagnostic accuracy, especially in trauma cases. Appropriate and accurate of radiological reading results could be as the guideline for surgeons in determining surgical procedures. Radiology examination was originally a head photograph, which is expected to evaluate the presence of fractures and some of the complications, but in cases of maxillofacial fracture, the modalities complexity has much deficiency because of it unevaluated the bones in an overlapping state¹.

CT Scan is used as an evaluation of trauma cases with an excess of axial reformed sagittal and coronal slices, MPR and 3D reconstruction that could evaluate anatomical structures more broadly and in detail. It could evaluate the state of the fracture to the size of <2cm, soft tissue, compartments that are regulated in craniomaxillofacial and evaluated the complications from intracranial hemorrhage to the presence of cranial also cervical fractures. Images of CT scan could be rotated, split, also anatomical structures could be separated and individual images of different tissue types could be generated. 3D images provide an overall spatial concept that allows a better understanding of the complexity of some 2D axial. 3D CT scan we are able to focus on specific areas of clinical and surgical concern. We could easily appreciate the postoperative improvement of possible complications. 3D reconstruction is useful in visualizing bone fragments from all points of view, not only the fracture fragments but suggestions of the

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mechanism of injury could easily assess. In addition, 3D CT scan reform has helped many patients with maxillofacial fractures².

This is in accordance with research conducted by Johnson and Feuerbach (2011) that stated by using conventional photos of bone trauma are technically difficult and only small information could be obtained. However, by using MSCT 3D with the volume rendering technique on fracture patients, it could be seen complex anatomical images such as facial bones from various orientations. A 3D MSCT image could make a better interpretation of difficult fracture than in CT cross-sectional image(Gillespie). 3D CT scans were performed on 100 patients with maxillofacial trauma, which 80% were male and 20% were female. Based on the etiology, road traffic accidents (75%) is the most common, followed by the attack (16%), decrease (7%) and sports-related accidents (2%), also 28 cases (28%). Head 3D CT scans have a significant degree of accuracy in determining the final diagnosis and treatment plan for the maxillofacial fracture. The conclusions were head 3D CT scans particularly valuable in assessing cases of maxillofacial fractures with the severe injury, allowing a clear perception of the primary rate of fracture line and resulting in fragment displacement. Modality allows precise surgical analysis and surgical planning compared to conventional radiography in cases of maxillofacial fractures³⁻⁷.

Based on the description above, the authors were interested to evaluate the diagnostic accuracy of maxillofacial fracture patients with the examination of head 3D CT scan that compared to the results of stabilization and instrumentation operations as the gold standard.

Method

Twenty-nine patients with clinical maxillofacial trauma at Radiology Section of Dr.Soetomo General Hospital Emergency Unit from November 2012 to March 2013. Total sampling with inclusion criteria conducted in this study was: Head 3D CT scans of maxillofacial clinical trauma patients and undergo stabilization operation and instrumentation.

A retrospective observational study by using secondary data derived from medical records was used, while the collected nominal data was arranged in tabular form and analyzed descriptively by calculating the sensitivity, specificity, positive and negative predictive

value also accuracy, followed by inferential analysis with Mc Nemar test and calculating Kappa coefficient.

Results

Characteristics The Study Sample

Twenty-nine subjects with maxillofacial trauma that consisting of 25 male (86.21%) and 4 female (13.79%) were obtained. There was a group of under 20 years old was 8 (27.59%) patients, age group 20 - 30 years old was 8 (27.59%) patients, age group 30-40 years old was 7 (24.14%) patients, age group 40-50 years old was 3 (10.34%) patients, and age group above 50 years old was 3 (10.34%) patients. The oldest was 52 years old while the youngest was 13 years old. From 29 patients, the injury was caused by traffic accident by 26 (89.66%), fell by 2 (6.90%), fights (3.45%) and sports (0%).

Characteristics of Maxillofacial fractures

Twenty-nine patients in this study were; who experienced a maxillofacial fracture was 27 (93.10%) and non-fractured was 2 (6.90%) (Table 1). Maxillofacial fractures were obtained on maxillofacial bone and zygoma bone (21.25%) and incarceration of rice and tooth septum (1.25%) (Table 1).

Table 1. Distribution of maxillofacial fractures according to affected bone

Bones	Frequency	Percentase (%)
Frontal Bone	7	8.75
Temporal Bone	4	5.00
Parietal Bone	3	3.75
Zygoma Bone	17	21.25
Orbital Bone	8	10.00
Nasal Bone	6	7.50
Maxilla Bone	17	21.25
Mandibular Bone	14	17.50
Ethmoidal Sinuses	2	2.50
Nasal Septum	1	1.25
Teeth	1	1.25
Total	80	100.00

Characteristics of Orbital Bone Fracture

The highest number of orbital segment fractures was on Supraorbital (27.27%) and infrequently on Lasser wing and Greater wing (0.00%) (Table 2).

Table 2. Characteristics of Fracture Segment Orbital

Segments	Frequency	Percentase (%)
Frontal Process	1	9.09
Supraorbital	3	27.27
Temporoorbita	0	0.00
Zygoma frontal process	2	18.18
Maksiloorbita	2	18.18
Lacrima bone	3	27.27
Lasser Wing	0	0.00
Greater Wing	0	0.00
Total	18	100.00

The most fractures obtained from the Zygoma Segments was on Orbital Process and Orbital Surface 12 (44.44%) also infrequently was Zygomaticofacial foramen 1 (3.70%). Meanwhile, fracture of Segment Zygoma mostly on left Frontal Process and Orbital Process was 8 cases.

Characteristics of a Zygoma Segment Fracture by Type of Fracture

The obtained fractures of the Zygoma Segment by Most Segmental Fracture Type was 53.33%.

Frontal Fracture

Most Characteristics of Frontal segments Fracture was Frontal bone (100%) and imprinted on the Peduncular plate (0.00%). Most Frontal Fractures on Frontal bone on the left side was 5 cases. The most characteristics of Frontal Segment Fractures based on fracture type was Segmental Type (80%).

Nasal Bone Fracture

Most nasal segment fractures were Nasal Bone characteristic (75%) and inhibited Peduncular plate (0.00%). Most Nasal Segment Fractures regarding Nasal Bone on both right and left side was 2 cases, while, most

Nasal Segment Fracture Based on Types of Fracture was Segmental Types (66.67%).

Maxilla Bone Fracture

Most maxilla segment fracture distribution of Orbital surface 11 frequency (27.50%) and infrequently on Temporal Process also Frontal Process 5 frequency (12.50%). Most of the maxillary segmental fracture characteristics on left side orbital surface were 10 cases. While, most Fracture of the Maximum Segment by Type of fracture was segmental and communitive Type (43.75%).

Mandibular Bone Fracture

The most characteristics of Mandibular segment fracture was Symphysis Mandibula (34.48%), infrequently was Condylar Process and Coronoid Process (0.00%) (Table 3). Then, the most Mandibular Segment Fractures was Symphysis Mandibula on the right side were 7 cases. While, the most Fracture of Mandibular Segment by Type of Fracture was Segmental and Communitive Type (42.86%).

Table 3. Characteristics of Mandibular Segment Fracture

Segments	Frequency	Percentase (%)
Condylar Process	0	0
Coroid Process	0	0
RamusMandibula	3	10.34
AngleMandibula	4	13.79
BodyMandibula	8	27.59
Alveola Process	4	13.79
Symphysis Mandibula	10	34.48
Total	20	100

Special Classification of Maxillofacial Fracture

Twenty-nine Orbita Fracture patients who experienced NOE type (Naso-Orbita-Ethmoidal) was 1 (3.45%) and Blow Out Orbita was none The classification distribution of maxilla fracture type Le-Fort 1 was 4 people (13.79%), Fracture Max type Le-Fort 2 and Le-

Fort 3 was none. Two-types head fractures that excluded in the Maxillofacial Fracture group was Cranii Bone Fracture (25%) and Occipital Fracture (75%).

Complications

Characteristics of maxillofacial fractures according to the appear complications from 29 patients were intracranial complications 16 (15.24%), Haematosinus

55 (52.38%) and Soft tissue hematoma 34 (32.38%). The most intracranial complications were ICH (31.25%) and infrequently were EDH (0.00%) (Table 4). Complications in the softest tissue was Orbita region (26.47%) and infrequently was Parietal Region (2.94%) (Table 5) The most common Haematosinus complications was Sinus Ethmoid and Maksilaris (29.09%) also Nasopharynx (1.82%). (Table 6)

Table 4. Distribution of intracranial complications

Intracranial	Frequency	Percentase (%)
ICH	5	31.25
IVH	0	0.00
SAH	3	18.75
EDH	0	0.00
SDH	2	12.50
Pneumatochele	3	18.75
Difusaxional brain injury	3	18.75
Total	16	100

Table 5. Distribution of complications in soft tissue

Region	Frequency	Percentase (%)
Ocipital	1	2.94
Frontal	6	17.65
Temporal	7	20.59
Parietal	1	2.94
Orbital	9	26.47
Nasal	4	11.76
Fasialist	6	17,65
Total	34	100.00

Table 6. Distribution of complications in haematosinus

Sinus	Frequency	Percentase (%)
Maxillary	16	29.09
Ethmoid Sinus	16	29.09
Frontalis	6	10.91
Sphenoid	7	12.73
Nasal Cavum	9	16.36
Nasopharynx	1	1.82
Total	55	100.00

Stabilization and instrumentation operations

From 29 patients, stabilization action and instrumentation were performed in the form of closed reposition was 3 (6.25%), open repositioning wiring was 15 (30.61%), Open Repositioning plating was 23 (46.94%) and Butterfly Gypsum was 7 (16.33%).

Comparison of MSCT Scan examination results and Stabilization also Instrumentation operations.

All of the total subjects, only 14 subjects the researchers could get from the patient’s medical records, from the 14 existing data with maxillofacial trauma, 3D CT Scan and result of stabilization and instrumentation operation were obtained. True Positive (TP) = 100%, True Negative (TN) = 100%, False Positive (FP) = 100%, and False Negative (FN) = 100%. (Table 7).

Table 7. Results of Stabilization & Instrumentation Operations

		Operation stabilization & instrumentation results		
		Positive	Negative	
3D MSCT Scan	Positive	14	0	14
	Negative	0	2	2
		27	2	29

Mc. Nemar p=0.000

Kappa=1.000 p=0.000

The result of Mc Nemar test showed no significant difference between head 3D CT scans result and stabilization also instrumentation operation with $p = 1,000$ ($p > 0.05$). While the of the analysis by calculating Kappa coefficient shows that there was a high suitability between head 3D CT scans with stabilization and instrumentation result with $\kappa = 1.000$, $p = 0.000$ ($p < 0.05$).

Discussion

A Head 3D CT Scan with Volume Rendering (VR) to display bone images in 3D reconstruction was

used, while 3D reconstruction was considered as the best modality in looking at the anatomical structure of bone because it produces spatial resolution and builds a combination of ultra-thin submillimeter combinations of slices^{8,9}.

In the study, the epidemiologic incidence of maxillofacial trauma was more common in male (86.21%) than female (13.79%) with the most in <20 years old group and 20-30 years old group (27.59%). The mechanism of etiology injury was a traffic accident (89.66%). This was in accordance with previous

research which states that the incidence rate was higher in men (20-29 y/o) with the etiology of traffic accidents, especially motorcycles.

The physical examination of the maxillofacial trauma patient was insufficient to maintain the maxillofacial fracture diagnostic, it still needs radiological examination. From a radiological examination that using a head 3D CT scan, it was found that patients with maxillofacial fractures (93.1%) and had no fracture (6.9%) with the most fractures occurring was in zygoma and maxillary bone (21.25%). This was in accordance with the previous study that most fractures occur in the maxillary bone due to bustrecess in the maxillary region^{10,11,12}.

Maxillofacial trauma results were; a severe variation injury, bruise, excoriation, various vulnus of soft tissues to fractures. Maxillofacial fractures only occur in one place or complex, due to impact with low strength or high strength (> 50% gravitational forces). Maxillofacial fractures will unreleased from the head injury due to the location and adjacent structures. Maxillofacial structures were considered reducer due to trauma, thus to protect the intracranial structure^{13,14,15}.

There were several complications in the form of Cranium Bone Fracture (25%), intracranial complication (15.24%), Haematosinus (52.38%) and Soft tissue haematoma (32.38%), the most intracranial complications was ICH (31.25%), most soft tissue complications was in the Orbital region (26.47%) and the most common Haematosinus complications was Sinus Ethmoid and Maxilla (29.09%). This was in accordance with previous studies that stated, 253 maxillofacial fractures patients with the head injury was 20.2%, maxillofacial fractures accompanied by intracranial hemorrhage was 28.3% in the upper third of the face while Maxillofacial fractures accompanied by a cranial fracture was 57.1%.

Conclusion

The 3D CT scan results were compatible with the results of stabilization and instrumentation operations.

Ethical Clearance: The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, nonmaleficence, and justice.

Conflict of Interest: There is no report of conflict of interest involved with this study so far.

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Breast Cancer Risk Trends of Iraqi Women

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Abstract

Background: Breast cancer (BC) are one of the significant prevalence malignances among Iraqi women, which ranked as the number one cancer documented in all provinces. Although there is a rising incidence in the frequencies of BC, there were not enough studies conducted on the incidence's frequencies over the Iraqi women in Thi-Qar provinces. It is well-known that incidence rates are informative. Analysis of tendencies would advantage in planning and organizing programs for control cancers incidence. **Objective:** The objective of the following study is to calculate the risk of BC using updated data from the cancer registries in the Iraqi health ministry and document its tendencies that released in different periods. **Materials and Method:** Data on incidence rates of BC were obtained from cancer registries of Iraq for the period between 2009 and 2015. Annual percent change in incidence and risk in terms of one in the number of women likely to develop cancer was estimated for both cancers' types in five cities in Thi-Qar province. **Results:** The incidence of BC ages group (45-49), (50-54) and (60-64) were significantly increased, while the age group (15-19) were significantly decreased. On the other hand, the higher increase in the incidence of BC in 2015 was reported to be 84 and 29 cases in Al-Nassiriya and Al-Shatra cities, respectively. **Conclusion:** Al-Refaey region recorded a decline in the incidence of BC, which is contrary to the observation in other cities, which showed an increase in breast cancer. On the other hand, the north side of the city which known to be more contaminated with pollution has higher incidence rate.

Keywords: *Breast cancer, cancer Age groups, Thi-qar cities*

Introduction

Breast cancer (BC), until today, is the most prevalent cancer diagnosed in women worldwide. BC ranks second, and cervical cancer ranks seventh according to the incidence of malignancies globally¹. Western countries have reported a specific decline in BC trends and incidence, while it is still a significant issue in developing countries.

International Agency for research cancer (IARC) has narrated that female breast cancer is a heterogeneous disease and responsible about 11.6% of total cancer incidence, and documented to be a commonly diagnosed cancer and ranked as the highest occurrence of all

females cancer types and as number one leading death for women worldwide¹. BC is the main prominent cancers sites amid Iraqi women with 13,4420 incident cases, 338,010 five yearly prevalence (Iraqi cancer registry 2009-2015).

The molecular biology reasons that underlay the breast cancer causes are variable. However, a higher number of scientists have documented that BRCA1 and BRCA2 are the two main tumor suppressor genes that are linked to breast cancer². Moreover, ZHX3 gene has been linked to be down regulated in breast cancer³. The rest of the ZHX family can also be disturbed in cancer⁴.

Mercifully, breast cancer is exceedingly treatable if diagnosed at earlier stages, but it might be extreme if identified at later stages⁵. In Asia, and particularly in the middle east, there is a climbing frequency of breast cancer even though they migrated to western countries decades ago.⁶ Counter to the latest downturn in the breast cancer episode in Western nations, the occurrence in Iraq has been increasingly growing. The predicted

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number of Iraqi's community in 2015 is 36,933,714 included 18,659,573 males and 18,274,141 females. (Ministry of planning / Central Statistic Organization). The quantity of breast cancer in Iraq which is 3763 cases in 2009 as it documented in the cancer registry data distributed by the Iraqi cancer board, has reached a terrifying number in 2015, so breast cancer boosted to be second female mortal cancer in Iraq. In 2015, 143 cases were registered as positive breast cancer in Thi-Qar exemplified by 11.7% of all cancer cases displayed in the city. These data shift us to focus on the next step towards examining the epidemiology and the ground that underline the breast cancer bias. BC patients can persist if they diagnosed at earlier stages. Therefore, there is an increasing incidence of breast cancer death for women living in the rural as compared to women living in the city.

Materials and Method

Data on prevalence rates of BC was obtained from the yearly book series issued by the Iraqi Cancer Board (ICB) at the Ministry of Health. The ICB is reliable for collecting the information related to every newly diagnosed cancer patient in both government and private hospitals and clinics. There were eighteen Population-based cancer registries for the years 2009- 2015. ICB brings out a comprehensive yearly report having various data summaries, for example, the occurrence and fatality rates. The approachability of data in different cities of the country depends on the year a particular registry came into the network of ICB and or preliminaries of the record in a specific area. Data for the years 2009-2015 were prepared for the eighteen provinces. Though the ICB cancer registry was established in 1990, the International classification of diseases (ICD) coding used was as per ICD. Age-specific annual cancer incidence rates for either sex in different registries for breast and cervical cancer sites for ages in the range of 15-64 years were used for computations. I focused in my project on breast cancer cases for the two separate registries which are 2009 and 2015 for the whole country were used for trend analysis. I centered my study on the age groups (15-19), (20-24), (25-29), (30-34), (35-39), (40-44), (45-49), (50-54), (55-59), (60-64) and (65-69). These data were plotted and analyzed using Excel.

Thi-Qar province breast cancer incidence for the period between 2009-2015 was plotted and statistically analyzed. Moreover, I compare the extent between the five cities that geographically belong to Thi-Qar

province, which is Al-Nassiriya, Al-Refaey, SookAl-Shiookh, Al-Jabesh and Al-Shatra. For assessing trends, exponential regression analysis was performed on age-adjusted rates (AAR) of incidence for breast sites in various registries. The common hazard is the probability that somebody will be diagnosed with cancer through a particular age time in the absence of any competing cause of death.

Nonetheless, APC in incidence would give better knowledge. The risk statistics based on frequency is not a replacement of incidence rate itself. The cumulative risk as one in number of persons developing cancer is an easily understandable statistics for public health communications for the respective governments and the use by the policymaker.

I focused on my analysis on examining women aged (12-70 years) and categorized according to the age groups like 15-39, 40-49, 50-59, 60-69, and 70+ years.

Statistical Analyses

All statistical analyses were performed using SPSS statistical software.

Results

Iraq breast cancer incidence over six years periods:

The BC cases were increased over the six years period (2009-2015). The elevation was documented to be significant between the group ages (30-34) which showed $p=0.05$, (40-44) $p=0.04$, (45-49) $p=0.005$, (50-54) $p=0.002$, (60-64) $p=0.004$, (65-69) $p=0.03$ figure (1).

Thi-qar breast cancer incidences

In 2009, 97 cases were reported in Iraq, which represent 16.28% of all the cancer cases that have been reported in this year. On the 2015 report, Thi-Qar reported having 143 cases which represented 11.7% among all types of cancers reported in this year. I think it should be 133 because the summation of all cities new cases is 133, not 143. By this, the percentages would be 10.7%. The comparison of Thi-qar cities has shown that Al-Nassiriya has reported to have significant increased $p=0.04$, Al-Refaey has no differences, Sook Al-Shiookh reported decreased in the incidence, Al-Jabaish has few numbers of cases but statistically considered significant. Finally, Al-Shatra has 18 cases in 2009 and

increased to be 29 in 2015, statistically is considered significant increased $p=0.04$ (Figure 2).

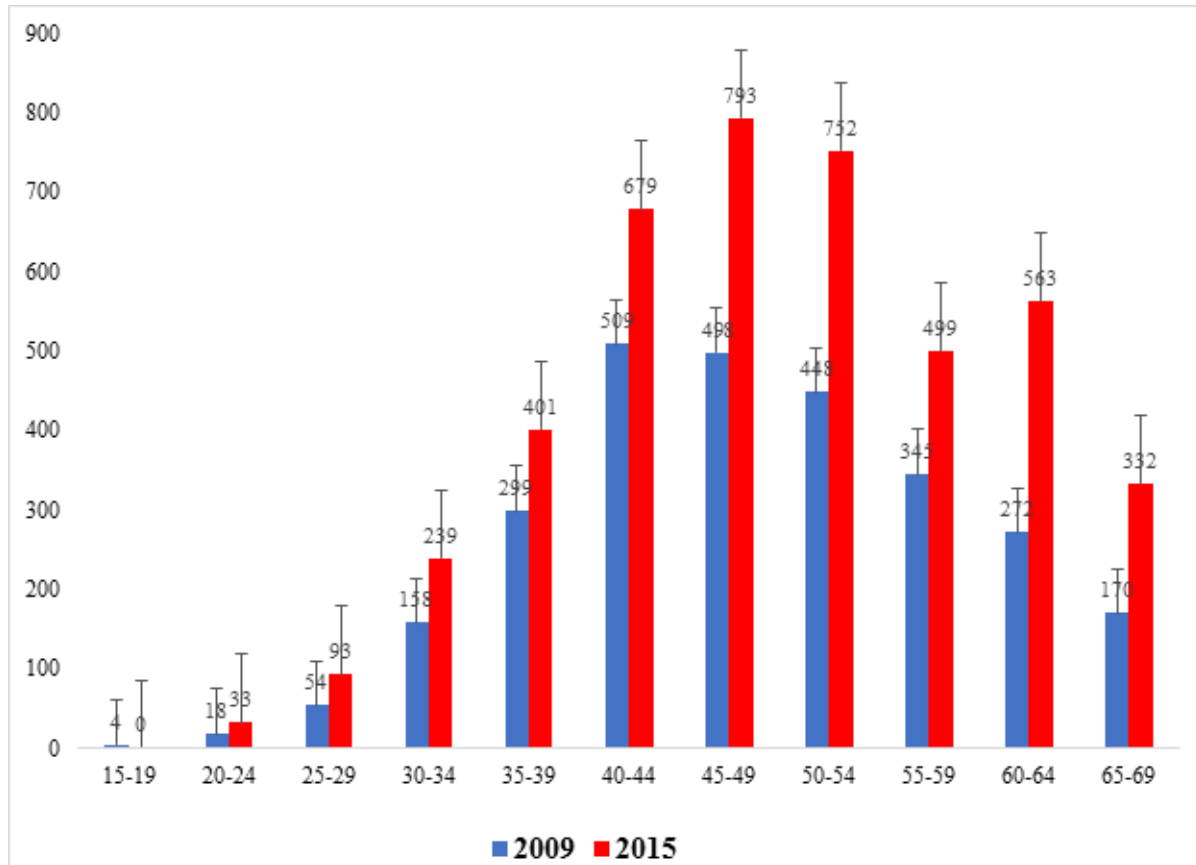


Figure 1: The significant increase in the breast cancer incidence in Iraqi women detected in four age groups

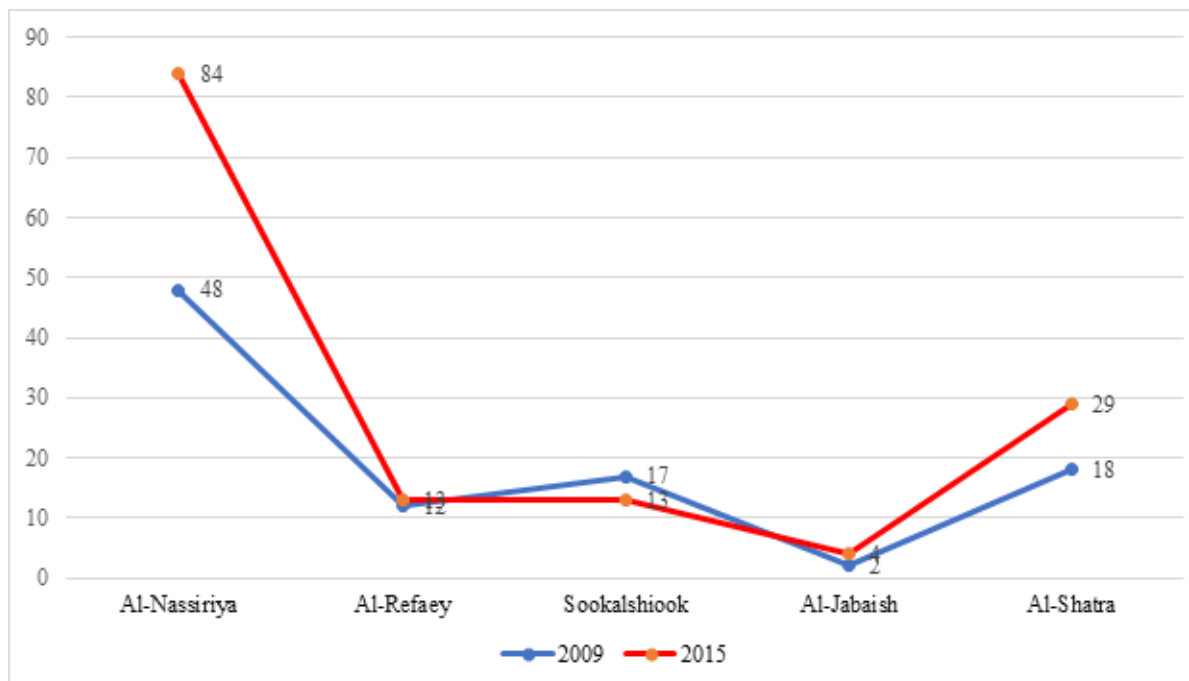


Figure 2: Thi-qar districts distribution of breast cancer over six years periods

Discussion

We still scratching the surfaces in term of learning the epidemiological characteristics of breast cancer in

Iraq. The ICB has used Can Reg4, while my study has investigated the data using SPSS. The study documents notified trends of breast cancer up to the recent year of 2015 on data is achievable by Iraqi board of cancer. The hazards as one in the number of women progress breast cancer are interpreted for all provinces in Iraq for 2009 and 2015.

The data in figure (1) suggested that Cancer registries propose that the age 15 is rarely getting cancer which might be because the high immune system for women in this age and it is the beginning of feminine hormonal to be produced. These finding is coming along the data that been reported by ⁷ who found that BC is highly variable upon menopausal status, body mass index and the activity of the immune system.

Cities in Thi-qar such as Al-Refaey and sookalshiookh did not show any significant increase in the breast cancer incidence. On the contrast, Al-Nassiriya and Al-Shatra observed a significant increase in the risk for breast cancer (figure 2).

In the destiny, we are looking for an extensive case-control study that can follow the patients since they have been diagnosed with the disease and support them in regulating their blood parameters, body mass and their response to the chemotherapy or radiation. Moreover, several genes have been studied universally such BRACA1 and BRACA2 ².

Conclusion

My study significantly highlighted the dramatic increase in the number of breast cancer patients via the six-year study periods in the whole country in general and in specific in Nassiriya. The increased was spectacular in the highly polluted cities, including Nassiriya and Shatra. My project highlighted the need to establish a cancer center in Shatra since it is statistically more prone to have double the number of cases in the next six years period. The increased knowledge among the physicians about breast cancer clinical exhibitions early laboratory diagnosis and information in society will help to lessen the morbidity and mortality correlated with disease.

List of abbreviation	Full definition
ICB	Iraqi Cancer Board
BC	Breast cancer

Ethical Clearance: The study is a part of regular university of Sumer observation.

Conflict of Interest: the author has no conflict of interest.

Source of Funding: the author declared that a self-fund has been used for this work.

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Colorectal Cancer in Nineveh: Five Years Survival Rate

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Abstract

Overall, colorectal cancer ranks third in terms of incidence but second in terms of mortality, according to the latest GLOBOCAN worldwide estimation in 2018. The aim of this study is to show the survival rates of colorectal cancer patients in Nineveh province for the period 2010 – 2014, a retrospective cohort study, conducted among patients at the Mosul Cancer Registry center. Survival analysis was carried out using the actuarial method to construct the needed life tables. Chi-square test, was used to study the relationship between cancer occurrence and sex, age and stage. The result of this study indicates that the 5 year survival rate (50.1%) with 95% confidence intervals (0.4985-0.5035) in Mosul was between developed and developing countries. The survival of colorectal cancer in men (50.0%) was significantly better than women (43.0%), older patients ≥ 70 years, had a poorer survival rate (25.9%) compared to younger patients <50 years (70.5%) and the survival rate by tumor stage was better in the localized stage (75.4%) than regional and distant stages of (63.6% and 11.7%) respectively.

Keywords: *Colorectal cancer, 5-year survival rate, Mosul Cancer Registry center*

Introduction

Over 1.8 million new colorectal cancer cases and 881,000 deaths are estimated to occur in 2018¹. Colorectal cancer (CRC) is the third most common cancer in men and the second in women, according to the latest GLOBOCAN worldwide estimation in 2012^{1,2}. About 55% of the cases are reported in the more developed countries. The highest rates were estimated to be in Australia/New Zealand: 44.8 and 32.2 per 100,000 in men and women, respectively, and the lowest in Western Africa (4.5 and 3.8 per 100,000)². Colorectal cancer is a major cause of morbidity and mortality throughout the world³. It accounts for over 9% of all cancer incidence^{4,5}. It is the third most common cancer worldwide and the second most common cause of death^{1,4}. It affects men and women almost equally³⁻⁶. Colorectal cancer is one of the ten leading cancers in Iraq, accounting for 4.8% of estimated cancer cases in males and 3.8% of estimated cancer cases in females⁷.

Aim of The Study

The aim of this study is to show the survival rates of CRC patients in Nineveh province for the period 2010 – 2014.

Objectives

1. To describe the sociodemographic characteristics of the CRC patients.
2. To calculate the 5-year survival rate (5YSR), according to the age, sex and stage of the cancer.

Materials and Method

Study Settings:

This was a retrospective cohort study, conducted among patients at the Mosul Cancer Registry center (MCRC). This study protocol was approved by the local ethics committee of Medical Collage, University of Nineveh and also obtained from the directorate of health in Nineveh

Study sample:

The sample of the present study included all colon and rectum cancer patients registered at the Mosul cancer registry center in Nineveh in 2010 to 2014 of all ages and both sexes. A total of 460 cases of CRC, recorded were retrieved from the medical records of MCRC.

The cancer cases are registered with respect to patient number, age, sex, clinical stage and cancer coded according to the International Classification of Diseases

(ICD10)^{8,9}. All the data are fitted on Can Reg 3 format and fed into the computerized database of the MCRC.

Staging is done according to the summary stage system^{10,11}. The cancer has become invasive and is categorized as local, regional, or distant based on the extent of spread¹². Stage “unknown” has been recorded to include tumour morphologies for which the summary stage system is not strictly applicable and patients with cancer of an unknown stage or carcinoma in situ were excluded from the present study.

The criteria of the age groups chosen were those used for the international standard cancer patient population¹³. With age been categorized into three groups (<50, 50–69 and 70+ years).

The sex was examined as a potential confounding variable for CRC for presentation of some descriptive results.

Survival Analysis

Survival analysis was carried out using the actuarial method to construct the needed life tables¹⁴. **Observed survival rate “OSR”** is the probability of surviving from all causes of death in a group of cancer patients under study. Observed survival was measured from

the date of diagnosis to the date of death or censoring, whichever occurred first^{14,15,16}. Cancer patient survival was estimated as the cumulative probability (range 0 to 1) of survival up to a stated time after diagnosis¹⁷. This method has been used in this study to estimate the absolute survival probability¹⁸. In the present study, period analysis was used to derive 5-year survival estimates for 2010-2014^{19,20}.

Statistical Analysis

95% confidence intervals and calculation of the standard error (s.e.) of the 5YSR obtained by the actuarial method uses the Greenwood’s formula^{14, 21}. Chi-square test was used to study the relationship between variables and some results²².

Micro Soft Excel 2010 was used for statistical analysis.

Results

The total number of the CRC cases, according to age, sex and stage of extension are shown in Table 1. The result is significant at $p \leq 0.05$, except for sex, the result is not significant and the chi-square statistic is 2.513.

Table 1: The frequency distribution of the colorectal cancer cases, according to age, sex and stage of disease.

Colorectal Cancer Cases (460)		Date of Diagnosis					Total	%	p-value
		2010	2011	2012	2013	2014			
Age group	<50	22	41	30	29	32	154	33.5	< 0.00001
	50-69	38	34	49	42	61	224	48.7	
	≥70	11	8	20	21	22	82	17.8	
Sex	Female	28	42	50	48	45	213	46.3	0.11291
	Male	43	41	49	44	70	247	53.7	
Stage	Local	14	8	26	17	27	92	20.0	< 0.00001
	Regional	30	42	34	25	51	182	39.6	
	Distant	26	21	27	27	28	129	28.0	
	Unknown	1	12	12	23	9	57	12.4	

To CRC death, about half of people (50.3%) die, is of 55-69 year of age, as shown in Table 2,

Table 2: The frequency distribution of the colorectal cancer deaths, according to age, sex and stage of disease.

Colorectal Cancer Deaths (163)		Date of Diagnosis					Total	%
		2010	2011	2012	2013	2014		
Age group	<50	0	3	11	9	13	36	22.1
	50-69	3	7	17	21	34	82	50.3
	≥70	6	2	6	12	19	45	27.6
Sex	Female	2	6	15	17	36	76	46.6
	Male	7	6	19	25	30	87	53.4
Stage	Local	0	0	3	9	6	18	11.0
	Regional	2	5	11	16	17	51	31.3
	Distant	7	7	16	15	35	80	49.1
	Unknown	0	0	4	2	8	14	8.6

Table 3, shows the CRC survival rate declined from 70.5% in the ≤50 age group to 25.9% among those aged ≥70 years. There was an greater difference in survival rates between female and male, which were 43.0% and 50.0%, respectively and between stages.

Table 3: The 5- year observed survival rate of the colorectal cancer cases, according to overall, age group, sex and stages for the period from (2010-2014)

Colorectal Cancer		OSR	95% CI
	Overall	0.501	0.4985-0.5035
Age Group	<50	0.705	0.7003- 0.7100
	50-69	0.518	0.5127- 0.5240
	≥70	0.259	0.2152- 0.3032
Sex	Female	0.430	0.4251- 0.4343
	Male	0.500	0.4954 - 0.5045
Stage	Local	0.754	0.7469- 0.7603
	Regional	0.636	0.6305- 0.6411
	Distant	0.117	0.0975- 0.1363

Discussion

Previous studies in other countries have reported variable CRC survival rates.

In Asia, the highest survival rates were found in China (68.0%)²³, the lowest rate was in India (33.6%) and Malaysia (34.3%)^{24,25}. This study showed that the overall 5YSR for patients with CRC was 50.1%. Various studies from Iran have reported 5YSR of CRC of 47%, 41% and 61% respectively²⁶⁻²⁸. In Saudi Arabia, the overall 5YSR of the CRC was 44.6%²⁹. The disparities in CRC survival between Japanese, Mediterranean countries could also be attributed to many factors, together with variations in socioeconomic standing, stage at identification, treatment, medical practitioner characteristics, and hospital factors. In Japan in 2005, the 5YSR was reported at 61.4%³⁰. Also, studies in Germany, USA, England, France, and Italy were reported the 5YSR 65%, 65%, 52.7%, 60.3% and 59.3% respectively³¹⁻³⁴. The 5YSR of patients with CRC in our city is lower than the developed regions. Therefore, we conclude that the survival rate of patients with CRC in Mosul is between developed and developing countries, like other patients in the world depend on various factors such as demographics, pathologic and tumor characteristics, geographical distribution and gene mutation or have a family history of^{35,36}.

In this study, there is no significant difference in the occurrence of CRC between females and males (p-value= 0.11291), but differences in survival rates were reported, 43.0% and 50.0%, for females and males, respectively. Yet, other studies had reported a lower 5YSR in females^{2,37}. The absence of gender differences in survival rates was reported in some of the previous studies^{23,25}. In a study in Germany and Cuba, the 5YSR in women was better than men that were not similar to the result of our study^{38,39}. The reason for better survival in men than women in this study may be due to a higher participation rate in men compared with women for screening programs like fecal occult blood test and colonoscopy⁴⁰.

This study showed that the hazard of death increased significantly with increased age being the highest in the age of ≥ 70 years. This result was reported in other studies²⁷ that showed that older patients had a poorer survival rate compared to younger patients. However, other studies^{26,41} reported no difference in survival according to age. The contradictory results of previous studies on age may be due to the inclusion of patients

from single referral centers and poor adjustment for the effect of possible confounds.

One of the most important factors that influence the survival of patients with CRC was the stage of diagnosis. Which were 75.4%, 63.6% and 11.7%, for local, regional and distant stages respectively. This finding is consistent with findings of other studies; in the USA, 5YSR is 90%; survival in local stage, declines to 71% and 14% with regional and distant stages, respectively³⁴, also in European countries, localized CRC reached levels close to 90% and 15% in the case of distant stage³⁸, while in Saudi Arabia, 63.3% for localized disease, 50.2% for those with regional disease, and 14.7% for patients with distant stage²⁹. But the most important factor for our CRC patient is that the disease diagnosed at an advanced stage⁴². So this significant difference in 5YSR may be due to, poorly established screening program like the fecal occult blood test, sigmoidoscopy and colonoscopy and limited accessibility in developing region⁴³.

Conclusions

In conclusion, the result of this study indicates that the 5YSR of patients with CRC in Mosul was between developed and developing countries. The survival of CRC in men was significantly better than women, older patients had a poorer survival rate compared to younger patients and the survival rate by tumor stage was better in the localized stage than other stages of CRC.

Conflict of Interest: no conflict of interest.

Source of Funding: self

Ethical Clearance: From Ethical Committee, Medical College, University of Nineveh

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Significance of Fingerprints in A Brutal Travel Bag Murder- A Case Report

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Abstract

Forensic Science can be defined as the application of science to law. On the crime scene, sometimes the odour of the evidence plays a vital role in the location and identification of the evidences. The present case is one of the best examples of this. Dubai police were informed about a bad smell emanating from an apartment in one locality. After an investigation, the investigators and the forensic expert discovered that the smell was from a decomposing human body. Immediately the fingerprints experts were called to the crime scene to collect, identify, and analyze all the fingerprints encountered. This case reflects the precision, accuracy, and reliability of the fingerprint expert and the technology used by them, including chemical methods like ninhydrin and cyanoacrylate along with the high efficacy of the Automated Fingerprint Identification System. The case was uniquely solved with the aid of fingerprint analysis.

Keywords: *Crime Scene, Fingerprints, cyanoacrylate, Ninhydrin, Automated Fingerprint Identification System.*

Introduction

Fingerprint evidence has been acknowledged as the gold standard in forensic science for more than a century¹. Fingerprints are the patterns created on the fingertips by the raised papillary ridges with rows of pores connected to the sweat glands². A fingerprint is a science of using an individual's physical representative to identify the person. It's unique as no two individuals were found to have the same fingerprint³. On the other hand, this case is also a typical case based on the particular type of odour (smell) from the dead body, that had served a significant mean of locating the evidence in the presented case. When odor molecules stick to the cell membrane, odors are sensed – this process is known as adsorption. The objective of this case is to

show the accuracy, determination and expertise of the experts at the General Department Of Forensic Science and Criminology also, how the investigator can use the primary evidences as basic tools in the criminal investigation and identification.

Background of the Case

On the 19th of April 2017, Dubai police received a call regarding a fouling stink approaching from an apartment in one of the locality. After investigation, it was discovered that the smell was arising from a decomposing human body. Further, it was found that a woman had been murdered and the body was hidden inside a travel trolley bag in her apartment (figure 1-2). Immediately the fingerprint experts were called in to collect all essential evidences from the crime scene to be tested for latent fingerprint by appropriate technique.

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Figure 1: Image of the apartment from where the fouling odour was approaching to the nearby surroundings. The suspected travel bag was lying on the floor.



Figure 2: The picture of the blood-stained travel trolley bag, where the dead body of the victim was kept, and fingerprints were collected from the bag and the surrounding areas.

Challenges for the Investigators

The body becomes flaccid, and blood ceases to circulate after the cessation of heart function. The body undergoes some well-documented modifications, known as the livor, rigor, and algor mortis “classic triad”.

Typically, a human body takes between one to three days to start decomposing after death⁴. The rate at which the body decays depends on several factors; how intact the corpse was at the time of death, the temperature and humidity of the environment where the body is kept. If

the body had skin breakages/injuries at the time of death, the body decomposes faster and smells sooner than the latter⁵. On the other hand, if the body is kept in an environment with high temperature and/or high levels of humidity, it decomposes faster and smells sooner than if it were kept in a cold dry environment.

It is plausible that the body at the apartment had been kept there for at least a day and a maximum period of three days. The apartment is usually regulated for temperature and humidity; thus, the body would have decomposed at the standard rate. The fact that the body was in a travel bag shows that the perpetrator(s) were trying to cover up the incidence until they had exited the apartment and its premises. By the fact that the victim's body was found in her apartment hidden in the bag, it is possible that the murder was committed within this apartment. Dubai police confiscated the bag in order to test for latent fingerprints.

Material and Method

In an attempt to reveal the fingerprints on the travel bag, the Fingerprint Department encountered two challenges. First, the inside part of the bag was covered by the victim's body fluids. This made it challenging to test and detect fingerprints on the inside, which would shed insight into the identification of the murderer. Cleaning of the bag or any similar attempts would result in loss of this vital evidence for the investigation, and the fingerprint experts had to be careful and methodical in identifying the prints. Secondly, the interior design of the travel bag was curved, making it difficult for experts to capture it with digital cameras.

The Fingerprint Department resorted to utilizing two main techniques; cyanoacrylate fuming, and ardrox. Cyanoacrylate fuming method uses the vapor of superglue to detect latent fingerprints on non-porous surfaces including glass, unfinished wood, plastic, and rubber bands⁶. This technique relies on the deposition of polymerized cyanoacrylate esters on the residues of latent fingerprints. After implementing this technique, the latent fingerprints become visible. This technique was implemented on the inside and outside of the travel bag, given that the latter is made of plastic.

Findings

Consequently, two fingerprints were detected on the outside and inside of the bag. The prints, however, were not clear enough for the analysis and the decipherment.

This necessitated the use of a second technique; ardrox. Ardrox is a fluorescent liquid dye that stains prints detected using the cyanoacrylate technique. Ardrox works well with Ultra Violet (UV) light, lasers as well as other alternative light sources. When used with cyanoacrylate, ardrox forms a compound that emits secondary radiations under UV light⁷. This compound enables experts to view and photograph fingerprints on a multi-colored and non-porous materials⁸.

After applying ardrox, the fingerprints on the inside and the outside of the travel bag became more explicit, allowing appropriate viewing and photographing. The results of the fingerprint examination revealed a set of prints that were matched those of a suspect.

Conclusion

The fingerprints still serve as an essential tool for the forensic expert during the investigation of the crime⁹. The most important consideration is the type of print encountered, its condition, nature, and the kind of surface it has been encountered¹⁰. Many times it is challenging to rely on the fingerprint evidence solely because of lesser ridge details or the inappropriate surface for the development of fingerprints¹¹. However, due to the cutting edge technology and trained experts in the field, we can reach conclusive results in many cases as happened in the presented case. The fingerprints of the suspect were found on both the inside and outside of the travel bag, even though they were not identical. Fingerprints are the most valuable sources of evidence for crime owing to their two main features; uniqueness and their never-changing nature¹². Accordingly, no two individuals have similar prints, and no two fingers of the same person are ever identical. Fingerprints also do not change for the entire of an individual life. The two prints on the travel bag matched those of the suspect and were not identical since they were from different fingers.

The suspect must have murdered the lady in her apartment. This is revealed by the presence of prints on the bag, an indication of involvement in the act. The prints on the inside of the bag indicate that the suspect tried to pack the body in the travel bag. The suspect must have handled the body in the events leading to the demise and hiding of the body in the apartment.

Conflicts of Interest Statement

The authors whose names are listed immediately below certify that they have NO affiliations with or

involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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Detect the Infection with Rubella Virus and Toxoplasmosis in Pregnancy Causes Suffering from Early Abortion by Using Real Time PCR

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Abstract

Congenital infections may cause fetal death or newborns with brain malformations, little information is available about the but the impact of these diseases on the outcome of pregnancy. In this study we tested the IgG and IgM antibodies for both *Toxoplasma gondii* and Rubella. among 58 pregnant women with abortion. and in order to differentiate between the serological and molecular detection methods the samples were also tested for both *Toxoplasma gondii* and Rubella by RT-PCR. The results showed that there is a positive relation between the infection with rubella and the infection with toxoplasma ($p=0.022$, $Odd= 4.9$) and this co-infection attribute to abortion in women. and these results of RT-PCR were significantly different than those with ELISA test.

Keyword: *Toxoplasma gondii*, pregnancy, abortion, newborns, brain malformations

Introduction

Birth defects are one of the most urgent global health problems affecting millions of births worldwide, but the causes remains unconfirmed [1]. Genetic and environmental factors have been found to cause these defects [2]. Congenital infections such as toxoplasmosis and rubella are known to play a non-negligible role in the development of brain malformations [3].

Toxoplasmosis is caused by the obligate intracellular protozoan *Toxoplasma gondii*. It is one of the most prevalent chronic infections affecting one third of the world's human population[4]. *Toxoplasma gondii* infections can cause to a more serious progression when accompanied with some other infection such as HIV and HBV [5]. Congenital infections such as toxoplasmosis and rubella are known to play a non-negligible role in the development of brain malformations [6]. *Toxoplasma gondii* seropositivity and coinfection with TORCH pathogens have been investigated in Qatar with the intention of testing the patients who are considered to be in the high risk group for TORCH pathogens[7]. Primary infections of toxoplasmosis, CMV, rubella and HSV during pregnancy can bring wide ranges of clinical symptoms dependent on the stage of pregnancy.

TORCH infections during the early stages of pregnancy may result in congenital malformations, intrauterine growth restriction (IUGR) or fetal death [8].

Rubella infection during pregnancy has a devastating consequence; defined as congenital rubella syndrome (CRS). Miscarriage and stillbirth is the most important sequel of CRS [9]

Material and Method

Subjects:

This study was performed among 68 pregnant women collected from maternity unit at Al-Yarmook teaching hospital in Baghdad, Iraq, from 2018 to 2019. These samples were categorized into two groups, first group include 34 women with spontaneous abortion the other 34 women with normal delivery were enrolled as the control group. A questionnaire including demographic, epidemiological criteria and clinical symptoms was recorded in both the case and control groups by interview.

Five milliliters of venous blood samples were collected from each pregnant woman. Serum were separated from the blood samples and stored at -20°C until use.

Serological evaluation

Specific IgG and IgM antibodies to *Toxoplasma gondii* and Rubella were measured by the Enzyme-linked immunosorbent assay, with commercial ELISA kits (ab108778 –Anti-Toxoplasma gondiiIgM) according to the manufacturer’s instructions and the optical density (OD) was read at 450 nm by the spectrophotometer ELISA reader (Awareness Technology INC Stat Fax-2100). Diagnostic criteria IgG and IgM was defined the upper limit of the standard 10 U/mL (Cut-off).

Nucleic acid extraction

DNA and RNA were extracted from *Toxoplasma gondii* and Rubella, respectively using (RIBO-sorb, K2-1-Et-50-CE, Italy) according to the manufacturing procedure.

RT-PCR for detection of viruses

Both viruses *Toxoplasma gondii* and Rubella were detected by using commercial RT-PCR kits that allow the qualitative detection of viral nucleic acids in plasma, *Toxoplasma gondii* Real-TM (Sacae, CAT#TP1-50FRT, Italy) for *Toxoplasma gondii* and Real-TM Qual (Sacace, CAT#V24-50FRT, Italy) for Rubella.

Statistical Analysis

All data were analyzed by SPSS version 11.5 (SPSS, Chicago, IL, USA) using Fisher exact test. The odd ratio (OR) and *P*-value were also calculated

Results

The difference in age between case and control groups wasn’t statistically significant, As shown in Table 1. Also the contact with cats showed no statistically significant differences

Table (1): The difference in age between case and control

Risk factors	Variables	Case (n = 34)	control (n = 34)	P-value
Age	<20	2	1	0.5
	20–40	29	30	
	>41	4	3	
Contact to cat	yes	9	7	0.6
	no	25	27	

Toxoplasma gondii IgG antibody was detected in 19 (55.8%) of case and 11 (32.3%) of control group (OR=1.23, P=0.5). Rubella IgG antibody was detected in 75.3% versus 86.7% in case and control groups (OR=0.46, P=0.05).

Table (2): The comparison results *Toxoplasma gondii* IgG antibody and Rubella

Infection type	Case	Control	OR	p-value
<i>Toxoplasma gondii</i>	19 (55.8%)	11 (32.3%)	1.23	0.53
Rubella	25 (75.3%)	29 (86.7%)	1.4	0.32
<i>Toxoplasma gondii</i> + Rubella	16 (47.0%)	2 (5.8%)	4.6	0.001

The detection of both viruses were also done by using RT-PCR and the resulted curves showed in figure-1 and the resulted data were compared to data obtained by using ELISA detection method. The comparison results summarized in table-2.

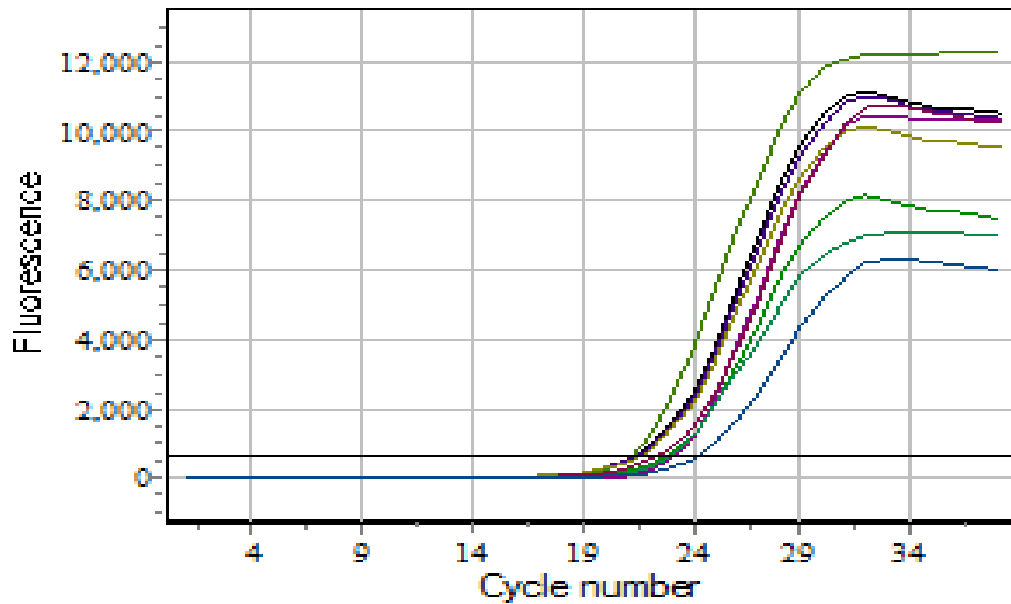


Figure 1:- resulted RT-PCR curves of Rubella and Toxoplasma detection.

The detection by using RT-PCR reported to be more sensitive than serological method as this method based on molecular detection of the active viruses. The results were summarized in table-3. 25 case subjects (with continues abortion) infected with rubella detected by ELISA were minimized to 20 sample after re-tested by RT-PCR and 29 control subjects minimized to 3 only this comparison were highly significant. While the infection with toxoplasma were recorded in 19 case subjects by ELISA minimized to 14 by RT-PCR and 11 control subjects to only 5 only this were also highly significant. The statistical test were done by ANOVA two way .

Table (3): The correlation between Rubella and toxoplasmos

Groups	Case		Control		p-value
	RT-PCR	IgM	RT-PCR	IgM	
Rubella	20	25	3	29	0.001
Toxoplasma	14	19	5	11	0.008

The correlation between Rubella and toxoplasmosis summarized in table--3 showed that 14 of the patients with Toxoplasmosis were also infected with Rubella and only 3 cases were infected with Rubella without the infection with toxoplasma. While the 20 subjects infected with rubella without toxoplasmosis infection and 21. These data showed significantly ($p=0.022$) high odd ratio= 4.9 (C.I.= 1.26 to 19

Table (4): Risk for congenital rubella syndrome increases when infection occurs in early stages of pregnancy

		toxoplasmosis		p-value	odd	
		infected	non-infected			
rubella	Infected	14	6	0.022	4.9	1.26 to 19.13
	non-infected	3	21			

An estimated 5% of couples attempting to have a baby experience recurrent pregnancy loss. Recurrent pregnancy loss is often defined as 3 or more consecutive miscarriages. There are many reasons a woman might miscarry, but in the past very few diagnoses were given or made known to the mother. Recent studies have shown that approximately 10

to 15% of all first time pregnancies end in miscarriages. The studies also suggested that a similar miscarriage rate could be expected for future pregnancies. [10]. Jaslow CR et al (2010) [11] and Rai R, Regan L.(2006) [12] found there is significant relationship between history of miscarriage in the family and the studied group this is may be estimated to be due to the life style in the family and their health status these studies agreed with the current study.

Risk for congenital rubella syndrome increases when infection occurs in early stages of pregnancy. Specifically, the percentage of infants with congenital malformation exceeds 50% in cases of infection during the first trimester of pregnancy while the relative percentage is significantly reduced after the 20th gestational week [13],[14],[15],[16],[17]. However, maternal viremia is not a proof of vertical transmission to the embryo, and fetal infection does not necessarily correspond to fetal damage. Namaei et al. reported that none of the infants of gravidas that received a measles-rubella vaccine at the interval between 3 months before and 3 months after conception appeared to experience viral consequences. This may be the reason why authors support detailed information provided to the mother in order to prevent unnecessary voluntary interruption of pregnancies [14,18].

Prenatal diagnostic exploration should be recommended in case of positive PCR in order to detect the affected embryos, having more precise information concerning the fetal health status before the decision of pregnancy's termination [19,20,21,22]. Studies have demonstrated an association between viral load in amniotic fluid and the risk of a symptomatic infant, whereas further investigation with a noninvasive diagnostic procedure might postulate a method to evaluate potential fetal affection [22,23,24,25].

Serological tests results by ELISA were not specific and may give false positive results that could be explain by chances of infection with other microorganism and that's also confirmed by the results as few of the results obtained by ELISA were confirmed by PCR [26]. In addition, The results obtained in Al-Najaf indicates that the percentage of Rubella IgG was 49.12% and that revealed less than the result recorded by Lenochove in Turkey [27].

Serological results obtained by Thikra [28]. revealed 12 out of 57 patients were IgM and IgG for Rubella

and after test them by PCR, only (50%) of results were positive. And this result agreed with Nolan [29], whose approved that out of 18 positive cases of Rubella by ELISA only 7 were positive by PCR. Our results revealed seropositive IgG for Rubella and Cytomegalovirus percentage were 49.12 % and 70.2% respectively. After PCR test has done the results percentage has declined to 10.53 % in Rubella virus, and this lead to real incidence of infection of this microorganism and reflect the false positivity of the routine ELISA test [30]. In addition, Toxoplasma gondii and Rubella both are considered non-active infections in human being with continuous mini foci that may lead to immune response state. Antigenic diversity in viruses may add another explanation to give false positive results in ELISA [31].

A small number of countries in Asia have a Rubella-containing vaccine in their national immunization programs. At the moment, control of Rubella through vaccination has been achieved only in Japan, Taiwan and Singapore. Rubella therefore remains poorly controlled in many Asian countries. Data from 2009 shows that, in the Southeast Asian continent, the vaccination coverage rate is only (4%) [32], while in Iraq, the vaccination coverage was 67.6% and 88% as demonstrated in retrospective and prospective study respectively [33]. Various vaccine strategies have been used the world over to mitigate Rubella infections. As inoculation is now well received, vaccination programs strive to immunize all young people before the onset of puberty using a two-stage Rubella vaccination. In the event of a negative result, there is a chance of being immunized during the early stages of pregnancy which lead to specific IgM being detected [34].

Conclusion

After representing these results we conclude that co-infection with both Rubella and Toxoplasma infection might increase the risk of miscarriage and we showed the sensitivity of molecular test and specially the RT-PCR is significantly sensitive than the serological test.

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Flexible Ureterorenoscopy Versus Extracorporeal Shock Wave Lithotripsy for Treatment of Lower Pole Renal Stones

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Abstract

Background: Urolithiasis affects 5-15% of the world population, with high recurrence, (2) which at 5 years can be up to 50%, with high frequency in the labor force population, which produces a high individual and hospital cost, so it constitutes a health problem of high socio-sanitary interest. **Objective:** To compare the treatment outcomes of Flexible ureterorenoscopy and extracorporeal shock wave lithotripsy for patients with lower pole stones. **Patients and method:** Data base review for the patients in the period from first of Jan 2018 to the end of June 2019, in which 131 patients underwent interventions for the management of small lower pole stone. Sixty-seven patients were treated by ESWL and the rest (64) treated by F-URS. The most common complication was UTI 9/19 **Results:** 86/131 were male and 45/131 were female with mean age for F-URS group (52±9.7 years) and (49.6±12.3 years) for ESWL group, with highly significant differences regarding the stone size between the studied groups. The treatment rate, operative time and procedure per patient were highly significantly decrease in F-URS group than in ESWL (p<0.001). Moreover, significant association were notice between the studied groups among SFR at 3 months and secondary procedures. **Conclusion:** lower pole renal stone in size between 10-20 mm treated successfully and more efficiently by F-URS in comparison with ESWL.

Keyword: Urolithiasis, Flexible ureterorenoscopy, extracorporeal shock wave lithotripsy, lower pole stone,

Introduction

The ideal management of renal stones of the lower calyces still continues in controversial discussions and is a dilemma for the urologist. No single method is suitable for removing all stones of the lower calyces. The aim of lower calyceal stones management is to achieve maximum stones clearance with least morbidity. Recently developed minimally invasive procedures have superseded open stone surgery. Extracorporeal shockwave lithotripsy (ESWL), percutaneous nephrolithotomy (PCNL), and flexible ureteroscopy are the presently used therapeutic methods⁽¹⁾. Urolithiasis affects 5-15% of the world population, with high recurrence,⁽²⁾ which at 5 years can be up to 50%, with high frequency in the labor force population, which produces a high individual and hospital cost, so it constitutes a health problem of high socio-sanitary interest⁽³⁾. The increase in the prevalence of urinary lithiasis has been considerable in recent decades, generating an increase in spending on health systems⁽⁴⁾.

The **first flexible ureterorenoscope** (F-URS) was used in 1983, developed by Bagley et al., Giving way to a number of technological advances, until the design of current equipment was achieved with a decrease in caliber associated with a wide working channel that allows use multiple instruments simultaneously, achieving active deflection at its distal end. Likewise, improvements in resolution have been incorporated to achieve a high definition digital image^(5,6).

There is a clear and linear relationship between the number of cases and the decrease in surgical times, complication and success rate; however, the complications associated with the use of F-URS remain a matter to be taken into a consideration. Among the complications described is the avulsion of the ureter, with an incidence of 0.5%, which has been decreasing since the beginning of the use of the F-URS, the intussusception of the ureter (defined as the folding of a tract of an organ hollow within the same organ), due

to a circumferential lesion in the wall of the same. This complication has been associated with the presence of fibro epithelial polyps and transitional cell neoplasms; however, the incidence is so low that it cannot be estimated in the available literature. Ureter perforation is another frequent complication with an incidence ranging from 0 to 15.4%. False routes are another frequent complication that occurs when an instrument pierces the ureteral mucosa without penetrating the total thickness of the ureter wall. Its incidence is low and ranges between 0.4-0.9%. Finally, one of the most feared intraoperative complications is the damage or malfunction of the instruments, however, today this complication has become more anecdotal and the incidence is close to 0%. Among these factors are the malfunction of the laser fiber tip, the breakage of the fiber inside the ureterorenoscope and the breakage of the extractor basket ⁽⁷⁾.

Extracorporeal shock wave lithotripsy ((ESWL) is the most frequently used treatment modality due to ease of use and great acceptance by the patient ⁽⁸⁾. The great success in fragmentation and the minimum rate of complications, associated with its non-invasive and frequently ambulatory condition, explain that it still displaces widely all other therapeutic alternatives in urinary lithiasis⁶ with approximately 80-85% of the initial indications, ⁽⁹⁾ especially for non-complex calculi of the upper urinary tract, their resolution rates range from 33 to 97% ⁽¹⁰⁾.

Aim of the study: To compare the treatment outcomes of Flexible ureterorenoscopy and extracorporeal shock wave lithotripsy for patients with lower pole stones.

Patients and method:

Data base review for the patients in the period from 1st of Jan 2018 to the end of June 2019, in which 131 patients underwent interventions for the management of 10-20 mm lower pole stone. 67 patients were treated by ESWL and the rest (64) treated by F-URS.

All patients underwent CT scan preoperatively to determine the size and location of the lithiasis, as well as the assessment of the approach using URS Flex.

Technique

The patient's position should not be a very forced lithotomy to facilitate the passage of the protective

sheath and the F-URS in a simple way and as straight ahead as possible.

We usually start with the passage of a guide wire through the ureteral orifice until it reaches the renal pelvis or upper calyx and visualize the lithiasis with fluoroscopic control.

Subsequently, and through the guide wire, we pass a dilatation balloon catheter to dilate up to 15 Fr from the ureteral orifice to the iliac ureter in cases where necessary. This is due to the fact that the protective sheath usually has an external caliber of 13-14-15 Fr although the new thinner Flexible URSs allow a smaller caliber.

After dilating the ureter to the iliac junction, we will perform a retrograde ureteropyelography that helps us subsequently control the passage of the protective sheath of the F-URS that we use in all cases.

The protective sheath will be passed on the guide wire and will be housed in the renal pelvis. Subsequently we remove the obturator of the protective sheath with the guide wire, leaving only the protective sheath in renal pelvis and the bladder catheter.

The use of the protective sheath of the F-URS, which we use in all procedures, will not only help us improve visibility, maintain low intra renal pressures or facilitate the extraction of fragments, but also considerably lengthens the half-life of the F-URS Flex and it represents a considerable economic saving.

Once we are with the F-URS inside the renal pelvis, we will try to locate the lithiasis and direct it with the help of a basket to a location that allows us to work in a straight line as a superior calyx or renal pelvis.

Working in locations other than the lower calyx is not only important for comfort during litho fragmentation by working in a straight line, but also makes it easier for residual lithiasic fragments that may remain to be expelled spontaneously more easily.

The caliber of the laser fibers used can be 220 microns. This fiber does not allow you any degree of flexion and forcing it can favor F-URS breaks.

The 150-220 fiber allows you all the degrees of flexion that your F-URS has, better visibility by limiting less the wash flow with the counterpart of being able to use less laser power and greater fragility and ease of

fiber breakage with its additional cost.

The fiber of 220 microns is the one that we use in most cases, it limits you very few degrees and being of greater diameter, allows you greater contact area with the lithiasis and therefore the fragmentation of the lithiasis will take less time in addition to resist greater lithotripsy power and be a fiber more resistant to breakage by handling it. It is important to avoid as much as possible a blood medium since the F-URS washing channel and its flow do not allow a good visualization.

If this happens, we must increase the pressure of the inlet flow without fear of raising intra renal pressures because we always use the protective sheath of the F-URS and maintain a constant intra renal pressure.

Although we use a gravity irrigation system, on certain occasions we use a manual pressure increase using a 60 ml syringe connected to the URS Flex using a saline serum system.

Once the lithotripsy is finished, for which we start with 0.8 J and 6 Hz and we increase the energy of the laser depending on the hardness of the lithiasis, we must with the help of nitinol baskets without tip, extract the larger fragments through of the protective sheath avoiding the use of tweezers through the Flex URS that can favor its breakage.

ESWL Technique:

Patients were took analgesia by diclofenac injection.

In about 3000 shocks (80 shocks/minutes) in each session or we continue until the stone was completely crushed. Evaluation of the patients post ESWL by K.U.B. if stone radio opaque and ultra sound if stone is radiolucent to see if there is residual stone. The treatment may reach 3 sessions if there is observation of stone with inadequate fragmentation

Follow up:

After 3 months, urography or Uro-CT scan were done to the patients to see the outcome. At this time we can assess whether or not there is residual lithiasis and whether they require any type of treatment or not according to their condition. We compared between F-URS and ESWL regarding the treatment and complications rate, SFR, secondary and total number of procedures and duration time of operation.

Results

131 patients with lower pole renal stone with size 10-20 mm were enrolled in the current study, 86/131 were male and 45/131 were female with mean age for F-URS group (52±9.7 years) and (49.6±12.3 years) for ESWL group, with highly significant differences regarding the stone size between the studied groups. No significant differences were found between the studied groups regarding gender, side of stone, previous treatment of stone, opacity, age, and BMI of the patients (table 1)

Table 1: Pretreatment and demographic data of studied patients

N	F-URS (n=64)		ESWL (67)		P-value	
	%	N	%			
Gender	Male	43	67.2	43	64.2	0.8
	Female	21	32.8	24	35.8	
Side of stone	Right	30	46.9	31	46.3	0.9
	Left	34	53.1	36	53.7	
Previous Rx. of stone	URS	3	4.7	5	74.6	0.3
	ESWL	8	12.5	8	11.9	
	PNL	9	14.0	3	4.5	
	Open	2	3.1	3	4.5	
Opacity	Opaque	52	81.3	57	85.1	0.7
	Lucent	12	18.7	10	14.9	
Age (mean± SD)		52±9.7		49.6±12.3		0.2
BMI (mean± SD)		28.6±2.3		29.3± 3.5		0.1
Stone size(mm) (mean± SD)		15.3±1.5		14.2±2.1		<0.001

Table 2 show that there is no significant differences were found between the studied groups among stone H. density

Table 2: Association between the studied groups among H density

HD	F-URS (n=64)		ESW (n=67)		P value
	N	%	N	%	
> 1000	23	36.0	23	34.0	0.9 NS
<1000	41	64.0	44	66.0	

As shown in table 3, the treatment rate, operative time and procedure per patient were highly significantly decrease in F-URS group than in ESWL (p<0.001). Moreover, significant association were notice between the studied groups among SFR at 3 months and secondary procedures.

Treatment and post-treatment data for the studied patients

No.	F-URS (n=64)		ESWL (n=67)		P-value	
	%	No.	%	No.		
Retreatment rate	5	7.8	41	61.2	<0.001	
Stone-free rates (SFR) at 3 months	53	82.8	47	70.1	0.008	
Secondary procedures	ESWL	5	7.8	0	-	0.004
	F-URS	0	-	7	10.4	
Operative time (min)	75±31		96±36		<0.001	
Procedures per patient	1.3±0.7 Range (1-2)		2.2±1.4 Range (1-5)		<0.001	

The most common complication was UTI 9/19 (four patients in F-URL group and five patients in ESWL group), eight patients presented with severe pain (5 patients in F-URL group and 3 in ESWL group), and two patients presented with gross hematuria one in each group (figure 1).

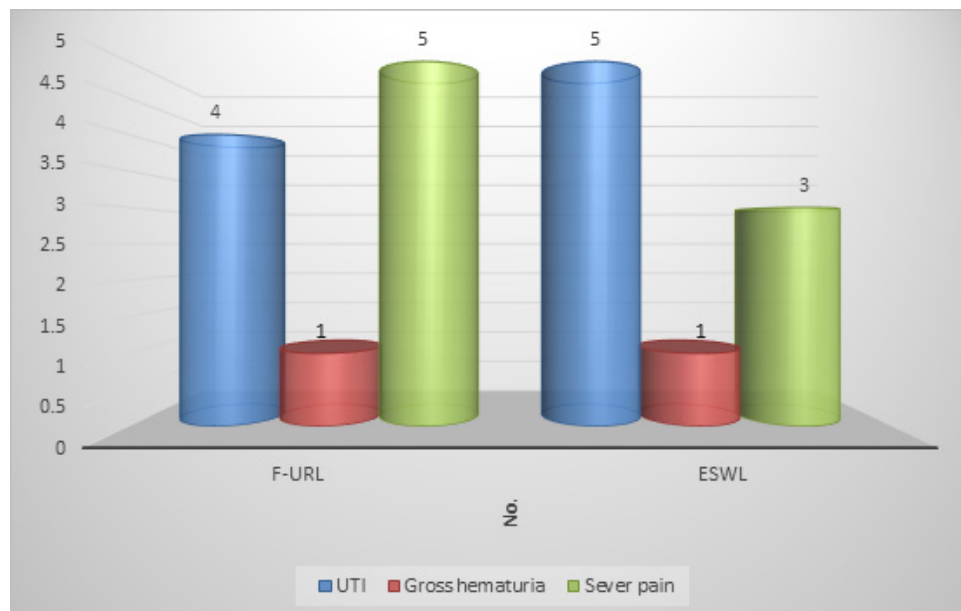


Figure 1: Complications

Discussion

Patients and physicians like highly the ESWL way for treatment of renal stone as it is non-invasive procedure despite lower SFR and high percentage of retreatment procedures^(11,12), which is considered by many of them (physicians) as first line renal stone treatment.^(13,14,15)

In spite of highly significant increase of the stone size in F-URS group than that in ESWL group we noticed that the retreatment rate were highly significant decrease in first group which is considered as most important finding in the current study.

SFR at 3 months were better in F-URS technique than that by ESWL with significant association, while in a study carried by Kumar A et al, the SFR at 3 months were better in F-URS (86.6%) than that in ESWL (82.2 %) but with no significant association^(16,17). Moreover, it is similar to that found by Pearl et al, but with no significant differences⁽¹²⁾.

In the present study we found that urinary tract infection is the common cause of complications in ESWL and sever pain in F-URS, while in study carried by Kumar A et al, the common complication found in ESWL was sever pain and UTI in patients treated with F-URS.

In a Cochrane analysis, study carried by Srisubath et al (2009) revealed that in three ways of renal calculi stone treatment the ESWL had the lowest efficacy than PCNL and URS but with no significant differences. Moreover shorter period of stay in hospital were found in ESWL than other two procedures, and these three treatments (ESWL, F-URS, and PCNL) looked to offer a good chance of rendering the patient stone free in one session⁽¹⁸⁾.

Conclusion

Lower pole renal stone in size between 10-20 mm treated successfully and more efficiently by F-URS in comparison with ESWL.

Conflict of Interest: None declared.

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Ethical Clearance: was taken from the scientific committee of the Iraqi Ministry of health.

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The Effect of Glutathione versus Co-Enzyme Q10 on Male Infertility Original Study

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Abstract

Background: Worldwide, numerous people are affected with the infertility problem. Especially married people find it the most stressful problem that can also cause psychological issues. Glutathione is a naturally produced oxidant that is quite useful to preserve other antioxidants. The level of glutathione varies from person to person. It plays a significant role to enhance the sperm motility pattern. Some men who are suffering from infertility problem because of andrological pathologies, the glutathione can eliminate such issues because of therapeutic effect. Men, who have a lower amount of Q 10 in the seminal fluid, experience the slow motion of the sperms. According to various studies, the increase in the quantity of Q 10 automatically enhances the motility of the sperm.

Material and Method: The presented prospective randomized placebo-controlled study was conducted in Saladin province of Samarra city (Iraq) between Jan 2016 to Dec 2018. The study deployed 51 infertile male subjects for the administration of oral glutathione (250mg sachets) for tenure of 6-months. Another group of patients 50 received oral Co-enzyme q 10 (200 mg sachets) for 6 months, a third group received a placebo (sugar sachets) for another 6 months.

Results: The results revealed oral glutathione and co-enzyme q 10 as an effective treatment for improving the sperm parameters (motility, morphology, sperm concentration) which were statistically significant except for semen volume where P value was > 0.05 . Also, this study showed no statistical significance between the use of glutathione and co-enzyme q 10 as a single agent therapy ($P>0.05$).

Outcomes: From this study, we can conclude that both glutathione and co-enzyme q 10 are effective treatment options for improving sperm motility, morphology and concentration

Key words: male infertility, glutathione, co-enzyme, Q10, sperm motility

Introduction

With the passage of time, the infertility rate is being increased in males. There are various reasons for infertility problem. According to the current estimation,

15% of couples are facing infertility problem around the world. Most of the time, there is not a single reason has been identified as infertility. About 20-30% of the infertility cases are identified in males. The major cause of infertility in males is associated with sperm disorder. Some other causes include genetic defects, undescended testicles, and various health issues, i.e. HIV, gonorrhea, mumps, and chlamydia. Infertility in males can be diagnosed with different signs and symptoms (1). Different men exhibit different signs and symptoms. For instance, some show variation in the sexual desires that are directly related to the health of fertility. Some experience pain and swelling in the testicles. An erection

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problem is also common in males who are suffering from infertility (2). Presently, male infertility can be treated with the help of medication by diagnosing the core reason for infertility such as erectile dysfunction or hormonal imbalance (3).

Glutathione is present in the cells of mammals and it is a tripeptide thiol, which is a non-protein sulfhydryl compound. It consists of three amino acids named glutamine, cysteine, and glycine. During the oxidative stress, the glutathione uses the power by the cells to act as a defensive appliance against oxidative destruction. There are two types of Glutathione, i.e. GSH and GSSG. Glutathione is present not only in somatic cells but also in germ cells. The defensive mechanism is consist of enzymatic and non-enzymatic functions, characterized by the Glutathione. In males, the deficiency of Glutathione results in the dysfunction of the central part of the sperm that ultimately results in the defective sperm movement. Glutathione protects the spermatozoa plasma membrane by forming a protective layer (4). As per previous researches, it is proven that Glutathione has the ability to maintain the biological importance of the germ cells (5). Men, who are suffering from genital tract inflammation, unilateral varicocele, and sperm dysfunction can be cured with the help of Glutathione.

The coenzyme Q 10 is a nutrient produced in the body in a natural way. It is also present in different food items. The main function of the Coenzyme Q 10 is that it performs like an antioxidant. It defends the cells of the body from any destruction and plays a key role in metabolism (6).

In the initial studies, many researchers have found that coenzyme Q 10 supplementation is quite beneficial to treat the infertility problem in males. Some males are suffering from low sperm count. It not only helps to increase the sperm count but also enhances the mobility so the sperms become efficient enough to enter the egg. About 200-300 mg Coenzyme Q10 intake is beneficial to eliminate infertility problem (7). With the help of Coenzyme Q 10, the sperm quality becomes better.

Aim/Objective

The aim of the present randomized placebo-controlled study is to identify the efficiency of Glutathione and Coenzyme Q10 in increasing the sperm motility rate. The quantitative research enhances the possibility of the Glutathione and Coenzyme Q10 efficacy related to motility, morphology, and concentration of the sperms.

Background Literature

According to various studies, male fertility is improved by the effect of ubiquinone. The motility, morphology, and concentration of the sperms get better with the help of Coenzyme Q10 action in an oxidized form. The reduced form of Coenzyme Q10 characterizes around 90% of the Coenzyme Q10. As per different experimental results, it has been noted that the low dose of Coenzyme Q10 that is 90mg per day for a duration of 12 weeks is quite effective to enhance the quality of sperms (8).

Another research revealed that the high dose of Coenzyme Q10 that is 300 mg per day for about 12 weeks is effective enough to treat the infertility issues in males because it has a powerful effect of antioxidant. According to the research conducted by Gyozdjaova, it has been revealed that the combination of carnitine and ubiquinol is very effectual to treat the male infertility problem by increasing the function of mitochondria in the sperms (8).

A randomized placebo-controlled study was conducted to observe the effect of Coenzyme Q10 on sperm concentration. It has been observed that the Coenzyme Q10 has a protective effect and it acts as a shield against oxidative stress to enhance the morphology as well as the concentration of the sperms. It took duration of 3 months to get significant outcomes. Another research was conducted by Nadjarzadeh, it is based on a double-blind placebo-controlled experiment. It has been observed that Coenzyme Q10 has no significant effect on sperm quality or concentration (9).

In human beings, the low quantity of the glutathione in the seminal fluid leads to the abnormality of the sperms because of the low level of glutathione ultimately unstable the middle portion of the sperm that effects the motility rate of sperms (10). The high dosage of Glutathione 600mg per day is proved to be effectual enough to treat the infertility disorder in males (9).

In the study conducted by Yarosh and colleagues, the role of glutathione S-transferase has been observed in idiopathic male infertility. There were three gene polymorphisms have been selected that include GSTM1, GSTT1, and GSTP1 to analyze their effect on the Russian men who are suffering from idiopathic infertility. 203 samples of DNA were collected from 203 infertile males and 227 DNA samples were collected from 227 fertile males. The PCR-Restriction Fragment Length

Polymorphism technique was applied in the research. It has been noted that GSTMI, GSTT1, and GSTP1 genes are responsible to develop idiopathic infertility in men⁽¹¹⁾. It has been noted that smoking is the major cause of its phenotypic effect that can be associated with the risk of infertility disorder.

Material and Method

Participants

The present randomized placebo-controlled clinical trial was conducted in Saladin province of Samarra city (Iraq) between Jan 2016 to Dec 2018. The study deployed 51 infertile male subjects for the administration of oral glutathione (250mg sachets) for 6-months. Another group of patients 50 received oral Co-enzyme q 10 (200 mg sachets) for 6 months, a third group was taken a placebo (sugar sachets) for another 6 months. All patients included in this study were of a normal female factor with idiopathic oligoasthenoteratozoospermia, patients with a chronic disease like mumps, hydrocele, neoplasm, trauma from prolonged riding, hypospadias, vas deference obstruction, varicocele, and genital tract infection were excluded from this study, also those who received treatment recently. Patients were from 30-40 years old. Before the start of the study, semen samples were taken for all three groups for baseline assessment. Another assessment was done at the end of the 6 months period. All samples were given to a lap. Within 20

minutes, the interpretation was done in accordance with the WHO 2010 criteria⁽¹²⁾, semen morphology was done according to Kruger criteria⁽¹³⁾. Data analysis was undertaken through SPSS 23.0 in the windows interface. Mann Whitney U-test, Kruskal–Wallis test, and chi-square test were used when needed for assessing the data significance for P value <0.05.

Informed Consent

Informed consent was obtained from all study subjects while categorically explaining them the interventions, objectives, and concerns. After taking the informed consent of the research participants, the data were collected.

Semen samples were taken for all three groups for baseline assessment. Another assessment is done after the end of six months duration. Semen morphology was performed as per Kruger criteria. Moreover, the precipitation and centrifugation were carried out to assess the seminal plasma of Glutathione and Coenzyme Q10 with the help of Ellman technique.

Several interactive interviews were conducted to get the informed consent of the participants of the current research. Some of the essential data were collected from the participants while taking the interview that includes age, marriage time, job type, and social habits.

Results

Table (1) showing the characteristic of patients before start of therapy:

Domains	Co-enzyme q 10 group (n=50)	Glutathione group (n=51)	Placebo group (n=50)	P value
Age (years)	32.2±10.2	31.4±11.6	30.1±7.6	>0.05
% of normal Motility (grade a+b)	28	26	28	>0.05
Sperm Concentration (million per ml)	50.4±12.3	50.2±10.1	51.5±8.2	>0.05
% of normal Morphology (kruger criteria)	10	12	10	>0.05
Semen Volume (ml)	2.24±1.23	2.25±0.85	2.21±0.92	>0.05

This table shows that there is no significant statistical difference among study parameters before the start of the study.

Table (2) showing percent of improvement of semen parameters at the end of the study after 6 months of different treatment interventions.

Domains	Co-enzyme Q10 group (n=50)	Glutathione group (n=51)	Placebo group (n=50)	P value
% of motility improvement	36	38	4	P=0.01
% of morphology improvement	28	24	6	P=0.03
% of concentration improvement	24	26	2	P=0.01
% of volume improvement	6	4	4	P>0.05

This study outcome revealed oral glutathione and co-enzyme q 10 as an effective treatment for improving the sperm parameters (motility, morphology, sperm concentration) which were statistically significant except for semen volume where P value > 0.05. Also, the study showed no significant statistical difference between the use of glutathione and coenzyme q10 as a single agent therapy (P >0.05)

Discussion

The infertility problem in men is because of defective mobility, concentration, and morphology of sperms. Such types of factors are very susceptible to the free radicals that are oxygen molecules and consisted of one or more additional electrons. As per statistics, around 25% of the males are affected with the infertility issues worldwide. There are various reasons that affect the spermatogenesis process such as nutrition, environment, genetics, and physiological issues ⁽¹⁾.

A study conducted to treat the Iraqi infertile men. In the study, around 60 males were selected. The semen was obtained from the participants and it was divided into three categories. The first category is in vitro sperm characterization, the second category utilized density gradient centrifugation technique and in the last category, the combination of density gradient centrifugation and TAD 600mg Glutathione is used ⁽¹⁴⁾. It has been concluded that TAD 600mg Glutathione had a very positive effect to enhance the quality and function of sperms.

Another study was conducted by Trang and his colleagues; the idiopathic male infertility was analyzed in the Vietnam males. 300 blood samples were collected in which 150 were control samples and 150 were infertile samples. The aim of e research is to identify two common SNPs that are associated with infertility. It has been revealed that NAT2 and GSTP1 are susceptible to cause infertility in males ⁽¹⁵⁾. Such genetic markers will be useful to investigate the cause of infertility in future researches. Research accompanied by the Kolesnikova and his colleagues. They have observed the Glutathione effectiveness on the men who are suffering from infertility issue. It has been found that a balanced amount of Glutathione is essential for proper functioning ⁽¹⁶⁾. Without a balanced quantity of Glutathione, the detoxification of toxic substances will not be possible. To cure infertility in men, it is better to balance the glutathione level in the body. The study conducted by Sinha in 2018 to analyze the role of antioxidants in male infertility, it has been revealed that glutathione has a promising effect as a defensive mechanism ⁽¹⁷⁾. It has the ability to cure the reproductive damage that is caused by ROS.

According to the research carried out by Ring and his colleagues, the contribution of the male infertility issue is about 50-60% in whole infertility. In most of the cases, the abnormal semen results in the infertility problem in males. The efficiency of the Coenzyme Q10 has been proved to play a major role to treat the males' infertility ⁽¹⁸⁾. The supplementation of Coenzyme Q10 is very effective to treat sperm concentration and quality.

A small study conducted in which azoospermic males were selected for the experiment. 183 patients were selected for the study. It has been observed that coenzyme Q10 has a quite positive effect on the experimental group who were treated with coenzyme Q10⁽¹⁹⁾. The motility and morphology of the sperms were enhanced significantly after getting the treatment. The current study indicates the significant improvement in the quality, quantity, morphology, and concentration of sperms with the treatment of glutathione and coenzyme q10.

Conclusion

From this study, we can conclude that both glutathione and co-enzyme q 10 are effective treatment options for improving sperm motility, morphology and concentration. There is no statistical difference between them as a single agent therapy; the researchers need to investigate the scope of co-administering other antioxidants like carnitine, selenium, and vitamin B complex with oral glutathione or co-enzyme q 10 to minimize the prevalence of male infertility in the selected population.

Conflict of Interest - (nil – There are “No Conflict Of Interest”).

Source of Funding - By all

Ethical Clearance: Committee members are approved to perform a study about:

“The Effect of Glutathione versus Co-Enzyme Q10 on Male Infertility Original Study”

After discussion of study plan with researchers:

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Incidence and Variations of Aberrant Renal Arteries in Kidney Donors Cases

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Abstract

The origin of renal arteries, vessel diameter, and point of entry to the kidney has all been analyzed as potential parameters which are a clinically relevant issue. This anatomical feature may be essential for fully understanding the process of renal perfusion, as it is not only the number of renal arteries that influences the extent of renal blood supply, also their diameter. The aberrant renal arteries that supply the inferior pole are more important because it provides arterial supply to the proximal part of the ureter. The objective of this study is to identify influences and prevalence of aberrant renal arteries of the kidney donors' cases to perform role of the aberrant renal artery.

Prevalence of aberrant renal artery was identified in 26.3% of the cases, incidence was more frequent in left than right side; about 78.7 % of cases presented unilaterally. The remaining cases 21.2 % were RAs presented bilaterally. Diameter of main RA in kidney presenting the RA was 5.73 mm and that of kidney with only single renal artery was 6.19 mm.

Keywords: Aberrant renal artery, renal arterial variations, renal angiography, kidney, incidence.

Introduction

As a wide range of renal vascular variations has been reported by anatomists and radiologists; prevalence of these variations is extremely divergent in various populations. Historically, first recorded aberrant renal artery (aRA) was reported by Eustachius ^[1] in one of his famous plates which remained unprinted in Papal Library until 1714. Since then various cases of aRA have been reported; including variations in origin, number, and branching pattern of renal arteries ^[2&3]. Therefore, as much as larger samples studied will give more clarifications and changes ^[3].

aRA defined by presence of more than one renal artery (RA) supplying kidney which may arise from aorta; above or below of main RA ^[2, 4&5], or may arise from coeliac, superior mesenteric ^[2], inferior mesenteric, and common iliac arteries ^[2&3]. name "aberrant" described in literature whereby additional artery branches from abdominal aorta either superior or inferior to main RA and enters kidney directly through the capsule at the upper or lower poles of the kidney, or as "accessory" whereby it enters the hilum directly. Anatomical variants in the renal vasculature considered

being extremely common variants ^[1, 6&7]; the prevalence of aRAs are found in 30% (ranging 20-30%) of the individuals ^[2-5].

Embryologically, as the kidneys ascend from the pelvis during the embryological development, they receive their blood supply initially from common iliac arteries. Later, they receive new branches from the aorta, and the inferior branches disappear. This continuous generation and degeneration of renal arteries as the kidney ascend explains the high incidence of the variations in the blood supply to the kidneys. Therefore, the complicated embryology variations of this organ are relatively higher when compared with the others ^[8&9].

The main objectives and aims identify the prevalence and variation of the aberrant renal arteries of the kidney donors' cases, as they had been regarded as perfect normal cases for the study. Determine the anatomy and topography of the aberrant artery and main renal artery donor kidneys and preserving total donated kidney function.

Material and methods This study was designed to determine the main RAs and aRAs including its morphometric and location on each side in kidney

donors. A double-blinded prospective and retrospective angiographic and morphometric imaging study performed on one hundred and eighty-four (184) potential prospective living kidney donors. This study was conducted from December 2018 to May 2019 at the radiology and imaging centre in Zheen International Hospital in Erbil city, Iraq. Only the cases that fit for the donation were selected medico-legally. This study was approved by the research ethics committee of the college of medicine, and written consent was received from the cases. Regarding the contrast media allergy cases, no hypersensitivity cases were recorded, other than some simple cutaneous rashes in two cases which need no interferences.

Computed Tomographic Angiographic (CT-Angiographic) imaging for the cases performed according to the four-phase protocol; which include an initial non-contrast image acquisition phase, followed by arterial phase, nephrographic phase, and excretory phase (delayed phase). The perfect anatomic coverage for CT-Angiography was extended between the dome of the diaphragm and the distal portion of the common iliac arteries or pelvic region. The dynamic CT-Angiography examination was performed with a 128-slice CT scanner (Somatom Definition AS+ 2012, SIEMENS Healthcare, and Germany) such that four phases were covered.

Finally, all images were reconstructed and analyzed by Syngo program (Siemens Healthcare, Germany). In 3D CT-Angiography, the VRT, MRP and MIP images were used for evaluation of the renal arteries. Regarding the RAs morphometry (diameter); retrospective analysis of the RAs of all the kidney donors was carried out in a double blinded fashion and measured at the aortic origin. To carry out the analysis of renal arteries variations and diameter based on the type of arterial blood supply present, the total number of the kidneys and arteries were established and then divided into different groups according to the following criteria; Gender, Side, Anatomic eRA – early branch renal artery, a single renal artery originating from the aorta and giving branch before reaching renal hilum and supplying poles, hilum of the kidney, and extra renal organs.

Statistical Analysis

Statistical analysis of the current study data was done by using social package for scientific statistic (SPSS) software version 24 (IBM Corporation, Armonk, New York, USA).

Result: The CT-Angiographic findings analyzed in one hundred and eighty-four (184) cases i.e. three hundred and sixty-eight (368) bilateral kidneys were enrolled in this study. Cases are distributed between 128 males and 56 females. Participants' age ranged between 19-61 years for males and 19-58 years for females. The mean age of males is (24.05 ±6.4) years, and the females mean age is (28.12 ±7.9) years; which there are no statistically significant differences between these two groups (t-test, P= 0.961).

The incidence of only single RA is identified in 271 (73.64%) out of 368 kidneys. Whereas the renal arterial variations i.e. aRA were identified in 97 (26.3%) out of 368 kidneys.

Accordingly, the incidence of aRA on the right side is 38 (20.7%) out of 184 kidneys. While on the left side, the incidence is 59 (32.1%) out of 184 kidneys. There are statistically significant differences between the left and right side, as the incidence of aRAs were more frequent in the left than the right side (Chi-square test, P= 0.001)

The distribution of RAs that are supplying the right kidney classified as follow:

- a) Only one
- b) single renal artery is identified in 149 (79.3%) kidneys.
- c) Double renal arteries (one main RA and one aRA) were identified in 37 (20.1 %) kidneys.
- d) Triple renal arteries (one main RA and two aRA) were identified in 1 (0.5 %) kidney which considered one of the rare cases.

Regarding the left side, number of RAs that supplying the kidney distributed as follow:

- a) One single renal artery was identified in 125 (67.9 %) kidneys.
- b) Double renal arteries (one main RA and one aRA) were identified in 53 (28.8 %) kidneys.
- c) Triple renal arteries (one main RA and two aRA) were identified in 5 (2.7 %) kidneys.

Importantly, one rare case recorded in this study in which the left kidney supplied by quaternary renal arteries (one main RA and three aRA) were identified in 1 (0.5%) kidney. Therefore, a statistically significant

difference between the left and right side, as the incidence of multiple RAs were more frequent in the left than the right side (Chi-square test, $P= 0.001$). demonstrating the RA and aRAs. Regarding the prevalence of the renal arteries among genders. Although there were large differences in aRAs frequency between males and females (more frequent in males) in the current study but these differences were not statistically significant (Chi-square, $P= 0.663$)

Among the 80 cases with aRAs, 63 (78.7 %) cases presented unilaterally. The remaining cases 17 (21.2 %) were the aRAs presented bilaterally. There is a statistically significant difference between groups with respect to the symmetricity were unilateral incidence was higher than bilateral incidence (Chi-square test, $P< 0.001$).

Regarding the origin of renal arteries, the total arteries that are originating from the aorta and other sources supplying the right kidney are 223 renal arteries distributed as 184 of single main RAs and 39 aRAs. In the left side, the total number of the renal arteries were studied are 249 renal arteries originating from the aorta and other sources distributed as 184 of single main RAs and 65 aRAs. Regarding the rare cases, only one (2.5 %) aRA was originated from the superior mesenteric artery was identified in the right side. In the left side, only one (1.5 %) aRA was identified to originate from the left common iliac artery. Table 1 summarizing the origin of renal arteries from the aorta and other sources.

Table 1: Distribution of renal arteries origin.

	Single RA (n.)	(%)	aRAs (n.)	(%)
Right side origin				
Aorta	184	100	38	97.4
Superior mesenteric artery	0	0	1	2.5
Right common iliac artery	0	0	0	0
Total	184	100	39	100
Left side origin				
Aorta	184	100	62	95.3
Trunk of inferior mesenteric artery	0	0	2	3
Superior mesenteric artery	0	0	0	0
Left common iliac artery	0	0	1	1.5
Total	184	100	65	100

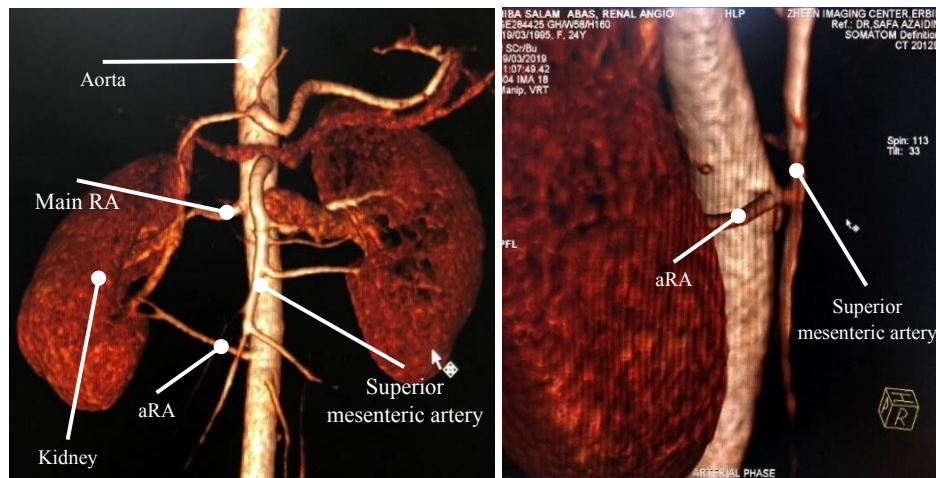


Figure 1: One of the rare cases demonstrating the aRA arising from superior mesenteric artery and merge with aorta and forming one artery supplying the lower pole of the right kidney.

The entrance of the main renal artery and aberrant renal arteries to the kidney:

The RAs that’s entering the kidney either to the kidney hilum or lower and upper poles calculated based on the total number of RAs supplying kidneys. In the right side, the number of arteries supplying the kidney is

223 RAs. All the single main RAs 184 (100%) was found to enter the kidney through the hilum. In the left kidney, the number of arteries supplying kidney is 249 RAs. All the 184 single main RAs enter the kidney through the hilum. Regarding the aRAs, Table 2 summarizing the distribution of aRAs position to the kidneys:

Table 2: distribution of aberrant renal arteries Entrance to the kidneys.

Position to the right kidney	n.	(%)
Lower pole	23	58.9
Upper pole	6	15.3
Hilum	9	23
Upper pole and hilum	1	2.5
Total	39	100
Position to the left kidney		
Lower pole	36	55.3
Upper pole	19	29.2
Hilum	9	13.8
Upper pole and hilum	1	1.5
Total	65	100

No stable course observed in aRA as out of 59 cases with aRAs in the left side, a group of variations in the course of aRAs was seen in this study:

1) The left aRA originating from the aorta (just above main RA) and crossing the main RA to supply lower pole of the kidney instead of the upper pole that’s demonstrated as nine cases (15.2 %) (Figure 2).

2) Regarding the right side, only one case (2.6 %) out of the 38 cases with aRA presented the crossing pattern; in which the aRA originating from the aorta and above the main RA then crossing it and enter the kidney hilum.

3) Two cases (3.3 %) demonstrating the aRA originating from the same trunk of the inferior mesenteric artery (Figure 3)

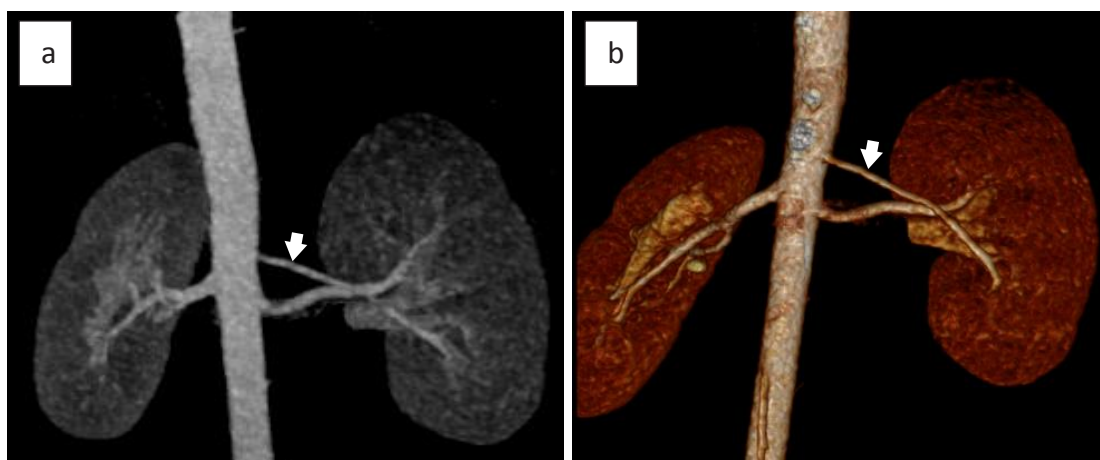


Figure 2: (a) and (b) showing the aRA (white arrow) arising just up to the main RA and crossing it to supply the lower pole of the left kidney.



Figure 3: The left aRA (white arrow) arising from aorta at the same trunk of inferior mesenteric artery (red arrow).

Regarding the eRA, in the right side, one tiny artery demonstrated in two (7.4 %) cases that were branching into two branches, first one reaching the pericardial area and the second one reaching the right diaphragm area supplying the right dome of the diaphragm. In the left side, a one (5.2 %) tiny eRA was reaching the left diaphragmatic curs.

Relationship between the aberrant renal artery and the diameter of the main renal artery.

Table 3 summarizing the diameter of main RA in case the presence of aRAs or not. However, on the right side, the diameter of the main RA in kidney presenting the aRA was significantly less than that of the kidney with single main RA (t-test, P= 0.006). Regarding the left side, the diameter of the main RA in kidney presenting the aRA was significantly less than that of the kidney with single main RA (t-test, P= 0.01).

Table 3: Summarizing the diameter of main RA in case presence of aRAs or not.

Symmetry	No.	Mean diameter of main RA (mm)	SD	P
Right side				
aRAs present	38	5.60	1.12571	0.006
aRAs not present	146	6.12	0.99664	
Total	184	11.73	2.12235	
Left side				
aRAs present	59	5.87	1.00817	0.01
aRAs not present	125	6.27	1.01004	
Total	184	12.1514	2.01821	

No.: number of cases, aRAs: aberrant renal arteries, (mm): millimeter, SD: standard deviation.

Discussion

Variations in the renal arteries are common, this explained by the development of the mesonephric arteries that's degenerates leaving only one mesonephric artery. Failure in degeneration of other mesonephric arteries results in an aberrant renal artery. This study is the first work in Iraq deals with aberrant renal arterial variation in details covering 184 kidneys donors' cases with medicolegal acceptance in Erbil city. This study showed the prevalence of aRAs of 26.3% compared with 20.2% in another angiographic study in Iraq [12] and within established ranges (20-30%) by most authors and textbooks [2&5]. The frequency of multiple renal arteries varies widely with ethnicity [13]. According to Gulas et al., the range of the frequency of multiple renal arteries depending on ethnicity is between 4% (Malaysians) and 61.5% (Indians) [14]. In the Polish population, the variability of multiple renal arteries seems to be between 11.2% and 38.3% [15]. This difference can be explained by the wide range of the prevalence of aRAs as showed by Satyapal et al (9-76%, average 28%) [13].

In this study, the entrance of aRAs to the kidneys was also studied. In the right side, 58.9% of the aRAs enters the lower pole of the kidneys, 23% of aRAs enters through the hilum, 15.3% enters the upper pole of the kidney. Regarding the left side, 55.3% of the aRAs directed toward the upper pole, and 29.2% passing to the upper pole, and 13.8% of the aRAs enters through the hilum. These findings matched with Alghizzi findings but the percentage lower than current study; Alghizzi reported the most of the aRAs was an inferior polar artery in 63.6% [12]. But present study findings disagreed with findings reported by Mustafa et al in which the results showed most of aRAs are pass through the hilum 53.62%, about 32.85% of the arteries enter the upper pole, and only 13.53% of the arteries enter the lower pole of the kidney [20]. Rarely, in the right side, only 2.5% aRA gives branch to upper pole and hilum of the kidney. Regarding the left side, only 1.5% of aRA gives branch to upper pole and hilum of the kidney.

There were variations in the course of aRA as interestingly, the left aRA originating from the aorta just above main RA and crossing it to supply lower pole of the kidney instead of the upper pole that's demonstrated as cases 15.2% . Regarding the right side, only 2.6% of the cases with aRA presented the crossing pattern; in which the aRA originating from the aorta and above the main

RA then crossing it and enter the kidney hilum. About 3.3% of the cases demonstrating the aRA originating from the same trunk of the inferior mesenteric artery (Figure 3).

Conclusion: This study concluded that:

1. The prevalence of aberrant renal arteries is 26.3% of Iraqi population.
2. Regarding the incidence side, it's more common in the left side (32.1%) than the right side (20.7%).
3. Presence of aberrant renal artery will affect the diameter of main renal artery; in which the diameter of the main RA in kidney presenting the aRA was significantly less than that of the kidney with single main RA.
4. No stable course observed in aRA in which the aRA originating from the aorta just above main RA and crossing the main RA to supply lower pole of the kidney instead of the upper pole.
5. Regarding the early branch renal artery, in the right side a one tiny eRA branching into two branches, one tiny artery reaching the pericardial area; and another artery that's reaching the right diaphragm area Source of Funding- Self

Ethical Clearance – Not required

Conflict of Interest: None.

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Evaluation of the Level of CXCL10 in Patients with Parainfluenza Virus Type III (HPIV3)

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Abstract

Acute respiratory illness could be caused by Human parainfluenza viruses (PIVs) in children, the old, and immunocompromised patients. The frequent and common cause of pneumonia and bronchiolitis is PIV3, whilst the upper respiratory tract illness and croup are frequently caused by PIV1 and PIV2. However, this study aimed to highlight a group of patients with type III influenza virus. 29 sample took from people suffering from upper and lower respiratory diseases as well as 27 control sample to assessing the level of a type of cellular motility in their catheter, cimclin cxcl10 by the use of ELISA. The study also showed that there were no significant differences between Male Injury Rate Now as well as an inverse relationship between the level of cimokin cxcl10 and age. Moreover, this study showed an increase in the level of cimcin cxcl10 in the case of HPIV infection compared with the control group.

Keywords: CXCL10; HPIV3; Respiratory infection

Introduction

Human parainfluenza viruses (HPIVs) are among the most common cause of acute airway illness in children, the elderly and immunocompromised patients ⁽¹⁾the elderly, and immunocompromised patients. PIV3 is a common cause of bronchiolitis and pneumonia, whereas PIV1 and 2 are frequent causes of upper respiratory tract illness and croup. To assess how PIV1, 2, and 3 differ with regard to replication and induction of type I interferons, interleukin-6, and relevant chemokines, we infected primary human airway epithelium (HAE. HPIV consists of four major serotypes, PIV4 is a common respiratory pathogen which is alike to PIV3 in clinical demonstration ⁽²⁾, whilst the upper respiratory tract illness and croup are frequently caused by PIV1 and PIV2 ⁽¹⁾the elderly, and immunocompromised patients. PIV3 is a common cause of bronchiolitis and pneumonia, whereas PIV1 and 2 are frequent causes of upper respiratory tract illness and croup. To assess how PIV1, 2, and 3 differ with regard to replication and induction of type I interferons, interleukin-6, and relevant chemokines, we infected primary human airway epithelium (HAE. Due

to optimal viral replication inside epithelial cells of the respiratory tract. HPIV3 is the common frequent in the worldwide amongst the four familiar serotypes that cause of hospitalization respiratory illness. Notwithstanding this high difficulty of illness, there is not any authorized vaccine or therapy to handle or even limiting this high difficulty of illness ⁽³⁾.

HPIV-3 is a virus which belongs to the Paramyxoviridae group, non-segmented, an enveloped as well as negative sense RNA virus ⁽⁴⁾non-segmented, negative sense RNA virus that belongs to the Paramyxoviridae family. HPIV-3 is a common cause of bronchiolitis and pneumoniae in children less than 1 year of age and one of the leading causes of acute lower respiratory tract infections in children under five years of age. In Israel, the epidemiology of HPIV-3 infections is not well characterized. In this study, epidemiology and molecular characterization of HPIV-3 was performed on patient samples collected between January 2012 and September 2015. Nasopharyngeal swabs (N= 15,946. HPIV-3 infecting lower airway epithelial cells induces bronchiolitis and pneumonia in children less than one year of age and one of age and it is considered as the leading cause of acute lower respiratory tract infections in children under five years of age ⁽⁴⁾non-segmented, negative sense RNA virus that belongs to the Paramyxoviridae family. HPIV-3 is a common cause

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of bronchiolitis and pneumoniae in children less than 1 year of age and one of the leading causes of acute lower respiratory tract infections in children under five years of age. In Israel, the epidemiology of HPIV-3 infections is not well characterized. In this study, epidemiology and molecular characterization of HPIV-3 was performed on patient samples collected between January 2012 and September 2015. Nasopharyngeal swabs (N= 15,946. ⁽⁵⁾ reported that HPIV3 may lead to asthma exacerbations in children and adults. Respiratory viruses contributing to the pathophysiology of lower and upper respiratory disorders by invading the epithelium activate innate immune response and induce inflammatory cytokines release. However, the effects of HPIV3 infection have not been well-defined on nasal epithelial cells (HNECs).

Chemokines are small, structurally related proteins, one of them is the chemokine interferon- γ (IFN- γ) inducible protein CXCL10 and also called IP-10 is a 10 kDa protein, which is functionally categorized as a T helper 1- (Th1) chemokine. Furthermore, CXCL10 is a member of the CXC chemokine which is the ligand of CXCR3, and regulates immune responses through the activation and recruitment of leukocytes, such as, T cells, eosinophils, and monocytes to induce chemotaxis, apoptosis, cell growth and angiostasis (6).

Alterations in CXCL10 expression levels have been associated with inflammatory diseases such as immune dysfunction, infectious diseases, and tumor development. According to (7), the severity of various diseases can be predicted as well as recognized through CXCL10. Th1 orientated immune response is the special case of the host immune response that can be determined through CXCL10 level in blood. According to (8), CXCL10 is stimulated through Tumor necrosis factor- α and IFN- γ which is produced by Th1 lymphocytes in inflamed tissues recruited. The common abundant chemokines induced are The T cell chemoattractants CXCL11 and CXCL10. Differences in replication and cytokine secretion might explain some of the differences in PIV epidemiology and serotype-specific pathogenesis(1)the elderly, and immunocompromised patients. PIV3 is a common cause of bronchiolitis and pneumonia, whereas PIV1 and 2 are frequent causes of upper respiratory tract illness and croup. To assess how PIV1, 2, and 3 differ with regard to replication and induction of type I interferons, interleukin-6, and relevant chemokines, we infected primary human airway epithelium (HAE. In order to adequately recognize determinants of variability of immune responses to respiratory virus infections of

airway epithelial cells in patients, this study focused mainly on understanding of the role of CXCL10 in HPIV3 infected patients.

Materials and Method

Blood samples

Blood samples were collected from people suffering from upper and lower respiratory diseases. The samples were collected from Al-Sadr Teaching Hospital and Al-Hakim General Hospital in Najaf Governorate. 5 mL of venous blood was withdrawn using a sterile syringe placed in a test tube containing no anticoagulant. The blood was then left at room temperature for half an hour; the serum was then removed from the rest of the blood components using a sterile microbial. It was distributed in five Pendrove tubes and 200 microliters per tube for the purpose of avoiding melting. , And was frozen (20-m) until the test (9).

Method

The antibodies against Parainfluenza (IgM) was determined in patients' and control urine, using ELISA technique , the test was performed according to the method reported and supplied with the VIRCELL test kit.

The number of tests used by Ray Biotech was used to measure the quantitative level of the public health laboratory in Najaf Governorate, as follows: The double-check factor and the human control factor (CXCL10) are studied in serum samples and by the associated immunosorbent system (Sandwich ELISA)

Statistical Analysis

The data were analyzed statistically using computerized SPSS v.24. Non-parametric tests has been used for variables that were n't followed the normal distribution such as Kruskal-Wallis Test (Multiple Comparisons) and Mann-Whitney Test, and Chi-square Test. ANOVA has been employed for variables that followed the normal distribution. Also, Microsoft Excel 2016 has been adopted to build histograms and figures of the correlation test. Data were expressed as (mean \pm SE), statistically significant at p-value 0.05.

Result and Discussion

Many studies have focused on HPIV-3 infection in children because of high positive rate and morbidity of

HPIV infection in kids⁽¹⁰⁾, therefore less is known about HPIV2 and HPIV-3 infection in adults.

In this study, 88 blood samples were collected from hospitalized HPIV-3 patient suffered from upper and lower respiratory airway after clinical diagnosis by the specialist doctor. The samples were collected from Al-Sadr Teaching Hospital and Al-Hakim General Hospital in Najaf Governorate, compared to 27 healthy people who did not suffer from respiratory or other chronic diseases, they were considered a control group.

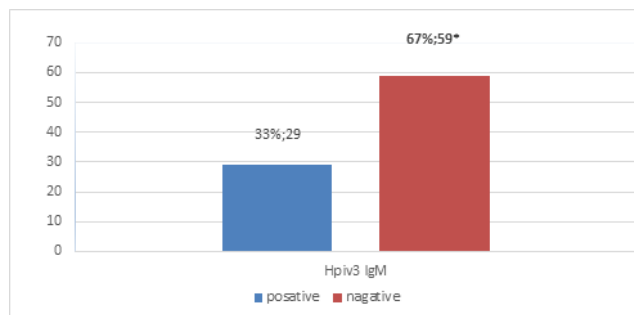


Figure (1) Spread of Parainfluenza virus type III HPIV3 in patient samples

The study demonstrated that the majority of HPIV3 patients had chronic infection negative IgM 59 (67%) while, 29 (33%) of HPIV3 patients had acute infection (positive IgM) as depicted in figure(1). This result somewhat compatible with previous studies have reported that, the majority of antibody levels of specific immunoglobulin G (IgG)-class antibodies in serum samples collected during the convalescent phase of the disease over the detection of specific IgM present during the acute phase of infection.⁽¹¹⁾

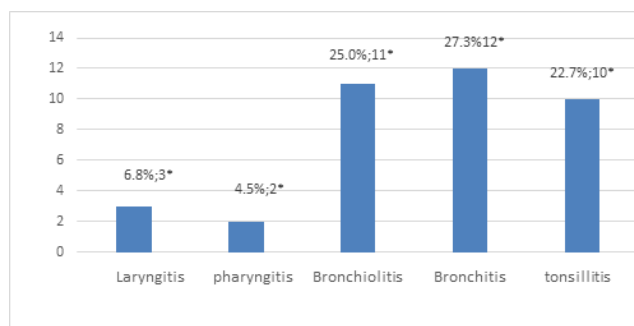


Figure (2): Percentage of clinical signs of patients infected with parainfluenza hpiV3

In figure (2) HPIV3 infections cause significant morbidity and burden of hospitalization. Clinical diagnosis revealed, 27.3% had bronchitis, bronchiolitis 25%, tonsillitis 22.7%, laryngitis 6.8%, and 2.4% had pharyngitis, these finding agree with the study noted that laryngeal trachea bronchitis (LTB) was most often

caused by HPIV 1 and HPIV 2 with only a single case caused by PIV 3, cases of bronchiolitis occurred during infection were 26%, while 70% cases of pneumonia were caused by PIV 3⁽¹²⁾.

PIV in children accounted for 6.8% of all hospitalizations for fever and/or acute respiratory illnesses. HPIV3 is the most frequent cause of hospitalization, followed by HPIV1 and HPIV2⁽¹³⁾. Some study reported that, the most common presenting symptom was cough 78% but other signs and symptoms of acute respiratory tract infection were common. 62% of patients had a documented fever upon presentation, and 40% of patients presented with gastrointestinal complaints of vomiting, diarrhea⁽¹²⁾, and our findings agree with the previous clinical reports that, almost all patients had some respiratory symptoms, the majority had cough 63.6%, and a large proportion also had documented breathlessness was 59.1%, fever 54.5%, vomiting 29.5% and rhinorrhea was 25%, Both of clinical diagnosis and symptoms have significant differences at $P < 0.05$ figure (3).

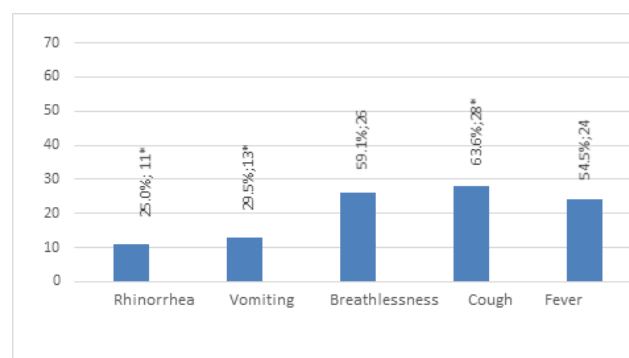


Figure (3): Percentage of clinical symptoms of patients with HPV3

HPIVs are common community acquired respiratory pathogens responsible for respiratory infections throughout the world without any gender, ethnic, age, or geographic boundaries⁽¹⁰⁾; however, morbidity and mortality rates are higher in patients living in poor countries such as rural areas without access to supportive care as compared to developed countries⁽¹⁴⁾.

This study shown that HPIVs were more commonly isolated from females patients than male in patient with acute infection (positive IgM), they were 10 males and 19 females, their ages ranged from 20 to more than 50 years with (Mean \pm SD) (39.97 \pm 2.83), a control group with mean age 40.85 \pm 2.79, the Patients from cities were 14 and rural areas were 15 Patients. Therefore, no significant differences were found in the result of age, sex and

housing between patient and control group. While other studies founded that, the median age (77.5 years; range, 19.0 - 84.0 years) of the 24 HPIV-3-infected patients was higher than the median age (63.0 years; range, 18.0-99.0 years) of 961 patients who tested HPIV-3-negative and also agree with us no significant differences found (P 5. 04) ⁽¹⁵⁾we tested acute- and convalescent-phase serum specimens from hospitalized adults participating in a population-based prospective study of lower respiratory tract infection during 1991–1992. We tested all available specimens from the epidemic seasons for each virus and ~300 randomly selected specimens from the corresponding off-seasons for antibodies to HPIV-1, HPIV-2, or HPIV-3. During the respective epidemic season, HPIV-1 infection was detected in 18 (2.5\%\%, which was older than our findings it can be because the result of the past decades.

PIV infection causes a spectrum of diseases associated with the expression and release of proinflammatory mediators, PIV-infected patients had higher nasal wash concentrations of chemokines such as CXCL8, CXCL9 and CXCL10 as compared to uninfected control patients ⁽¹²⁾. A specific diagnosis of a lower and upper respiratory viral infection is often difficult despite frequent clinical suspicion, may be improved the diagnostic tools by use of sensitive detection methods and biomarkers. The previous study demonstrated, that the T cell chemo attractants CXCL10 one of the most abundant chemokines induced in HPIV3 ⁽¹⁾the elderly, and immunocompromised patients. PIV3 is a common cause of bronchiolitis and pneumonia, whereas PIV1 and 2 are frequent causes of upper respiratory tract illness and croup. To assess how PIV1, 2, and 3 differ with regard to replication and induction of type I interferons, interleukin-6, and relevant chemokines, we infected primary human airway epithelium (HAE. Human airway epithelial cells may generate CXCL10 in response to

virus infection with high concentrations. In particular, have been correlated with more severe HPIV disease ⁽¹⁶⁾.

This study findings support previous research, where this study found a significant difference in CXCL10 concentrations in patients when compared to control cases (P< 0.001), whereas CXCL10 concentrations levels were higher in patients than control group, the mean was 2023.98±273.13 and 776.62±86.79, respectively. Moreover other study suggested that, respiratory viruses can be found in patients with serious acute airway illness CXCL10 may be a useful biomarker for viral ARI (as opposed to non-viral) by use of PCR assays more frequently than previously appreciated ⁽¹⁷⁾ clinical predictors and inflammatory mediator profile of respiratory viral infection in serious acute respiratory illness were investigated. Sequential bronchoalveolar lavage (BAL.

A study conducted by ⁽¹⁸⁾ on 164 healthy subjects with age ranges from 10 to 79 year-old. They reported that serum levels of CXCL10 and sCCL2 were significantly increased in older individuals (r = 0.32, P < 0.001). This finding is in contrary with our finding, where, a significant negative correlation between was found between the serum level of CXCL10 and older HPIV3 patients (r=-0.428, P=0.020). This might be due to the small number of patients examined in the current study as compared to that of their study.

To compare the result associated with this study, we classified HPIV3 patient with acute infection (positive IgM group) into three different age groups. Group I consisted of 13 patients with age range from 20-34, group II consisted of 6 patients with age range 35-49 and group III 10 patients with age more than 50 year and were each group appears normally distributed using descriptive statistics.

Table (1): The effect of age in the concentration of CXCL10 among the group of HPIV3 (HPIV3 IgM) compared to control group

Age group	Control (SD ± mean)	CXCL10 (SD ± mean)	Number of patients
20-34	966.62 ± 145.07	2304.42 ± 435.4	13
35-49	966.62 ± 145.07	2148.63 ± 820.91	6
≥ 50	696.52 ± 110.22	1584.62 ± 293.29	10

In Table (1), figure (4) A significant relationship between CXCL10 among different age group of HPIV3 patients compared to control group was founded in this study with $P < 0.05$, the concentration of CXCL10 for the age group I was 2304.42 ± 435 compared to control group (145.07 ± 966.62) pg / ml, whereas the concentration of CXCL10 for the age group II was 2148.63 ± 820.91 compared to the control group (145.07 ± 966.62) pg/ml. In the group III CXCL10 concentration 1584.62 ± 293.29 was compared with control group (110.22 ± 696.52) pg / m. This is agreeing with the study which mentioned that, decrease in pro-inflammatory cytokine expression by aging in bronchoalveolar lavage patients ⁽¹⁹⁾the natural variation of cytokine expression in healthy horses has yet to be described. The objectives of this study were to: (1. This finding is in contrary with ⁽²⁰⁾ study, increase of pro-inflammatory cytokines production by age-associated may be a co-factor for the pathogenesis of airway diseases, where pro-inflammatory cytokines in humans such as CXCL10 are increase with age, the phenomenon known as ‘inflamm-aging’.

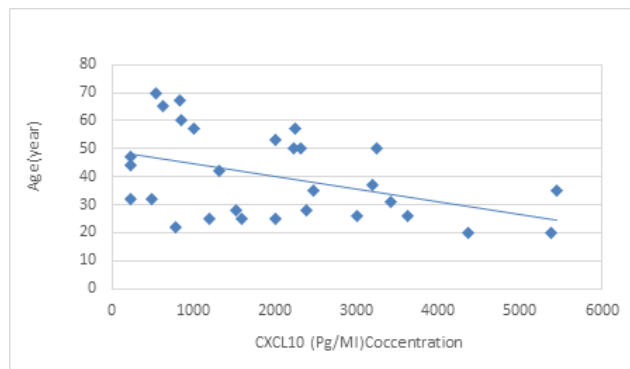


Figure (4):An inverse (negative) relationship between CXCL10 concentration and age in patients with HPV3 ($r = -0.428$ *, $p = 0.020$)

Table (2) the effect of sex in the concentration of CXCL10 among the group of HPIV patients (HPIV3 IgM) compared to control group

Group of study	Gender	SD ± mean	Total
Patient	Male	*385.72± 2001.66	29
	Female	*327.73 ± 2066.38	
Control	Male	134.50 ± 771.04	27
	Female	116.38 ± 781.81	

On the other hand, according to gender in table (2), the observed association of HPIV3 with over expression of CXCL10 were more pronounced in female than males in both patient and control group, the concentration of CXCL10 for males patients was (2001.66 ± 385.72 *) pg / ml compared with the control group (771.04 ± 134.50) pg / ml, while the CXCL10 concentration for females patients was (2066.38 ± 327.73 *) pg / ml compared to the control group (781.81 ± 116.38) pg / ml. This finding is in agreement with the result of (18) reported that CXCL10 was slightly higher in healthy females than that of males. This may be due to estrogen enhanced CXCL10 expression (21). But this study finding is contrary what mentioned before, over expression of CXCL10 were more pronounced in males than in female patients with Cerebral malaria (22)CXCL10, is a strong predictor of both human and experimental cerebral malaria. Increased plasma and cerebrospinal fluid levels of CXCL10 were tightly associated with fatal CM in Indian and Ghanaian patients. In the present study, we hypothesized that in a subset of malaria patients, CM susceptibility is associated with variation in CXCL10 expression. We determined whether polymorphisms in the CXCL10 gene promoter region played a role in the clinical status of malaria patients and addressed the genetic basis of CXCL10 expression during malaria infection. Following extensive bioinformatics analyses, two reported single nucleotide polymorphisms in the CXCL10 promoter ($-135G>A$ [rs56061981] and $-1447A>G$ [rs4508917]. Further study involving larger sample size is recommended for evaluating usefulness of these markers in HPIV3 patients.

Ethical Clearance- Obtained from University of Kufa from Faculty of Education for women, Department of biology.

Source of Funding- Self

Conflict of Interest - Nil

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Association between the Characteristics of Pre-Surgery Vascular Ultrasonography and the Successful Arterio-Venous Fistula Shunt Surgery as Hemodialysis Access to Patients with Kidney Disease Stage V

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Abstract

Background: The failure rate of arterio-venous fistula shunt for hemodialysis access in patients with chronic kidney disease is high. Vascular characteristic is one of the important indicators in successful operation.

Objective: To determine the association between pre-surgery vascular ultrasonography characteristics and the successful arterio-venous fistula shunt surgery as hemodialysis access in patients with chronic kidney disease stage V.

Methods: This study used descriptive analytic studies to determine the relationship between pre-operative vascular ultrasonography characteristics, such as arteries (diameter, velocity, thickness of intima-media tunica) and vein (diameter, velocity, depth) with successful arterio-venous fistula shunt surgery that evaluated in four week post-surgery in patients with chronic kidney disease stage V.

Results: Eighteen samples that consisted of 27.8% female and 72.2% male were enrolled in this study. The most surgery location was vascular radio-cephalic of 13 samples (72.2%). Statistical analysis used was Mann-Whitney U Test. There was no significant correlation between arterial diameter ($p=0.127$), venous diameter of AVFs ($p=1.000$), arterial velocity ($p=0.721$), velocity vein ($p=0.721$), intima media tunica thickness ($p=0.721$), and venous depth ($p=0.192$) with successful arterio-venous fistula shunt surgery.

Conclusion: There was no significant correlation between diameter, thickness of intima media tunica, and arterial velocity as well as diameter, velocity and venous depth with successful arterio-venous fistula shunt surgery.

Keywords: *Vascular, Ultrasonography Examination, Arterio-venous Fistula*

Introduction

In patients with catheterization or patients requiring venous access, doppler ultrasonography of upper limb

venous was required for identifying suitable vascular to access. This vascular was screened for the possibility of central stenosis or occlusion. It was recommended to use pre-surgery ultrasonography in patients who had experienced previous central venous access associated with deep venous thrombosis in order to assess central or occlusion stenosis¹. SG of vascular mapping prior to placement of hemodialysis access was a prescribed procedure. Pre-surgery sonographic mapping prior to placement of hemodialysis access may change surgical management, with an increasing number of AVF and the

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possibility of an increase in the most functional vascular selection².

Chronic Kidney Disease (CKD) is the final stage of renal failure with the Glomerular Filtration Rate (GFR) of <15 ml/minute³. Causes of CKD are diabetes mellitus, hypertension, renal ischemia, toxic substances, obstruction, autoimmune disease and renal infiltration⁴. Data from The United States Renal Data System (USRDS 2013) showed the prevalence rate of people with chronic kidney disease in the United States (2011) of 1,901 every a million population. Treatment of End-Stage Organ Failure in Canada (2000-2009) reported that nearly 38,000 Canadians lived with chronic renal failure and has increased almost three times from 1990. 59% of those number (22,300) have undergone hemodialysis and 3000 patients have been waiting kidney transplant⁵. Meanwhile, Indonesia reached 200-250 cases every a million populations every year.

Hemodialysis requires a well-functioning vascular access. The best type of vascular access is the Arterio-Vena Fistula (AVF). Making AVF is associated with failure rates and complications. The most common causes of AVF dysfunction are non-maturation, thrombosis, and stenosis, thus most cases of previous stenosis lead to disruption of blood flow. Function and morphological of USG was used for AVF dialysis that affects the risk of vascular access dysfunction⁶.

Vascular access is ideal if it can be used for long periods of time as access to blood circulation with minimal complications. Arterio-venous fistula (AVF shunt) is the most ideal access of all available hemodialysis access. If AVF shunt is successful then it can be used for long periods with low thrombosis and infection rates, without much interventions and low costs⁷. AVF-shunt cubiti operation is an AVF operation technique. AVF shunt operation is the first choice in AVF technique whereas; AVF cubiti is the second choice. However, the failure rate of both techniques remains high⁸. There remains a high failure rate of fistula arterio-venous shunt installation in patients with chronic kidney disease. Complications of vascular access are the common cause of failure and hospitalization in dialysis patients. Limited data to comprehend the complications of arterio-venous fistula especially stenosis and thrombosis also inhibit the success of arterio-venous fistula techniques.

Based on the research described above, it is necessary to examine the association between the characteristics of

arterial ultrasonography (USG) and pre-surgery vein with the successful AVF shunt surgery, thus the characteristic factor of arteries and veins that affect the success of shunt AVF operation could be recognized. Therefore, the authors aimed to determine the association between pre-surgery vascular ultrasonography characteristics and the successful arterio-venous fistula shunt surgery as hemodialysis access in patients with chronic kidney disease stage V.

Method

This study was a retro-prospective longitudinal with the observational design. We used a consecutive sampling technique to the patients of chronic kidney disease stage V. The inclusion criteria were patients aged >18 years, undergoing routine hemodialysis or will be planned of routine hemodialysis, had been performed operation of AVF shunt in Dr. Soetomo General Hospital Surabaya from January to March 2015.

Patients with chronic kidney disease stage V, which will be operated with AVF shunt as a hemodialysis vascular access, were performed USG examination using high-resolution USG Hitachi equipped with linear probes (7-10 MHz) in Radio Diagnostic Unit of Dr. Soetomo General Hospital Surabaya. The scan was performed in recumbent position with the arm down of 45 degrees from the body.

The USG results were recorded and then analyzed statistically. Descriptive analysis was conducted to obtain the characteristic of the sample. Normality test using Kolmogorov-Smirnov test was performed prior to analyze the correlation between pre-surgery vascular ultrasonography characteristics and the successful arterio-venous fistula shunt surgery as hemodialysis access. Mann-Whitney U Test was used with confidence interval of 95% and p value <0.05. The analysis was conducted with SPSS software. The study protocol was approved by Dr. Soetomo Teaching Hospital.

Results

Characteristics of Subjects

This study obtained 16 CKD patients who will be performed AVFs surgery. Patients consisted of 12 male and 4 female with age ranged from 33 to 62 years. All patients had a vascular duplex USG examination at the location that will be performed, however two patients performed two surgeries at different sites due to the

failure on the first surgery thus we obtained 18 samples. The youngest age of the patient was 33 years old and the oldest was 62 years.

that will be performed AVFs surgery was 51-60 years of 9 patients (50%). The age group of <40 years was 2 patients (11.1%), 41-50 years old of 6 patients (33.3%), and >60 years of 5 patients (5.6%) (Table 1).

Distribution of Subjects by Age

The most age group in eighteen samples of study

Table 1. Distribution of Samples by Age

Age	Frequency	Percentage (%)
< 40 years	2	11.1
41-50 years	6	33.3
51-60 years	9	50.0
> 60 years	1	5.6
Total	18	100.0

Distribution of Subjects by Sex

We found 13 male (72.2%) and 5 female (27.8%). CGK patients who had pre-surgery vascular USG of AVFs were more prevalent in males than females with a ratio of 3:1

Distribution of Subjects by AVFs Location

Subjects who had performed AVFs surgery were 5 patients (27.8%) in the inferior fossa cubiti brachio-cephalic blood vessels and 13 (72.2%) subjects who had performed surgery on arterial radio-cephalic arteries.

Characteristics of Vascular Samples

Table 2. Characteristics of Vascular Samples

		Mean	Median	SD	Minimum	Maximum
Diameter (mm)	a.Brachialis	3.2	3.2	0.2	2.9	3.5
	a.Radialis	2.1	2.2	0.5	1.2	2.8
	v.Cephalica	1.6	1.5	0.8	0.6	3.5
Tunica intima Media (mm)	a.Brachialis	0.4	0.4	0.07	0.3	0.5
	a.Radialis	0.4	0.3	0.1	0.2	0.6
Velocity (cm/s)	a.Brachialis	51.8	50.5	16.3	28.4	74.0
	a.Radialis	52.1	47.3	15.4	27.8	73.8
	v.Cephalica	7.1	7.2	2.7	3.2	12.3
Depth (mm)	v.Cephalica	2.8	2.6	0.9	1.8	4.4

Table 2 showed the vascular characteristics of the sample consisted of the brachial artery, radial artery, and cephalica vein as the vascular access of the AVFs surgery. We found five samples of brachial artery, 13 samples of radial artery, and 18 samples of venous cephalica.

Distribution of Subjects Based on Successful AVFs Surgery

Eight-teen samples have been performed AVFs operation which resulted in 14 (77.8%) successful operations and 4 (22.2%) failed operations.

Results Analysis

The Correlation of Artery Diameter with AVFs Operating Results

Successful AVFs surgery was 14 (77.2%) samples with a minimum diameter of 1.5 mm, a maximum of 3.5 mm, a median of 2.4 mm and a mean diameter of 2.5 mm and a standard deviation of 0.6. Meanwhile, failure surgery was 4 (22.8%) samples with a minimum diameter of 1.2 mm, maximum of 2.6 mm, a median of 1.8 mm and mean diameter of 1.8 mm and standard deviation of 0.7. The statistical test showed no association between arterial diameter with AVFs surgery results ($p=0.127$).

The Correlation of Vena Diameter with AVFs Operating Results

From 18 samples of the study, 14 (77.2%) of cephalica vein samples from successful AVFs surgery had a minimum diameter of 0.6 mm, a maximum of 3.5 mm, a median of 1.6 mm and a mean diameter of 1.6 mm and a standard deviation of 0.7. Whereas, 4 (22.8%) of cephalica vein samples from failed surgery had a minimum diameter of 1 mm, a maximum of 3.4 mm, a median of 1.4 mm, a mean of 1.8 mm diameter and a standard deviation of 1.1. The statistical test showed no association between vein diameter and result of AVFs surgery ($p=1.000$).

The Correlation of Artery Velocity with AVFs Operating Results

From 14 samples of brachial artery and radial artery from successful AVF operation had a minimum velocity of 27.8 cm/s, a maximum of 74 cm/s, a median of 50 cm/s and a mean of 50.9. Meanwhile, 4 samples from failed operation had a minimum velocity of 40 cm/s, maximum of 71.3 cm/s, median of 56.7 mm, mean of 56.2 cm/s and standard deviation of 15.5. Statistical tests showed that there was no association between arterial velocity and successful AVFs surgery ($p=0.721$).

The Correlation of Vena Cephalica Velocity with AVFs Operating Results

From 14 venous cephalica samples had a minimum velocity of 3.6 cm/s, a maximum of 12.3 cm/s, median of 7.2 cm/s and mean of 7.3 cm/s and standard deviation of 2.6. While the 4 sample venous cephalica from the failed operation had a minimum velocity of 3.2 cm/s, maximum of 10 cm/s, median of 6.1 cm/s, mean of 6.4 cm/s and standard deviation of 3.3. The statistical test showed no association between velocity of venous and successful operation of AVFs ($p=0.721$).

The Correlation of Thickness of Tunica Intima Media Artery with AVFs Operating Results

The intima media tunica thickness of 14 (77.2%) successful surgeries had a minimum diameter of 0.2 mm, a maximum of 0.6 mm, a median of 0.4 mm, a mean of 0.4 mm and a standard deviation of 0.15. Whereas, 4 (22.8%) samples from failed operation had a minimum intima media tunica thickness of 0.3 mm, maximum of 0.4 mm, median of 0.4 mm, mean of 0.4 mm and standard deviation of 0.06. The statistical test showed no correlation between intima media tunica thickness with successful AVFs surgery ($p=0.721$).

The Correlation of Depth of Vein with AVFs Operating Results

We found 14 (77.2%) samples from successful AVFs operations with a minimum depth of 1.8 mm, a maximum of 4.1 mm, a median of 2.5 mm and a mean of 2.6 mm. While 4 (22.8%) failed samples had a minimum depth of 2.2 mm, maximum 4.4 mm, median 3.4 mm and mean of 3.4 mm. The statistical test showed no association between cephalica vein depth with successful AVFs surgery ($p=0.192$).

Discussion

Doppler USG of vascular provided qualitative and quantitative data on arterial and venous systems prior to the establishment of AVFs. Doppler USG techniques could identify which veins are often missed on clinical examination. This approach was particularly useful in patients with DM and the elderly due to arterial narrowing and a relatively common classification in patients with CKD. Therefore, arterial evaluation should be performed to determine patency, morphology of capillary walls, diameter and anatomy, while venous evaluation was performed to determine patency, diameter, and depth⁹.

The study obtained 18 samples consisted of 5 females (27.8%) and 13 males (72.2%). The most common age

group was 51-60 years by 8 people (50%) followed by age group of 41-50 years by 5 people (31.25%). This was similar the epidemiological data of CKD patients who underwent hemodialysis that it happened more in male than female and often occurred at the age of 40-60 years old¹⁰.

The diameter of the artery in this study was smaller than the mean diameter of the brachial artery in other studies by 4.31 ± 0.77 mm and the mean of radial artery by 2.325 ± 0.4 mm^{11, 12}. The velocity of the brachial and radial arteries in this study was lower than the normal value of Brachial artery by 50-100 cm/s and Radial artery by 40-90 cm/s¹³.

There was no significant correlation between arterial diameter and AVFs operation results ($p=0.127$); the mean diameter of successful surgery was 2.5 mm and the failed surgery had a mean of 1.8 mm. The successful AVFs surgery were linked to a minimum diameter of artery by 2 mm⁹.

The statistical test showed no correlation between the thickness of tunica intima-media with the successful operation of AVFs ($p=0.721$). Moreover, there was no association between arterial velocity and AVFs surgery results ($p=0.721$); a mean velocity of successful surgery was 50.9 cm/s and a mean velocity of failed surgery was 56.2 cm/s.

Statistics tests showed no association between vein diameter and AVFs operation results ($p=1,000$). The mean of venous diameter on successful AVFs was 1.6 mm and failed AVFs had a mean diameter of 1.8 mm. The results were different to a study by Silva who reported successful surgery of AVFs had a minimum diameter of 2.5 mm and she recommended a diameter of at least 3 mm for AVFs surgery⁹.

The larger diameter of the cephalic vein was associated with lower resistance of blood flow and increased blood flow rate in the fistulas. The larger diameter of the cephalic vein was also associated with low risk of thrombotic, post-inflammatory lesions, and morphological vein wall abnormalities. This results confirmed the importance of pre-surgery vascular assessment prior to the establishment of AVFs⁶. Previous studies recommended to use an artery diameter of at least 2.5 mm and a vein diameter of at least 2 mm to establish the AVFs. However, there was no agreement on the threshold value of minimal diameter of the artery or vein that should not be used to form anastomosis. Therefore,

there was also a medical center which required an AVFs procedure with a diameter of less than 1.5 mm⁶.

This study also showed that there was no association between venosity of venous and successful AVFs surgery ($p=0.721$); the mean velocity of the successful operation was 7.3 m/s and the mean velocity of failed operation was 6.4 cm/s. Moreover, there was no association between cephalica vein depth with successful AVFs surgery ($p=0.192$). The mean venous depth of successful operation was 2.6 mm and the failed operation had a mean vein depth of 3.3 mm. This study showed that successful AVFs surgery had higher velocity rates and a shallower cephalic vein depth.

Conclusion

There was no significant correlation between diameter, thickness of intima media tunica, and arterial velocity as well as diameter, velocity and venous depth with successful arterio-venous fistula shunt surgery.

Ethical Clearance: The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, nonmaleficence, and justice.

Conflict of Interest: There is no report of conflict of interest involved with this study so far.

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Prevalence of Childhood Disability in Basrah City Using the Ten Questions Too

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Abstract

Background: The neglect of disabled children in the developing countries and less information about its types and prevalence in addition to the low level of health services they had.

Aim: To identify the prevalence of handicapping disabilities among children up to 9 years of age and their epidemiological pattern in the Basrah city center.

Methods: In a population-base, cross-sectional household survey was carried out in Basrah city. A total sample (1734) children, males were 56% and females were 44 % of the sample using the ten questions survey tool.

Results: The survey team detected 73 disability cases 48 were males and 25 were females. The detected prevalence of disability in our sample was 37.7%. Disabled children, on average, were in the fourth or fifth birth order among their brothers and sisters and 47 % of them were counted as the second or third disability in the same family. The number of disabling conditions in the same child varied widely: 31.5% of cases had a single disability, 24.6% had two conditions and 43.8% had three or more conditions. The questionnaire children up to 9 years of age in these families formed 56.2% of the population.

Conclusion: The survey managed successfully to document a comparable estimate of the prevalence rate for childhood disabilities in the community and provided a general picture of their types and suspected causes. It also reported a low service delivery for these disabilities and identified some risk factors related to their occurrence. To apply this survey method in center Basra city is justified in an extended field study with certain modifications to suit the local culture. This study also should be complemented with a second stage referral for follow up examination of detected cases of and evaluation of the disability and its required services.

Keywords: Prevalence, Childhood disability, Basra, Ten questions tool

Introduction

In countries with reasonably well-developed services for children with Disabilities, administrative data and registries provide a useful source of population-based

Information on childhood disabilities¹. In developing countries, where services for children with disabilities are not universally available, administrative data, if available at all, provide an incomplete account. Census Data provide an alternative source of population data on disability, but it is likely that²these data under-identify disabilities in children and especially in girls and children of low socioeconomic status¹¹. A third approach is the so-called 'key informant' approach, which relies on interviews with teachers, health care providers and other key persons in a community to identify children in the population with disabilities. This approach, however, has been shown to miss disabilities that are least publicly

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evident, such as cognitive and hearing disabilities¹². A fourth approach consists of household surveys³.

However, information on the validity of single-phase survey data on disabilities in children is lacking, especially in developing countries. In addition, instruments that have been used to survey childhood disabilities in developed countries are unlikely to be cross-culturally valid in developing countries. The above considerations led to the development of a two-phase methodology for surveying childhood disabilities in populations where professional resources are extremely limited. This paper describes the methodology, presents data on its reliability and validity across culture, discusses its uses and limitations, and identifies areas for future research⁴. The need for information on the frequency of childhood disabilities in populations, as well as the status and characteristics of children with disabilities, has been emphasized repeatedly¹⁻⁷. For example, information on the number and status of children with mental retardation, learning, vision, hearing and seizure disabilities⁵. Behavioral disorders is needed to monitor on a population level the impacts of: improvements in survival; exposures to nutritional deficiencies, environmental toxins, serious diseases and trauma; and interventions designed to improved child health and development. In addition, population-based, epidemiologic studies of childhood⁶. Disabilities are needed for identifying risk factors and causes, and for needs assessments to facilitate planning of services for children and families with special needs⁷.

In countries with reasonably well-developed services for children with disabilities, administrative data and registries provide a useful source of population-based information on childhood disabilities⁸⁻¹⁰. However, in most low income or developing countries, where services for children with disabilities are not universally⁸. Available, administrative data, if available at all, provide an incomplete account. Census data provide an alternative source of population data on disability, but it is likely that these data under-identify disabilities in children and especially in girls and children of low socioeconomic status¹¹ a third approach is the so-called 'key informant'⁹. Approach, which relies on interviews with teachers, health care providers and other key persons in a community to identify children in the with disabilities. This approach, however, has been shown to miss disabilities that are least publicly evident¹⁰.

Such as cognitive and hearing disabilities and to include children from outside the population of interest¹¹. A fourth approach consists of household surveys. However information on the validity of single-phase survey data on disabilities in children is lacking, especially in developing countries. In addition, instruments that have been used to survey childhood disabilities in developed countries are unlikely to be cross-culturally valid in developing countries¹². The above considerations led to the development of a two-phase methodology for surveying childhood disabilities in populations where professional resources are future research extremely limited. This paper describes the methodology, presents data on its reliability and validity across culture, discusses its uses and limitations, and identifies areas for Handicapping disabilities in both developing and developed countries are important public health issues¹³.

Basic data on their frequencies, underlying risk factors and associations are necessary in order to plan health programs and to provide social services for them. Screening in community surveys is a good strategy for providing a quick insight for this problem among children¹⁴. Many community surveys have been conducted for handicapped children in various parts of the world." the ten-questions survey tool was proposed for this purpose and has been validated for its sensitivity and specie city in many developing countries. This paper is reporting a led survey in Jeddah, Saudi Arabia¹⁵. In which a population-based study has applied the ten-questions tool to estimate the prevalence of handicapping disabilities among children up to 9 years of age and describe the epidemiological pattern of disabilities in the eastern part of the city. The study was part of the training led survey for male medical students in the Medical College. All children have a right to care by a parent or trusted adult¹⁶. In countries with reasonably well-developed services for children with disabilities, administrative data and registries provide a useful source of population-based information on childhood disabilities.

Material and Method

Study setting and population

A Population based cross-sectional study carried out in Basra city from October 2016 to February 2017. The estimated population of Basra city center is 38,989 and about 28.7% of that population being female in

child bearing age. Interviews at the selected houses were conducted primarily by gathering the basic socio-demographic information of the family from the head of the family, usually the father. Variables included in this part were family income, number of family members, age of the child, ages of parents, occupation of parents, educational level of parents, history of disabilities in either parents families and consanguinity between parents. The ten questions tool with their probes was explained to the head of the household to detect any disabled member of the family in the age 9 or below. Houses with no children at the required age were skipped and replaced by the next one fulfilling the research criteria. The detailed questionnaire was filled for any child with a positive answer on one or more of the disability questions.

The study sample and data collection

Total 1734 samples were collected to study the prevalence rate of childhood disabilities in Basra center from November 2016 to March 2017. The percentage of under nine years children from the total population is about 11.8% (WHO).

Statistical analysis

The data were fed to the (SPSS) program (version 16) for interpretation of result, through the application of the descriptive data analysis frequency and percentage.

Results

In the present study, we have screened 4601 population and about 1734 samples were collected for further studies. So the prevalence can be calculated as follows

$$\text{Prevalence} = 1734/4601 * 100 = 37.7 \%$$

In the collected samples (1734), about 984 (56%) were males and 750 (43.2%) were females. It shows the high percentage male (56%) and the lower percentage female (43.2%) from the total sample.

Table 1. Characteristics of number of disable children in the family

Number of children	No.	%
1	5	6.8
2	30	41
3	37	52
Total	73	4.2

The high percentage (52%) of the studied families had three disabled child while the lowest percentage (6.8%) of families had only one disabled child's.

Table 2. Characteristics of order of birth of disable child among their sibling in the family

Order	No.	%
1	2	2.7
2	3	4.1
3	3	4.1
4	40	54.7
5	25	34.2
Total	73	4.2

This table show that the high percentage (54.7%) of disabled children had the fourth order of birth among their siblings in the family while the lower percentage (2.7%) have had the first order.

Table 3: Age frequencies of all children and the disabled group

Age	Disabled group		All children	
	No	%	No	%
1 year >	1	1.3	85	4.9
1 – 2	8	10.9	121	6.9
2- 6	23	31.6	619	35.6
6-	41	56.2	909	52.4
Total	73	42	1734	43.3

This table show disabled group in age (6 -9) has 56.2% the high percentage this age group high percentage in total sample.

Table 4. Frequency of various types of disabling conditions in Basra city

Condition	Previously diagnosed	Newly identified
Speech	23	3
Motor	12	2
Mental	9	3
Fits	7	1
Learning difficulty	6	2
Hearing	7	1
Vision	4	1
Emotional problem	3	1
Chronic or hereditary	2	1

Conditions have not been totaled due to multiple disabilities in some cases.

Table 5. Causes of disabilities as perceived by parents

Suspected cause of disability	No	%
Hereditary causes	37	50.6
Non hereditary illnesses	10	13.6
Accidental/traumatic causes	4	5.4
Other causes	2	2.7
Unknown cause	20	27.3

This table show high percentage 50.6 the parents believes hereditary causes and the lower percentage 2.7 has other causes.

Discussion

Disabled children in developing countries are estimated to form 85% of the world’s disabled children). Accurate determination of the prevalence is hindered by a group of inherent problems in these countries including under reporting, late identification, poor registration and lack of infrastructure for their monitoring and service provision.To overcome these shortcomings, a variety of methods were tried in order to identify disabilities at the community level.These include the addition of questions to the national census

and the interviewing of key informants in the community such as community leaders and teachers. The previous methods were found to produce serious faults of under-enumeration of handicapping conditions and under representation of children and women. “Researchers in developing countries have proposed the use of the ten question tool in a house survey to overcome these drawbacks. The questionnaire Children up to 9years of age in these families formed56.2% of the population (1734)with male forming 56% of them.Household. Using the ten questions survey tool, the survey team detected 73`disability cases in the age group males.. Disabled children, on average, were in the fourth or fifth birth order among their brothers and sisters and 47 % of them were counted as the second or third disability inthe same family. The number of disabling conditions in the same child varied widely: 31.5% of cases had a single disability, 24.6% had two conditions and 43.8% had three or more conditions. These conditions were categorized according to the answers on the ten questions (table 6). Disabled children. The survey tool managed to document, successfully, a prevalence rate of childhood disabilities in the community with a general picture of their types and suspected causes which is quite compare to that found in Saudi Arabia, a multistage sampling method was applied to screen children in 875 houses using the ten questions survey tool for identification of disabilities. Further information collected for detected disabilities possible risk factors, cause of the disability as perceived by the family and services previously provided to the child. Results: A total of 137 cases of disability were detected giving a point prevalence rate of 36.7 per 1000 children. Twenty-nine children (21.2%) were discovered for the rest time during the survey. The majority of cases were male (57.7%) and the mean age for all cases were 10 years (SD⁻ 5.5) with no case detected under one year of age. Disabled children were in the fourth or fifth birth order among their brothers and sisters and 47 (34%)of them were recorded as a second or third disability in the same family. Number of disabilities in the same child varied widely: 59% of cases had a single disability, 22% had two conditions and 19% had three or more conditions.^{(17) (18)(19)}

Conclusions

The survey managed successfully to document a comparable estimate of the prevalence rate for childhood disabilities in the community and provided a general picture of their types and suspected causes. It also reported a low service delivery for these disabilities and

identified some risk factors related to their occurrence. To apply this survey method in Basra city is justified in an extended field study with certain modifications to suit the local culture. This study also should be complemented with a second stage referral for follow up examination of detected cases of and evaluation of the disability and its required services.

Conflict of Interest - Nil

Source of Funding- Self

Ethical Clearance- Not required

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Expression of e-NOS in Human Placentas of Idiopathic Intra Uterine Growth Restriction at Term

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Abstract

Endothelial nitric oxide synthase (e-NOS) is a chemical agent that involves in placental angiogenesis. It is conveyed through embryogenesis. In the contemporary study, we intended to examine the character of placental angiogenesis in the progress of intrauterine growth restriction (IUGR) by means of matching the levels of expression of e-NOS in normal-term pregnancy and IUGR placentas. Angiogenesis is one dominant factor in normal embryogenesis and hence the wellbeing of the newborn. The expression of e-NOS was planned using the streptavidin-biotin-peroxidase technique in placental tissues identified as normal (n = 33) and IUGR (n = 33) cases from mothers looking apparently normal. All were chosen at term pregnancy and obtained between 2nd of February of 2018 and 31th of January 2019 at selected hospitals. Outcomes were appraised semi-quantitatively. The expression of e-NOS marker as an immunohistochemistry total score and staining percentage were significantly greater ($p < 0.05$) in epithelial surface, smooth muscle cells of fetal vessels and the connective tissue terminal villous core of the IUGR placentas when matched with placentas collected from normal pregnancies at term. Encountered placental histochemical changes regarding the expression of the e-NOS angiogenic factor for idiopathic IUGR newborns raised the suspicion of that, it was caused by pure placental factors and could represent further requirement for Nitric Oxide to dilate fetal vessels to optimize functional requirement during placental insufficiency. The noticed Increased expression of e-NOS may be the result of inadequate uteroplacental perfusion supporting the proposal that abnormal angiogenesis plays a role in the pathophysiology of IUGR.

Keywords: Idiopathic Iugr, E-Nos, Placenta, Terminal Villi, Immunohistochemistry.

Introduction

Intrauterine growth restriction/retardation (IUGR) is a complex placental vascular disorder resulting in limited weight at birth, preterm delivery, with highly expected perinatal morbidity and mortality¹⁻⁴. IUGR could be triggered by different fetal, maternal, and placental influences^{1-3,5}. Angiogenesis is regarded as a placental factor acting essentially in the development of IUGR^{2-4,6,7}. Angiogenesis involves the branching of new microvessels from present larger blood vessels. It is an imperative aspect in normal embryogenesis⁸⁻¹⁰. Angiogenesis affects greatly the development of the villous vascular tree and the development of chorionic terminal villi. Placental vascular branching early in embryonic life and continues all over gestation^{9,11}. Precise angiogenesis up regulators and down regulators adjust this process^{4,8,9}. Fetal growth restriction happens because of the failure of elongation, branching,

or dilatation of the capillary circulation of terminal villi⁴. e-NOS has been acknowledged as stimulator for angiogenesis⁸. It is highly expressed throughout embryogenesis and fetal development^{1,6,10,12}. It synthesizes nitric oxide (NO) solely in the placenta^{13,14}, signifying that e-NOS is in charge for the increased NO in the placenta. e-NOS is chiefly accountable for the propagation of NO in the vascular endothelial layer of fetal vessels in the placenta^{15,16,17}. The e-NOS-derived NO is likewise a strong vasodilator compound in the perfused fetoplacental vasculature which is empowered by smooth muscles¹⁸, that is essential for the upkeep of decreased resistance at the fetoplacental interface¹⁹. Initial revisions have demonstrated that drug conveyed e-NOS suppression results in signs resembling preeclampsia and growth restricted fetuses in rats²⁰⁻²⁵.

Patients and Methods: This work was carried out through Department of Anatomy, Medical Faculty,

University of Al-Mustansiriyah, in assistance of Gynecology and Obstetrics department at Fatima Al-Zahraa Administrative Hospital, Al- Khadhraa Private Hospital and Al- Yarmook Teaching Hospital in Baghdad, Iraq. Permitted by the scientific committee of each of these medical institutes. A total of 66 mothers, along with their newborns and placentas were incorporated in this study. All were chosen at term pregnancy (of 38-40 weeks), they were non-smoker, non-diabetic, normotensive apparently healthy and normal women according to their history, clinical assessments, laboratory tests and ultrasound check. Fetal state as IUGR likewise was verified by Doppler ultrasonic exam without apparent fetal anomalies. Any mother suffered from difficult or delayed labor been ruled out from this work. A consent was gained verbally from each mother to be a component of this work. All fetal IUGR was considered to be idiopathic, given that there were no apparent maternal nor fetal basis. Placentas were assigned into two groups. The 1st embraced 33 placentas of newborns having normal average body weight (Control), whereas the 2nd group holds 33 placentas of newborns having idiopathic IUGR based on the basis of a valued fetal weight of less than the gestational tenth percentile, decreased amnion, and proved diminished end diastolic flow velocity of the umbilical artery by Doppler study confirmed by successive obstetric ultrasound examination²⁶. Every tissue block measured roughly 1×1×1 centimeter to be fixed to be stained by Immunohistochemistry e-NOS marker. Then, from every tissue block five sequential sections of about 4 µm thicknesses were obtained and were collected on positive charged slides. After de-waxing, the sections were rehydrated gradually. Immunohistochemical staining achieved by the avidin-biotin-peroxidase technique. 3% hydrogen peroxide blocking agent was used to block Endogenous peroxidase. Kept in oven for 15 minutes in sodium citrate buffer solution (pH=6.0) for antigen retrieval. Rabbit polyclonal antibodies reactive with e-NOS (Abnova) was added to the sections and incubated for one hour at room temperature. Sections were washed with phosphate-buffered saline with Tween, then a secondary antibody added for 20 minutes and after that with a biotin-streptavidin complex for half an hour at room temperature. 3,3-diaminobenzidine tetrahydrochloride (DAB) was used to visualize reaction. Finally, the sections were counterstained with hematoxylin and mounted. The intensity and localization of the staining reaction in Syncytiotrophoblasts

(epithelial cells), vascular smooth muscle cells (vessels) and chorionic villous stromal connective tissue cells (C.T.) were calculated by two pathologists blinded to the drive of the study. Immunohistochemical reaction of e-NOS antibody scored semiquantitatively for intensity of staining: 0 / negative = no staining, 1+ = weak positive, 2+ = moderately positive; 3+ strongly positive. The total score of immunohistochemistry staining obtained from multiplying the staining intensity with staining percentage for each region in high power field. Statistical analysis achieved by using SPSS v24. Continuous variables were illustrated as mean ± SD and the categorical variables were demonstrated in percentages. Chi-square test was used to compare groups for immunohistochemical outcomes. P - values < 0.05 were considered statistically significant.

Results

e-NOS immunohistochemistry cytoplasmic staining was perceived from both control and idiopathic IUGR tissues (Table 1, and Figures 1,2 and 3). A highly significant increase in the expression of e-NOS in IUGR placentas seen in syncytiotrophoblasts (epithelial cells) when compared to control group with p value = 0.003, Also, increase in staining percentage in the IUGR group but no statistical significance with p value = 0.077 difference when compared to the control groups. Regardless, the total score of e-NOS marker in epithelium was significantly higher in IUGR group than that in control groups (p = 0.004). regarding the fetal vessels, the staining intensities of e-NOS marker were significantly higher in IUGR group with p value = 0.02 when compared to the control group. Staining percentage of e-NOS marker in vessels was also significantly higher in IUGR group than that in control groups with p value =0.016. The foregone total score of e-NOS marker in vessels was significantly higher in IUGR group than that in control groups with p=0.011. Regarding the expression of e-NOS in the connective tissue of the villus core of terminal chorionic villi revealed statistically significant increase in intensity in IUGR group when compared to the control group with p value = 0.001. The staining percentage was also significantly higher (p=0.001) and the staining score is also significantly higher in IUGR when compared to control group (p=0.007).

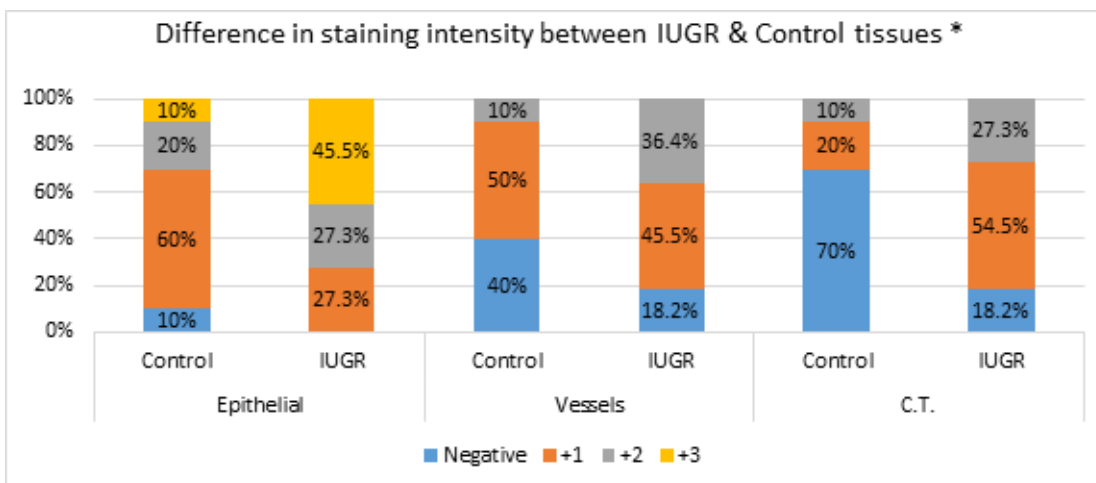


Figure (1): Difference in staining intensity of e-NOS between IUGR & Control tissues (* p value <0.05)

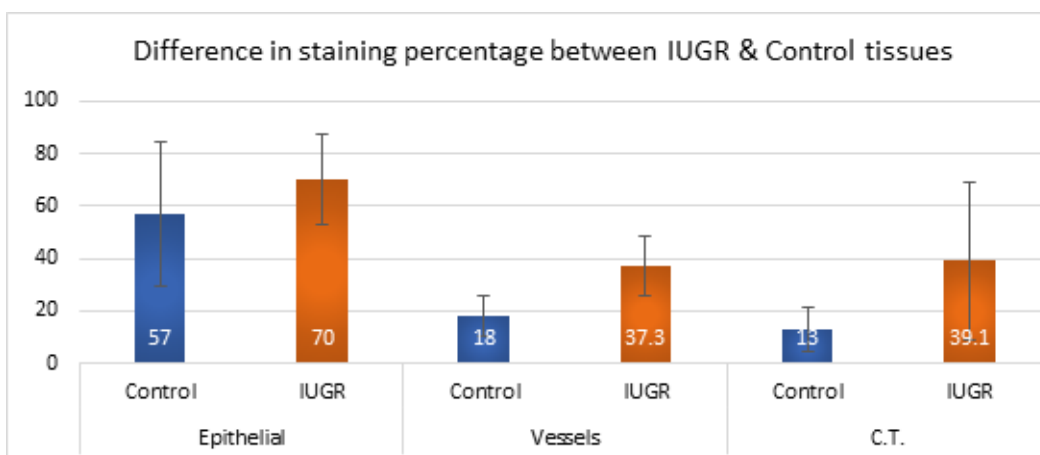


Figure (2): Difference in staining percentage of e-NOS between IUGR & Control tissues.

Table (1): Difference in staining total score of e-NOS between IUGR & Control tissues.

localization		Mean	Std. Deviation	p Value
Epithelial	Control	1.0	± 0.82	0.004
	IUGR	1.62	± 0.86	
Vessels	Control	0.27	± 0.5	0.011
	IUGR	0.61	± 0.62	
C.T.	Control	0.21	± 0.51	0.007
	IUGR	0.58	± 0.55	

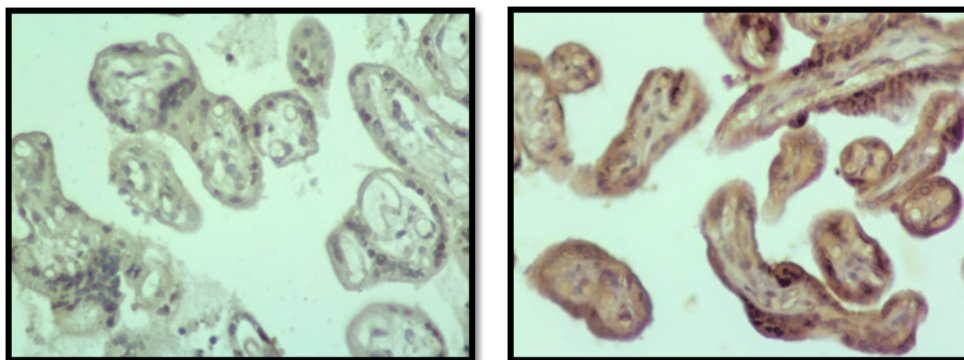


Figure (3): e-NOS staining reaction expressed in terminal villi of placenta, A; showing weak e-NOS staining in control group, B; showing e-NOS stronger expression in idiopathic IUGR group (DAB, A; B; × 400).

Discussion

Many previous studies had documented that a pure placental factor was the solitary cause in some IUGR cases²⁷. IUGR incidence was noticed 3% regarding developed countries, though, it scopes 15-20% in developing countries, it partakes in more than 26% stillbirths and congenital anomaly^{1,4,5}. Not to forget it yields many lasting health issues for grownups²⁸. Therefore, the precise diagnosis, and proper management of IUGR-complicated pregnancies are important. Regarding e-NOS expression in the epithelial cells, our results differ from the study of Myatt et al (1997)²⁹ as they had found no differences in the intensity or type of staining. Regarding the fetal vessels, our results agree with Myatt et al (1997)²⁹ and Rutherford and colleagues (1995)³⁰. However, other authors have found decreased levels of e-NOS in vessels in these condition like Giannubilo et al. (2008)³¹ and Noris et al. (2004)³². We hypothesize that the increased e-NOS expression in their vessels is not a disease-specific feature, but perhaps an adaptive response to increased resistance and poor perfusion. It seemed to be no previous works measured the expression of e-NOS in the villus core of terminal chorionic villi of term placenta neither in normal nor in pathological cases like IUGR. The significant elevation in expression of this enzyme, e-NOS, in this region particularly could be explained by its rapid diffusion from endothelial cells to the core, it had been found that it down regulates fibroblast production to decrease villus fibrosis decreasing the fibroblastic activity³³ which in turn reducing the density of the villus core to enhance feto-maternal exchange. It is possible that increased expression of e-NOS seen in our results in idiopathic IUGR placentas at term in all mentioned regions impinge upon regulation of placental vascular reactivity by the smooth muscle of fetal vessels and hence blood flow regulation. In support of this, it had been shown that concentrations of nitrate, a breakdown product of NO, were significantly higher at delivery in umbilical venous blood from idiopathic IUGR pregnancies compared with controls³⁴. The observed increased expression of e-NOS that we saw in placentas of Idiopathic IUGR could encourage pathological angiogenesis³⁵.

Conclusion

Toward elucidate the pathogenesis of idiopathic IUGR and the associated placental vascular insufficiency, it is needed to clarify the regulatory mechanism of placental vascular development. The noted increased

staining expression of e-NOS designates pathological angiogenic action, due to lacking proper uteroplacental perfusion, resulting in the formation of idiopathic IUGR.

Ethical Clearance: was approved and granted from Al-Mustansiryia University, Al-Rusafa and Al-Karkh health Directorate application forms as a requirement to obtain PhD degree in Anatomy, Histology and Embryology. Research projects are reviewed and conducted ethically. This research is not published yet.

Source of Funding: This study was self-funded.

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Conflict of Interest: Nil

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Characteristics of Multidrug Resistant Tuberculosis in Minia, Egypt

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Background

Tuberculosis (TB) is a disease of great antiquity and has almost certainly caused more suffering and death than any other infection. A total of 40 patients were registered with a diagnosis of MDR-TB during 2010–2018 in Minia. The majority of patients were from rural areas (27; 67.5%) and male (27; 67.5%). Emergence of MDR-TB has the potential to be a serious public health problem in that necessitates strengthened TB control and improved continuous monitoring of therapy.

Keywords: TB; MDR-TB; Therapy

Introduction

TB is a major public health problem owing to its high risk of person-to-person transmission, morbidity, and mortality. TB still remains one of the major health miseries facing humans, particularly in developing countries (1).

Multidrug-resistant TB (MDR-TB) remains a public health crisis and a health security threat. World Health Organization estimates that there have been 558 000 new cases with resistance to rifampicin – the foremost effective first-line drug, of that – 82% had MDR-TB.

According to the latest WHO estimation the incidence of tuberculosis (per 100,000 people) in Egypt was reported at 13 in 2017 (2). Screening, diagnosis, notification, and registration of TB cases were implemented all over Egypt according to the National TB Strategy of the National Tuberculosis Control Program (NTP). One of the registration sites is Minia

Chest Hospital, Minia, Egypt where the current study was conducted.

Method

This was a hospital-based retrospective study conducted to detect the pattern of prevalence, risk factors and treatment outcomes among patients with multidrug-resistant tuberculosis (MDR-TB) in Minia, Egypt and involving a record review of patients with TB notified and registered in Minia Chest Hospital. Data of 40 MDR-TB cases reported from January 1, 2010 to December 31, 2018 were analyzed. The diagnosis of MDR-TB in Minia Chest Hospital is made in line with the National Egyptian TB Control Program Guidelines of the Ministry of Health (NTP). Sociodemographic characteristics, associated comorbidities, fate of outcome and regimens of previous antituberculous treatments received either category I (CAT1) (Isoniazid “H”, rifampicin “R”, pyrazinamide “Z”, ethambutol “E” with or without streptomycin “S” for 2 months followed by isoniazid and rifampicin for 4 months {2HRZE(S)/4HR}), category II (CAT2) (2HRZES/1HRZE/5HRE) were collected. Cured patient was defined as a patient who is smear-negative in the last month of treatment and on at least one previous occasion. Treatment completed was defined as a patient who has completed treatment but who does not meet the criteria to be classified as a cure or a failure. Death was defined as a patient who dies for any reason during the course of treatment. Treatment default was defined as a patient whose treatment was interrupted for two months

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or more. Treatment failure was defined as a patient who remained or became again smear-positive at five months or later during treatment or defined as a patient who was initially smear-negative before starting treatment and become smear-positive after completing the initial phase of treatment. Trend curve of prevalence rate of MDR-TB cases in Minia, Egypt from 2003 to 2018 was performed.

Limitation of the study

By using retrospective data there were unavailability of clinical data, radiologic and other laboratory investigations.

Statistical Analysis

Data analysis was performed using SPSS version 20 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp. US). Crude and adjusted odds ratios (ORs) and their 95% confidence intervals (CI95) were calculated. A binary logistic multivariate model was applied to determine the independent predictors of the treatment outcome out of those factors that demonstrated significant association by bivariate analysis at a level of significance of $p \leq 0.05$.

Results

A total of 40 patients were registered with a diagnosis of MDR-TB during 2010–2018 in Minia. The majority of patients were from rural areas (27; 67.5%) and male (27; 67.5%). The mean age of the patients was 38 years

(SD \pm 14.3 years). Smokers represented 55% of patients. Married patients were 60% of patients (Table1).

Majority of patients received CAT1 treatment at home and about half of them were regular in treatment. The commonest side effects of drugs used in treatment of MDR-TB patients were GIT symptoms and peripheral neuritis as shown in (Table 1).

The adjusted odds ratios (OR) and 95% confidence intervals (CI) for the association between the combined effect of independent variables and the outcome variable (MDR-TB). These estimates were obtained by logistic regression analysis. Marital status, place of previous treatment, compliance and associated comorbidities were statistically associated with. Compliance to treatment was found to be the most important determinant (Table 2).

Regarding the associated co-morbidities, 2.5% of the included patients were positive for HIV, 17.5% of them had cardiac diseases, 25% were diabetics, 10% had HCV and 10% had chronic chest diseases (Fig. 1).

Patients completed treatment performed 37.5% and cases with favorable outcome were 22.5% while failure of treatment were only 5% (Fig.2).

The trend curves of MDR-TB and TB cases in Minia were decreasing in the years 2004, 2010, 2012 and 2018. The trend curves were increasing in the years 2005 and 2011 (Fig 3).

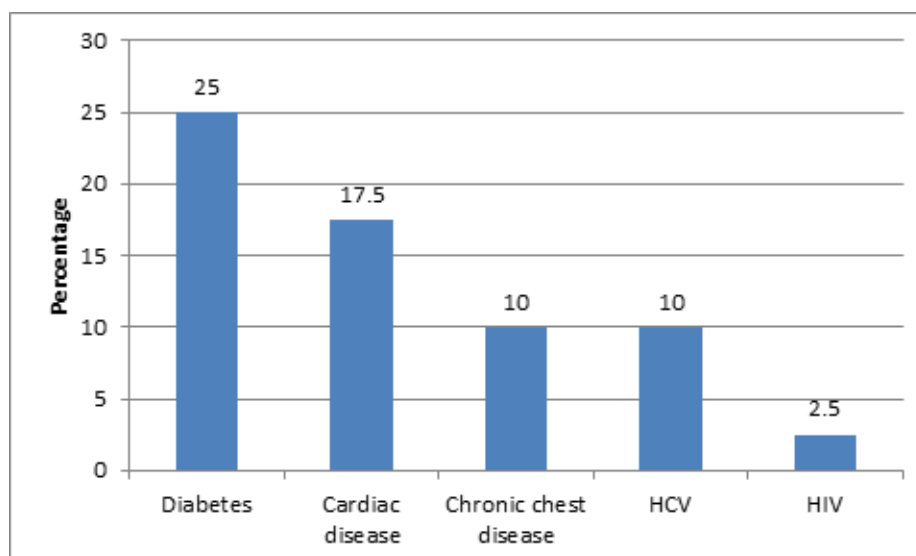


Fig (1) Associated co morbidity among the studied cases

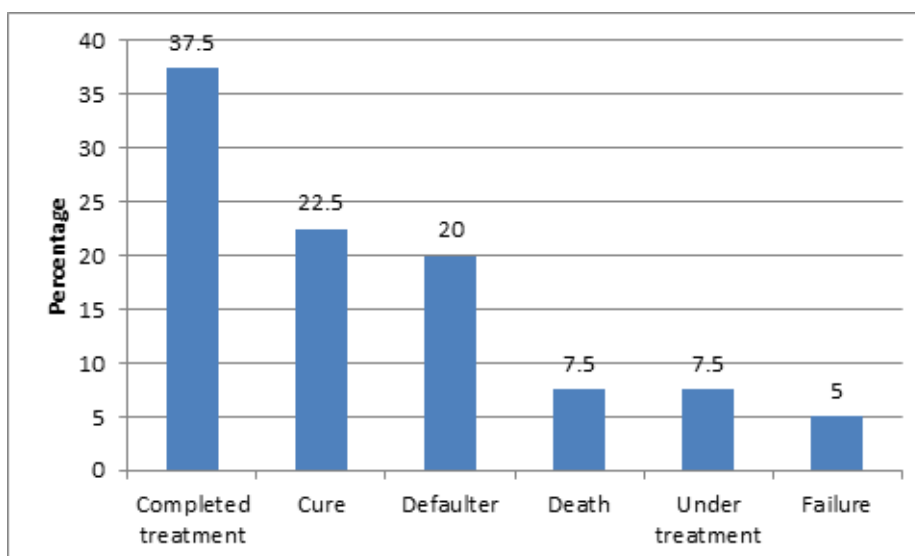


Fig (2): Outcome of TB treatment among the studied cases

Fig (3): Trend in prevalence of MDR- TB among TB patients in the period from 2003 to 2018

Table (1): Characteristics of MDR-TB cases in the period 2010-2018, Minia, Egypt

Age (years)	Mean ± SD	38.6±14.3	
		No.	%
Sex	Male	27	67.5
	Female	13	32.5
Smoking status	Smoker	22	55
	Non smoker	18	45
Residence	Rural	27	67.5
	Urban	13	32.5
Occupation	Non-worker	13	32.5
	Manual	6	15
	Farmer	13	32.5
	Housewife	8	20
Marital status	Single	5	12.5
	Married	24	60
	Widow	7	17.5
	Divorced	4	10
Place of treatment	Home	36	90
	Hospital	4	10
Regimen of treatment	CAT1	37	92.5
	CAT2	3	7.5

Cont... Table (1): Characteristics of MDR-TB cases in the period 2010-2018, Minia, Egypt

Compliance	Regular	21	52.5
	Irregular	7	17.5
	Uncertain	12	30
Side effects	Nothing	16	40
	GIT symptoms	18	45
	Peripheral neuritis	2	5
	Arthritis	4	10
Total		40	100

Table (2): Logistic regression analysis of factors affecting MDR-TB among the studied cases, Minia, Egypt

Variables	OR	CI	P-value
Age	0.95	0.86-1.04	0.26
Sex	1.1	0.075-16.5	0.9
Occupation	1.9	0.7-5.04	0.18
Residence	2.006	0.28-14.6	0.5
Marital status	5.6	1.1-28.7	0.03*
Smoking	4.5	0.4-51.5	0.2
Place of previous treatment	4.6	3.08-26.2	0.04*
Regimen of previous treatment	3.02	0.006-1509.8	0.7
Compliance to treatment	2.03	1.3-3.9	0.02*
Side effects of drugs	1.3	0.65-2.5	0.84
Associated comorbidities	1.95	1.57-2.6	0.04*

Discussion

Multi Drug Resistance Tuberculosis MDR-TB is a rapidly increasing public health problem with major socio-economic and individual consequences. The spread of MDR-TB can only be prevented by rapid identification of these cases and treatment with a combination of effective drugs ⁽⁵⁾.

In the present study, males constituted 67.5% while females represented 32.5%. This coincides with the epidemiological picture of tuberculosis where males spend more number of hours outdoor exposure and more challenging and hazardous working environments. Also this came in accordance with ⁽⁶⁾ who reported that the

percentage of MDR-TB among males was 75.9% and that of females was 24.1% in three different governorates in Egypt.

In this study, we found that 55% of MDR-TB patients were smokers and this coincided with that of ⁽⁷⁾ in El-Abbasia Chest Hospital who revealed that in MDR TB, smokers were 61.53% and non-smokers were 38.47% among MDR-TB cases.

In many countries, differences in MDR-TB prevalence rates between urban and rural areas have been described. In the current study, 62.5% of patients were from rural areas and 32.5% were from urban areas. A study by ⁽⁸⁾ has reported similar findings that 90% were

from rural areas and only 10% were from urban area in the Dakahlia governorate from 2006 to 2011. Increased MDR-TB cases in rural areas could be explained by poverty, bad social conditions, milk sanitation, and occupational exposure to infected animals.

In this study, the most common co-morbidity associated with MDR TB was diabetes. This result agreed with those of ⁽⁹⁾ who reported that the highest co-morbidity among MDR-TB patients was DM 29.9%. Also, it was matched with those of ⁽¹⁰⁾, who reported that the highest co-morbidity among MDR-TB patients was DM (18.3%) of the patients.

In the present study, cured patients were (22.5%), dead patients were (7.5%) and defaulters were (20%). This result was matched with those of ⁽¹¹⁾, who reported that (19.4%) were successfully treated, (20.9%) died, defaulted (13.4%). On the other hand, the result didn't agree with ⁽¹²⁾, who studied the outcome of treatment of MDR TB patients in Russia that 76.0% was cured. Again, the result didn't match with those of ⁽¹³⁾ who reported that 70.6% were cured in United Kingdom from 2004-2007. This difference might be due to patient compliance with treatment and regular drug in developed countries.

In the present study, 45% of patients suffered from gastrointestinal disorders. This result coincided with those of ⁽¹⁴⁾, who stated that the most frequent side effect of Anti TB drugs was gastrointestinal manifestations (64%). Also, this result agreed with those of ⁽¹⁰⁾, who reported that dominant adverse effect was gastrointestinal disorders (55%). Oppositely, the result did not coincide with those of ⁽¹⁵⁾ who reported that the highest adverse effects were ototoxicity 41.8%, psychological 21.3% and gastrointestinal 14%. This difference might be due to the fact that Törün study included 263 MDR TB patients who received individualized treatment for MDR-TB between April 1992 and June 2004 at Istanbul, Turkey and also the author said that the frequent and early occurrence of ototoxicity may be due to the extended exposure to amino glycosides and Capreomycin during or prior to MDR-TB treatment.

In the current study, the studied cases were resistant to CAT1 (rifampicin, isoniazid, ethambutol and streptomycin) represented 92.5%. This result agreed with the findings reported by ⁽¹⁶⁾ that 65% of patients were resistant to CAT1. Contrary to our results ⁽¹⁷⁾ in Bulgaria founded that only 52% of cases were resistant to CAT1 this high percent of acquired resistance may

be due to alcoholism, number of previous treatments and irregular treatments. A study by ⁽¹⁸⁾ reported that only 42.8% of patients in a tertiary hospital in India were resistant to CAT1. Such variation may be due to varied geographical distribution, circulating strain patterns, demographic, ethnic, and epidemiological differences.

In this study comorbidities increased risk of MDR-TB ($p=0.04$) and this was observed by ⁽¹⁹⁾ in South Korea who found that relapse with resistant strains and poor treatment outcome of MDR-TB was documented among comorbid patients. Active screening for diabetes and HIV among TB patients is suggested as a cost-effective measure to be incorporated within the TB control program.

Our study revealed that MDR-TB infection had a statistically significant association with patients place of previous treatment ($p=0.04$) and this is in agreement with study done in Addis Ababa, Ethiopia by ⁽²⁰⁾ on patients who visited health facilities ($p<0.005$). Compliance to treatment appeared to be a predictor for MDR-TB ($p=0.02$) and this finding was in agreement with a study by ⁽²¹⁾ in China ($p<0.005$), which requires strong commitment and collaboration among health organizations and greater compliance with TB treatment guidelines by service providers and patients.

In the present study, the trend curve of MDR-TB cases in Minia was decreasing in the years 2004, 2010, 2012 and this may be due to that the program of MDR-TB was approved and implemented in Egypt in the year 2003, by the Green Light Committee (GLC) ⁽²²⁾. The trend curve was increasing in the years 2005 and 2011 with more detection rate of drug resistant TB cases with drug susceptibility tests and increasing slum areas, low socioeconomic status and poor nutrition and political disturbance and 25th January revolution.

Conclusion

Emergence of MDR-TB has the potential to be a serious public health problem in that necessitates strengthened TB control and improved continuous monitoring of therapy. Emphasis on the need to complete medical records of patients in hospitals.

Declarations:

- There is no conflicts of interest and/or funding
- The paper has been read and approved by all authors.

- Ethical considerations: The study was approved by the ethical committee of the Faculty of Medicine, Minia University. Prior to data collection, official permissions were obtained from the authorities of Minia University Hospital. Following the ethical guidelines of epidemiological research, a written informed consent was taken from each participant.

- Data is available on request.

Ethical approval: Ethics approval to use, report, and publish the collected data was obtained from the administrator of Minia Chest Hospital. Patient information was anonymized and deidentified prior to the analysis. Research Ethics Committee at the Faculty of Medicine, Minia University, approved this study protocol.

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Prevalence of Uncorrected Refractive Errors Among the Internally Displaced Schoolchildren in Iraq

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Abstract

Purpose: The aim of this study was to estimate the prevalence of uncorrected refractive errors among the internally displaced schoolchildren in Iraq.

Method: A school-based cross-sectional study in the academic year of 2016-2017. Schoolchildren were selected from 8 primary schools for the internally displaced children in Kurdistan region, Iraq. All children underwent full ophthalmic examination, uncorrected visions were tested and cycloplegic refractions were done for children with visual impairment. Refractive errors in this study were determined by the results of the cycloplegic refraction.

Results: From 592 selected children, 94.7% had participated in our study, and 553 were eligible (age ranged from 6 to 12 years). The prevalence of refractive errors was 34.5%; 32.2% of them were uncorrected. The prevalence rates of myopia, hyperopia and astigmatism were 3.8%, 13.9% and 14.9%, respectively.

Conclusion: This study has found a high prevalence of uncorrected refractive errors among the internally displaced children in Iraq. This result represents an important health issue among those children, requiring major actions to tackle and resolve it.

Key-words: Internally displaced children, Cross-sectional study, Refractive errors, Prevalence, Iraq.

Introduction

Refractive errors (RE) affect a large proportion of the world's population, regardless of their age, gender and ethnicity [1]. According to the World Health Organization (WHO), uncorrected refractive error is considered as the leading cause of avoidable blindness and visual impairment worldwide, with estimated number of 12 million of schoolchildren aged 5 to 15 years worldwide affected [1, 2, 3]. Uncorrected refractive error has great impediment on the individual's education, personality development and career opportunities, along with its economic burden on society [1]. Therefore, the need for an effective screening programs to detect

individuals with refractive error is rising in the recent years. VISION 2020- The Right to Sight, is the global initiative set by WHO to prevent the visual impairment resulting from the uncorrected RE. One of its strategies is to include a simple visual acuity test into the school health programs, and to perform spectacles provision to children with significant refractive errors [4, 5]. Provision of appropriate spectacles is considered as a simple, cost-effective strategy in order to improve vision.

In Iraq, as a result of the violence and conflicts in the past decade, more than 1.7 million persons, including over 900,000 children, had fled their homes and are living in camps or homes in the Kurdistan region of the country [6]. To our best knowledge, there is no available published data or information regarding the prevalence of visual impairment among these internally displaced children. Therefore, this study aimed to draw attention to the on-going health problems of the internally displaced people by determining the prevalence of the uncorrected refractive errors among the displaced schoolchildren.

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Material and Method

Study area and sampling

A cross-sectional school-based study was carried out among primary schoolchildren in the academic year of 2016 - 2017. The students were recruited from 8 primary schools for internally displaced children located in Kurdistan region, North Iraq. The study included all the cooperative students of both genders from these schools after obtaining informed consents from their parents or guardians. The age of students included in the study ranged from 6 to 12 years; since in Iraq, children enroll in the elementary schools at age of 6 years, and the duration of study is six years.

Ophthalmic Examination

All the medical procedures were performed by trained ophthalmologists and optometrists. Examination included full ophthalmic history, slit lamp examination, and uncorrected visual acuity (UCVA) using Snellen's (E letter) chart at 6 meters' distance. Those with UCVA of 6/12 or worse in the better eye were declared to have defective vision and were examined by cycloplegic autorefraction using (Topcon KR 8000), and appropriate spectacle corrections were given. Children already wearing spectacles at time of examination were also examined and any changes in refractive errors were noted. The visual acuity, types of refractive error and correction were noted down in a self-designed proforma.

Definitions

Normal vision was defined as UCVA of 6/9 or better in at least one eye. Visual impairment was defined as an UCVA of 6/12 or worse in the better eye. Refractive errors were classified into myopia, hyperopia and astigmatism. Myopia was defined as a spherical equivalent (SE) of ≤ -0.50 diopter (D), hyperopia as $SE \geq +2.0$ D, and astigmatism as a cylinder of ≥ 0.50 D.

Astigmatism was further classified into: simple myopic, simple hyperopic, compound myopic, compound hyperopic and mixed astigmatism.

Statistical Analysis

The prevalence of RE was calculated as the ratio of the number of subjects with RE to the total number of the children studied. The prevalence of different types of RE (myopia, hyperopia, and astigmatism) was presented as percentage. Microsoft excel package and SPSS software (IBM Version 23) were used for the data analysis.

Results

Study population

A total of 592 students from 8 primary schools for internally displaced children in Kurdistan region, Iraq, were recruited for this study. Of whom, 561 had participated in the study with a response rate of 94.7%. We excluded 8 cases from the data analysis because of poor cooperation and missed information. The remaining 553 subjects consisted of 287 males (51.9%) and 266 females (48.1%), Errors! Reference source not found. The age of the students ranged from 6 to 12 years. Mean age \pm SD of the participants was 7.31 ± 0.59 years, **Table 1**.

Vision and VA

Uncorrected visual acuity of 6/9 or better in at least one eye was found in 362 out of 553 students (65.5%). The prevalence of visual impairment (UCVA of 6/12 or worse) in the better eye was 34.5% (191 of 553). The results of the vision screening according to gender and age of the participants are shown in **Tables 1 and 2**.

Of the 34.5 per cent of this sample found to have UCVA of 6/12 or worse in the better eye, 32.2 per cent of them had refractive errors (178 of 553). The remaining 2.3 per cent (13 of 553) had UCVA of $\leq 6/12$ due to other ocular causes, see **Table 3**.

Table 1: Overall results of vision screening in schools of internally displaced students in Iraq by gender.

Gender	Screened students	Visual acuity 6/9 or better	Visual acuity 6/12 or worse
		Number (%)	Number (%)
Male	287 (51.9%)	173 (31.3%)	88 (16%)
Female	266 (48.1%)	189 (34.2%)	112 (20.2%)
Total	553 (100%)	362 (65.5%)	191 (34.5%)

Table 2: Overall results of vision screening in schools of internally displaced students in Iraq by age.

Age group (years)	Visual acuity 6/9 or better	Visual acuity 6/12 or worse	Total
	Number (%)	Number (%)	Number (%)
6 -7	161 (29.1%)	64 (11.57%)	225 (40.7%)
7 -8	70 (12.7%)	45 (8.14%)	115 (20.8%)
8 -9	56 (10.1%)	30 (5.4%)	86 (15.6%)
9 -10	57 (10.3%)	28 (5.06%)	85 (15.4%)
10 – 11	13 (2.4%)	18 (3.25%)	31 (5.6%)
11 - 12	5 (0.9%)	6 (1.08%)	11 (1.9%)
Total	362 (65.5%)	191 (34.5%)	553 (100%)

Table 3: Causes of visual impairment in the internally displaced schoolchildren in Iraq.

Causes	Number (%) of students with visual impairment
Refractive error	178 (32.2%)
Amblyopia	10 (1.8%)
Keratoconus	2 (0.3%)
Retinal disease	1 (0.2%)
Total	191 (34.5%)

Refractive errors

The overall prevalence of refractive error in the better eye was 32.2% of the studied sample (n = 178), **Table 3**. Of those 178 students with RE, only 18 (3.3%) wore spectacles during the time of the examination, and this making the prevalence of uncorrected RE was 28.9% in the examined schoolchildren (160 of 553). **Tables 4 and 5** are showing the prevalence of refractive error types distribution according to gender and age of the examined schoolchildren.

The overall prevalence of hyperopia was 13.9% (n = 77). Myopia was detected in only 3.8% of the studied sample (n = 21), and the prevalence of astigmatism was 14.5% (n = 80). In case of astigmatism, mixed astigmatism was the most prevalent type (6.7%) of the total studied cases, followed by compound hyperopic astigmatism (3.6%) and compound myopic astigmatism (2.4%), **Table 6**.

Table 4: The prevalence of myopia, hyperopia and astigmatism by gender.

Type of refractive error	Gender		Total Number (%)
	Male Number (%)	Female Number (%)	
Myopia	9 (1.6%)	12 (2.2%)	21 (3.8%)
Hyperopia	25 (4.5%)	52 (9.4%)	77 (13.9%)
Astigmatism	41 (7.4%)	39 (7.1%)	80 (14.5%)
Total	75 (13.5%)	103 (18.7%)	178 (32.2%)

Table 5: The prevalence of myopia, hyperopia and astigmatism by age.

Age (years)	Type of RE			Total Number (%)
	Myopia Number (%)	Hyperopia Number (%)	Astigmatism Number (%)	
6 – 7	1 (0.2%)	32 (5.7)	27 (4.9%)	60 (10.8%)
7 -8	5 (0.9%)	17 (3.1)	20 (3.6%)	42 (7.6%)
8 -9	2 (0.4%)	14 (2.5)	12 (2.2%)	28 (5.1%)
9 -10	5 (0.9%)	7 (1.3)	14 (2.5%)	26 (4.7%)
10 -11	5 (0.9%)	5 (0.9)	5 (0.9%)	15 (2.7%)
11 -12	3 (0.5%)	2 (0.4)	2 (0.4%)	7 (1.3%)
Total	21 (3.8%)	77 (13.9%)	80 (14.5%)	178 (32.2%)

Table 6: Type and distribution of astigmatism by gender.

Type of astigmatism	Gender		Total Number (%)
	Male Number (%)	Female Number (%)	
Simple myopic astigmatism	5 (0.9%)	3 (0.5%)	8 (1.4%)
Simple hyperopic astigmatism	0	2 (0.4%)	2 (0.4%)
Compound myopic astigmatism	8 (1.4%)	5 (0.9%)	13 (2.4%)
Compound hyperopic astigmatism	9 (1.6%)	11 (2%)	20 (3.6%)
Mixed	16 (2.9%)	21 (3.8%)	37 (6.7%)
Total	41 (7.4%)	39 (7.1%)	80 (14.5%)

Discussion

This study was conducted to test the visual performance and estimate the prevalence of refractive errors in the internally displaced schoolchildren in Iraq.

In general, in this study, refractive errors were found in 32.2 per cent of the examined students. Results of refractive errors prevalence studies throughout the worlds vary widely. In Iraq, the prevalence of refractive errors among schoolchildren has been studied in a limited number of studies; in Amara city was (47%) [7], in Thiqr governorate was (35%) [8], in Erbil governorate was (25%) [9], and in Massif Kurdistan was (23.33%) [10]. In other studies around the world, refractive errors prevalence among children were; (26.67%) in Iran [11], (18.6%) in Saudi Arabia [12], (22.1%) in Egypt [13],

(20.9%) in India [14], (6.3%) in Ethiopia [1], (12.8%) in China [15], (46.8%) in Australia [16], and (79 %) in the Unites States [17]. This wide variation in the results could be explained by; the racial and genetic factors of the different countries [18], the difference in the sampling methods and by the sample size. Also, the age range of the children is different in each study. While in our study it was (6 - 12) years, other studies had older or younger age groups included.

Furthermore, 28.9 per cent of the internally displaced children with refractive errors were uncorrected, as only a small number of them wore corrective glasses. This can be explained by the fact that; as a result of the conflicts in their cities, many of these children never had a previous visual examination. Also, for those who had previously examined and prescribed spectacles, the low

compliance for wearing glasses came from social stigma and financial causes.

In this study, astigmatism was found as the more prevalent type of refractive error (14.5%) followed by hyperopia (13.9%), while the prevalence of myopia was (3.8%) among the examined schoolchildren. An explanation to these results could be by the fact that the majority of the studied children were at younger age (mean age around 7 years). Also, the prevalence of astigmatism could be explained by the high prevalence of dry eye and allergic conjunctivitis among the Iraqis children [10,19].

In conclusion, uncorrected refractive error was found to be an important health problem among the internally displaced children in Iraq. Major actions need to be taken by performing regular school-screening programs that provide corrective glasses at low costs or free to those who need them.

Conflict of Interest: Nil

Source of Funding: self-funded

Ethical Clearance: Ethical approval for this study was obtained from the Scientific Committee of University of Fallujah / College of Medicine before any measurements were carried out. The school principals also approved this study. Written informed consents were obtained from the children's parents or guardians.

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The Influence of Additional Food Hotong Porridge with Moringa Leaves Mixture on Improvement Nutritional Status of Children Nutritional Children

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Abstract

Malnutrition is one of the main nutritional problems in Indonesia. Toddler is one of the age groups that are vulnerable to nutritional problems. One of the causes immediate nutritional problem is a lack of energy. This study aims to analyze the effect of supplementary feeding (PMT) hotong porridge mixed with moringa leaves and government biscuits on weight gain and underweight nutritional status in the working area of the Five Public Health Center. This study used Randomized Controlled Trial Design, with a quasi-experimental approach. The distribution of PMT hotong porridge with Moringa leaf mixture as a treatment group and the administration of PMT biscuits by the government program as a control group. The sample size was 32 toddlers. Data were analyzed using paired-sample T test. There was a significant effect on body weight and nutritional status after administration of PMT hotong porridge with moringa leaf mixture and PMT biscuits of government programs with p-value of 0.001 in the treatment group and the control group. Hotong slurry feeding and biscuit mix Moringa leaves government programs throughout a period of 30 days to take effect on the increase in body weight and nutritional status of children on the mark with most of the value of z-score infants already stood at -2SD s/d +2SD, which means that most of the children under five are already in the nutritional status of the mall.

Keywords: Toddler, Weight, PMT, Nutritional status

Introduction

Malnutrition is a condition of body weight according to age (weight/age) not in accordance with the age that should be⁽¹⁾. Malnutrition at the age of 2-5 years can affect mental development (ability to think). The brain reaches its maximum shape at the age of two years, malnutrition at this age can result in disruption of brain function permanently and malnutrition in general causes disruption in the processes of growth, energy production, body defense, structural behavior and function⁽²⁾

Based on the results of Riskesdas, the prevalence of underweight by province and national is 2018 by 17.7%

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including poor nutrition by 3.9% and under nutrition by 13.8%. When compared with the national prevalence rate in 2007 (18.4%), in 2010 (17.9%) and in 2013 it was 19.6%. Maluku Province is one of nine provinces with a high prevalence of severe under nutrition (24.9%)⁽³⁾. In 2016 the incidence of malnutrition in Central Maluku district showed a figure of 5.1% in 2017 (4.5%) and in 2018 (4.5%)⁽⁴⁾

One direct cause of malnutrition is low nutrient intake⁽¹⁾. Nutrient intake can be obtained from macro nutrients such as energy, protein and fat needed in large quantities by the body and plays a role in providing energy⁽²⁾. One ingredient food of high nutritional value, especially energy and protein is hotong. Hotong (*Setaria Italica (L) Beauv*) is a type of cereal crops sorghum. This plant is not widely known by the people of Indonesia and its processing is still limited.

Hotong plants grow widely in the Buru island area of Maluku and are used as staples with cassava, sago, corn,

and rice. Hotong content high enough seed nutrients are carbohydrates (84.02%), protein (14.05%), fat (3.3%), 100 grams of seeds contain energy hotong huge 359 calories⁽⁵⁾. Moringa leaves also have a main source of several nutrients and therapeutic elements including antibiotics that stimulate the immune system. Moringa leaves have a high content of protein, vitamins and minerals that are good to be used as additional food for malnourished toddlers⁽⁶⁾.

Method

This research was a quasi experimental study with Randomized Control Trial Design. The sampling technique was simple random sampling. The sample were stunting as many as 32 people consisting of 16 infants in the treatment group and 16 infants in the control group with the inclusion criteria, namely children aged 24-59 months who suffered less nutrition with weight/age. z-score $-3SD$ up to $<-2SD$, no disease, infants who are not breastfed and are willing to be respondents. This research was conducted for 30 days from 10 May to 10 June 2019 in the working area of the Public Health Center "Lima", Central Maluku. The independent variable was the administration of PMT hotong porridge mixed with moringa leaves and biscuits, the dependent variable was weight and nutritional status. PMT hotong porridge was given to the treatment group as much as 120 grams with 324 kcal energy and 10 grams protein and biscuits PMT were given to the control group as much as 120 grams (12 pieces/day) with 300 kcal energy and 8.45 grams protein.

Toddler characteristics in this study consisted of age and gender. Family characteristics include the

number of family members and family income. Primary data were obtained from body weight measurements using digital scales with 0.01 kg-accuracy, interviews with questionnaires and food recall form 1x24 hours. Secondary data were the number of malnourished children under the age of 24-59 months registered in the working area of the public health center "Lima".

The results of measuring under-fives weight use the weight/age index and compared with the z-score and are classified into 2 categories: malnutrition if included in the category of under nutrition and good nutrition and over nutrition if included in the category of good nutrition and over nutrition. Energy, protein and Fe intake compared with the cut of point Estimated Average Requirements (EAR), namely the deficit category if $<70\%$ RDA, less if $70-80\%$ RDA, while if $81-90\%$ RDA and good category if $91-100\%$ RDA .

To see the effect of energy, protein, and Fe intake on body weight and nutritional status of toddlers the paired-sample T test.

Findings

Characteristics of toddlers and families in table 1 shows that most of the toddlers in this study were aged 24-36 months in both the treatment group of 12 toddlers (75%) and the control group of 11 toddlers (68.75%). This age group is usually vulnerable to nutritional problems such as underweight, stunting and wasting. Toddlers aged 2 years have also entered the weaning period and have adopted the same diet with other families so that food intake is very important to support the growth process of infants⁽⁷⁾.

Table 1. Distribution of Toddler and Family Characteristics

Characteristics	Treatment		Control	
	n	%	n	%
Toddler Age (month)				
24-36	12	75	11	68.8
37-48	4	25	2	12.5
49-59	0	0	3	18.8
Total	16	100	16	100

Cont... Table 1. Distribution of Toddler and Family Characteristics

Toddler Sex				
Male	8	50	5	31.2
Girl	8	50	11	68.7
Total	16	100	16	100
Number of family members				
Solid (>4 people)	7	43.8	5	31.2
Rarely (\leq 4 people)	9	56.2	11	68.8
Total	16	100	16	100
Family Income				
<UMK	16	100	12	75
\geq UMK	0	0	4	25
Total	16	100	16	100

The sex in this study were mostly women, both in the treatment group of 8 toddlers (50%) and the control group of 11 toddlers (68.75%). Research in Ghana states that girls are more at risk of nutritional problems compared to boys. That is because in parenting, diet and care, boys take precedence over girls⁽⁸⁾.

The number of family members in this study mostly had sparse family members (\leq 4 people), namely in the treatment group of 9 toddlers (56.25%) and the control group of 11 toddlers (68.75%). This shows that the number of members in a family can influence the less optimal distribution and level of food consumption. Families with a large number of family members tend to get less food available. Lack of food availability in a long time can affect the low level of food consumption and have an impact on malnutrition⁽⁹⁾.

The level of family income in the treatment group (100%) and the control group (75%) <UMR. Family income is one of the socio-economic indicators that play a role in providing food and family eating patterns. Low income can be one of the factors causing underweight nutritional status in infants, if the amount of income is low, then the level of food expenditure is also low so that it can cause low purchasing power and availability of food that contributes to the level of suboptimal nutritional consumption⁽¹⁰⁾.

Prior to PMT administration, most toddlers experience a deficit in food intake. In the treatment group namely 14 toddlers (87.50%) deficits in energy

intake, 5 toddlers (31.25%) deficits in protein intake and 9 toddlers (56.25%) had deficits in Fe intake.

The control group most of the toddlers experienced energy intake deficits namely 12 toddlers (75.0%), 4 toddlers (25.0%) had a protein intake deficit and 12 toddlers (75.0%) had a deficit in Fe intake.

In the treatment group, the level of energy intake deficit was reduced to 2 toddlers (12.50%), the level of protein and Fe intake decreased deficits so that there was no deficit intake of toddlers.

In the control group, there was a decrease in the deficit energy intake to 6 children under five (37.50%). The majority experienced an increase in the level of protein intake, namely 6 toddlers (37.50%) and Fe deficit intake increased to less intake, namely 9 children under five (56.25%).

The test results differ in levels of energy, protein and Fe consumption between the treatment group and the control group after PMT administration with p-value = 0.007. Previous research stated that there was a change in the level of energy consumption in the treatment and control groups after the administration of PMT by p=0.008⁽¹¹⁾. This study is other states that people with a less risky energy consumption 6.73 malnutrition was comparable to the n that the energy consumption enough⁽¹²⁾.

The effects of energy, protein and Fe intake on body weight and nutritional status before and after PMT administration are presented in table 4.

Table 2. Effects of Energy, Protein and Fe Intake on Body Weight and Nutritional Status Before and After Giving PMT

Average	Treatment		Control	
	Before	After	Before	After
Energy (%)	65.49	80.03	66.60	71.00
Protein (%)	79.53	95.88	85.27	86.61
Fe (%)	72.00	81.32	69.37	76.40
BW (kg)	7.93	10.06	8.05	8.95
Z-Score	2.58	3.86	2.02	2.93

Table 2 showed that the treatment group or the control group increased intake of energy, protein and Fe. In the treatment group, the intake of energy, protein, Fe, body weight and nutritional status increased after administration of hot porridge mixed with moringa leaf.

The results of different tests of energy intake, protein intake and Fe intake on body weight and nutritional status before and after PMT administration showed significant differences, namely in the treatment group $p=0.001$ and the control group $p=0.039$ and $p=0.001$.

Discussion

Effects of Moringa Leaf Hotong Slurry Supplement Supplementation for Weight Loss

PMT hotong porridge with moringa leaf mixture is a snack made from several specific ingredients, as the main ingredient of hotong flour and Moringa flour with a comparison of certain nutritional levels in order to obtain high nutritional value. Consumption hotong flour and flour of Moringa is alternative way to promote weight loss nutritional status of stunting.

Hotong has several advantages compared with rice, nutrients are protein on hotong 3 times greater (13.05g) of protein in rice (5.0 g), carbohydrates at hotong of 84.02 cal and at 70-80 cal rice and fat in hotong 3.37 grams greater than fat in rice that is 1.0-2.0 g⁽⁵⁾.

Moringa leaves also have several advantages including vitamin C in moringa is equivalent to 7 times vitamin C in citrus fruits, 4 times calcium in milk, 3 times potassium in bananas, 2 times protein in yogurt, 4 times vitamins in carrots and 25 times iron in spinach⁽⁶⁾.

Moringa leaves also contain 46 antioxidant compounds that protect the body against the damaging effects of free radicals by neutralizing them before they can cause cell damage and disease.

The results of the study are known before giving hotong porridge the mixture of Moringa leaves the average value of body weight is 7.93 kg and after administration of hotong porridge the mixture of Moringa leaves the average value of a toddler's body is 10.06 kg, meaning that there is an increase in toddler body weight after the administration of hotong pulp mixed with moringa leaves in the treatment group was 2.13 kg (8.50%)

Hotong porridge mixed with moringa leaves can be used as an alternative intake of morning uptake with complete nutritional content. by consuming 1 plate or 120grams of hotong porridge mixed with moringa leaves can be fulfilled energy by 27.07% of RDA and protein 33.35% of RDA with the fulfillment of energy and protein intake in a day can increase weight gain in infants.

Earlier research stated that the more increased administration of Moringa leaves were added, the higher the content of protein, sugar, calcium, fiber content and β -carotene. This allows good absorption of nutrients contained in hotong and Moringa leaves⁽¹³⁾. Other studies also stated that the body weight of children who received average Moringa leaf powder was higher (8.9 \pm 4.30 g/kg/day compared to 5.7 \pm 2.72g/kg/day in group II) and the level recovery is faster with an average stay time of 36 \pm 16.54 g/kg/day compared to 57 \pm 19.20 g/kg/day for those who do not receive Moringa supplements⁽¹⁴⁾.

Other research states there is an effect of energy intake and protein intake on the addition of BB and TB under five after giving Moringa BMC PMT for 30days. The results of the analysis of energy intake and protein intake on BB and TB before and after giving BMC Moringa get the average value of BB before 10.29 kg and BB after 11kg. The average TB value before giving BMC Moringa PMT 88.12 cm and TB after an average of 89.16 cm⁽¹¹⁾.

The results of the difference between body weight before and after PMT administration showed a significant difference with a value of $p=0.001$.

The Effect of Supplementation of Moringa Leaf Hotong Porridge Supplement Against Nutritional Status

The results showed that the nutritional status of the treatment group prior to the administration of hotong porridge with Moringa leaf mixture was lacking nutritional status-the average nutritional status of children under five was 2.58kg and after administration of hotong porridge with Moringa leaf mixture the average value of nutritional status was 3.86kg. meaning that an increase in nutritional status after the administration of hotong porridge mixed with Moringa leaves by 1.28 kg

In the control group before administration of government program biscuits the average nutritional status was 2,02 whereas after administration of government program biscuits the average nutritional status was 2.93. This means that an increase in BB of 0,91.

Statistical test results showed that there were significant differences before and after the administration of hotong porridge mixed with moringa leaves ($p=0.001$) and government program biscuits with a value ($p=0.001$) on nutritional status. From the results of the study, samples that were given supplementary food both hot moringa mixed porridge with leaves and biscuits during the government program for 30days increased nutritional status, and the most effective improvement in nutritional status was supplementary feeding of hotong porridge mixed with moringa leaves.

Increasing the nutritional status of children under five is influenced by good food intake. Meeting the nutritional needs of children under five is the fulfillment of food intake that contains important compounds needed by the body of a toddler, including calories,

protein, vitamins and minerals in accordance with their age. So at the age of five, balanced nutrition is needed so that the growth and development of toddlers can run well.

Conclusion

There is an effect of the administration of PMT hotong porridge with moringa leaf mixture and PMT biscuit of government programs to increase body weight and nutritional status of under-fives nutrition.

Suggestion is that the hotong porridge mixed with moringa leaves can be considered as an alternative for breakfast as a substitute for rice porridge,so as to reduce the incidence of malnutrition in infants.

Ethical Clearance: Taken from Ethical Commission of Health Research, No.125/HRECC.FODM/IV/2019, Faculty of Dentistry-UNAIR.

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Conflict of Interest- No

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The Stiffness Comparison of Four-Screw versus Six-Screw Short Segment Pedicle Posterior Stabilization Instrumentation in Cyclic Axial Compression

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Abstract

Background: Thoracolumbar burst fracture required to conduct short segment posterior stabilization as the operative therapy. The short segment fixation (above and under fracture level (four-screw pedicle)) encounters loss of correction and failure including progressive kyphosis, screw pedicles and rods that are bent or fractured. Rod around fracture site receives bigger loads than other parts due to its function as cantilever. To overcome this, it uses short-segment posterior stabilization instrumentation in which pedicle screw is installed above, under, and on fracture site level (six-screw pedicle) to increase stiffness.

Objective: To analyze the comparison stiffness of four-screw versus six-screw short segment pedicle posterior stabilization instrumentation in cyclic axial compression.

Method: This study used in vitro mechanical test in simulation of vertebrae from UHMWPE (Ultra High Molecular Weight Polyethylene) that was fixated with four-screw and six-screw pedicle. Each construction is given cyclic axial compression. Afterwards, the stiffness of each construction was measured.

Results: Six-screw short segment pedicle posterior vertebrae stabilization instrumentation had higher stiffness of 43.38% than four-screw short segment pedicle posterior vertebrae stabilization instrumentation in cyclic axial compression. There was a significant difference in both groups ($p < 0.05$)

Conclusion: Six-screw short segment pedicle posterior vertebrae stabilization instrumentation was better than four-screw short segment pedicle posterior vertebrae stabilization instrumentation in cyclic axial compression.

Keywords: *In vitro mechanical test, thoracolumbar burst fracture, six-screw short segment pedicle, four-screw short segment pedicle, cyclic axial compression, stiffness*

Introduction

In Indonesia, the case of spinal cord injury has commonly occurred. Spine fracture therapy can be performed either operatively or nonoperatively. The goal of spinal fracture therapy is to restore stability, reduce pain and correct deformity. The variety of therapy instrumentations that are currently used are SRSSI, PSP, and PSR (Pedicle Screw and Rod). Fixation with transpedicle screw is often used as a spinal instrumentation for the stabilization and correction of deformity caused by trauma, degenerative processes, tumors, and congenital abnormalities^(1, 2). The pedicle

screw system can provide instability treatment because of a burst fracture or tumor resection in the thoracolumbar⁽³⁾.

In the previous study on the short segment of four-screw pedicle, there was a change in kifotic angle post op of 2.0625 to 5.312 after 6 months, whereas in the short segment of six-screw pedicle, there was a change in kifotic angle post op of 1.000 to 1.333 after 6 months (4). The short segment fixation (above and under fracture level (four-screw pedicle)) encounters loss of correction and failure including progressive kyphosis, screw pedicles and rods that are bent or fractured. In

this case, if the construction is mounted a pedicle screw on the fracture site, it will overcome the problems (5). Several studies reported a 25% failure on lumbar or thoracolumbar fractures treated with instrumentation with short-segment pedicle screw(6). This is due to the short segment caused by the occurrence of axial instability that reflects the anterior and medial mechanical incompetence.

Several biomechanical studies are aimed to indicate the character of the spine in a physiological (non-injury) state, which includes a stiffness test or flexibility. The results of the study are described in the load displacement curve. Clinically, this series of instrumentation requires in vitro testing either in a plugged in synthetic material or cadaveric spine. The results of this biomechanical test provide information on tool stiffness, fatigue life and failure mechanisms to improve the instrumentation (7).

The researchers are intended to compare the stiffness by assigning a load to a cyclic axial compression force between the construction of four screw short-segment pedicles with six screw short segment pedicles on a vertebral simulation using polyethylene material.

Method

This research is an in vitro biomechanical test with true experimental. This method used Post test only control design, which distinguished two types of short-segment pedicle construction mounted on polyethylene (UHMWPE) material that resembles human spine with unstable fracture or (anterior and medial damage) and cyclic axial compression load. The first construction used four pedicle screw (pedicle screw mounted above and below fracture level) while the other type of construction used six pedicle screw (pedicle screw mounted above, below fracture level and fracture level).

The tool used was material testing machine servohydraulic type Schenck, 1990, made in Germany. Biomechanical tests on the vertebral simulation of polyethylene material was performed to compare the stiffness of a six-screw pedicle short-segment construction with four-screw pedicle short-segment construction in cyclic axial compression. The specimens were subjected to repeated loading on the top and downward direction in the sinusoidal function with cross head displacement of ± 1 mm. The frequency of displacement was 2 Hz in sinusoidal wave. The magnitude of this displacement was determined based on previous studies showing that displacement of 1 mm

provided a load to the pedicle screw equivalent to the load received during walking (8). The amount of load received is calculated; thus, the load displacement curve can be obtained to calculate the stiffness coefficient.

The measurement of the slope stiffness of the load displacement curve was carried out in the range of 10-90% from the 1000 cycles. It was intended to remove the pre-stress conditions received during insertion or tightening of the screw (8). This measurement was conducted four times; thus, each specimen has a total of 3000 cycles to recognize changes in the entire cycle. This test used a servohydraulic testing machine (ESH) composed of displacement transducer and compressive load-cell. The data collection of load displacement was conducted through analog to digital interface. Three groups of data obtained were time (s), displacement (mm), and load (N).

Two holes were made on polyethylene on the posterior side with 40 mm distances. Both holes had the same distance from the bottom surface of the block, which was 9 mm. The direction of the screw hole was perpendicular to the cut posterior surface; thus, it angles 15° anteromedial. Both holes were tapered 6.0 and mounted two monoaxial pedicle screw in each polyethylene block. The screw had 35 mm long from 316L stainless steel made by PT Marthys Indonesia. This study used two types construction: the first construction used two blocks of polyethylene by spacing between two blocks and the second construction used three blocks of polyethylene. Once tested, the polyethylene specimen can be reused only if visual inspection was not cracked, ebris due to the usage, or permanent shaping. Furthermore, the reduced torque strength can cause the polyethylene cannot be used.

Screw pedicle used had a head structure that can accommodate longitudinal rod, perform closure mechanism, and deformity correction. Closure mechanism is an important part because it has an effect on the rigidity of a construction. To see the actual strength of the construction, a scenario condition was created, in which the construction must support axial compression loads on both polyethylene blocks above and below. The statistical analysis was conducted by using ANOVA (Analysis of Variance) with $p < 0.05$ as the degree of significance. This study compared the stiffness between devices as well as between cycles; therefore, it was not possible to use t test.

Results

Based on the statistical test descriptively, the highest average stiffness of 6 screw pedicle after giving axial compression style of 500 N was 528.75 ± 32.50 N/mm in initial cycle (cycle 0). On the other hand, the lowest stiffness value in 3000 cycle was 431.25 ± 37.50 N/mm. In the results of axial compression of 900 N, the highest stiffness in initial cycle was 356.25 ± 71.80 while

the lowest stiffness in cycle 3000 was 137.50 ± 43.30 N/mm. The highest average stiffness of 4 screw pedicle after giving axial compression style of 500 N was 276.25 ± 16.52 N/mm in initial cycle (cycle 0). On the other hand, the lowest stiffness value in 3000 cycle was 243.75 ± 23.93 N/mm. In the results of axial compression of 900 N, the highest stiffness in initial cycle was 175 ± 95.74 while the lowest stiffness in cycle 3000 was 87.50 ± 25.0 N/mm.

Table 1. The multi-cyclic stiffness post compression force in pedicle screw installation

Treatment	Sample	Compression 500N				Compression 900N			
		Cycle	Cycle	Cycle	Cycle	Cycle	Cycle	Cycle	Cycle
		0	1000	2000	3000	0	1000	2000	3000
		(N/mm)	(N/mm)	(N/mm)	(N/mm)	(N/mm)	(N/mm)	(N/mm)	(N/mm)
6 pedicle screw	1	525.0	475.0	450.0	475.0	375.0	350.0	250.0	100.0
	2	515.0	485.0	475.0	450.0	400.0	225.0	200.0	175.0
	3	500.0	435.0	400.0	400.0	400.0	150.0	100.0	100.0
	4	575.0	450.0	410.0	400.0	250.0	175.0	150.0	175.0
4 pedicle screw	1	285.0	275.0	260.0	225.0	300.0	200.0	200.0	125.0
	2	295.0	285.5	275.5	260.0	100.0	75.0	75.0	75.0
	3	275.0	265.0	250.0	225.0	100.0	175.0	100.0	75.0
	4	300.0	270.0	250.0	250.0	200.0	175.0	100.0	75.0

The analytical statistic used Independent t-test. Mann-Whitney was performed to measure the average stiffness after giving the axial compression 500 N and 900 N in 6 screw pedicles and 4 screw pedicles. It was also repeated ANOVA test to understand the stiffness change along with cycle change (1000, 2000, dan 3000 N/mm) in both ways of installations.

Table 2. The comparison of stiffness mean in 6 pedicle screw and 4 pedicle screw (independent t-test)

Compression	Pedicle screw treatment	Stiffness mean (N/mm)	Difference percentage (%)	(p)
The comparison of stiffness mean in 6 pedicle screw and 4 pedicle screw post compression 500 N and 900 N (independent t-test)				
500 N	6 screw	463.75 ± 49.91	43.38	0.001
	4 screw	262.56 ± 19.11		
900 N	6 screw	223.44 ± 67.15	39.85	0.008
	4 screw	134.38 ± 66.38		
The comparison of stiffness mean each cycle in 6 pedicle screw and 4 pedicle screw post compression 500 N (independent t-test)				
0	6 screw	528.75 ± 32. 50	47.75	0.001a
	4 screw	276.25 ± 16. 52		
1000	6 screw	461.25 ± 22. 86	42.52	0.029b
	4 screw	265.12 ± 10. 95		
2000	6 screw	433.75 ± 37. 50	38.87	0.001a
	4 screw	265.12 ± 10. 95		
3000	6 screw	431.25 ± 37. 50	43.38	0.001a
	4 screw	243.75 ± 23. 93		
The comparison of stiffness mean each cycle in 6 pedicle screw and 4 pedicle screw post compression 900 N (independent t-test)				
0	6 screw	356.25 ± 71. 80	50.88	0.023
	4 screw	185 ± 95. 74		
1000	6 screw	225 ± 88. 97	30.56	0.238
	4 screw	156.25 ± 55. 43		
2000	6 screw	175 ± 64. 54	32.14	0.234
	4 screw	118.75 ± 55. 43		
3000	6 screw	137.50 ± 43. 30	36.36	0.104
	4 screw	87.5 ± 25. 00		

* Homogeneity test was performed using Levene test

a Analytical test using independent t-test parametric test

b Analytical test using non-parametric test Mann-Whitney test

It has been revealed that the average stiffness of 6

screw pedicles was higher than 4 screw pedicles with the percentage of 43.38% post compression of 500 N and 39.85% post compression of 900 N. It was a significant difference (p<0.05). The stiffness in 6 screw pedicles post giving axial compression of 500 N was higher than 4 screw pedicles of each cycle with the initial cycle

percentage of (47.75%) and it was considered significant ($p < 0.05$). The stiffness in 6 screw pedicles post giving axial compression of 900 N was higher than 4 screw pedicles of each cycle in the initial cycle and it was considered significant ($p < 0.05$). However, there was no significant difference in other cycles ($p > 0.05$).

The average stiffness of 6 screw pedicles had tendency to decrease along with increased cycle yet it was not considered significant ($p > 0.05$). The post hoc test of 4 screw pedicles showed that there was significant decreased stiffness from cycle 0 to 1000, as well as from cycle 1000 to 2000 ($p < 0.05$). However, there was an insignificant decrease of average stiffness in cycle 2000 to 3000 ($p > 0.05$). In general, there was decreased stiffness along with insignificant increased cycle with axial compression of 500 N in 3-level pedicle screw ($p > 0.05$). In addition, there was a decreased stiffness along with insignificant increased cycle in 4 pedicle screws ($p > 0.05$). Based on post hoc test in 4 pedicle screws, there was no statistically significant average stiffness in each cycle change ($p > 0.05$). It can be concluded that there was no significant decreased stiffness along with increased cycle with axial compression of 500 N in 4 pedicle screws ($p > 0.05$).

The average stiffness of 6 screw pedicle showed a tendency to encounter insignificant decreased along with increased cycle ($p > 0.05$). Based on post hoc test in 6 pedicle screws, there was no statistically significant average stiffness in each cycle change ($p > 0.05$). It can be concluded that there was no significant decreased stiffness along with increased cycle with axial compression of 900 N in 6 pedicle screws ($p > 0.05$).

The average stiffness of 4 screw pedicle showed a tendency to encounter insignificant decreased along with increased cycle ($p > 0.05$). Based on post hoc test in 4 pedicle screws, there was no statistically significant average stiffness in each cycle change ($p > 0.05$). It can be concluded that there was no significant decreased stiffness along with increased cycle with axial compression of 900 N in 4 pedicle screws ($p > 0.05$).

Discussion

To ensure the ability of instrumentation construction as a fixation of the spine, the implant construction must have genuine stiffness. Therefore, the stiffness should be measured to support and stabilize the spine until bone healing occurs in an instrumentation construction. Basically, the instrumentation construction has varying

stiffness due to the difference in load and the amount of cyclic received. It is due to the interspecimen slippage and microcrack in the implantable material. By using UHMWPE as a consistent fixation medium with the right size, the depth and placement of the implants can be made constantly ⁽⁹⁾.

This study protocol is a consistent and logical technique for the posterior spinal instrumentation biomechanical test. This method also provides evaluation base and biomechanical comparison of both constructions. In implant construction, the construction material and types affect the stiffness from the implant construction (10). Theoretically, the posterior stabilization of the short segment of six screw pedicles can increase the resistance and stabilization of the spine (13). In this study, in addition to the stiffness between the two constructions, we also observed the change of stiffness between cycles, so it can be found how strong the construction after being given increased cyclic axial compression cycle. This is in accordance with studies stating that the stiffness of an implant will vary according to the size of the load cycle received as a result of the intraspicemen slippage and microcrack occurring in the implant material (10, 12).

In this study, there was no broken construction on screw pedals and rods when the device was given cyclic axial load or upon inspection after the tool was removed. From the results of research using synthetic spine of UHMWPE material, it is found how big the difference of stiffness in both constructions is. The use of UHMWPE has the advantage of being a stable specimen in a research because it can be reduced to biological deterioration; therefore, it can be used as a consideration for deciding which type of construction will be used to deal with cases of spinal trauma. However, the value obtained does not mean exactly the same as if it is implemented on the patient directly. In the use to the patient, it still must be considered because there are many biological factors such as the age of patients, osteoporosis, the patient's nutrition, postoperative rehabilitation of the patient or the presence of comorbid diseases such as malignancy, and infection.

Conclusion

The six-screw short segment pedicle posterior vertebrae stabilization instrumentation was better than four-screw short segment pedicle posterior vertebrae stabilization instrumentation in cyclic axial compression.

Ethical Clearance: This study received an ethical test from Dr. Soetomo General Hospital and faculty of medicine Universitas Airlangga.

Source of Funding: This research was carried out through individual funding.

Conflict of Interest: There was no conflict of interest from this study.

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Correlation of Aggressivity Papilloma Recurrent Respiratory Tract With Human Papillomavirus Types 6 And 11

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Abstract

Background : Recurrent respiratory tract papilloma (PSPB) is a viral disease that correlated with an airway exophthalmia lesion. Papilloma is primarily caused by human papillomavirus (HPV) types 6 and 11 which are classified as low-risk HPV. Reports indicate that patients with the HPV-11 experience more aggressive course of the disease than HPV-6. Patients are often diagnosed at a younger age, the longer duration, require more frequent surgery and rare diseases of the disease when compared with those caused by HPV-6.

Objectives : To investigate the correlation of aggressiveness of PSPB with HPV-6 and 11.

Methods : Fifteen samples were conducted in the Outpatient Unit of Otorhinolaryngology and the Lotus Inpatient Installation of Dr. Soetomo General Hospital from December 2012 to March 2013 then determine the disease aggressiveness. PCR examination was done at the Tropical Disease Institute of Universitas Airlangga. Aggressive correlation of disease with HPV type was tested using Chi-Square.

Results : Fifteen patients were enrolled that divided; the male was 10 and female was 5. The mean annual number of operations was 2.8 ± 1.27 and 9 patients reported more than 3 surgeries each year. 10 patients had distal papilloma and 11 patients had a history of tracheostomy. PSPB was found in 12 patients, HPV-11 was 9 patients and HPV-6 was 6 patients. Chi-square test results showed no significant results with $p = 0.525$.

Conclusion : There was no correlation between PSPB aggression with HPV-6 and 11

Keywords : Aggressive Papilloma Respiratory Channels, HPV types 6 and 11, Chi Square.

Introduction

Recurrent respiratory tract papilloma (PSPB) is divided into child-onset PSPB or juvenile type and adult or adult-onset PSPB^{1,2}. Recurrent respiratory tract pneumonia is a disease caused by HPV in particular types 6 and 11^{3,4}. The manifestation of this viral infection is an esophageal lesion in the respiratory tract and has repetitive growth properties. This disease might undergo remission after obtaining multiple microscopic laryngeal surgeries, but in other conditions, it continues to grow and spread along the respiratory tract making it

more difficult to cure^{5,6}.

There are 76.47% of patients with implantation of the distal papilloma, even 21.57% has expanded to the trachea and bronchi. The tracheotomy was performed in 60.78% and 10% were tracheotomized more than once. A history of microscopic laryngeal surgery three times or more was obtained in 14.58% of patients. The transition sites include the inferior surface of the vocal cord, the vestibule of the rice, the nasopharyngeal mole palate, the trachea, the carina, and the bronchi, as well as the area around the tracheotomy stoma⁷. Virus type examination could predict the prognosis of disease travel⁸.

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Alternative therapies began to be considered based on the course of the disease. In-study therapy was included interferon- α , indole-3-carbinol, retinoid, bevacizumab, and cidofovir⁹. Human papillomavirus

(HPV) part of the cellular-mediated immune-response¹⁰, a virus belonging to the Papoviridae group that has no capsule, icosahedral, composed of double chains by 8000 pairs of DNA molecular bases^{11,12}. There were 35 types that infect the genital mucosa, including high-risk types correlated with malignancy and low risk with condyloma or low-grade cervical intraepithelial neoplasia¹². Human papillomavirus is considered an etiologic factor in PSPB with the discovery of an antigen or genome of HPV in papilloma tissue¹³.

Mounts, et al (1982) examined capsid antigen in the surface epithelial nucleus that using immunoperoxidase techniques and the HPV genome in papillary tumor tissue was using hybridization analysis techniques. Papillary viral antigens were found in four of the 20 PSPB specimens, while the HPV genome was found in all specimens¹³. HPV transmission is suspected to be multifactorial, but in children, the most common risk factor is vertical transmission when the delivery from an HPV-infected mother. There was an increased risk of juvenile PSPB up to 200 times in women with genital condylomata accuminata. Transmission of adult type PSPB occurs through oral sexual activity with multiple partners¹⁴. Cesarean section operation is estimated to decrease the incidence of vertical HPV transmission¹⁵.

Recurrent respiratory pneumonia is a problem for the THTKL expert because of the unknown aggressiveness correlation with HPV-6 and 11. This study intends to identify HPV types 6 and 11 in patients with PSPB is expected to be a factor in predicting the aggressiveness of the disease.

Method

An observational cross-sectional analytic was used by observing how HPV-6 and 11 in recurrent respiratory tract could lead to aggressive or non-aggressive disease¹⁶. Aggressive PSPB criteria were diseases that require surgical removal of papilloma three or more times within a year, have undergone a tracheotomy, or have implanted distal laryngeal papilloma on rigid or flexible laryngoscopy examination¹⁷. The non-aggressive PSPB criterion was a disease requiring surgical removal of papilloma less than three times within a year, never undergoing a tracheotomy and no

implantation of the distal laryngeal papilloma on rigid or flexible laryngoscopy¹⁷.

The PSPB patient the Outpatient Otolaryngology Dr. Soetomo General Hospital and undergoing Microscopic Laryngeal Surgery (BLM) at Surgical Installation Center from December 2012 to March 2013. The sample of this study came from the tissue of patients with PSPB who underwent BLM. The inclusion criteria were respiratory papilloma recurrence of all ages, medical records of patients during the complete treatment, and willing to participate the research by signing an informed consent. Patients will be determined by the group aggressive or not aggressive. The tissue of BLM surgery results conducted at Surgical Installation Center of Dr. Soetomo General Hospital was as a research sample. The sample was taken at the Universitas Airlangga Tropical Disease Institute for HPV-6 and 11 examinations using PCR (Polymerase chain reaction) method. The research data was tabulated in the data collection sheet and then processed statistically using the x2 test.

This research requires several tools in the implementation, that were Microscopic microscopic surgical devices include Optomic OP C-12 optical microscopes, Kleinsasser laryngoscope brand Storz 8590C, Aesculap straight or upturn forceps, cotton, lidocaine-ephedrine 8%, and suction set. The operative specimens were stored in a glass bottle filled with 0.9% normal saline liquor. Polymerase chain reaction checking tool is with PCR Thermal Cycler engine from Bioneer, HPV Intron 2x primer reagent PCR master mix. Primary HPV-6 in LCR region along 258-361 base pairs in the 5'-TAG GGG ACG GTC CTC TAT TC-3 'or 5'-GCA ACA GCC TCT GAG TCA CA-3' sequence. While the HPV-11 primer at the L1 region along 356 base pairs with the base sequence of 5'-GAA TAC ATG CGC CAT GTG GA-3 'or 5'-AGC AGA CGT CCG TCC TCG AT-3'.

Results

There were 15 patients that all of them was a child of PSPB type. All patients had complete data during the first diagnosis up to the control so that all were included in the study

Table 1. Distribution of distal laryngeal papilloma and history of tracheotomy of PSPB patients in Dr. Soetomo General Hospital Surabaya in December 2012 to March 2013

	Amount	Percentase
Distal laryngeal lymphoma		
Yes	10	66.67
No	5	33.33
History of tracheotomy		
Yes	11	73.33
No	4	26.67

Distal laryngeal lymphoma was found in 10 patients (66.67%), while 5 patients (33.33%) had a history of papilloma in the distal larynx. Tracheotomy history was found for 11 patients (73.33%), while 4 patients (26.67%) did not have a history of tracheotomy.

Table 2. Distribution of PSPB aggressiveness of PSPB patients in Dr. Soetomo General Hospital Surabaya in December 2012 to March 2013

Aggressiveness	Amount	Percentase
Aggressive	12	80
Non-aggressive	3	20

Aggressive papilloma was obtained from 12 patients (80%), while 3 patients (20%) were classified as non-aggressive PSPB.

Table 3 Distribution of HPV-6 and 11 patients with PSPB in Dr. Soetomo General Hospital Surabaya in December 2012 to March 2013

HPV Type	Amount	Percentase
HPV-6	6	40
HPV-11	9	60

Human papillomavirus type 6 was obtained in 6 patients (40%) and 9 (60%) were infected with HPV-11.

Table 4. Distribution of annual BLM history, distal laryngeal palsy, and history of tracheotomy on HPV-6 and 11 patients with PSPB in Dr. Soetomo General Hospital Surabaya in December 2012 to March 2013

	HPV Types		Total
	6	11	
History of BLM every year			
< 3x	3 (50%)	3 (50%)	6 (100%)
≥ 3x	3 (33.33%)	6 (66.67%)	9 (100%)
Distal laryngeal lymphoma			
Yes	3 (30%)	7 (70%)	10 (100%)
No	3 (60%)	2 (40%)	5 (100%)
History of tracheotomy			
Yes	4 (36.36%)	7 (63.63%)	11 (100%)
No	2 (50%)	2 (50%)	4 (100%)

The history of BLM <3x was obtained in three patients (50%) with HPV-6 and HPV-11. Whereas the history of BLM ≥ 3x was obtained by 3 patients (33.33%) with HPV-6 and 6 samples (66.67%) with HPV-11. The history of distal laryngeal papilloma was obtained in 3 patients (30%) with HPV-6 and 7 patients (70%) with HPV-11. Patients without the history of distal laryngeal

papilloma consisted of 3 patients (60%) with HPV-6 and 2 patients (40%) with HPV-11. The history of tracheotomy was found in 4 patients (36.36%) in HPV-6 and 7 patients (63.64%) in HPV-11. Patients without a history of tracheotomy have the same amount. i.e., 2 patients (50%) in both HPV-6 and HPV-11 (Table 10).

Table 5 Aggressive correlation between PSPB and HPV-6 and 11 patients with PSPB at Dr. Soetomo General Hospital Surabaya in December 2012 to March 2013

	HPV types		Fisher
	6	11	
PSPB aggressivity			
Aggressive	4 (33.33%)	8 (66.67%)	0.525
Non-aggressive	2 (66.67%)	1 (33.33%)	

Aggressive recurrent respiratory febrile respiration consists of 4 patients with HPV-6 (33.33% of all HPV-6 patients) and 8 patients with HPV-11 (66.67% of all HPV-11 sufferers). Recurrent non-aggressive respiratory nasal passages consisted of 2 HPV-6 patients (66.67% of all HPV-6 patients) and 1 patient (33.33% of all HPV-11 sufferers). One-Sample Kolmogorov-Smirnov test results obtained p = 0.002. Fisher test results obtained p = 0.525 (Table 11).

Discussion

Table 1 shows the percentage of papilloma growing at the distal site of the larynx was 66.7% and the tracheotomy history was 73.3%. It shows that most sufferers have aggressive disease. The figure was proportional to Doyle. et al. (1994) that reported 60% had a history of tracheotomy and 55% had distal papilloma¹⁸. Wiatrak et al. (2004) reported 11% had the tracheotomy and 23.3% experienced distal papilloma growth¹⁹. The more aggressive course of the disease was seen from the many incidences of distal papilloma growth and the history of tracheotomy.

Table 2 presents an aggressive disease was 80%. Some of the aggressive PSPB findings was performed by Doyle. et al. (1994) with the amount 58.8% and Buchinsky. et al. (2008) was 81%. The results were in accordance with the above findings. The high findings of the aggressive PSPB were consistent with the high incidence of aggressive factors in the above discussion. All patients were classified as juvenile type PSPB^{17,18}.

Table 3 shows the percentage of HPV-6 infections by 40% and HPV-11 by 60%. No samples with double infection or HPV infection other than types 6 and 11. Wiatrak. et al. (2004) stated that patients with HPV-6 by 53.5%, HPV-11 was 39.7% and 6.9% had both types. Buchinsky. et al. (2008) get the percentage of HPV-6 infection by 60% and HPV-11 by 40%. The results of this study were in accordance with Buchinsky that the incidence of HPV-11 infection was more dominant than HPV-6¹⁷.

Table 4 was the distribution of annual BLM history correlation, distal papilloma and tracheotomy history of HPV-6 and 11. The annual BLM history was grouped into two categories i.e., BLM history of more or equal to 3x (≥ 3x) within one year and BLM history less than 3x within one year period provided that the BLM history ≥ 3x was an aggressive type of PSPB category.

Patients with a history of BLM every year <3x consisted of 3 persons each with HPV-6 and HPV-11 infections, while patients with annual BLM category ≥ 3x consisted of 3 people with HPV-6 and 6 people with HPV-11. Human papillomavirus type 11 causes the patient to experience BLM every year ≥ 3x more often than BLM each year <3x (6 samples vs. 3 samples), while HPV-6 balanced in causing BLM every year ≥ 3x or <3x. Human papillomavirus type 11 tends to cause BLM surgery more frequently.

Papilloma with spread to the distal larynx was one indicator of disease aggressiveness. Seven patients with distal laryngeal palsy are known to be infected with

HPV-11, while a number of 3 patients infected with HPV-6. Patients with no history of distal laryngeal papilloma accompanied by HPV-6 were 3 patients and 2 patients with HPV-11. Wiatrak. et al. (2004) stated that 12 samples for papilloma in the trachea with HPV-11 infection and 11 patients with HPV-6. Patients without a history of papilloma in the trachea consisted of 28 patients with HPV-6 and 11 patients with HPV-11¹⁹. This study was in accordance with the literature that HPV-11 tends to cause patients to have distal laryngeal palsy compared with HPV-6.

Seven patients with a history of tracheotomy had the HPV-11 infection and 4 HPV-6 infected persons, while patients without tracheotomy obtained 2 patients with HPV-6 infection and HPV-11. Wiatrak. et al. (2004) stated that 21.7% of patients with a history of tracheotomy having HPV-11 of 5 samples and 1 sample with HPV-6. Patients without a history of tracheotomy consisted of 30 samples with HPV-6 and 18 samples with HPV-11¹⁹. The results were similar to the literature findings because the trends in HPV-11 cause the patient to require tracheotomy compared with HPV-6.

Table 5 shows the correlation between aggressiveness and HPV types 6 and 11. The assessment aspect of the correlation was whether there was an association between aggressive PSPB and HPV-11 versus non-aggressive PSPB with HPV-6. Aggressive respiratory febrile respiratory infections were 8 HPV-11 infected and 4 with HPV-6, while the non-aggressive PSPB consisted of 2 HPV-6 and 1 patients with HPV-6.

The results of the One-Sample Kolmogorov-Smirnov test was $p = 0.002$ which mean the data has abnormal distribution because of the value of $p < 0.05$. Fisher test got result $p = 0.525$ meaning that there was no correlation between aggressiveness PSPB and HPV types 6 and 11 because of $p > 0.05$.

Buchinsky. et al. (2008) obtained 43 aggressive PSPB samples with HPV-11 infection and 52 patients with HPV-6, while PSPB was not aggressive with HPV-6 infection of 19 patients and 4 patients with HPV-11. These results indicate that HPV-11 tends to cause more aggressive disease than HPV-6 and the correlation was statistically significant with $p = 0.02$ ($p < 0.05$).

Conclusion

There was no correlation between recurrent respiratory tract aggressiveness with HPV-6 and 11.

More aggressive recurrent respiratory papillomas more infected with HPV-11 and HPV-6 than recurrent non-aggressive respiratory tract papillomas.

Ethical Clearance: The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, nonmaleficence, and justice.

Conflict of Interest: None declared

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Investigation of IL-17F (rs763780) gene Polymorphisms in cases with Iraqi renal failure patients

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Abstract

Renal failure (RF) is common disease, it is decrease of kidney function, glomerular filtration rate (GFR) this use to estimate the kidney function reduction usually is less than 60 mL / min, depending on global Burden of Disease, and the disease is ninth cause of death in the world, According to the global Burden of Disease. Our study is investigated in the relationship between IL-17F (rs763780) genes polymorphic variants in renal failure patients in Iraq. This study was accompanied around Iraqi renal failure patients, the period from February to November 2018. This study included 70 patients from Abn-Sina Center for dialysis and kidney disease, and 30 healthy controls. Tetra-primer ARMS-PCR is rapid, effective and developed assay used our study for studying in genotyping polymorphism of IL-17F (rs763780) genes. Result of our report including the correlation between the genotypes of IL-17F (rs763780) and the incidence of renal failure, as the results show a non-marked difference between patients and controls when genotype T/T (OR = 0.75). Also, no significant difference between patients and control when genotype C/C (OR = 0.85), while the genotype T/C (OR = 2.23) show important difference between control and patients more than two times. In conclusion, IL-17F play an essential role as pro-inflammatory cytokine in renal failure patients and development disease.

Keyword: - renal failure patients, rs763780 , ARMS-PCR and IL-17F gene.

Introduction

Kidney is important organ, its function is regulation of the blood composition and volume, filtration the urine by eliminating the metabolic wastes, secretion of the end metabolism products and maintenance the acid or balance in the body via regulate fluids and electrolytes (1). Renal failure (RF) is common disease , usually is defined as the decrease of kidney function, glomerular filtration rate (GFR) this use to estimate the kidney function reduction usually is less than 60 mL / min (2) .

Interleukins -17F (IL-17F) types of cytokine produced from Th 17 cells. act on Stimulate inflammation and causing organ injury , also act on enhancing produce of pro-inflammatory cytokines by resident cells , that lead to increase penetration of neutrophils to affected organ and induce inflammation and damage in this organ such as kidney (3,4) . All these interleukins are similar in structure protein, but have in the N termini large sequence divergence.

Both IL-17A and IL-17F genes are located on chromosome 6p12.3-q13, and each consists of three exons and two intron the transcribed occurs in opposite direction, cytokine genes resulting together during gene replication also use same regulatory elements. In human, about of 50 % sequence identity between IL17A and IL17F, both of these types produce homodimer and heterodimer proteins (5). Cytokine production may be effected by cytokine gene Polymorphisms through effect this gene on transcription. Single nucleotide polymorphisms (SNPs), acts on induce susceptibility or resistance to any infection, also may be used to diagnose some factors that contribute to cancers or inflammatory disease because SNP occurs in regulatory regions for cytokine gene (6). Tetra-primer amplification refractory mutation system PCR (T-ARMS-PCR), these methods is very important to detect (SNP) genotyping because have several features rapid, ease to perform, an inexpensive, and accurate method (7).

This method is ARMS-PCR modification; four primers are used. Two inner primers were allele specific and lead to produce two bands are different in size (lower molecular weight), this band appears depend on wild or mutant allele is present. And two external or outer primers produce non-allelic was control band. And the location of mismatch is middle for the specific allele primers and use four primers in these methods (8). While in ARMS-PCR the location of mismatch in 3' end for the specific allele primers and utilize five primers. T-ARMS-PCR assay represent successfully methods to detect SNPs and others genetic or biological markers that associated with different disease such as effect TNF- α gene polymorphism in chronic pancreatitis patients (9).

Aim of our study is to determining the association and relationship between IL-17A (rs2275913) genes and Iraqi renal failure patients .

Material and Method

This study was accompanied around Iraqi renal failure patients, the period from February to November 2018. This study included 70 patients from Abn-Sina Center for dialysis and kidney disease and 30 healthy controls.

1-Collection of samples:-

Study groups Samples were Collected 2 ml from whole blood in EDTE tube until extraction human genome. And use to investigate about IL-17F (rs763780) genes in study groups.

2-Genomic DNA Extraction:

The DNA was extracted by use special kit (Geneaid, Korea) according to the company directions.

3-T-ARMS-PCR and Primer Design:

Batchprimer3 program was used for designing, several types of primers are used included generic primers (including SSR primers with SSR detection) and SNP genotyping primers (including allele-specific primers, single-base extension primers, and tetra-primers for tetra-primer ARMS PCR), furthermore, DNA sequencing primers ⁽¹⁰⁾. Show table 1. T-ARMS-PCR Analysis occurs by using Accupower PCR Premix (Bioneer, Korea) whole volume of 20 μ L included DNA (4 μ L), outer primers (1 μ L), inner primer (1 μ L) and add D.W (12 μ L). PCR process is start at (95) $^{\circ}$ C for five minutes, then the second step is start at (95) $^{\circ}$ C for twenty second, then annealing is start for twenty sec , annealing was carried out at 72 $^{\circ}$ C for twenty seconds and finally the process is finished at (72) $^{\circ}$ C for three minute. Then electrophoresis are used for emigration of all PCR products after stained it by ethidium bromide.

Statistical Analysis

Our study used SAS program for statistical Analysis for differentiates between in parameters wherever LSD test was trying to compassion between groups ⁽¹¹⁾. Whereas odds ratios (OR) and 95% confidence intervals (95% CI) were calculated using MedCalc for Windows, version 18.10 ⁽¹²⁾.

Table 1 the used primers used in ARMS-PCR technique

SNP	System	Primer	Allele	Tm	Amplicon
rs763780 IL17F	Forward inner primer	GAGTGGATATGCACCTCTTACTGCAAAC	C	62	158
	Reverse inner primer	CGTCACCCCTGTCCATCCAACA	T	62	106
	Forward outer primer	AGACAGGACTTGTTCAGAGCACTG		62	215
	Reverse outer primer	ATGAATTCCGTTCCCATCCAGC		62	

*Tm Temperature of melting

Result

The renal failure patients group consisted of 70 patients, 40 males (57%) and 30 females (43%), with a mean age of 49.5 ± 5.91 years. The healthy control group consisted of 30 subjects, with a mean age of 30.3 ± 3.62 years.

In IL-17F (rs763780), the fragment lengths for the specific amplicons were as follows; 158 bp for the C allele and 106 bp for the T allele. The presence of two specific amplicons for an SNP indicates heterozygosity. In addition, non-indicative amplicons resulting from the common primer pairs are always present (215 bp for the two outer primers) show figure 1.

The IL-17F (rs763780) TC, CC and TT genotypes figure (1) were detected in 5 (7%), 4 (6%) and 61 (87%) patients, and in 1 (3%), 2(7%) and 27 (90%) controls, respectively. Frequency of genotype TC, CC and TT significantly increase in the groups of patients compared

with control.

The genotype TT recorded highly ratio in both groups patients and control (57-90%) which made it the common genotype for this locus in Iraqi population. both homozygous genotype showed preventive fraction according odds ratio (0.85, 0.75), while TC genotype according odds ratio consider as etiological fraction. The analysis of the allele impact, including both genotypes that containing C allele showed no significant association in patient group comparing with control ($p=0.829$). According OR, allele C tend to be risky allele, while allele T tend to be a preventive allele (Table 2).

According to the sex the results in Table (3) the genotype TT showed as preventive fraction according odds ratio (0.34), while TC and CC genotype according odds ratio consider as etiological fraction (3.22, 2.35) respectively. Also according OR, allele C tend to be risky allele, while allele T tend to be a preventive allele.

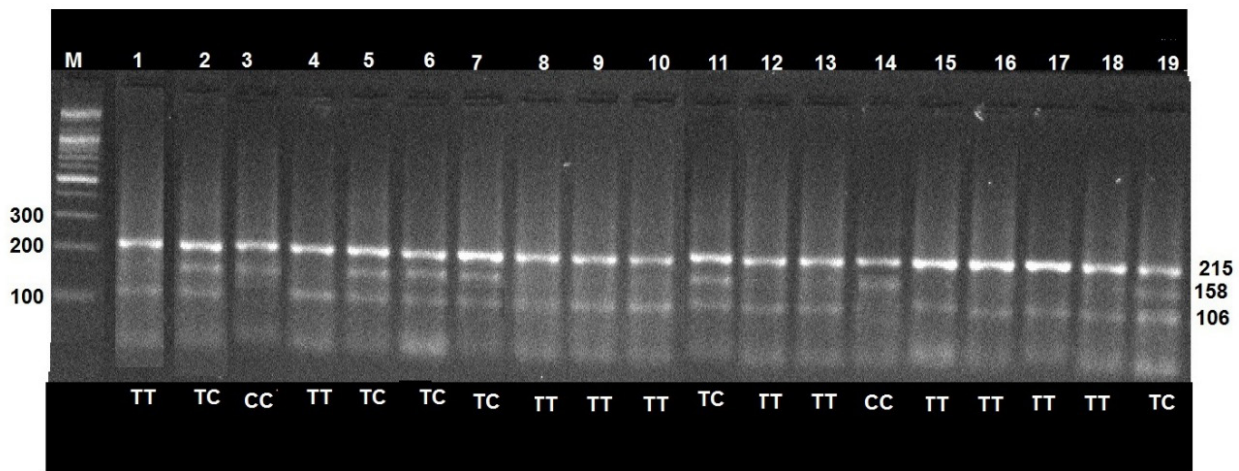


Figure (1): electrophoresis of samples on agarose gel by using T-ARMS-PCR assay: The IL-17F (rs763780) locus genotyping by T-ARMS-PCR resolved on a 2% agarose gel stained with ethidium bromide (45 min, 150V/cm, 1X Tris-acetic buffer). 215 bp, the bands are amplicon, and T and C allele-specific bands are 106 bp and 158bp amplicons respectively (Bioneer, Korea).

Table (2) Distribution of genotypes for the IL-17F (RS763780) gene samples of patients and healthy controls.

SNP	Genotype	Patients* n=70 n (%)	Control n=30 N (%)	OR(95%CI)	P.value
Rs763780 IL17F	T/C*	5 (7%)	1 (3%)	(0.26-19.30) 2.23	0.415
	C/C	4(6%)	2 (7%)	(0.15-4.79) 0.85	0.585
	T/T	61(87%)	27 (90%)	(0.19-2.94) 0.75	0.488
	Allele frequencies				
	T	127(91%)	55(92%)	0.88(0.301-2.61)	0.829
	C	13(9%)	5(8%)	1.12(0.39-3.31)	0.829

*only present significant in TC genotype between two groups.

Table (3): prevalence of IL-17F (Rs763780) gene in patient samples according to sex.

SNP	Genotype	Male* n=40 n(%)	Female n=30 N (%)	OR(95%CI)	P.value
Rs763780 IL17F	T/C*	4(10%)	1(3.3%)	(0.35-29.36) 3.22	0.281
	C/C*	3 (7.5%)	1(3.3%)	(0.24-22.95) 2.35	0.423
	T/T	33 (82.5%)	28 (93.4%)	(0.07-1.71) 0.34	0.164
	Allele frequencies				
	T	70 (87.5%)	57(95%)	0.36(0.1-1.4)	0.143
	C	10 (12.5%)	3(5%)	2.71 (0.71 – 10.33)	0.143

*only present significant in TC and CC genotype between two genders.

Discussion

Recently , some studies were improving CD4+ differentiation to Th1 ,Th2 and Th17. Th17 able to producing IL-17 family such as IL-17A and IL-17F and these are playing essential role in autoimmune disorders by stimulation (acute and chronic) inflammation such as renal disorders. Also macrophages, mast cells and neutrophils are able to produce IL17A ⁽¹³⁾.

Renal failure occurs in male more than female and the mean age is 49.5 ± 5.91 years respectively , this result agree with ⁽¹⁴⁾ this study group consisted of 53 Renal failure patients and present 28 males and 25females , with a mean of age 51.0 ± 13.6 years. Also agree with ⁽¹⁵⁾ in this study included 100 sample: males sample was 61 (61%) and females was 39 (39%), and age range about (44.7 ± 22.1) year).

Polymorphisms located for IL-17A and IL-17F within genes coding play a role as genetic factors, and that lead to associate with occurring disease.

In IL17F polymorphisms the genotype T/C (OR = 2.23) show a significant difference between patients and control more than two times. This result similarity with ⁽¹⁶⁾ this study show IL-17F frequencies allele A were significantly higher in immune thrombocytopenia for patients and controls : 31.85% and 18.98% respectively . Specifically, patients have higher frequencies in AA and AG genotypes compared with controls [AA: 17.12% vs. 9.49% and AG: 29.46% vs. 18.98%].

This result is leading to role of AA and AG genotypes for IL-17F as risk factors in renal failure disease. IL-17F polymorphism have association with several disease include : IBD ⁽¹⁷⁾, Development of asthma ⁽¹⁸⁾ , autoimmune thyroid diseases ⁽¹⁹⁾ , acute myeloid leukaemia ⁽²⁰⁾ and recently in MS ⁽²¹⁾.

Another study is improves the polymorphisms in IL-17A and IL-17F genes play a significant role in Rheumatoid Arthritis ⁽²²⁾. In Southern Brazil, ⁽²³⁾ were show the relationship between IL17A rs2275913 polymorphisms and chronic periodontitis, while IL17F polymorphism was not associated with same disease. IL-17A and IL-17F play main role in development of inflammation and others act on host defense against infection by prompting gene expression that encoding for several pro-inflammatory cytokines, chemokine and antimicrobial ^(24, 25) . IL-17F and IL-17A have same sequence in amino acid ant both have same function. The cytokine have able for activation of neutrophil ⁽²⁶⁾ .

Conclusion

IL-17F play an essential role as pro-inflammatory cytokine in renal failure patients and development disease. And renal failure disease associated with heterozygote allele.

Conflict of Interest:- No there any conflict of the interests that related with this paper.

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Ethical Clearance:- Local ethics committee in Diyala University is approve results of our study.

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A Descriptive Study to Assess the Problem Faced by the Adolescents of Alcoholic Parent

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Abstract

A descriptive study to assess problems faced by the adolescents of alcoholic parent in selected community area, Kancheepuram district, Tamil Nadu. Objectives of the study to assess the problems faced by the adolescents of alcoholic parents and to find out association between the problems faced by the adolescents of alcoholic parent with their selected demographic variables. Non experimental approach and descriptive design used for this study. Samples were selected by using purposive sampling technique. The sample consisted of 50 adolescents. Self-structured questionnaires for assessment of demographic variables and used to assess the problem faced by adolescents of alcoholic parents. The data collected from 50 adolescents (Girls and boys) in the age group between 15 to 18 years. Study show that 9(18%) severe problems, 31(62%) moderate problems and 10(20%) mild problems. Study shows that there was significant association between the levels of problem faced by the adolescents of alcoholic parent with age and occupation of alcoholic parent (p value = < 0.05).

Key words: assess, problems, alcoholic parent, adolescents.

Introduction

Alcoholism today clearly seen as a family disease ravaging not just the individual who drinks excessively but also the entire family. The primary victim is the individual who drinks excessively, no doubt, but the family members are also affected with just the same intensity, if not more. Families complicated by alcoholism can be considered as families in a never ending series of crisis. Alcoholism disrupts even normal routine family tasks and function, increase conflicts and demands adaptive responses from family members who simply do not know 'how' to respond appropriately. The social stigma associated with alcoholism, the economic drain on the family's resources, the threat to physical well-being job insecurity all compound to the problem^[4]

An estimated 6.6 million children under the age of 18yrs live in household with at least one alcoholic parent. Current research findings suggest that these children are at a risk for a range of cognitive, emotional and behavioural problems.^[1] Between 15 and 20 per cent of Indian people consume alcohol and, over the past twenty years, the number of drinkers has increased from one in 300 to one in 20. In globally today in there

are an estimated 28 million children who have alcoholic parents. The adolescents world wide 10 to 24 years is 356 million,^[3] Tamil Nadu 1.24 crore, India 253 million. According to 2012 in India report approximately 1.28 Million Parents have a alcohol addiction problem. 11 million of those children under the age of 18. In 2012 about 3.3 million death or 5.9% of all global death due to alcohol consumption.^[3]

Method

Adolescents (Girls and Boys) who were in the selected community area (pooncheri & payanoor) in the age group between 15 to 18 years residing in a selected community area, Kanchipuram district, Tamil Nadu,, 50 samples were chosen for the present study.

Design

In this study non experimental research approach and Descriptive research design adopted, Purposive sampling technique adopted. Self-structured questionnaires consist of 20 questions used and self -structured questionnaires to assess demographic variables. Each sample will take 30 minute to completion of the data.

Instrument/material

Self-structured questionnaires consist of 20 questions used and self -structured questionnaires to assess demographic variables. Each sample will take 30 minute to completion of the data. There are Two Section (A&B) Section A consist of self-Structured Questionnaires to assess demographic variable & Section B Self-Structured Questionnaires to assess the problem faced by the adolescents of alcoholic parent consist of 20 questions.

SCORING INTERPRETATION	
SCORING	INTERPRETATION
27-40	Severe
26-14	Moderate
13-1	Mild

Procedure

The written informed consent was obtained from the parent and guardian as well as from the study participants. Permission letter was obtained from the HOD of Mental Health Nursing department, HOD of Community Health Nursing department, Community area, UG Committee and Human Ethical Committee.

Statistical Analysis

Descriptive statistics like frequency distribution, percentage, mean, standard deviation and inferential statistics like chi square was used to analyse the data.

Result:

The study finding revealed that,

❖ Our study results shows that assessing the levels of problems faced by the adolescent of alcoholic parent 31(62%) moderate problems, 10(20%) mild problem and 9(18%) severe problem.

S.no	Problems Level	Frequency	Peren-Tage
1.	Mild problems	10	20%
2.	Moderate problems	31	62%
3.	Severe problems	9	18%

(N=50)

Discussion

The study was conducted to assess H1 there is a significant association between the levels of problems faced by the adolescents of alcoholic parent with selected demographic variable and to assess H₂ There is significant association between the problems faced by the alcoholic parent and selected Demographic data. The hypothesis H₁ and H₂ was accepted suggestion that there will be significant association between the level of problems faced by the adolescents of alcoholic parent and the selected demographic characteristics of adolescents. The finding revealed that the problems has statistically significant with age of adolescent and occupation of alcoholic parent p value < 0.05 level and other variables are not significant. The limitation of the study was the data collection period was limited for one week. Large number of sample could not be obtained due to difficulty found the samples in the age group of 15 to 18 years of adolescent of alcoholic parent for data collection. Based on the findings of the study, following recommendation are put forth the study can be done on a large sample thereby findings can be generalized. a similar study can be conducted using teaching strategies like structured teaching programme, video assisted teaching. The nurse researcher will help us to know the adolescents with severe problems and give them awareness and psychological support and helpline numbers to prevent or to reduce the problem. On the basis of conducted research it can be concluded the assessment of problem faced adolescent by the adolescent of alcoholic parent has a important determination of early prevention from complication. Problems faced by adolescent of alcoholic parent and associated factor in previous study shows that the study to assess the problem faced by the adolescents of alcoholic father. The study is consisted of 60 adolescents . Study finding data shows that most (61.66%) of the children were females and 38.3% were males. The data presented was shows no association between physical health status and selected demographic variables like sex, age, duration of father's alcoholism, treatment received for alcoholism except to income of family per months at significance of 0.05 level. **Deepa shaji Thomas et al (2012).**

Ethical Clearance: Chettinad Academy of Research & Education – Institution Human Ethics Committee.

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Conflict of Interest: Nil

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Demographic, Clinical and Hormonal Characteristics as Predicting Factors Affecting the Outcome of Laparoscopic Ovarian Drilling in Women with Poly Cystic Ovary Syndrome

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Abstract

Background: Laparoscopic ovarian drilling as a second line of treatment modality for those PCOS patients failed to respond to clomiphene citrate they may have the benefit of avoiding the side effects of long term drug therapy, lower costs and less time for successful ovulation and conception compared to medical treatment.

Objectives: Before doing LOD recognize factors that affect the outcome of the procedure for selecting patients to avoid unnecessary or unbeneficial intervention. **Method:** 143 anovulatory infertile PCOS patients followed up for 6 months after LOD for ovulation with pre-operative assessment for demographic characters and serum hormone levels (LH, FSH, free testosterone, AMH and prolactin). **Results:** Ovulation was demonstrated in 59.4%. Regression analysis showed significantly higher rates of ovulation among women < 5 years duration of infertility (OR = 3.35, 95% CI = 1.47-7.65), LH > 12 mIU/ml (OR = 4.18, 95% CI = 1.28-13.63) and free testosterone < 4.5 ng/ml (OR = 3.22, 95% CI = 1.08-9.59). No significant (p = 0.078) association was detected between the ovulation rate and the AMH level, but it is evident that the OR was around 2 among women with AMH level of less than 7.7 ng/ml.

Conclusion: preoperative LH, free testosterone and duration of infertility regarded as 3 important predicting factor for success of LOD

Keywords: PCOS: polycystic ovary syndrome; LOD: laparoscopic ovarian drilling, Ovulation.

Introduction

Polycystic ovary syndrome (PCOS) is one of the most prevalent endocrinopathies affecting about 5-10 % women of reproductive age group. There is a great controversies regarding the diagnosis and mode of treatment of this syndrome¹, although experts have been succeeded to develop a universally accepted criteria for diagnosis of PCOS² but adoption of optimal treatment had not yet reached. Wedge resection of ovary which is first described by Stein and Leventhal³ for treating anovulation by laparotomy has been developed to less traumatic ovarian surgery through the laparoscope by Gjonnaess⁴. LOD is currently recommended as an

alternative second line approach, safe and cost effective to gonadotropins for those with anovulatory infertility, without the risk of multiple pregnancy and ovarian hyperstimulation⁵, still there is no well-established mechanism of action of LOD and therefore we can not exactly answer the question why some PCOS patients not responding to this treatment⁶, and it is not known whether it will exerts it is effect directly on the ovary or through systemic endocrine pathway⁷, it may act by destroying ovarian androgen-producing tissue and reducing the peripheral conversion of androgens to estrogens. However, others believe that ovarian diathermy works by increasing the sensitivity of the ovaries to endogenous FSH, and that only a minimal amount of thermal injury is required⁸. A fall in the serum levels of androgens and LH and an increase in FSH levels have been demonstrated after ovarian drilling⁹,

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The aim of the present study was to identify some of the factors that affect the outcome of LOD for improvement of success in women with PCOS for better selection of the patients that get benefit from this intervention and avoidance of unbeneficial surgery.

Materials and Method

The current study followed 143 subfertile women with anovulation failed to respond to oral medical therapy (persistent anovulation despite maximum dose of oral therapy for up to 6 cycles) consulting the outpatient gynaecology and fertility clinic in Maternity Teaching Hospital, public maternity hospital in Erbil, Iraq from September 2016 to July 2018. All included patients in the study diagnosed to have PCOS based on Rotterdam criteria include at least two of the three criteria: oligo-anovulation, clinical and/or biochemical evidence of hyperandrogenism, and sonographic features of polycystic ovaries². Written informed consent was obtained from each participant after explaining the study purpose, procedures and follow up time. Those associated with tubal and male factors infertility, endocrine disorders (thyroid disease, Cushing's syndrome and androgen secreting tumor) AMH < 4ng/ml and FSH >12.5mIU/ml are all excluded from the study. All enrolled women underwent transvaginal ultrasound preoperatively.

Preoperatively baseline hormones were measured at the day 2-4 of cycle for serum levels of LH, FSH, testosterone, SHBG, AMH and prolactin, the LH:FSH ratio and FAI calculated. Serum hormone levels were measured by Elecsys machine (Roche Diagnostics, Hitachi, Switzerland) for determination of human LH, FSH, testosterone, prolactin and SHBG levels. AMH was measured by Enzyme linked immunosorbent assay (ELISA) kit.

After cycle in the proliferative phase (progesterone induced withdrawal bleed or spontaneous) LOD performed by or in the presence of first author to ensure that the same technique was used for each patient by a laparoscope (Karl Storz, Germany) with assessment of tubal patency with methylene blue and macroscopically uterus, tubes and ovaries were examined. The technique described by⁹ four punctures performed per ovary, each for 4 s to a depth of 4-6 mm, a monopolar coagulating electrical current at 40 W power setting used, at the end of the procedure pelvis was irrigated with lactated Ringer's solution and 500 cc was left intraperitoneally. Ovulation

and pregnancy followed up to 6 months (ovulation defined as the presence of at least one mature graffian follicle measuring ≥ 18 mm by transvaginal ultrasound and serum progesterone level at the day of 21 as indicators of ovulation (serum progesterone level ≥ 13 nmol/l was considered a strong indication for ovulation¹⁰).

Statistical analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS, version 22). Student's t test of two independent samples was used to compare means of two groups. Chi square test of association was used to compare between proportions. When the expected count of more than 20% of the cells of the table was <5, Fisher's exact test was used. Logistic regression analysis was used where the dependent variable was binary categorical (ovulation whether yes or no). Variables found (by univariate analysis) to be significantly associated with the dependent variable were entered into the regression model as independent variables (covariates). A 'p' value of ≤ 0.05 was considered as statistically significant.

Results

The study included 143 infertile women with polycystic ovary syndrome. Their mean age \pm SD was 29.52 ± 4.58 years, ranging from 20 to 39 years. The median was 29 years. Table 1 shows that around half (45%) of the students aged 25-29 years, and the duration of infertility of 64.3% of them was ≥ 5 years. The type of infertility of the majority of the women (76.2%) was primary. Regarding the menstrual pattern, it was irregular in the majority (88.8%) of the women. It is evident that only 9.8% of the women were of normal weight, 30.1% were over-weight, and 60.1% were obese.

Table 2 shows that the rate of ovulation was significantly high among women with less than five years of infertility (76.5%) compared with 50% among women with ≥ 5 years of infertility ($p = 0.002$). No significant association was detected between ovulation with age ($p = 0.165$), type of infertility ($p = 0.264$), menstrual pattern ($p = 0.421$), BMI ($p = 0.138$), hirsute ($p = 0.377$), and acne ($p = 0.688$).

The rate of infertility was significantly high (79.2%) among women with LH level of more than 12mIU/ml compared with 55.5% among women with LH level of ≤ 12 mIU/ml ($p = 0.031$). The rate of ovulation was also high (63.4%) among women with free testosterone level of less than 4.5ng/ml compared with 35% among

women with free testosterone of ≥ 4.5 ng/ml. Ovulation occurred in 66.7% of women with AMH level of less than 7.7ng/ml compared with 50% among women with AMH level of ≥ 7.7 ng/ml ($p = 0.044$). No significant association was detected between the rate of ovulation with FAI ($p = 0.096$) and LH FSH ratio ($p = 0.166$).

Table 4 shows no significant differences between the means of hormones (SHBG, prolactin, and FSH) of women who have ovulated and the means of hormones of women who didn't ovulate ($p = 0.173$, $p = 0.598$, $p = 0.0058$ respectively).

Regression analysis (Table 5) showed significantly higher rates of ovulation among women with less than five years duration of infertility (OR = 3.35, 95% CI = 1.47-7.65), high LH of more than 12mIU/ml (OR = 4.18, 95% CI = 1.28-13.63), low free testosterone of less than 4.5ng/ml (OR = 3.22, 95% CI = 1.08-9.59). No significant ($p = 0.078$) association was detected between the ovulation rate and the AMH level, but it is evident that the OR was around 2 among women with AMH level of less than 7.7ng/ml.

Table 1. Basic characteristics of the studied sample.		
Age (years)	No.	(%)
20-24	19	(13.3)
25-29	65	(45.5)
30-34	33	(23.1)
35-39	26	(18.2)
Duration of infertility (years)		
< 5	51	(35.7)
≥ 5	92	(64.3)
Type of infertility		
Primary	109	(76.2)
Secondary	34	(23.8)
Menstrual pattern		
Regular	16	(11.2)
Irregular	127	(88.8)
Body mass index (Kg/m ²)		
< 25	14	(9.8)
25-29	43	(30.1)
≥ 30	86	(60.1)
Total	143	(100.0)

Table 2. Ovulation rate by the studied factors after LOD.							
	Ovulated		Non ovulated		Total		
	No.	(%)	No.	(%)	No.	(%)	p
Age (years)							
20-24	15	(78.9)	4	(21.1)	19	(100.0)	
25-29	40	(61.5)	25	(38.5)	65	(100.0)	
30-34	16	(48.5)	17	(51.5)	33	(100.0)	
35-39	14	(53.8)	12	(46.2)	26	(100.0)	0.165
Duration of infertility (years)							
< 5	39	(76.5)	12	(23.5)	51	(100.0)	
≥ 5	46	(50.0)	46	(50.0)	92	(100.0)	0.002
Type of infertility							
Primary	62	(56.9)	47	(43.1)	109	(100.0)	
Secondary	23	(67.6)	11	(32.4)	34	(100.0)	0.264
Menstrual pattern							
Regular	11	(68.8)	5	(31.3)	16	(100.0)	
Irregular	74	(58.3)	53	(41.7)	127	(100.0)	0.421
BMI							
< 25	11	(78.6)	3	(21.4)	14	(100.0)	
25-29	28	(65.1)	15	(34.9)	43	(100.0)	
≥ 30	46	(53.5)	40	(46.5)	86	(100.0)	0.138
Hirsute							
Yes	67	(61.5)	42	(38.5)	109	(100.0)	
No	18	(52.9)	16	(47.1)	34	(100.0)	0.377
Acne							
Yes	44	(57.9)	32	(42.1)	76	(100.0)	
No	41	(61.2)	26	(38.8)	67	(100.0)	0.688
Total	85	(59.4)	58	(40.6)	143	(100.0)	

Table 3. Ovulation rate by the hormone level after LOD.

Table 3. Ovulation rate by the hormone level after LOD.							
	Ovulation						
	Yes		No		Total		
	No.	(%)	No.	(%)	No.	(%)	p
LH mIU/ml							
≤ 12	66	(55.5)	53	(44.5)	119	(100.0)	
> 12	19	(79.2)	5	(20.8)	24	(100.0)	0.031
Free testosterone ng/ml							
< 4.5	78	(63.4)	45	(36.6)	123	(100.0)	
≥ 4.5	7	(35.0)	13	(65.0)	20	(100.0)	0.016
AMH ng/ml							
< 7.7	54	(66.7)	27	(33.3)	81	(100.0)	
≥ 7.7	31	(50.0)	31	(50.0)	62	(100.0)	0.044
FAI							
< 5	8	(57.1)	6	(42.9)	14	(100.0)	
5-14.9	46	(68.7)	21	(31.3)	67	(100.0)	
≥ 15	31	(50.0)	31	(50.0)	62	(100.0)	0.096
LH FSH ratio							
< 2	27	(51.9)	25	(48.1)	52	(100.0)	
≥ 2	58	(63.7)	33	(36.3)	91	(100.0)	0.166
Total	85	(59.4)	58.0	(40.6)	143.0	(100.0)	

Table 4. Means of hormones by ovulation status after LOD.

	Ovulation		No ovulation		
Hormones	Mean	(+SD)	Mean	(+SD)	P
SHBG nmol/l	19.59	(+8.04)	21.68	(+10.18)	0.173
Prolactin ng/ml	19.43	(+9.73)	20.27	(+8.83)	0.598
Serum FSH mIU/ml	4.70	(+1.00)	4.39	(+0.94)	0.058

Table 5. SPSS output of binary logistic regression analysis where ovulation was the dependent variable.

	B	p	OR	95% C.I.for OR	
				Lower	Upper
Duration of infertility (years)					
< 5	1.21	< 0.001	3.35	1.47	7.65
≥ 5 (reference)			1.00		
LH					
> 12	1.43	0.018	4.18	1.28	13.63
≤ 12 (reference)			1.00		
AMH					
< 7.7	0.69	0.078	1.99	0.93	4.28
≥ 7.7 (reference)			1.00		
Free testosterone					
< 4.5	1.17	0.036	3.22	1.08	9.59
≥ 4.5 (reference)			1.00		
Constant	-1.75	0.003	0.17		

Discussion

Ovulation rate reported in our study was 59.4% and pregnancy rate 32.9% many studies recorded higher rates in their results^{4,9,11}. For prediction of response we focused on ovulation being the primary outcome after treatment.

In the current study, there was no association between the age group, type of infertility, menstrual pattern, presence or absence of hirsute or acne and rates of ovulation after drilling, the same results recorded by other studies^{6,12} while in another study age < 30 years considered as a significant predictor for success¹³ this difference may be due to that their studied population more in younger age. BMI exhibited a great variation regarding it is effect on the success of LOD, some authors found that lean women respond more than obese^{13,14}, on the contrary an author correlated high BMI with the success¹², although in our results and previous studies reported that BMI had no influence on overall ovulation rate^{11,15}. Shorter duration of infertility < 5 years appear to be the best determinant in the present study and before^{6,13,16}, this is not in agreement with the a study of¹² found no association, this can be explained

that longer duration of subfertility may be associated with other causative factors and chronic anovulation needs more time for cure.

It was also noted that preoperative serum LH level were significantly higher among those who achieved ovulation after surgery with a “cut-off” of 12mIU/ml, this is in agreement with several other studies^{11,15} using the same value and same results, Logistic regression in the study of^{6,16} using 10 IU/L “cut-off” value also recognized high LH as a predicting factor for success.

Many researches considered AMH as a predicting factor for diagnosis and response to LOD, High AMH associated with poor response may be due to severity of the PCOS condition in these women. Although association of AMH and ovulation revealed significant ($p = 0.044$) in our data, but by regression analysis AMH is not regarded as a predicting factor. In contrary another author⁷ reported that AMH affect the outcome after LOD using the same “cut-off” value (7.7ng/ml), a possible explanation is that number of the holes by electrocautery and degree of tissue destruction may affect the success.

Favorable outcome was recorded in those with low free testosterone level <4.5 ng/m, this result was consistent with ⁶. Although this is in disagreement with earlier results ^{15,16} can be explained by smaller sample size in their study or inadequate destruction of androgen producing ovarian tissue, so an adjusted thermal dose based on ovarian volume ¹⁷ to be fully elucidated.

On the other hand LH/FSH ratio, FSH, SHBG, FAI and prolactin have no impact on the outcome after LOD, AL-Ojaimi¹² also recorded no significant association with FSH and prolactin level while LH:FSH ratio showed significant while Dubela et al¹⁴ found that high SHBG is significant for success. Inability to follow-up patients for longer periods to record pregnancy and live-birth rates was the main limitation of our study.

Conclusions

Identifying factors that affect outcome of LOD helps in increasing success rate, it is an important issue not only to improve outcome but also to avoid unnecessary surgery and its complications. Higher rate of ovulation found among those with less than 5 years duration of infertility, LH > 12mIU/ml and free testosterone < 4.5ng/ml.

Conflicts of Interest: No conflicts of interest

Ethical Clearance: The Research Ethics Committee of HMU, College of Medicine, approved the study proposal.

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Stress Perception and Stress Response against Internet Psychological Addiction (IPA) on Adolescents (Psychoneuroimmunology Approach)

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Abstract

Background: Phenomenon of IPA in long-term effect is dominated by negative effect that has risk in undergoing stress. Stress perception will activate the change of physiology system in the body in form of stress response through activating *Hypothalamic-Pituitary Adrenocortical* (HPA) that will increase cortisol production. **Purpose:** investigate how the correlation between stress perception and stress response against IPA for adolescents based on psychoneuroimmunology (PNI) concept. **Method:** This research used cross-sectional design. There were 39 Senior High School students, who were indicated to undergo internet psychological addiction and they were as the sample of this research. **Result:** There were 39 students in six Senior High Schools in Makassar, Indonesia, who were identified to undergo IPA. Stress perception in most of adolescents who underwent IPA was high (61.5%), particularly for adolescent who underwent high internet addiction, and so as the stress response on IPA, which was also high (53.8%), which described health quality for IPA. **Conclusion:** there was a significant correlation between stress perception and stress response on adolescent who underwent IPA based on psychoneuroimmunology approach.

Keywords: internet psychological addiction, adolescents, psychoneuroimmunology, stress perception, stress response

Introduction

Psychoneuroimmunology is an integrated concept regarding function of immune regulation for defending homeostasis. PNI concept views on the correlation among stress, immune system, and health. Stress is consisted of stress-perception and stress response¹. Stressor is a cause for stress-perception and stress response². Ader in Putra³ showed that regulation of immune system or immunoregulation, which firstly was believed as autonomous process, was proven to be influenced by nervous system performance through learning proses that was occurred in central nervous system. Thus, it was proven unautonomous³.

Limitation of PNI according to Ader-Cohen in Putra³, related with behaviour-neuroendocrine-immune system. Definition of stress that was stated was closer with Selye in Putra³ and it was as non-specific response of the body to any demand with biological concept. However,

definition of stress in PNI also used Eric Linderman-Gerald Caplan concept as psychological state involving cognition and emotion, which gave limitation of stress concept in psychological side, whether, psychic stress was defined as cognition that was learning process result or stress perception which could be observed based on modulation of immune response (stress response)³.

The criteria of IPA are: excessive using internet (>6 months); making internet as a dominant activity (salience); undergoing internal and external conflict; appearing euphoria while being able to access internet (mood modification); increasing needs to access internet (tolerance), uncomfortable feeling when the use of internet was limited (withdrawal)⁴⁻⁷.

Phenomenon of IPA on adolescents has become global epidemic. Research result regarding IPA in long-term effect is dominated by negative effects which have risk to undergo depression, anxiety, aggressive behavior,

social isolation, psychiatric symptoms, interpersonal problems and stress⁸⁻¹⁰. Even, negative effect of IPA is as dangerous as alcohol and narcotics addiction^{11,12}

Phenomenon of internet addiction will influence other activities and this will impact to adolescent's physical, cognitive, socio-emotional, and spiritual development disorders that contribute to personal distress (dangerous and destructive stress)^{13,14}

According to conducted observation, it was found low productivity on adolescent who underwent IPA in Makassar. Interview result with students in several Senior High Schools and IPTEK-KOM research¹⁵ showed that they used internet excessively and they made the internet as dominant activity in daily life (Salience) until their time was wasting more only for accessing internet which was not for learning process.

Nevertheless, if the internet was used for searching information for completing homeworks or school tasks, the advantages of internet itself could raise enthusiasm for learning process (eustress), but if it was used excessively, it could cause distress. In other words, internet could cause the students did not want to learn anymore because they could not concentrate well, they were easy to forget (low memory), difficult to understand, and as the impact, they could have poor score at school, and also could have poor sleep quality. This would impact to their learning achievements at school, which caused high academic stress¹⁶.

Internet could not be separated from adolescent's life. Almost all their needs could be fulfilled by internet¹⁷. There were pleasant experiences while accessing internet (mood modification) that was triggered by dopamine spending which caused them would repeat the experience until their time intensity that was needed to access the internet added (tolerance). Although the time intensity to access the internet was controlled, they would try to repeat it with longer intensity (relapse) because they had felt pleasant experience before. However, when they was hindered to access internet, they would feel unpleasant such as annoying, angry, and restless (withdrawal). When the internet had dominated life activity, it would cause imbalance among biological, psychological, and social needs, thus, it would cause conflict either internal or external conflict, even, it could cause aggressiveness to the adolescents¹⁸.

Adolescent's characteristic which was in identity crisis stage, tended to have high curiosity^{19,20} and this

was really supported by socio-cultural condition in urban area that facilitated ease to access internet in several public facilities. Besides, it was also supported by booming smartphone market. Even, rapid information and telecommunication systems development also had the potency to facilitate the occurrence of IPA.

In addition, referring to psychoneuroimmunology paradigm, the stressor (impact of internet addiction on physical, cognitive, socioemotional and spiritual development aspects) would be responded by brain cognitively in stress perception (how coping or adolescent's self-adjustment cognitively and behavior in facing the impact of internet addiction). As we know that, stress perception is an ability to understand or conceptualize accepted stressor that results a cognition (understanding) which can cause stress response in modulation of immune response³. A condition that is stated as stressor by the brain will cause a stress and the change of physiological, psychological, and behavioral aspects.

Lazarus & Cohen assumed that stress involved transaction between the individual and other worlds from him/herself²¹. Primary appraisal is individual first assessment against the occurrences either in positive side, negative side, or netral side which can cause stress (such as incomplete homework due to they are too busy to access internet, school task is assumed as difficult thing that can cause stress). Secondary appraisal is an assessment against resources or self-ability in confronting an occurrence or intimidation. The adolescents will respond stress in different way, they will search information directly, they will not do nothing or will use their owned coping style as their defense efforts.

Perception process is consisted of selection, organization, and stimulus interpretations which are accepted by human sense until they become meaningful things²². Every individual will perceive a stress differently. If it is valued as negative thing by repeating the behavior without trying to correct it well, it will cause a problem for them.

Then, stress perception will activate the change of physiological systems in stress response through activating HPA that can increase production of cortisol. Hence, it impacts to development of health problem. In long-term effect, cortisol can cause the decrease of immune function and nerve damage in hippocampus. This change will increase infection, psychiatric problem,

and loss of concentration and memory²³.

This reseach was conducted in order to investigate how the correlation between stress perception and stress response against IPA on adolescent based on psychoneuroimmunology concept.

Method

This research utilized cross-sectional design. Locations of sample collection in this research were in six Senior High Schools in Makassar from August 2018 until February 2019. The population was all of twelfth grade students in Senior High School who were detected to undergo internet psychological addiction and there were 244 students. The sample size was 39, selected by purposive sampling. Data were collected using IPA questionnaire²⁵, serum cortisol levels measurement (Elisa) and stress perception questionnaire. Afterwards, the research result was analyzed by using Chi-square in order to observe the comparison among variables, then, it was conducted correlation analysis in order to investigate the correlation between stress perception and stress response.

Findings

IPA level on most of adolescents was high (Figure-1).



Figure-1. Distribution of IPA Level

The most of stress perception level was high (Figure-2).



Figure-2. Distribution of Stress Perception Level

Table 1 showed that there was no significant difference between stress perception score and IPA (p=0.097).

Table 1. Comparison of Stress Perception Score based on IPA Level

IPA	Stress Perception Score			p-value
	Mean	SD	Median	
High	55.10	2.83	55	0.097
Low	53.26	3.88	53	

The Stress Response Level on most of adolescents was high (Figure-3).

Figure-2. Distribution of Stress Response Level

Table 2 showed that there was significant difference between stress response and IPA (p=0.000) and significant difference between stress response and stress perception (p=0.016).

Table 2. Comparison of Stress Response based on IPA Level and Stress Perception

IPA	Stress Response Score			p-value
	Mean	SD	Median	
High	23.98	1.29	21.93	0.000
Low	12.20	4.01	11.60	
Stress Perception				
High	21.54	1.26	16.29	0.016
Low	12.97	5.80	11.60	

Discussion

Stress Perception

Most of stress perception on IPA was high. This condition was occurred more on female adolescents who accessed social network by using cellphone. Although it was not proven that there was a significant correlation between stress perception and respondent's characteristic, the activity of accessing internet since in early age was used for accessing others which did not have any advantages for learning process.

Adolescents were in identity crisis stage. They tended to have high curiosity and they were easy to be influenced by their peer friends²⁰. The adolescents

tended to have high confidence to access internet, but unstable, thus, they had not been able to select useful internet activities.

Phenomenon of internet addiction would influence other activities that impacted to imbalance in fulfilling other needs and contributing to personal distress or dangerous stress and could damage the adolescent development in the future^{13,14}.

Several researchers proved that internet addiction in long-term effect was dominated by negative impacts, such as depression, aggressive behavior, mental disorders, and stress²⁵⁻²⁹. In psychoneuroimmunology concept, stress is divided by two kinds, which are eustress and distress³. Eustress is stress that is needed to advance but if it is excessive, it will be distress.

Stress Response

Most of stress response on adolescent was high. The stress condition on IPA gave description that cortisol, product from hormonal reaction of the body due to stress, had spread into the body. Regulation of cortisol secretion was controlled by three organs, which were hypothalamus secreted Corticotrophin Releasing Hormone which would stimulate the anterior pituitary gland to secrete Adrenocorticotrophic Releasing Hormone which afterwards, it would stimulate adrenal cortex to secrete cortisol. Cortisol had important role in metabolism of protein and fat through increasing gluconeogenesis and it also had role in the process of adaptation against stress. In gluconeogenesis, it was occurred the increase of glucose secretion in the liver and changes in non-carbohydrate sources (amino acids) to be carbohydrates. Cortisol also caused lipolysis, thus, releasing free fatty acid increased, and it would be occurred centripetal fat deposits³⁰. Other functions of cortisol were regulating arteriolar tone and maintaining blood pressure (stimulating angiotensin II secretion), increasing glomerular filtration rate, water excretion, potassium excretion, sodium retention, and suppressing calcium uptake in renal tubules and intestines. This condition was caused by significant permissive effect of cortisol against other hormone activities. Epinephrine was one of hormone types which its activity was influenced by hormone level of cortisol. Moreover, cortisol must be in sufficient quantities for epinephrine in order to cause vasoconstriction. In stress condition, human body would increase epinephrine secretion until 300 times greater from normal level and it was depended

on type and intensity of stress stimulus³⁰. Cortisol increased epinephrine activity, thus, it was occurred the increase of heart rate and blood pressure.

The role of cortisol in helping the body to overcome anxiety or stress, and it was estimated that it related with its metabolic effect. Cortisol had metabolic effect which was increasing concentration of blood glucose by using protein and fat from the body. A logical assumption stated that the increase of glucose, amino acids, and fatty acids supply was available to be used when it was needed³⁰.

Correlation between Stress Perception and Stress Response

Stress perception in overcoming the impact of internet psychological addiction that was occurred would be responded by Hypothalamus-Pituitary-Adrenalin (HPA-axis), hence, it caused the cortisol level increased. If stressor that was accepted by hypothalamus was strong, the CRF that was secreted would increase more and more. Thus, stimulation that was accepted by pituitary also increased and cortisol secretion by the adrenal gland also increased. If the emotional condition had been stable, coping mechanism became positive, signal in the brain would hinder the release of CRF³¹⁻³². Due to stress, cortisol secretion could increase until 20 times greater. Stress was main factor in causing relapse in all addictions³³.

The use of internet excessively on IPA chronically would cause change of sensitivity in nervous system. Adolescents who were in condition of negative emotion or anxiety would increase cortisol level in the blood. Almost each response in the body, such as stress, could increase cortisol even in 20 times greater. The ability in regulating stressor until resulting different perception was really depended on their condition and perception against accepted stress³⁴. If their stress coping was good although there was stressor, the susceptibility against health problem could be reduced³⁵.

Conclusion

When the adolescents who underwent IPA was in stress condition, they could result perception against stress that would stimulate HPA axis, thus, CRF secretion by hypothalamus would increase. Then, it would be followed by the increase of ACTH by pituitary and the increase of cortisol secretion by adrenal gland.

Conflict of Interest- No

Source of Funding-Authors

Ethical Clearance-Yes

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The Prevalence of Sperm Parameters for Infertile Males in Thi-Qar City

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Abstract

Objective Male infertility is a term in which the male is not capable to attain pregnancy in a female. It occurs due to a lack of semen and low-quality semen. Semen Quality is referred to as a surrogate measure of male fecundity. This study aims to assess the frequency of sperm factors in infertile men in Thi-Qar City. Materials and Methods: This study involved an infertile couple, seminal fluid analysis (SFA) was done to evaluate male factors. Males with normal seminal fluid parameters were excluded. Regarding male, SFA was examined according to WHO 2010. Information such as age, duration of infertility and type of infertility were taken Results Among the percentage of abnormal sperm parameters for infertile couples in which the largest percentage was for asthenozoospermia that represent 66.70% of all infertile males. The second sperm abnormality is 12.13% for oligoasthenozoospermia. Asthenoteratozoospermia and oligoasthenoteratozoospermia have the same percentage (4.4). Azoospermia represents 6.7% while the lower percentage for teratozoospermia. Conclusions largest percentage was for asthenozoospermia that represents 66.70% of all infertile males .

Keywords: Seminal fluid analysis (SFA), sperm parameters

Introduction

Infertility is a different type of medical care as it relies on both male and female. Infertility is a unique medical condition because it involves a couple, rather than a single individual. In this condition, a couple fails to conceive after 1 year of intercourse without the usage of contraception in females less than the age of 35 years; and after the duration of 6 months of intercourse without the usage of contraception in females less than the age of 35 years and older (clinical definition) [1]. This is a very disturbing medical condition as the couple cannot have children if they are suffering from infertility. This further causes depression, psychological distress, and low self-esteem in the couple [2,3].

Types of male infertility

1. Asthenozoospermia

This term is described as the total sperm motility

(non-progressive and progressive), non-progressive motility is less than 40 percent and progressive motility is less than 32 percent. [4]

2. Oligozoospermia

A few months ago, the World Health Organization reevaluated the sperm criteria and announced a lower reference point which is less than 15M sperm/ML. (WHO 2010).[4]

3. Azoospermia

This term is described as the full absence of sperms from a minimum of 2 individual samples of centrifuged semen [4].

4. Teratozoospermia

Teratozoospermia; normal sperm morphology is <4% Kruger strict criteria [4]

Male infertility

There is a common misunderstanding that the female is responsible for infertility but, it has to be understood that male is equally responsible for this severe medical

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condition [5].

Seminal fluid analysis

Materials and Method

The study was carried out at infertility unit in Thi Qar city patient. From February 2015 to July 2017. This study involved an infertile couple, SFA was done to evaluate malefactors. Males with normal seminal fluid parameters were excluded. Regarding male, SFA was examined according to WHO 2010. Information such as age, duration of infertility and type of infertility were taken

The seminal fluid sample was taken in a clean, sterile, and dry disposable Petri-dish after three to five days of sexual absence. This was done by masturbation in a quiet room near the laboratory of semen analysis. The dish was a label with the name of the male, his age, sexual intercourse absence period, and the exact time of sperms collection. The sample was liquified using an incubator at the temperature of 37 °C for half an hour. It was then mixed and analyzed by microscopic and macroscopic tests. To note the results of seminal fluid analysis, the standard form of (WHO 2010) was used (Table 1).

Table 1: Normal values of semen variables [4]

Sperm parameters		WHO Criteria
Sperm concentration millions/mL		15x10 ⁶ spermatozoa/mL or more
Total sperm motility (%)		>40%
Sperm Grade Activity	Progressive motility (%)	>32%
	Non Progressive motility (%)	
	Immotile sperm(%)	
Normal sperm morphology (%)		>30%*

Results

Figure 1 shows the percentage of abnormal sperm parameters for infertile couples in which the largest percentage was for asthenozoospermia that represent 66.70% of all infertile males. The second sperm abnormality is 12.13% for oligoasthenozoospermia Asthenoteratozoospermia and oligoasthenoteratozoospermia have a same percentage (4.4). Azoospermia represents 6.7% while the lower percentage for teratozoospermia.

In our study table, 2 show the effect of male infertility duration on sperm parameters. Regarding

sperm concentration there is a significant decline at 5-10years, also there is a significant decline in sperm morphology when duration more than 10 years.

Table 3 discuss the effect of male infertility type in sperm parameters whether primary or secondary. There is no significant difference between primary and secondary types for all sperm parameters (sperm concentration, motility, and morphology).

Table 4 shows the distribution into primary and secondary fertility among infertile couples, 60% of them with primary infertility and 40% with secondary infertility.

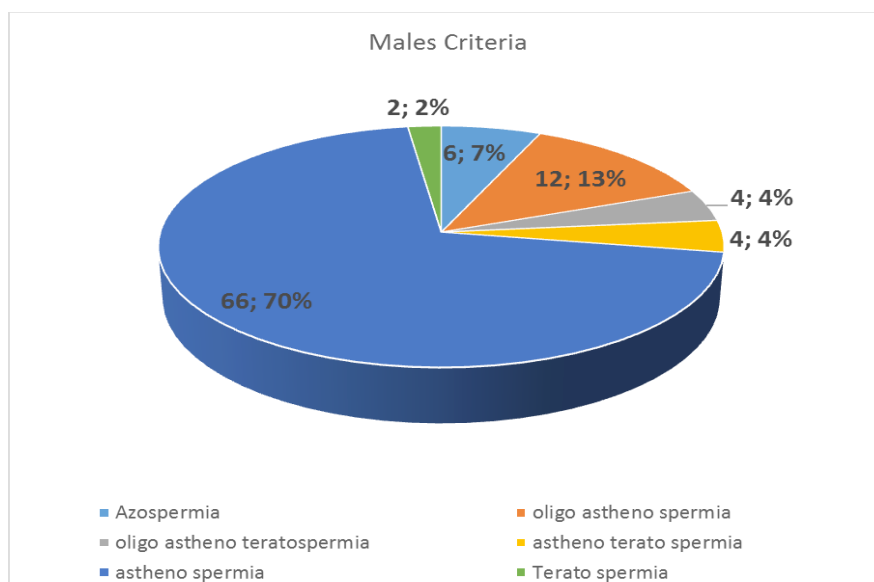


Figure 1. sperm parameters

Table2: Effect of male infertility duration on sperm parameters.

Infertility duration Parameters	1-5 years	5-10 years	≥10 years
Sperm concentration	44.417±4.10a	38.375±4.92b	46.944±5.74a
Progressive motility %	11.763±2.21a	8.081±2.58a	12.300±3.42a
Non-progressive motility %	28.383±2.69a	29.425±3.23a	32.178±4.17a
Immotile sperm	43.615±2.79b	44.813±4.38b	52.439±5.34a
sperm morphology %	52.944±3.67a	43.188±3.64b	45.468±2.47b

• Means with similar letters are nonsignificant different (P>0.05).

Means with different letters are significant deferments (P≤0.05).

Table3: Effect of male infertility type in sperm parameters.

Age groups Parameters	Primary	Secondary
Sperm concentration	42.459±3.59a	43.649±4.41a
Progressive motility %	10.298±1.80a	11.254±2.69a
Non progressive motility %	28.984±2.38a	30.141±2.93a
Immotile sperm	44.633±3.11a	47.265±2.84a
sperm morphology %	44.567±2.30a	48.595±3.05a

• Means with similar letters are non-significant different (P>0.05).

Means with different letters are significant deferments (P≤0.05).

Table 4: Distribution into primary and secondary fertility among infertile couples.

Infertility	Frequency	Percentage (%)
Primary	60	60%
Secondary	40	40%
Total	100	100%

Discussion

Moreover, the sperm parameters correlate negatively with increased period of infertility^[7]. These findings are in agreement with the results of the present study that the male patients with duration of infertility (1-5) years were with the lowest percentage of sperm motility.

The results of this study showed that primary infertility (60%) was more than secondary infertility (40%) as it is obvious from table 4. But, in men having primary infertility, genetic and chromosomal factors have a vital role in the presence of primary infertility than secondary infertility^[8].

A retrospective study, conducted between 1992 to 1999 highlights the occurrence of asthenozoospermia as 18.71% and for asthenozoospermia, it was 63.13%, linked with oligo- or teratozoospermia. So, 81.84 percent of the investigated samples indicated altered motility.^[9]

In research conducted in Nepal, 20% of the couples indicated semen abnormality. 47% indicated oligospermia while 39% indicated azoospermia. Moreover, 14% of males had asthenormia^[10].

Socioeconomic, environmental, and nutritional aspects are responsible for compromising the health of the male reproductive system [11]. Chemotherapy, radiation, and surgery may have an impact on spermatogenesis [12]. A research conducted in Senegal to check this abnormality, oligoasthenoteratonecrozoospermia showed the highest percentage that is 20.2 percent while azoospermia showed 14.5 percent and asthenonecrozoospermia and astheno-necrozoospermia both showed the occurrence as 10.3% [13]. However, Pontonnier indicates that oligoasthenoteratozoospermia is the chief abnormality that is usually found in the general population and particularly in varicocele [14].

Conflict of Interest: The author has no disclosures

to report.

Source of Funding: Self.

Ethical Clearance: Not required.

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Awareness of Medico-Legal Issues among Medical College Health Professionals

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Abstract

Introduction: Medicine, a noble profession, aims at providing healthcare service to the people. But today medical practice is much beyond the concept of service. It deals with legal issues and it is necessary for doctors to know about the various medico-legal aspects of their practice. A doctor is solely responsible for the patient who comes to him for treatment. A patient has all rights to sue the doctor if the treatment and care provided is not satisfactory. Assessment of awareness about medico-legal issues and related aspects among the health professional population thus becomes necessary.

Methodology: A cross sectional study was conducted using a self administered questionnaire with clinical scenario based questions. Responses were tabulated and analyzed.

Result: Most of the doctors are aware about various medico-legal issues and precautions to be followed to prevent getting involved in such situations. Doctors have knowledge about informed consent, record keeping, confidentiality etc.

Conclusion: Medical practitioners are well aware about the consequences they will have to face if treatment and care provision becomes faulty. They also have knowledge about the steps to be followed in order to protect themselves from getting involved in such situations. There is a need to spread awareness about medico-legal issues to further raise the quality of the service they provide.

Keywords: *Medico-legal cases, Informed consent, Confidentiality, Record keeping.*

Introduction

Medicine is a noble profession. It is considered as a pious profession all over the world. Its sole objective is improvement of quality of life and mitigation of sickness and suffering. It is not a mathematical process but a service oriented liberal profession having a self regulating code of ethics. The relationship between doctor and patient is based on hope and confidence ⁽¹⁾.

With commercialization spreading to all aspects, medical profession and services rendered are also

affected. There is growing anxiety both within the medical profession and in the society regarding increasing trends of complaints and law suits against physicians ⁽²⁾. It is necessary that doctors be aware of the legal aspects linked or associated to their profession and take the needful measures to protect themselves and their patients from legal traps. Knowledge of medico-legal issues is as fundamental to practice of medicine as clinical skills.

Today, with the development of internet and other media, patients are much aware about their condition and treatment to be taken. Practicing medicine in the present times is not an easy task. A doctor is solely responsible for each and every step he takes in providing care and treatment to his patients.

Hence a doctor must be aware of the consequences he or she might have to face if something goes wrong in patient care. A doctor must know about the precautions

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to be taken when involved in a medico-legal issue.

MLC or medico-legal cases are an integral part of medical practice that is frequently encountered by medical officers. The occurrence of MLCs is on the increase, both in Civil as well as Armed Forces. Proper handling and documentation of these cases is very important to avoid legal complications⁽³⁾. Law suits for medico-legal issues can be minimized or avoided by taking steps to keep patients satisfied, adhering to policies and procedures, developing patient centre care and knowing ways of defending against malpractice judgments. Having comprehensive professional liability, insurance is a necessity in the present day litigious society⁽⁴⁾.

This study focuses on medico-legal issues and aspects in daily clinical practice. Doctors face a lot of situations involving medico-legal issues in their daily practice⁽⁵⁾. It is necessary to have knowledge about these medico-legal aspects. Assessment of awareness about medico-legal issues and related aspects among the health professional population thus becomes useful. This study aims at analyzing and assessing the awareness of medico-legal issues among doctors.

Methodology

A cross sectional study was conducted using a self structured questionnaire with 20 questions that was distributed among 100 doctors of Saveetha Medical College. Each question was a clinical scenario with a medico-legal aspect. Questions about informed consent, patient confidentiality, important acts like MTP ACT, medico-legal cases, record keeping etc. were included in the survey. Response to each situation was recorded and analyzed.

Doctors willing to participate in the study were given the structured questionnaire after receiving written informed consent form. Out of the 100 doctors surveyed, 54 were men and the other 46 were women. The questions were of multiple choice type and participants had to tick the right option for each question. None of the participants left any questions unanswered. The response rate was 100%. All participant details were kept confidential and then analysis was done using SPS software. Response to each question was tabulated, analyzed and percentage for the same was also calculated.

Result

Most of them believed the purpose of informed

consent was to protect both doctor and the patient while actually its main purpose was to protect the patient. 90% of the population were aware of the importance of informed consent (Fig: 1). They also take consent forms for various treatment procedures explaining to the patient about details, pros, cons and other treatment options available.

Regarding record keeping, 69% responded to maintaining records of MLC till the case is judged and 20% believed it to be 3 years (Fig: 2). 48% of the population feel that records of patients are their legal property while 37% don't so and the remaining 15% have no clear idea about this. In India it is a very common practice that the patient keeps all the records with him or her. In Government offered health services the records are with the respective hospitals, only the treatment summary is given to the patient during discharge or if need arises. In most of the corporate setups the patient's records are with the hospital and only copies in the form of treatment summary or photocopies of entire case file are given to the patient⁽⁶⁾.

Among the doctors who were a part of this study, 95% feel it is wrong to reveal the sex of the fetus during scanning. Still, 5% are not aware that it is unethical and a criminal offence to reveal the fetus gender. 74% have the knowledge about the period up to which MTP can be performed while some doctors are still not sure (Fig:3).

A good proportion, 91%, know that they are obliged to treat any patient coming to them for help and care, at least provide first aid with the facilities available. A majority support to the fact that there is a necessity of informing the police about medico-legal cases like suicidal attempt, road traffic accidents etc. (Fig: 4). They stick on to their duty of providing service, care and treatment even if the patient behaves violently.

Keeping the patient details confidential signifies the strength of doctor-patient relationship. Most of the doctors believed that revealing patient's personal details with regard to illness is wrong. But there are situations where details with regard to the patient can be disclosed among the members of the treating team.

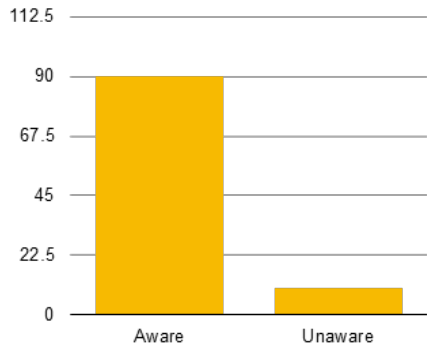
Question: The main purpose of consent form is to...

A: Protect doctor

B: Protect patient

C: Both

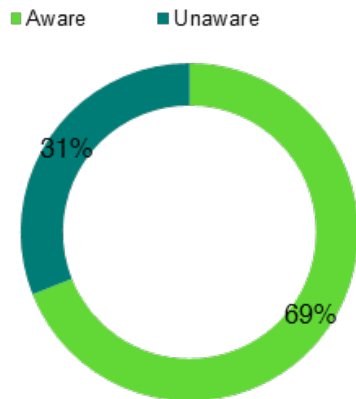
C: Not sure



(Fig: 1) Awareness about informed consent

Question: How long do you have to keep the records of a patient if it is a medico-legal case?

- A: 2 years
- B: 3 years
- C: 5 years
- D: Till the case is judged



(Fig: 2) Awareness regarding record keeping

Question: The MTP act, 1971 permits termination of pregnancy for a broad range of conditions upto

- A: 22 wks of gestation
- B: 20 wks of gestation
- C: 25 wks of gestation
- D: 18 wks of gestation

Question: A case of suicidal poisoning comes to Emergency Department. Patient insists he doesn't want a MLC. What will you do?

- A: Agree to patient's request
- B: Disagree to patient's request

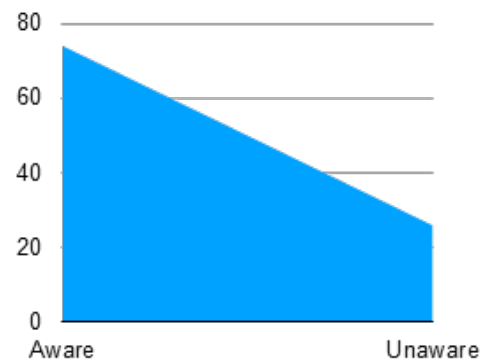
Discussion

The success of the health system depends on the medical personnel equipped with requisite knowledge, skills and attitudes towards patient rights (7, 8). This study was an attempt to investigate and assess the awareness of medico-legal issues among health care professionals of Saveetha Medical College, Chennai. The participants of this study included both doctors working in the clinical and non-clinical departments of the college.

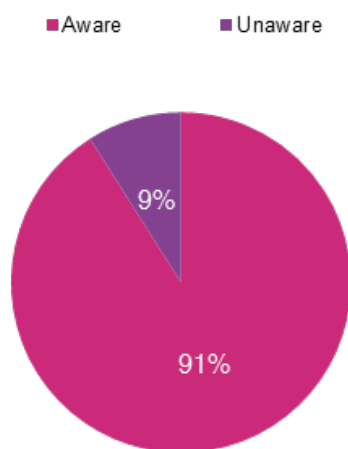
Most of them were aware about the legal aspects of their practice.

Informed consent is a process for getting permission before conducting a healthcare intervention on a person (9). Consent signifies acceptance by a person of the consequences and complications of an act that is being carried out. Informed consent form aims at providing information to the patient about the procedure and consequences going to be performed on him or her (10). The main purpose of the consent form is to protect the patient. Consent is necessary for every medical examination and procedure (11).

Usually written consent is not taken for routine examination. But expressed consent is required for any procedure. In a study conducted in a medical college in Vadodara to assess knowledge and awareness of medical law and ethics among interns and residents, it was found that almost 90% of the respondents were aware of informed consent and 61% regarded informed consent with reasonable physician standard model as their choice (12). This study also has a similar result whereby 90% are aware about informed consent.



(Fig: 3) Awareness about MTP Act



(Fig: 4) Awareness about cases requiring police intimation

Written records, which include medical history, chart notes, radiographs, and photographs, must be meticulous, and it is necessary for the documents to be signed and dated. Legally, physician written records carry more weight than patient's recollections ⁽¹³⁾. Regarding record keeping and maintenance almost 70% believed that records of medico-legal cases must be maintained till the judgment of the case. But these results vary slightly from the study on medico-legal awareness amongst health professionals in Sudan where 94.5% agreed that hospitals must maintain records until the case is judged.

It is difficult to decide if to treat a patient behaving violently. Article 21 of the constitution guarantees protection of life and liberty to all citizens. Every individual has the right to life which includes right to healthcare and medical assistance. There is still confusion among doctors to decide if to provide treatment to violently behaving patients. Majority of the doctors agree to provide treatment to such people. The healthcare worker should take reasonably practicable steps to maintain a safe environment for patients and staffs. This helps in providing better patient care. If violence or aggression cannot be controlled so as to provide a safe working environment, the health service's duty to staff takes precedence over its duty of care of patients.

Health care services and professionals must work together to develop strategies to prevent and manage the risk of occupational violence ⁽¹⁴⁾. When compared to a study conducted to assess awareness and knowledge about medico-legal issues in a medical college in Vadodara, where more than half the respondents (55%) said that treatment should not be refused if the patient behaves

violently, the response in this study differed by 78% of the population agreeing to treat the patient despite his violent behaviour.

According to Section 357 C Cr.P.C., all hospitals, public or private, whether run by the Central Government, the State Government, local bodies or any other person, shall immediately, provide the first-aid or medical treatment, free of cost, to the victims of any offence covered under section 326A, 376, 376A, 376B, 376C, 376D or section 376E of the Indian Penal Code, and shall immediately inform the police of such incident. Thus a doctor has no right to deny treatment to any person who comes to him for treatment, be it a criminal, victim or an ordinary man ⁽¹⁵⁾.

Medical practice is a service and not accepting to help one in need of treatment and care is a criminal offence. When facilities at a clinic or a healthcare centre are not sufficient to provide complete care or treatment, a doctor can refer to nearby hospitals with sufficient facilities. This does not give him rights refuse first aid to an emergency case like road traffic accident with head injury. Necessary first aid should be provided and then only can he refer or shift the patient to a hospital with better facilities needed to sustain the patient's life.

Confidentiality is an implied term of contract between the doctor and his patient ⁽¹⁶⁾. The doctor is obliged to keep secret, everything he comes to know concerning the patient in the course of his professional work. There are situations where doctors of a treating team must know all details about the patient even if it is about HIV or Hepatitis ⁽¹⁷⁾. If an HIV positive patient approaches for treatment involving a surgery, then the doctor can inform his colleagues about it if they are a part of the treating team. Confidentiality regarding the patient is maintained within the treating team. A study conducted in Ghana reveals that there is no consensus among health care workers on confidentiality matters regarding management of HIV ⁽¹⁸⁾. There is a variation in this study where majority (91%) agrees to maintain confidentiality regarding matters like HIV and its treatment.

Conclusion

In general the doctor population of Saveetha Medical College is well aware of various medico-legal issues and its aspects in daily life practice. They do have knowledge and idea about various medico-legal issues and how to face them. They do have a general idea of

how to approach medico-legal cases and knowledge about the things they should follow in order to protect themselves from such issues and continue a successful career. Doctors must follow the guidelines provided in their practice. This will help them have a trouble free and a peaceful time while working. Guidance and awareness is necessary among health professionals to raise the quality of service they provide and also to protect themselves from the troubles and difficulties they might face in their practice.

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Source of Funding: Self

Ethical Clearance: Obtained

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Effect of Antenatal Exercise Teaching Program on Neonatal Outcomes During Delivery in Erbil, Iraq

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Abstract

Background: Antenatal exercises are safe and beneficial for the fetus, and neonatal health, wellbeing, were positive effect on neonatal outcomes during delivery, such as prevent fetal distress, remained the Apgar score and birth weight in normal range level. The aim of this study was to determine the effect of antenatal exercise classes on the neonatal outcomes during delivery. **Methods:** prospective -Interventional study was conducted in Maternal – Child Health Department in Najdi Heydari Health Care Center, Maternity and Razgary Teaching Hospitals / Erbil City / Kurdistan region / Iraq. One hundred and twelve healthy pregnant women. One half of the pregnant women were included in the intervention group (n = 56) and the other half in the control group (n= 56). The intervention group was educated about antenatal exercises. While the control group remained on standard maternal health care program (without exercise classes). Neonatal outcomes evaluated from documents of birth registry and mothers interview in the postpartum ward using a special check list prepared for that purposed.

Results: In the original data, there was a statistically significant difference between both groups. Regarding the fetal heart rate (P<0.01), Apgar score (P<0.004), neonatal complications (P<0.039), admission neonatal intensive care unit (P<0.003) through the progress of delivery. in other hand, not a statistically significant difference between intervention and control groups concerning neonatal weight. **Conclusion:** Antenatal exercise is recommended for healthy pregnant women as a safe and effective strategy, enhance the neonatal outcomes during the delivery process.

Key words: antenatal exercise, teaching program , neonatal outcomes

Introduction

The pregnancy phase is an interval of growth, development, and physiological change in mother and fetus¹. In uncomplicated pregnancies, women with or without a previously sedentary lifestyle should be encouraged to take part in aerobic and strength class exercises as a part of a healthy lifestyle¹. Both the American College of Obstetricians and Gynecologists and the Society of Obstetricians and Gynecologists of Canada currently recommend that in the absence of complications during pregnancy, pregnant women should exercise for half hour at a moderate intensity on

most, if not all, days of the week^{3,4,5}. Many evidences showed there was a significant effect of exercise training during the course of pregnancy on the fetal heart rate, fetal complications during labor and neonatal Apgar score^{6,7,8}, and the effect of exercise during pregnancy on the newborn's birth weight is unclear^{9,10}. Moderate to high level of continues maternal exercise have been associated with reduced birth weight¹¹. A few studies^{12,13} have found reduced birth weight among women who continue vigorous exercise during pregnancy compared with those who discontinue the exercise or who are sedentary.

In this study, we amid to evaluate the effectiveness of antenatal exercise classes on the neonatal outcomes during delivery in Erbil City / Kurdistan Region / Iraq.

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Materials and Method

Tools for collecting data included the following:

assessment form was constructed by the researcher based on the literature and recommendations of antenatal exercises by the American College of Obstetrics and Gynecologists, 2015¹⁴, that included identifying demographic data, obstetrical history, assessment contraindications during pregnancy of the participants and checklist form. Content validity and reliability was secured. The sample size was calculated as 112 subjects based on PS program (power and sample size calculation) version 3.0.43. Who was attending the Maternal – Child Health Department in Najdi Heydari Health Care Center, Maternity and Razgary Teaching Hospitals, Erbil City, Kurdistan Region , Iraq. The subjects were selected using accessible sampling. The inclusion criteria were the following: age 18 - 40 years old, gestational age 17- 36, single tone pregnancy. Exclusion criteria were: free from contraindications of performing an exercise during pregnancy based on recommended of the American College of Obstetricians and Gynecologists (ACOG),2015 ⁴, as an obstetrician assessed all study participant subjects who had any medical health problem or pregnancy complications were excluded from the study. Subjects were purposely divided into intervention group 56 and control group 56. The intervention group was divided into nine subgroups and required to attend exercise classes for one hour weekly for four weeks. The purpose of the study was explained to all subjects in both

groups then informed consents were taken from them, and they completed the basic information forms which were prepared by researchers. The classes include the following:

- 1-Benefits, counterindications and discontinue of exercises during pregnancy.
- 2- Aerobic exercises and strength training of all the major muscle groups (walking or running and lower limbs relaxation exercise)
- 3- Pelvic floor exercises and birth ball exercise.
- 4- Coping in Labor (Helpful positions and breathing for labor).

During the classes demonstration of exercises and practical training, slides and pamphlets were used. All study participants were instructed to stopped exercises and reported immediately to the Maternity Teaching Hospital in the case of vaginal bleeding, abdominal contraction, vaginal fluid discharge. Participants in the control group received the routine care without attending classes. All participants who were unable to continue the program from both groups were excluded from the study finally subjects in the intervention group 48 and control group 49 Figure 1.

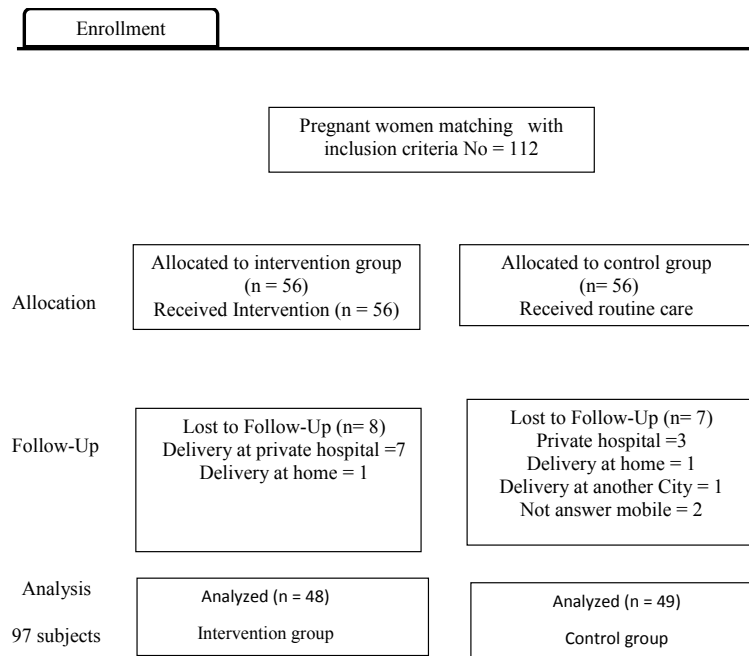


Fig 1. Flowchart of the participants through the study.

Outcomes and Statistical analysis

The delivery outcome of the fetus and neonatal (fetal heart rate, fetal complications during labor, Apgar score, birth weight, and admission neonatal intensive care unit) was evaluated from documents of birth registry and mothers interview in postpartum ward using a special checklist prepared for that purpose. Statistical analysis was performed using SPSS for Windows version 20.0 software. Chi-square tests, ANOVA test, and Fisher exact were used for comparisons of intervention and control groups data. A value of P values (< 0.05) was accepted as statistically significant.

Results

The present study findings that highest percentage (57.1%) (58.9%) of intervention and control groups respectively their age ranged between 20-29 years old and highest percentage (37%) of the intervention group had six years schooling were (32.1%) of the control group was Illiterate. The same table indicates that the highest percentage (91.1%) (92.9%) of both groups were housewives, respectively. Results also showed that demographic characteristic of both groups was homogeneous and no significant difference was observed between them regarding the age group, educational level and gravidity ($P<0.978$, $P<0.738$, $P<0.849$) respectively (Table 1).

Table 1: Demographic data of the study sample N= 112

Variables	IG =56 No. (%)	CG = 56 No. (%)	P- Value
Age (years) < 20 20 – 29 40 +	6 (10.7) 32(57.1) 18(32.1)	6 (10.7) 33(58.9) 17(30.4)	0.978
Education level Illiterate Primary Secondary Institute & College	13(23.2) 21(37.5) 12(21.4) 10(17.9)	18(32.1) 17(30.4) 11(19.6) 10(17.9)	0.738
Gravida 1 2 – 4 = 5 +	27(48.2) 22(39.3) 7(12.5)	25(44.6) 22(39.3) 9(16.1)	0.849

IG: Intervention group, CG: Control group

The highest percentage 97.9% of study sample their fetus heart rate was normal range rate of intervention group within compared to 81.6% of the control group. Which observed a statistically significant difference between intervention and control groups concerning pregnant women is fetal heart rate) $P>0.01$ (, in favors of intervention as shown in (Table 2).

Table 2: Comparison of the fetal heart rate during delivery between the two groups

Variable	IG (48) No. (%)	CG (49) No. (%)	-P- Value
Fetal Heart Rate/ bpm			
>120	0(0)	7(14.3)	0.01
120 -160	47(97.9)	40(81.6)	
<160	1(2.1)	2(3.1)	

IG: Intervention group, CG: Control group, bpm: Beats per-minutes

Table 3 showed that 10.4% of the study sample in the intervention group had fetal distress within compared to 28.6% of control group, a statistically significant difference between intervention and control groups concerning neonatal complication) ($P>0.039$), in favors of the intervention group.

Table 3: Comparison of the fetal complications during labor between the two groups

Variables	IG (48) No. (%)	CG (49) No. (%)	-P- Value
Fetal distress	5(10.4)	14(28.6)	0.039
Non- complications	43(89.6)	35(71.4)	

IG: Intervention group, CG: Control group

Table 4 indicated that highest percentage (93.8%) of the neonatal their Apgar score higher than 7 scores in intervention group within compared to 71.4% of control group, a statistically significant difference between intervention and control groups concerning neonatal Apgar score ($P>0.004$), in favors of the intervention group. The same table showed that higher percentage (89.6%) of the neonatal in the intervention group their body weight between 2500 to < 4000 mg within compared to 89.8% the control group, while 89.8% of the neonatal their body weight between 2500 to < 4000g, not a statistically significant difference between intervention and control groups concerning neonatal weight ($P<1.00$). In addition, only 8.3% of the neonatal admission to intensive care unit in the intervention group within compared to 32.7% of control group, a statistically significant difference between intervention and control groups concerning neonatal admitted care unit ($P>0.003$), in favors of the intervention group.

Table 4: Comparison of the neonatal Apgar score, birth weight and admission neonatal intensive care unit between the two groups

Variables	IG (48) No. (%)	CG (49) No. (%)	-P- Value
APGAR Score			
< 7Score	45(93.8)	35(71.4)	0.004
7 > Score	3(6.3)	14(28.6)	
Birth weight / g			
<2500	1(2.1)	1(2.1)	1.000
2500 to < 4000	43(89.6)	44(89.8)	
≥4000	4(8.3)	4(8.2)	
ANICU			
Yes	4(8.3)	16(32.7)	0.003
No	44(91.7)	33(67.3)	

IG: Intervention group, CG: Control group, g: gram, ANICU: Admission neonatal intensive care unit

Discussion

This study was carried out to determine the effect of antenatal exercise on neonatal outcomes during the delivery process. In the present study, the novel program was studied, the lower limbs relaxed, sitting on the birth ball, Kegel exercises (pelvic floor exercise), and breathing exercise and relaxation during labor are new phenomena for the pregnant women in Kurdish culture. Through this program were oriented the pregnant women about the importance of antenatal exercise and the effect of antenatal exercise on the neonatal outcome and their health wellbeing during delivery. The studies related antenatal exercise is limited but suggests that moderate exercise during uncomplicated pregnancy does not lead to adverse outcomes for the fetus and improves overall neonatal health well-being^{12,13,14,15}.

The present study showed that the fetal heart normal range 120 -160 bpm in the intervention group were higher than the control group, which a statistically significant difference between two groups ($P < 0.01$). Found a higher percentage of the fetal heart rate (less or above normal range 120-160 / bpm) in the control group (17.4% vs. 2.1%) respectively, the reason for abnormal fetal heart rate during delivery in the control group are due to prolonged labor, hypoxia and meconium¹⁴. Concerning the fetal complication, fetal distress was less reported during labor, also the rate of fetal distress in intervention group less than the control group. The reasons of fetal distress are due to prolonged labor, lack of fetal head descent into the pelvis, incomplete rotation of the fetal head hypoxia and meconium^{14,16}.

Another appealing finding in this study is that the Apgar score was higher in the intervention group compared to the control group at the first minute^{2,8,15}. Miquelutti et al and Nascimento to disagrees with the result of the present study, found that exercise during pregnancy has no effect and no significant difference between intervention and control groups regarding the Apgar score at first minute^{17,18}. Regarding birth weight, in the present study, we did not find a statistically significant difference in birth weight between intervention and control groups, we observed that the prevalence of newborns with birth weight between 2500 to < 4000 g was 89.6% (n = 43) in the intervention group vs. 89.8% (n = 44) in the control group, also was no a statistically significant difference between groups in low birth weight (<2500 g) or macrosomia (< 4000 g). The results of some studies are agreement with the present

study findings^{2,7,14, 18,19,20,21,22, 23} there are found that performing the exercise during pregnancy has no effect on birth weight.

We also found that the pregnant women performed of antenatal exercises had a significant association with their newborn admission to neonatal intensive care unit. The rate of referring newborn to neonatal intensive care unit in the intervention group less than the rate of neonatal admission in intensive care unit in a control group. 8.3% (n=4) in the intervention group vs. 32.7% (n= 16) in the control group needed admission to the neonatal intensive care unit after birth. were due to meconium aspiration, asphyxia¹⁷.

Conclusion

Antenatal exercise is recommended for healthy pregnant women as a safe and effective strategy for enhancing fetal and newborn outcomes (fetal heart rate, fetal complications during delivery, Apgar score and reduced birth weight and admission neonatal intensive care unit)

Conflict of Interests: None

Ethical Clearance: This perspective - intervention study, was approved by the Ethics Committee in the College of Nursing, Hawler Medical University (Registration No:8) and the Directorate of health in Erbil City, Kurdistan Region, Iraq.

Source of Funding: myself

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Study of Dyslipidemia in Iraqi Hypertension Patients in Tikrit City

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Abstract

Background: Hypertension is prevalent all over the world and represent a major health problem. Dyslipidemia is a major cause of cardiovascular morbidity and mortality. There is a correlation between hyperlipidemia and hypertension.

Aim of study: to find out the prevalence of dyslipidemia in Iraqi hypertension patients, and to find out how many of them on statin therapy, and how many reach target according to the last guidelines

Patients and methods: a cross-sectional study conducted in outpatient clinic in Salahaddin General Hospital in Tikrit City. About 344 hypertensive patients were included in this study. A questionnaires including general information about patients were filled and venous blood was drawn from every patient and sent for hospital lab to measure necessary investigations. ASCVD risk score was calculated for every patient by ASCVD Risk Estimator Plus. Then data were analyzed by application of Microsoft excel program and Statistical Package for Social Sciences (SPSS) version 23.

Results: (49%) of hypertension patients had total cholesterol of >200 mg/dl, (63.4%) had LDL of ≥ 115 mg/dl, (57.6%) had HDL of <40 mg/dl, and (54.1%) had triglycerides of ≥ 150 mg/dl. Smoker patients in this study had highest ASCVD risk score ($12.65 \pm 6.63\%$) followed by former smokers ($7.36 \pm 3.56\%$) and non-smokers ($6.02 \pm 4.16\%$). Only 76 (22.1%) of hypertension patients were on statin therapy for hyperlipidemia and only 18 (23.7%) of them reaching target LDL level according to 2016 ESC/EAS guidelines. While 268 (77.9%) of hypertension patients had no statin therapy and only 65 (24.3%) of them had LDL level within target.

Conclusion: Hyperlipidemia is very prevalent in hypertension patients in Tikrit City, despite that only one of five receiving treatment and only one of four from those who received treatment reaching the target of LDL level according to 2016 ESC/EAS guidelines, and three of four of those who are on no treatment are out of the target. This is a major health problem need attention.

Keywords: Hypertension, Dyslipidemia, Cholesterol, HDL, LDL, Triglycerides

Introduction

Hypertension can be defined as an abnormally high arterial blood pressure. It is still accepted that

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hypertension defined as systolic blood pressure ≥ 140 mm Hg and/or diastolic blood pressure ≥ 90 mm Hg [1-3]. Because of its prevalence, hypertension represent a major health problem [4-7]. Hypertension affect about 32.6% of US population above 20 years of age [8]. In Iraq , about 35.6% of population above 18 years of age have hypertension [9]. Worldwide, dyslipidemia is a major cause of cardiovascular morbidity and mortality [10, 11]. Atherosclerosis is a progressive pathological process that lead to heart and cerebrovascular diseases [12,13] an dyslipidemia is a major risk factor of atherosclerosis.

About 39.6% of Iraqi population above 18 years of age have raised cholesterol or currently on statin treatment^[9]. There is a correlation between hyperlipidemia , hypertension and pulse pressure ^[14].

The aim of this study: to find out the prevalence of dyslipidemia in Iraqi hypertension patients, and to find out how many of them on statin therapy, and how many reach target according to the last guidelines.

Patients and method

This is a cross-sectional study conducted in outpatient clinic in Salahaddin General Hospital in Tikrit City, from 1st of January 2019 to 31st of May 2019. All established hypertension patients above 25 years of age that agreed to participate in this study were included.

Exclusion criteria: Patients with: established coronary or valvular heart disease, chronic kidney disease, diabetes mellitus , stroke or peripheral vascular disease were excluded.

About 344 hypertensive patients were included in this study after an oral informed consent taken from every patient . 156 (45.3%) of them were males, and 188 (54.7%) were females. Age range from (30-80) years with mean age of (50.34±10.35) years. Every patient was reviewed individually by a questionnaire including general information about patients beside smoking state and history of : cardiovascular disease, diabetes mellitus, chronic kidney disease or peripheral vascular disease, and history of treatment of dyslipidemia. Weight (Wt) and height (Ht) of every patient was recorded and body mass index (BMI) was calculated. Systolic and diastolic blood pressure of each patient was also recorded. Then 5 ml of venous blood was drawn from every fasting (for 14 hours) patient in this study and sent directly to hospital lab for measuring : fasting blood sugar, blood urea and serum creatinine to exclude diabetic patients and patients with Chronic kidney disease. Lipid profile including: serum total cholesterol, low density

lipoprotein (LDL), high density lipoprotein (HDL), very low density lipoprotein (vLDL) and serum triglycerides were also measured.

Then atherosclerosis cardiovascular disease (ASCVD) risk was calculated for every patient by ASCVD Risk Estimator Plus , an application provided by American College of Cardiology (ACC). Then patients were grouped into 4 groups: 1- low risk with ASCVD risk score of <1%, 2- moderate risk with ASCVD risk score of ≥1% and <5%, 3- high risk with ASCVD risk score of ≥5% and <10% and 4- very high risk with ASCVD risk score of ≥ 10% according to European Society of Cardiology (ESC) and European Atherosclerosis Society (EAS) 2016 guidelines for the management of dyslipidaemias ^[15].

Then data were analyzed by application of Microsoft excel program and Statistical Package for Social Sciences (SPSS) version 23. Outcomes of analysis were arranged into tables and figure. P-value was calculated by different probability tests.

Results

About 344 hypertensive patients were included in this study. 156 (45.3%) of them were males, and 188 (54.7%) were females. Age range from (30-80) years with mean age of (50.34±10.35) years. FB. sugar mean ± SD was (93.00±0.00 mg/dl) , B. urea mean ± SD was (33.79±6.82 mg/dl) ,and S. creatinine mean ± SD was (0.83±0.15 mg/dl).

About 171 patients (49%) had total cholesterol of >200 mg/dl (42.1% males and 57.9 females, and 218 of patients (63.4%) had LDL of ≥115 mg/dl (43.1% males and 56.9% females, and 198 of patients (57.6%) had HDL of <40 mg/dl (57.1% males and 42.9% females), and only 158 of patients (45.9%) had serum triglycerides of <150 mg/dl (38% males and 62% females. There was statistically significant increment of HDL and triglycerides in females as shown in table (1).

Table(1) Frequency of dyslipidemia according to gender distribution in Hypertension patients.

Variables	Subvariables	Male		Female		Total		P-value
		No.	%	No.	%	No.	%	
Total Cholesterol	>200 mg/dl	72	42.1	99	57.9	171	49.7	0.230
	≤200 mg/dl	84	48.6	89	51.4	173	50.3	
LDL	≥115 mg/dl	94	43.1	124	56.9	218	63.4	*0.621
	<115-100 mg/dl	32	51.6	30	48.4	62	18.0	
	<100-70 mg/dl	25	45.5	30	54.5	55	16.0	
	<70 mg/dl	5	55.6	4	44.4	9	2.6	

Cont... Table(1) Frequency of dyslipidemia according to gender distribution in Hypertension patients.

HDL	≥40 mg/dl	43	29.5	103	70.5	146	42.4	<0.0001
	<40 mg/dl	113	57.1	85	42.9	198	57.6	
Triglycerides	< 150 mg/dl	60	38.0	98	62.0	158	45.9	0.039
	150-199 mg/dl	48	52.7	43	47.3	91	26.5	
	≥ 200 mg/dl	48	50.5	47	49.5	95	27.6	

By Fisher Exact test.*

Patients with BMI of ≥ 30 Kg/m² had higher total cholesterol (212.38±54.84) mg/dl and HDL level (38.25±11.86) mg/dl, while patients with BMI of 25-29.9 Kg/m² had higher level of triglycerides (190.44±128.34) mg/dl and patients with BMI of 18.5-24.9 Kg/m² had higher level of LDL (144.71±44.84) mg/dl as shown in table(2). The differences were statistically not significant.

Table(2) Lipid profiles (mean ±SD) among hypertension patients according to BMI.

Variables	18.5-24.9 Kg/m ²	25-29.9 Kg/m ²	30≤ Kg/m ²	P. value
Total cholesterol (mg/dl)	210±46.21	200.37±41.57	212.38±54.84	0.132
HDL (mg/dl)	36.86±7.65	37.63±8.08	38.25±11.86	0.174
LDL (mg/dl)	144.71±44.84	127.46±33.03	134.06±41.22	0.815
Triglycerides (mg/dl)	123.71±32.34	190.44±128.34	179.88±114.87	0.133

Smoker patients in this study had highest ASCVD risk score (12.65±6.63%) followed by former smokers (7.36±3.56%) and non-smokers (6.02±4.16%) respectively as shown in table (3). The difference was statistically significant.

Table(3) ASCVD-score (Mean ±SD) among hypertension patients according to smoking status.

Variable	Smokers	Former	Non-smoker	P-value
ASCVD score (%)	12.65±6.63	7.36±3.56	6.02±4.16	<0.0001

In the present study there were 107 (31.1%) patients with hypertension had very high risk for developing ASCVD, most of them were males (65%), while 128 (37.2%) patients had moderate risk for developing ASCVD, most of them were females (71.9%) as shown in table (4). The difference was statistically significant.

Table (4) ASCVD risk according to 2016 ESC/EAS guidelines and gender distribution in hypertension patients.

Variables	Male		Female		Total		P-value
	No.	%	No.	%	No.	%	
Low risk	7	63.6	4	36.4	11	3.2	<0.0001
Moderate risk	36	28.1	92	71.9	128	37.2	
High risk	48	49.0	50	51.0	98	28.5	
Very high risk	65	60.7	42	39.3	107	31.1	

Only 76 (22.1%) of hypertension patients were on statin therapy for hyperlipidemia and only 18 (23.7%) of them reaching target LDL level according to 2016 ESC/EAS guidelines. While 268 (77.9%) of hypertension patients had no statin therapy and only 65 (24.3%) of

them had LDL level within target as shown in figure (1). The difference between treated and non- treated patients in reaching targeted LDL level was statistically not significant.

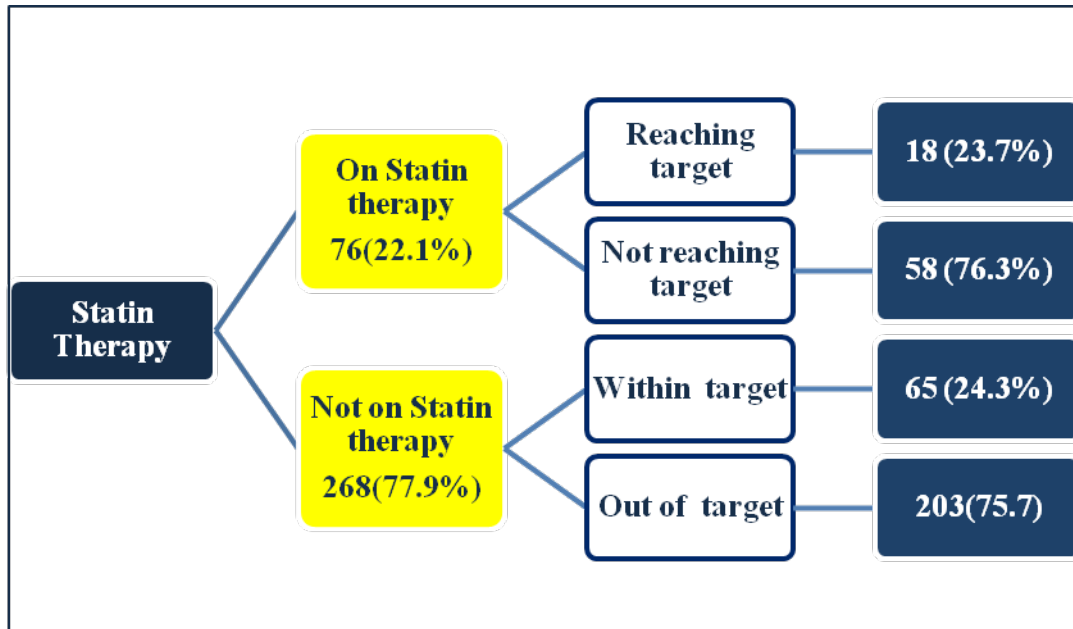


Figure (1) Flow-chart of hypertension patients according to using statin and reaching target of LDL level according to 2016 ESC/EAS guidelines.

Discussion

In the present study, females had levels of HDL and triglycerides significantly higher than that in males , while there was no significant difference in regard to levels of total cholesterol and LDL. Previous study ^[16,17] reported that sex -related differences in triglycerides, total cholesterol , HDL and LDL levels, other study ^[18] found no sex -related differences in TC and LDL in subjects aged 50 years and more but females had lower level of triglycerides and HDL than males. In another study ^[19] females aged 18 years and more had lower levels of triglycerides and LDL and higher level of HDL than males.

In the present study there was no significant differences in levels of total cholesterol, triglycerides, LDL and HDL among different BMI groups. Associations of adiposity at baseline and dyslipidemia have been shown in large prospective studies^[20-24], however there is inverse relationship between smoking and body weight ^[25], and smoking associated with low HDL ^[26], for this reason and perhaps using of statin therapy by some patients in this study may lead to these

results.

The present study revealed the effect of smoking on raising ASCVD risk and this is in agreement with other studies ^[27-30]. Also this study revealed that most of very high risk group for developing cardiovascular disease were men and this is in agreement of other studies ^[20-24].

The present study revealed that only 22.1% of Iraqi hypertension patients in Tikrit City on statin therapy and only 23.7% of them reaching target of LDL level , while 77.9% of them are not on any treatment for hyperlipidemia, although 75.7% of them are out of target of LDL level according to 2016 ESC/EAS guidelines. This is comparable to a study done in Russia ^[31].

Conclusion

Hyperlipidemia is very prevalent in hypertension patients in Tikrit City, despite that only one of five receiving treatment and only one of four from those who received treatment reaching the target of LDL level according to 2016 ESC/EAS guidelines, and three of four of those who are on no treatment are out of the target. This is a major health problem need attention.

❖ **Conflict of Interest** - (nil – There are “NO CONFLICT OF INTEREST”).

❖ **Source of Funding** - By all researchers (**self**).

❖ **Ethical Clearance:** Committee members are approved to perform a study about

“Study of dyslipidemia in Iraqi Hypertension patients in Tikrit city”

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Isolating Some Pathogenic Bacteria from Packed Milk and Detecting of Formalin in its Components

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Abstract

Aims: The main aims of this study is to isolate pathogenic bacteria from packed milk in Basrah city, and to detect the presence of formalin in milk samples.

Methodology: A total of 9 types of packed milk were collected from the market in different period. The samples were transported to the laboratory in cooling conditions. They were stored in a refrigerator and analyzed within 24 hours. One ml from each sample was diluted in 9ml sterile distilled water, the diluted sample was a streak inoculated on chromogenic media. Three ml of milk sample was taken in a test tube and diluted with equal size of water. 5ml of sulfuric acid (90%) were added to the diluted milk slowly to the side of test tube which must handle with slant position in order to form separation layer. In case of formaldehyde presence a violet layer will form. This method detect of 1 part of formaldehyde in 200000 parts of milk

Result: The result showed only *Staphylococcus saprophyticus* and *Staphylococcus aureus* have been isolated from milk samples (23.4 %) and (10.6 %) respectively. The result showed that high temperature not very effective since two pathogenic bacterial species have been isolated and formalin have been detected in milk samples. The result showed no effect of addition of formalin in some sample and did not inhibit the growth of bacteria.

Conclusions: This study concludes that most of the packed milk under study contaminated with some pathogenic bacterial species, most of milk samples contained formalin.

Key words: Bacteria, Milk, Formalin, Basrah

Introduction

Milk and its products have been an important part of the human diet for some 8000 years and are part of the official nutritional recommendations in many countries worldwide. Milk products are rich in calcium, protein, potassium and phosphorus and it is very important for children and adolescents because it contains numerous essential nutrients so it provides around 52–65 % of the dietary reference intake of calcium and 20–28 % of the protein requirement^{1,2}. Some of the bacteria contained in

milk (such as *Lactobacillus spp* or *Bifidobacterium spp.*) are also present in the healthy human gastrointestinal tract, aiding in digestion and protection from other infections, while other bacteria can be extremely harmful to human health. Milk can be polluted by *Mycobacterium bovis*, *Brucella* species, *Streptococci* and *Coxiella burnetii* from infected cattle. Agents from human sources such as *Salmonella* species, *Shigella* species, *Corynebacterium diphtheria* and *Streptococcus* species can also be presented in milk³.

Many preservatives such as nitrate, boric acid, salicylic acid, hydrogen peroxide, formalin, carbonate and bicarbonate are adding to milk to improve keeping quality of milk and to delay spoilage is a problem for regulatory bodies from the early history of dairying. The toxic effect, hypersensitivity, teratogenic effect

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and carcinogenic effect are the most common serious public health hazard appears as a result of accumulation of preservatives⁴. The addition of Formalinas adulterant in milk affects on the health of consumers; it causes vomiting, diarrhea and abdominal pain. Larger doses may cause decreased body temp, shallow respiration, weak irregular pulse and unconscious. It also affects the optic nerve and cause blindness. It is one of the potent carcinogens⁵. Therefore the present study was performed to throw out a light on the microbiological examination for detecting pathogenic bacteria and formalin detection in packed milk.

Methodology

Collection of milk products

Nine types of packed milk were collected from the market in different period. The samples weretransported to the laboratory in cooling conditions. They werestored in a refrigerator and analyzed within 24hours⁶.

Microbiological analysis

One ml of each sample was diluted in 9ml sterile distilled water. The diluted sample was a streak inoculated on chromogenic media as given below:

**Staphylococcus* chromagar (Paris, France) used to isolate *Staphylococcus aureus* and *Staph. Saprophyticus*.

**E. coli* chromagar (Paris, France) used to isolate

Escherichia coli and other gram negative bacteria.

*Salmonellchromagar (Paris, France) used to isolate *Salmonella* spp.

**Pseudomonas*chromagar (Paris, France) used to isolate *Pseudomonasaeruginosa*

Detection of formaldehyde presence

Three ml of milk sample was taken in a test tube and diluted with equal size of water. 5 ml of sulfuric acid (90%) were added to the diluted milk slowly to the side of test tube which must handle with slant position in order to form separation layer. In case of formaldehyde presence a violet layer will form. This method detect of 1 part of formaldehyde in 200000 part of milk⁷.

Results

The recent study was detected of pathogenic bacteria(*Escherichia coli*, *Salmonella typhi*, *Staphylococcus aureus*, *Staphylococcus saprophyticus* and *Pseudomonas aeroginosa*) in packed milk samples from different origin of products in more than one date of production (November 2018 to February 2019). Only, *S. saprophyticus* and *S. aureus* have been isolated from milk samples (23.4%) and (10.6%) respectively. The CFU number of *S. aureus* and *S. saprophyticus* isolated from milk samples was documented in Table 1.

Table 1: number of bacterial colony forming unit (CFU) on chromo agar media

Type of sample/origin of product	No. of samples	Number of CFU	
		<i>S. aureus</i>	<i>S. saprophyticus</i>
Safio /KSA	1		Uncountable
Almarai/ KSA	1	1	
	2		1
	3		1
KDD/ Kuwait	1	2	6
	2	Uncountable	
	3		1
	4		3
	5		Uncountable
	6		1
Kalleh /Iran	1	1	
	2		1
	3		1

All samples under study have been written on its packet “sterilized by high temperature” and no added preservative was mentioned. However, the result showed that high temperature not very effective since two pathogenic bacterial species have been isolated and formalin have been detected in milk samples (Table 2). In some samples, the addition of formalin to milk also did not inhibit the growth of bacteria.

The lack of mention of the ingredients of any particular food products, especially the presence of preservatives is a commercial fraud.

Table 2: Number of milk samples contain formalin

Sr.No.	Type of sample / origin of product	Total number of samples	No. of the samples contain formalin
1	Safio /KSA	8	2
2	Almarai/ KSA	8	8
3	KDD/ Kuwait	11	11
4	Kalleh /Iran	6	–
5	Farms alsaba/Syria	3	–
6	Tiffany /UAE	6	3
7	Nesquik/ Turkey	2	2
8	Alis / Iran	2	2
9	Nada/ KSA	1	1

Discussion

Iraq relies heavily on imported products, so that there was no Iraqi milk available during the collection of samples from the market. There are Iraqi products of yogurt and cheese, but not packaged milk. The packaged milk found in the Iraqi markets is a Saudi, Kuwaiti, Turkish, Iranian, UAE and few Syrian ones. Since, the war in Syria have been started, Syrian products decreased in Iraqi markets. Formaldehyde is quickly absorbed from the gastrointestinal tract following ingestion and quickly diffuses into many tissues, including the brain, testis, and liver⁸ which makes it a dangerous chemical to be used as preservative^{9,10}. Toxicological effects including histopathological alteration in the stomach (i.e., gastrointestinal lesions (such as papillomata’s

hyperplasia and hyperkeratosis), allergy, asthma¹¹, abdominal pain and vomiting.

A Bangladesh study showed some severe histological alterations in liver and kidney in treated mice, which were fed with formalin as 30µl, 3µl and 0.3µl for 30 days¹². Formalin is significantly related with cancer, particularly nasopharyngeal cancer in humans through inhalation during occupational exposure¹³. Sometimes caused gastrointestinal cancer when present with high concentration in drinking water¹⁴. Consumption of foods contaminated with this dangerous chemical exposes humans, particularly kids and elderly to severe health problems in Iraq and some developing countries. We conclude that most of the packed milk under study contaminated with some pathogenic bacterial species, most of milk samples contained formalin.

Ethical Clearance: Ethical clearance taken from nursing college/university of Basrah.

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Screening Study for Some Strains of *E. Coli* Collected from Five regions in Kurdistan-Iraq for its Sensitivity, Resistance and MDR against Thirteen Antibiotics

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Abstract

Background: New strains of bacteria, which are sensitive and resistant to antibiotics, has been selected due to the overuse of antibiotics. The profiles of *Escherichia coli* (*E. coli*), which is resistant to antibiotics, are taken from different samples of human fecal and urine.

Aims: This article investigates the occurrence and observing the sources of *E. coli*, which is sensitive and resistant to antibiotics. The study samples are collected from human urine and fecal by limited inhibition zone.

Results: The study revealed a 92% sensitivity to Chloramphenicol and Gentamycin, 77% to Clarithromycin and Neomycin and 54% to Doxycycline. While the lowest sensitivity level was documented for Erythromycin and Novobiocin represented by 6.8%. Furthermore, the lowest level of sensitivity was reported for Erythromycin, and represented by 38% in comparison to control. Moreover, the sensitivity to penicillin was low. Besides, this study revealed that the isolated samples of *E. coli* were highly resistant to the multiple antibiotic resistance of the three antibiotics, namely Ampicillin, Lincomycin and Rifampin during the same time.

Conclusion: All of the antibiotics used in this study had a clear impact against *E. coli* bacteria as antimicrobial drugs to inhibit its growth and infection.

Keywords: *E. coli*, Antibiotics resistance, Antibiotics sensitivity.

Introduction

E. coli is gram-negative bacilli, facultative anaerobic bacteria that belong to the *Enterobacteriaceae* family¹, and propelled by long flagella. It is found in the intestinal tracts of human and animal due to faecal contamination or food contamination during the slaughter of an animal. It frequently exists in food, water and soil². Furthermore, *E. coli* causes lower urinary tract infection, septicaemia or coleocystis. Resistance to multiple drugs in human pathogenic bacteria has been established because of the random use of commercial antibacterial medicines commonly utilized in treating infectious diseases. In the literature, there are a number of factors impact of developing resistance to antibiotics. These factors include 1) the specific nature of the relationship between bacteria and antibiotics; 2) using an antimicrobial agent; 3) characteristics =of the host; and 4) ecological factors.

Generally, bacteria have the genetic ability to transmit and acquire resistance to drugs, which are used as therapeutic agents³.

Antibiotic resistance

It is well known that the extended-spectrum β lactamases (ESBLs) are produced by multidrug-resistant *Enterobacteriaceae*, commonly *E. coli* (e.g., the enzymes of CTX-M). These enzymes are more active against cefotaxime than other oxyimino-beta-lactam substrates like ceftazidime, ceftriaxone or cefepime. They are defined within the setting of the community as a significant cause of urinary tract infections (UTIs). Recently, there are studies describing ESBL-producing *E. coli* as being a cause of bloodstream infections related to these community-onsets of UTI⁴. It is an organism that occurs widely in sewage because it is a

faecal coliform. It has a significant role in the analysis of water sanitary. Over the past fifty years, two studies conducted by Maaloe and his colleagues have described the growth rate regulation in bacteria for the first time. This has been a significant issue in bacterial physiology⁵. The virulence factor (toxicity) of *E. coli* explains its pathogenicity. There are varied factors that define the pathogenicity of *E. coli*. Based on the nature of these factors, various infections may be caused by these strains, including skin wounds infections⁶.

Pathogenic strains of this organism are distinguished from normal flora by the presence of virulence factors, such as exotoxins. *E. coli*, also known as UPEC, is the most prevalent extra digestive pathogen that causes UTI in children and accounts for about 80-90% of the community-acquired cases. Five pathogenic strains of *E. coli* are frequently isolated from humans and animals suffering from diarrhea. *E. coli* is the most commonly recognized bacterial pathogen in infantile gastroenteritis⁷.

Recently, bacteria species resistant to antibiotics are formal in the environments. The negative effect of bacteria has considerably increased. Resistance to antibiotics in *E. coli* is totally defined in isolates from human, animal and environmental sources. Among the antibiotics, Ampicillin, that belongs to the penicillin family, is used to treat and study these bacteria. The standard Kirby-Bauer disk diffusion method has been employed in this study for determining the profiles of antibacterial sensitivity of the *E. coli* isolates with different antimicrobial agents¹.

Aim and Objectives

This article investigates the occurrence and observing the sources of *E. coli*. The objectives of this work are as follows:

Isolating pure culture of *E. coli* from human fecal samples.

Assessing the antibacterial effectiveness of antibiotics against isolates under study.

Describing resistant strains for the antibiotics used in this study.

Limited multi drug antibiotics (MDA) resistant.

Material and Method

Collection of Stool Specimens

This study included 250 male and female patients. The ages were ranged between 6 months and 5 years. Fifteen samples were selected from 5 years (i.e., positive sample) that included 2 control (not infected). *E. coli* was taken from human fecal. The samples were obtained from hospitals in areas of Soran, Qaladwza, Hawler, Rania and Koya in the Kurdistan region, Iraq. The period of sample collection was during the period from October 2014 to April 2015. The samples were transferred to the laboratories of the research center at the University of Soran. *E. coli* was isolated using the bacteriological and biochemical test of fecal sample collected from patients¹.

The gram-stained slides were obtained from the Central Drug House (P) Ltd. (CDH), which was tested microscopically. Samples were cultivated on Nutrient Broth (Lab M™, Bury, UK) to activate the bacterial isolation of the chemical test reactions (37 °C, 24 h). After that, they were transferred on selective media (Mac Conkey agar, Lab. M. Limited UK) to isolate the rod to the negative gram bacteria and differentiate between fermented and non-fermented isolates of sugar Lactose, Eosin methylene blue (EMB) agar Himedia. The ionic dye contained two blue ones planted by *E. coli*, giving a bright color green. Concerning the final identification, tests of API 20E Biomerieux were used⁸.

Culture media

The preparation of all media utilized in the current study was done in accordance with their manufacturers.

Isolation of bacteria (*E. coli*):

Culture media used were MacConkey agar, EMB agar, Nutrient agar and Blood agar. The standard loop was sterilized and dived in a vertical way after cooling in fecal samples, filed and immediately transported to culture media by duplicate streaking. One of the streaked plates was incubated under aerobic conditions of growth, and the other one was incubated under partial anaerobic conditions of growth with 5% of CO₂. Finally, all streaked plates were placed at 37 °C for 24 hours⁹.

Identification of bacterial isolates

Culture media were prepared for the purpose of purification, conservation, revitalization, quality

appearance identification, cultural recipes and for making a biochemical test of the bacterial isolates. Also, the dyes, solvents and reagents were used to complete biochemical tests as clarified below:

Characteristics of the developed colonies:

The colonies observed on culture media were distinguished according to the following: 1) color; 2) the surface of the colony; 3) strength; 4) transparency; 5) smell; 6) lactose fermentation on Macconkey agar; and 7) the appearance of metallic sheen on EMB agar for *E. coli*⁹.

Microscopic examination:

Smears of each type of appeared colonies were prepared. Gram stain was done to examine the microbial cells gram positivity and negativity as well as cells arrangement⁹.

Biochemical tests:

In the literature, Biochemical tests were done to distinguish *E. coli* and *Staphylococcus epidermidis* from other bacterial isolates. They included Catalase, Oxidase, Coagulase Voges Proskauer, Methyl red, Motility test, Urease, Indol, H₂S Production, Citrate utilization, Sugar fermentation Haemolysis⁹.

Preparation of McFarland turbidity standard No. 0.5

In this study, 50 µl of a 1.175% (wt/vol) barium chloride dihydrate (BaCl₂•2H₂O) solution was added to 9.95 ml of 1% (vol/vol) sulfuric acid to prepare the 0.5 McFarland turbidity standard. Next, the McFarland standard tube was sealed with Parafilm for preventing evaporation. Then, it was stored in a dark place at room temperature. After that, the density accuracy of the prepared McFarland standard was examined through utilizing a spectrophotometer with a 1 -cm light path for the 0.5 McFarland standard, the absorbance at a wavelength of 625 nm and water as a blank standard was 0.08 to 0.13. The turbidity was vigorously agitated by the 0.5 McFarland standard on a vortex mixer before use. As with the barium sulfate standards, a 0.5 McFarland Standard was analogous to a microbial suspension of 1.5 X 10⁸ colony-forming units (CFU)/ml¹⁰.

Antibiotics Tests

Antibiotic discs

High potency discs of the following 13 antibiotics were used against all *E. coli*: Streptomycin (S), Novobiocin (NV), Neomycin (N), Lincomycin (L), Norfloxacin (NOR), Chloramphenicol (C), Doxycycline (DO), Rifampin (RA), Ampicillin (Am), Erythromycin (E), Tetracycline (TE), Gentamycin (CN), Clarithromycin (CLR).

Antibiotic resistance screening test

The resistance of test strains to different antibiotics was determined using the disk diffusion method as described by the Clinical and Laboratory Standard Institute (CLSI) standards. The test strains were first enriched in nutrient broth for 24 h at 37 °C by picking off technique. By using sterile swab sticks, plates were seeded with 1 ml of a suspension of the test strains containing approximately 10⁶ cells. Antibiotic discs were dispensed on the plates seeded with organisms. The plates were incubated at 37 °C for 24 h, and antibiotic resistance was interpreted by inhibition¹¹.

Results and Discussion:

Outcomes of isolation and identification of tested bacteria

There is a significant reason for mortality and morbidity throughout the world, represented by bacterial infectious diseases. Consequently, there is an increasing interest in developing new antibacterial agents for treating bacterial infections.

Table 1: Antibiotic disk.

Antibiotics	Con. Mg	Antibiotics	Con µg.
Ampicillin	10 µg	Rifampin	5µg
Streptomycin	10 µg	Gentamicin	10 µg
Novobiocin	30µg	Chloramphenicol	30 µg
Neomycin30	30 UI	Erythromycin	15µg
Lincomycin	15µg	Tetracycline	30µg
Norfloxacin	10µg	Clarithromycin	15µg
Doxycycline	30µg		

Note: Con.: Concentration

Table 2: Antibiogram of *E. coli* isolates from fecal of different provinces.

Average inhibition zone of diameter size (mm) of <i>E. coli</i> isolates																
Antibiotics	C1	C2	Ave	S 1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
S	1.8	2.8	2.3	1.7	1.7	1.7	1.6	2.4	2.7	1.9	1.5	1.9	1.9	1.7	1.5	1.6
NV	R	0.8	0.4	0.9	0.9	0.9	0.9	1.3	0.5	0.8	2.2	0.9	0.7	1.8	1.7	1.7
N	1.7	1.9	1.8	2	R	R	R	1.6	1.9	1.5	1.7	1.9	1.5	1.6	1.5	1.7
L	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
NOR	2.7	2.8	2.7	3.2	3.2	3.2	2.5	2.7	3	3	2.1	3	2.7	1.9	2.5	2.4
C	2.5	1.6	2	2.5	3	1.6	2	3.2	2	1.2	1.6	2.5	2.1	0.7	1.9	1.5
DO	1.3	R	0.6	3	2.5	R	2	R	R	R	2.5	R	R	1.7	1.9	1.9
RA	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Am	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
E	R	R	R	R	R	R	R	R	R	1.2	2.5	R	R	2.5	3	2.1
TE	1.2	R	0.6	R	R	R	R	R	R	R	1.4	1.7	R	R	1.3	1.4
CN	2.3	1.8	2	2.5	2.6	R	1.5	2.6	2.5	1.2	2.5	1.7	0.9	2.5	2.6	2.5
CLR	1.5	1.5	1.5	R	2	R	2	1.2	2	1.8	2.5	2.3	R	2.5	4.3	4.3

**C: Control, **S: Sample, **R: Resistant, Ave: Average

Table 3: The percentage of *E. coli* sensitive to antibiotics isolated from different samples of fecal.

Antibiotics														
Number	C	S	L	NOR	N	NV	TE	CN	CLR	AM	RA	DO	E	
		12	13	0	13	10	5	4	12	10	0	0	7	5
Percentage	92	10	0	10	77	38	31	92	77	0	0	54	38	

Table 4: The percentage of *E. coli* resistant to antibiotics isolated from different samples of fecal.

Antibiotics														
Number	C	S	L	NOR	N	NV	TE	CN	CLR	AM	RA	DO	E	
		0	0	13	0	3	0	9	1	3	13	13	6	8
Percentage	0	0	0	0	23	0	70	8	23	100	100	46	62	

Table 5: The percentage of intermediate resistance of *E. coli* isolated from different samples of fecal.

Antibiotics													
Number	C	S	L	NOR	N	NV	TE	CN	CLR	AM	RA	DO	E
	1	0	0	0	0	8	0	1	0	0	0	0	0
Percentage	8	0	0	0	0	62	0	8	0	0	0	0	0

Table 6: Multiple antibiotics resistance of *E. coli* isolated from different samples of fecal.

Source of isolates	Number of isolates	Number (%) of isolates that showed resistance to multiple antibiotics 3 antibiotics L, RA , Am
Children	13	100%

Prevalence of *E. coli* that is sensitive and resistant to antibiotics isolated from faecal samples:

The results showed that all of the *E. coli* isolates from human fecal are resistant to all medicines at different levels to different antibiotics. As illustrated in Table 2, 53% of the isolates were sensitive to antibiotics, 41% resistant, and 6% intermediate resistant. Some isolates under study showed sensitivity to Erythromycin compared with the control, which gave a negative result. There was a possibility that these isolates were Rfactor. According to Table 3, 92% of Chloramphenicol and Gentamycin, 77% of Neomycin and clarithromycin, 54% of Doxycyclin, 38% Novobiocin and erythromycin, 10% of Streptomycin and Norfloxacin.

Nevertheless, equal amounts (100%) of isolates were found to be resistant to Ampicillin, Lincomycin and Rifampin, 70% of Tetracycline, 62% of erythromycin, 46% of Doxycyclin, 23% of clarithromycin and Neomycin (see Table 4). These results were consistent with those of studies of Masuder (2007), and Zinnah et al. (2008) for above 80% and 53% of the *E. coli* isolates from human fecal were sensitive to Gentamycin, Clarithromycin and Neomycin, respectively. Simultaneously, these studies differ from the current research, as only 8 % of isolates showed resistance to Gentamycin. Also, this study is consistent with that of Wolde Tenssay (2002), which revealed that 100% and 79% of isolates showed resistance to amoxicillin and tetracycline, respectively. Nevertheless, results of this

study are similar to those of in terms of the isolates percentage (50%) that are resistant to tetracycline and due to the insignificant percentage of *E. coli* isolates from human fecal and urine that showed resistance to cotrimoxazole, respectively. Likewise, the current paper was consistent with that of ¹² in that a very unimportant number of isolates reported resistance to norfloxacin. Table 5 shows that the isolates are intermediately resistant to antibiotics depending on the inhibition zone.

Bacteria that were resistant to multiple drugs were taken from fecal samples that were collected at Al-Iklem (see Table 6) represented by 13 *E. coli* isolates examined for revealing resistance to antibiotics. All of them (100%) demonstrated multiple resistance for antibiotics ¹³. Finally, similar studies conducted in and nearby Jimma, Ethiopia indicated that nearly all *E. coli* isolates from environmental sources showed resistance to the frequently used antibacterial medicines including amoxicillin, tetracycline and cotrimoxazole.

Conclusion

From the above findings, we conclude the following:

All antibiotics used in this study had a clear impact against *E. coli* bacteria as antimicrobial drugs to inhibit their growth and infection.

The isolated strains of *E. coli* have a highly sensitive effect on the third-generation aminoglycosides, fourth-generation cephalosporins and carbapenem.

The method of disc diffusion is simple, reliable and low-cost for examining the *E. coli* susceptibility to Am, S, N, L, NOR, C, DO, RA, E, TE, CN, CLR.

Limited MDR depending on the resistant zone, the study found multiple resistance to three types of L, RA and Am.

Conflict of Interest: There is no Conflict of Interest..

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Ethical Approve: This study was conducted with approval from the research ethics committee at the Department of Biology, College of Science, the University of Kirkuk as well as Training and Human Development Division, Department of Health, Kirkuk Governorate.

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The Role of Silver (Ag) Nanoparticles synthesis by *Penicillium spp* against the Toxicity of *Echinococcus Granulosus* in Adult Albino Male Rats

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Abstract

The aim of the study was to synthesize Ag nanoparticles by using filamentous fungus

Penicillium sp. The fungal culture was isolated from the soil samples collected from agriculture fields in Kirkuk city. The synthesis of silver nanoparticles was investigated by X-ray diffraction peaks were measured at (101), (200) and (202) respectively, and scanning electron microscopy .

The present study was designed to indicated the role of Ag nanoparticles synthesis by *Penicillium spp* against toxicity of *Echinococcus granulosus*. The present study used twenty adult albino male rats that distributed at random to following teams (each group consist five rats); management group received ad libidium, second group injected with $2,5 \times 10^3$ of *Echinococcus granulosus* protoscolices third group injected with protoscolices and treatd with 50 mg/kg AgNanoPs, fourth group injected with protoscolices and treatd with 100mg/kg AgNanoPs. The results show high important exaggerated ($P < 0.05$) in levels of MDA (malonedialdehyied) and important decrease ($P < 0.05$) in levels of glutathione (GSH) and catalase compared with management group. While, after used AgNPs with *Echinococcus granulosus*, the results indicated non-significant changes ($P < 0.05$) in MDA, GSH and catalase also showed non-significant changes ($P < 0.05$) compared with control group. histological study show decrease in numbers of spermatogonia and spermatocytes with absent of spermatid. While, after using AgNPs the testis in third and fourth groups appear semi-normal. It had been ended that AgNanoPs has been potential role against toxcicity of *Echinococcus granulosus* in rats male.

Keywords: Ag nanoparticles; *Echinococcus granulosus*; testis.

Introduction

Cystic Echinococcosis (CE) is one of the most important zoonotic helminthic diseases throughout the world (1). The larval stage of the *Echinococcus granulosus* leads to hydatidosis (2). Adult worms live in the small intestine of canids as definitive hosts with a high prevalence in the world (3, 4). Intermediate hosts include humans as well as cows, sheep, camels, horses et al that acquire the infection by oral uptake of tapeworm eggs. once intake by appropriate host and sequent passage through abdomen and intestinal, the oncosphere brute become activated, penetrate the tissue layer, enter to the blood stream and body fluid vessels and area unit disseminated within the body. once associate indefinable time period, *E. granulosus* metacestodes area unit shaped (1, 5). Nano-biotechnology is presently

one among the foremost dynamic disciplines of analysis in modern material science whereby plants and totally different plant merchandise ar finding an important use within the synthesis of nanoprticles (NPs) (6, 7). in nano-biotechnological analysis, AgNPs have received important attention owing to their distinctive physical chemical, biological properties, and since of their pertinence in natural philosophy, optics and drugs (8). Among diverse nanaoparticles, Ag nanoparticles because various properties like chemical change,, chemical science conduction and antimicrobial activity, are often employed in completely different applications like biomedicine, agriculture, icon chemicals and food chemistry (9, 10). The present study was designed to indicate the role of green Ag nanoparticles againted toxicity of *Echinococcus granulosus*.

Materials & Method

Animal model

In this study twenty adult male albino rats, (wt 225-275 gm with age 4-6 month) obtained from Technicals college/ North Technical University, and unbroken on customary pellete diet for week to insure its normal.

Isolation sample

Soil samples were obtained from town of city. For soil suspension preparation, CaCO₃ was treated with one0: 1 weight / weight and incubated in brooder at thirty seven ° C for four days. For drying functions, a series of ten - so took 0.5 milliliter of dilutions 10-3.10.4 and placed in sterile Petri dishes and poured within the middle of the sterile PDA and fluid to (50-45) m and stirred the dish to homogenize the soil answer with the middle of the plant so incubated for 6-4 days when uninflected the isolates and diagnosing, looking on.

Preparation of fungal biomass and composition of silver nanoparticles

The fungal fungus was prepared by taking a tablet of the clean, pure fungal colony using a 7 mm sterile veneer hole, where the developing colony edges were punctured on the fungal growth plate and placed in a 100 mL conical flask of the liquid MYPG medium where it was quietly placed to the disc on the center surface After a period of time, the disk stabilized on the surface of the liquid medium, and then placed in the incubator at 26 ° C for 5-7 days to obtain a mat with different weights (11). After the fungus was nominated the fungal mass using the filter paper(Whatman filter paper NO 1) And then rinsed thoroughly with distilled water to remove the residue of the medium. The fungal flask was then placed in a conical flask containing 100 ml of distilled distilled water and left for 72-24 hours in the incubator. The fungal mass was again filtered using filter paper to ensure that all components of the medium were removed. Filtration in an electric oven of Memmert (Germany) at a temperature of 50 m. The dry weight of the fungus was measured by weight between the dried paper mass with its contents after filtration and the filter paper block. It was dried before filtration. 10 g of fungal mass and then placed in 100 ml of Ag NO₃ prepared silver nitrate With a concentration of 1mM and placed in the incubator In completely dark conditions and after chromatography, AgNPs were examined x-ray shimadzu during a laboratory within the academic department - school of

Science, University Bagdad. The scanning microscopy SEM (Scaning negatron Microscopy) (TESCAN-VEGA) was conjointly employed in the engineering center.

Echinococcus granulosus

hydatid cysts were collected and obtained from infected sheep livers. They were put in plastic bags, and transported to the Department of biological science , school Technical , North Technical University, wherever protoscolices were isolated from livers in keeping with (12) technique . Protoscolices indicates the fertility of hydatid cyst and it's were counted according to method cited by(13). cyst and it's were counted in keeping with technique cited by (13). The viable protoscolices for parasite were counted in oneml from supernatal supported the formula : Viability in 1 metric capacity unit = variety of protoscolices in (10 µl) × one hundred.

Experimental design

Twenty adult male albino rats were used and divided as follow (each groupe consist 5 rats):

management group: rats were received normal pellet diet just for seven days so killed..

Positive group rats injected with protoscolices, and so killed.

Third group rats injected with protoscolices and treated with 50mg/kg Ag NanoPs for month, and so killed.

Fourth group rats injected with protoscolices and treated with 100mg/kg Ag NPs for month, and then killed.

Prepare of blood solution

The blood collection from rats by internal organ puncher, below anaesthesia, and place in check tubes . After clotting, the tubes were activity for ten min to get sera. The bodily fluid was taken and hold on by deep phase transition till used.

Homogenization

Testis samples were removed immediately and the put in glass dish contents 0.9% NaCl buffer for washing and removed the blood. To oxidative stress factors determination, 10% from organ weight was dissolved with buffer (PH 7.4) and the organ tissue was crashed

by use ceramic mortar. Then mixture was centrifugation for 10 min. Supernatant was taken and stored by deep freezing till used (14).

Measurements

Plasma Peroxidation levels (MDA), Glutathione (GSH) and Catalase

MDA (malondialdehyde), was measured based on the quantitative chemical analysis reaction with thiobarbituric acid (TBA) exploitation photometer (15). GSH level calculable by mixed two.3 cubic centimeter buffer with zero.2ml of the sample and so side zero.5ml of 5,5-dithio-bis-(2-nitrobenzoic acid) (DTNB). The mixture was analyzed by spectrophotometer (16). Catalase was measured by using the procedure of Biovision-USA kits.

Histological study

testis biopsies were soft on 4mm punch and 2% xylocaine was used as an anesthetic. The biopsies were mounted in 10% formalin, habitually processed and embedded in paraffin sections that were stained with hematoxylin and fluorescent dye and examined under the microscope.

Statistical Analysis

the info were analyzed employing an applied math Minitab program. An applied math distinction between the suggests that of the experimental teams was analyzed exploitation a way analysis of variance (ANOVA). Results

Isolation and identification of *Penicillium sp.*

Fungal cultures were isolated from the soil samples collected from varied agricultural lands in Kirkuk city. The fungus isolates were characterized on the premise of colony characteristics and microscopic look (17). Genus *Penicillium sp.* colonies appeared as velvety and fissure with inexperienced color on personal organism medium plates. Reverse aspect of the colony was yellow in color. Results are displayed in Figure 1. Microscopic identification of the plant isolates was performed by LPCB mounting. Genus *Penicillium sp.* appeared as extremely branched mycelium part, septal hyphae. Conidiophores up on the mycelium part and conidiospores were unreal.

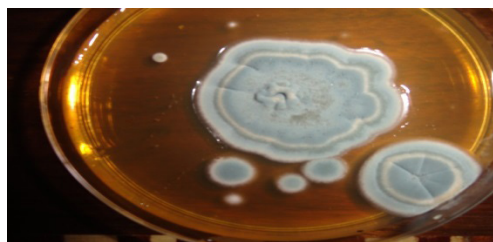


Figure 1: Colony morphology of the *Penicillium sp.* isolate

Characterization of silver nanoparticles Color amendment Cell free filtrate of *Penicillium sp.* was mixed with caustic resolution and incubated in dark in rotary shaker. Samples showed modified in color from virtually colourless to brown, this is often a transparent indication of the formation of silver nanoparticles within the reaction mixture. The intensity of the color was accumulated throughout the amount of incubation. The looks of brown color was because of the excitation of surface plasmon vibrations (18).

X-Ray differentiation analysis

The XRD pattern therefore clearly shows that the conductor NO_3 nanoparticles fashioned by the reduction of Ag ions by fungus genus *sp.* are crystalline in nature (Figure 2). Our results similar output was obtained by (19, 20)

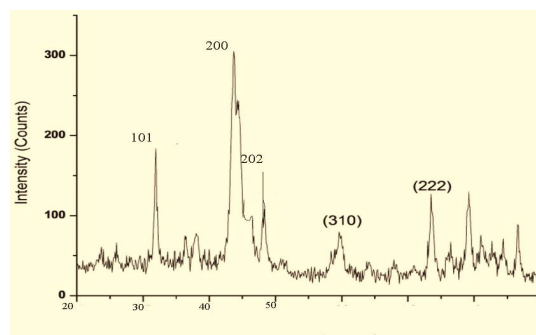


Figure (2) XRD of silver nanoparticles mistreatment genus *Penicillium sp.*

Scanning Electron Microscope

The dried silver nanoparticles were obtained by action at 10000 rev for twenty mts. The scale and form of the silver nanoparticles biosynthesized was studied by SEM as in figure 3.

show non-significant changes ($P < 0.05$) compared with management rats as shown in table (1).

Table (1): The levels of MDA, GSH and CAT in testis

Parameters Groups	MDA (mmol/l)	GSH (mol/l)	Cata (mmol/l)
Control group	1.24 ± 0.11 b	0.276 ± 0.043 a	1.16 ± 0.02 a
Second group	2.18 ± 0.37 a	0.139 ± 0.025 b	0.46 ± 0.07 b
Third group	1.38 ± 0.2 b	0.252 ± 0.031 a	1.03 ± 0.04 a
Fourth group	1.27 ± 0.16 b	0.294 ± 0.052 a	1.11 ± 0.03 a

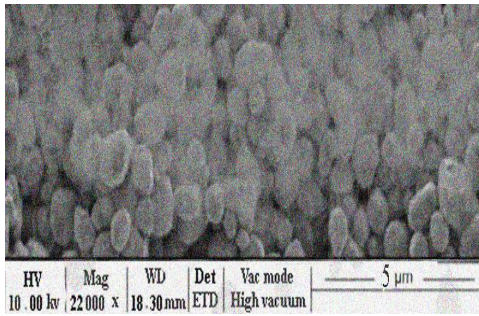


Figure (3)SEM image of silver nanoparticles.

Oxidative stress (MDA) & antioxidant parameters (GSH and catalase) in testis

The levels of MDA (2.18 ± 0.37), GSH (0.139 ± 0.025) and enzyme catalase (0.46 ± 0.07) in second group show high significant changes ($P < 0.05$) compared with management rats (1.24 ± 0.11 ; 0.276 ± 0.043 and 1.16 ± 0.02 respectively). The levels of MDA (1.38 ± 0.2 ; 1.27 ± 0.16 respectively), GSH (0.252 ± 0.031 ; 0.294 ± 0.052 respectively) and catalase (1.03 ± 0.04 ; 1.11 ± 0.03 respectively) in third and fourth groups

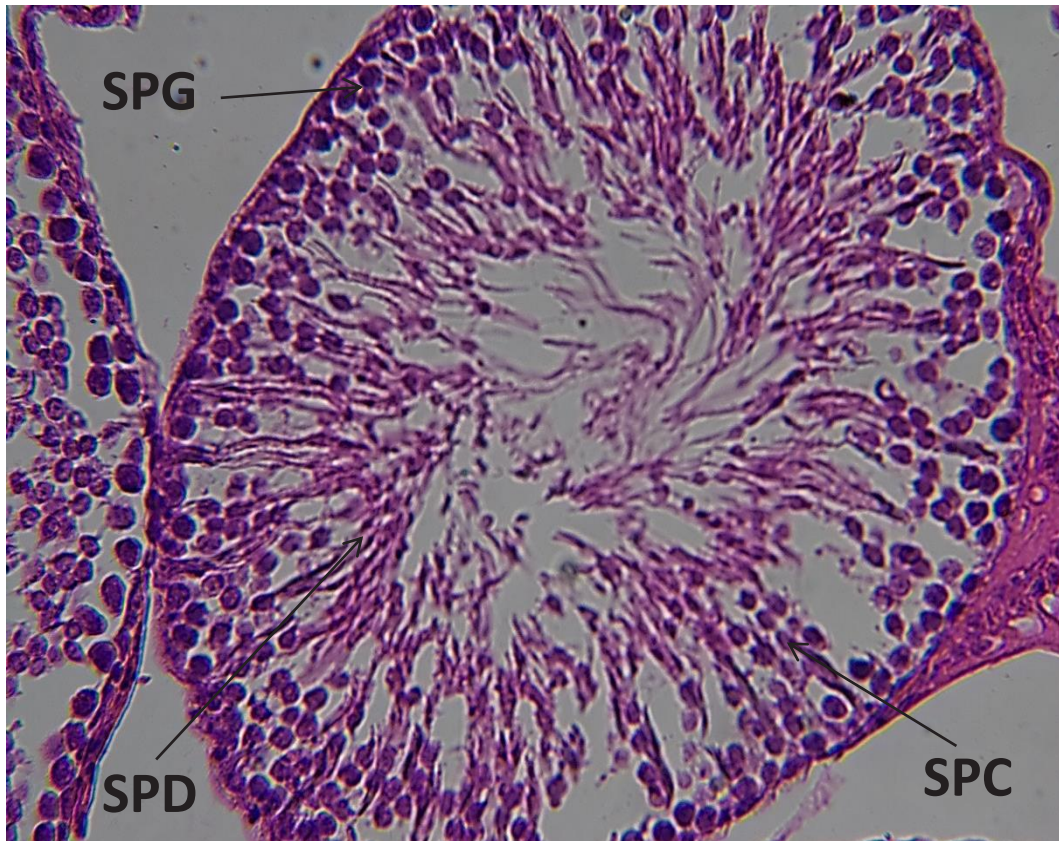


Figure (4): testis of control group show spermatogonia (SPG), spermatocytes (SPC) and gamete (SPD). H&E X400.

Histological study

The sections that prepared with control group that show normal in normal structure of spermatogonia, spermatocytes and spermatids as shown in figure (4). The sections that prepared from third and fourth groups show a semi-normal structure spermatogonia, spermatocytes and spermatids as shown in figure (5).

Discussion

The results of present study increased in levels of MDA and decrease in levels of glutathione (GSH) and enzyme catalase in second group that infected with *E. granulosus* With decrease in numbers of spermatogonia and spermatocytes. The results is in agreement with (21) who referred that the infection with *Echinococcus granulosus* lead to elevated the levels of MDA, where found the mean +/- SD of MDA levels of patients with *Echinococcus granulosus*(21). On the other hand, (22) referred that *E. granulosus* lead to decrease in numbers of spermatogonia and spermatocytes that is in agreement with present study (22). About the treatment and the role of AgNPs. many study show the ability of AgNPs as antimicrobial against different bacteria (*S.aureus*, *E.faecalis*, *Pseudomonas* and *E.coli*) (23). The bactericidal activity of nanoparticles is associated with alternative ways by direct react with microbial cells or effect on metabolic process lepton transport from biological process that inhibits respiratory chain enzymes or interferes through covering porousness to phosphate and protons(24). Finally, the present study show after using AgNPs decrease in MDA and increase levels of GSH and catalase suggest the possibility of using Ag NPs as an anti-oxidant agent by inhibition the formation of free radicals and scavenging all species of (ROS) (25).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Characteristics of Lower Back Pain in Pregnant Ladies in Thiqr-Iraq

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Abstract

Objectives: to evaluate the frequency of back pain among pregnant female in Thiqr province in Iraq and its demographic characteristics.

Methodology: this is a case series descriptive study of one hundred pregnant female in Thiqr province in Iraq complaining from lower back pain in different stages of their pregnancies. the patients were evaluated firstly by history taking through questioner specially prepared for this study ;as well as; clinical and radiological assessment.

Results: in our study seventy one patients experience back pain in different stages of pregnancy giving a (71%) as frequency of back pain in the studied group. Most of the patients Seventy four patients (74%) developed the pain during the first trimester of pregnancy and (22%) experience the pain during the second trimester. Fifty eight (14) patients (11.96%) gave history of previous back problems before pregnancy; of these; nine patients (7.69%) diagnosed before pregnancy as herniated lumbar disc prolapse and kept on medical treatment and physiotherapy, 2 patients (1.7%) with previous laminectomy surgeries for herniated lumbar disc prolapse, 3 patients (2.56) with diagnosis of degerative spine. One patient underwent cesarean section for sever back pain dueto lumbar disc prolapse at the end of the pregnancy period (non-gynecological indication for cesarean section).

Conclusion: lower back pain is a common problem during pregnancy ,and it shows some common epidemiological characteristics.

Keywords: *Thiqr-Iraq ; back pain ; pregnant ladies*

Introduction

Low back pain is a common complaint among pregnant women. It is estimated that about 50% of pregnant women complain of some form of back pain at some point in pregnancy or during the postpartum period (1).

Pregnancy has a profound effect on the human body, particularly the musculoskeletal system. Hormonal changes cause ligamentous joint laxity, weight gain, and a shift in the center of gravity that leads to lumbar spine hyperlordosis and anterior tilting of the pelvis. In addition, vascular changes may lead to compromised metabolic supply in the low back. The most common musculoskeletal complaints in pregnancy are low back

pain and/or pelvic girdle pain. They can be diagnosed and differentiated from each other by history taking, clinical examination, provocative test maneuvers, and imaging. Management ranges from conservative and pharmacologic measures to surgical treatment. Depending on the situation, and given the unique challenges pregnancy places on the human body and the special consideration that must be given to the fetus, an orthopedic surgeon and the obstetrician may have to develop a plan of care together regarding labor and delivery or when surgical interventions are indicated (2).

Risk factors that contribute to the development of low-back pain during pregnancy have been examined in several studies. The results consistently suggest that the major predictors of back pain during pregnancy are back

pain prior to pregnancy and multiparity.¹ Age, height, weight, race, baby weight, and socioeconomic status do not seem to correlate with risk for development of back pain during pregnancy⁽³⁾.

Two major subtypes of back pain occurs during pregnancy ; (Lumbar and pelvic pain) lumbar pain located at and above the waist in the center of the back. But what is most common is the posterior pelvic pain which 5 times more common than lumbar pain and experience below the waist on either sides⁽⁴⁾.

Usually the treatment is conservative by rest, sleeping on the side, physiotherapy, lifting in proper way without bending, acetaminophen may be sufficient to relieve the pain. But ; the managing doctor should remember the fact that Back pain during pregnancy may be a sign of premature labor or urinary tract infection. Severe back pain during pregnancy lasting more than one week is dangerous sign and need physician consultation⁽⁵⁾.

Patients, material and method

This is case series of One hundred pregnant in Thiqr province in the south of Iraq were studied, all patients were selected randomly from the outpatients clinic of Bint Alhuda teaching hospital during their antenatal care visits and history of back pain were recorded; patients with positive history of lower back pain were evaluated by gynecologist firstly to exclude non-musculoskeletal back pain like preterm labor, urinary tract infection or other rare cause like ectopic pregnancy, such patients were excluded from the study, all patients then were referred to orthopedic out patient in Alhusein teaching hospital and evaluation done by orthopedic surgeon by history taking according to special questioner .clinical musculoskeletal examination of the back done by localizing the site of the pain, straight leg rising test, FABER test for sacroiliac joint pathology, in addition to full neurological examination of the lower limbs. Some patient were sent to x-ray examination for lumbosacral spine and the data from the were collected aiming to study the demographic and epidemiological characteristic of back pain problem in Thiqr province-Iraq.

Results

Our study include 100 pregnant women. 71 patients were found to have back pain giving frequency of (71%) .The mean age of the pregnant woman was 29.4 years. The mean gestational age were 28.3week . 29 patients

(41%) were employer. Thirty nine patients out of 71 patients with back pain (54.92%) were not completed their secondary school. Fifty four patient out of 71 were multipara (76.05) . seventeen patients out of 71 with back pain patient ere primigravida(23.94) .forty one patients of multipara patients experience the same back pain during previous pregnancy(75.92). fifty seven patient out of 71 patient with back pain experienced the pain during second trimester (80.28%). The pain nature was burning sensation in lower back in 49 patients (69.01%). thirty patients with back pain have striae gravidarum in the lower abdomen and flanks (42.25%).

Discussion

Some studies considered back pain during pregnancy is a part of the pregnancy reflecting its common occurrence, Ng BK and his colleagues studied the frequency of back pain during pregnancy and it shows a frequency of 84.6% ; our result is consistent with that study in which a result of 71% indicating that this problem is common during pregnancy in addition to; this study is the one of the few studies which discussed the strong association between the problem of back pain during pregnancy in office worker, our study also shows some association between employment of pregnant female and the problem of back pain (41%)⁽⁶⁾.

In our study 54.92% of pregnant female with back pain didn't completed their secondary education and this result is significantly differs from that of Carvalho MECC in his study which showed only 16.8% only and this difference may be dueto the cultural and educational facilities between our country and European population⁽¹⁾.

Our study show association between multiparity , striae gravidarum and the problem of back pain and this association is well studied by Kokanalı D which showed a an association between presence and severity of striae gravidarum and back pain⁽⁷⁾.

Our study shows that most of pregnant female developed the back pain during second trimester of pregnancy (81.4%) and this finding is not consistent with result of Carvalho MECC in his study who show incidence of back pain during second trimester is only 43.7% a point which need further study and evaluation⁽¹⁾.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of

both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Thyroid Dysfunction in Iraqi Patients with Acromegaly

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Abstract

Acromegaly is a chronic endocrine disorder caused by hypersecretion of growth hormone (GH) mostly because of pituitary adenoma. GH induces the formation of Insulin like Growth Factor1 (IGF1) from the liver. Both GH and IGF1 lead to sign and symptom of acromegaly.

Aim: This study designed to identify the prevalence of thyroid dysfunction in Iraqi patients with acromegaly ,to identify the factors responsible for thyroid dysfunction in patients with acromegaly.Is the treatment modalities for acromegaly has a role in thyroid dysfunction?

Study design: A cross sectional case control study

Patients and Method: seventy patients with acromegaly were enrolled from 2 different tertiary centers of endocrinology from Jan. -Dec. 2017 compared with 70 non acromegalic subjects. Their mean age 46 +/-11 years ;forty one (58.5%) males and 29(41.5%)females. Thyroid function test conducted to both patients and control groups including TSH, free T4 and total T3 in both centers. In addition to other variables.

Results: Out of 70 (100%) patients with acromegaly; (51.5%) were euthyroid, (20%) had primary hypothyroidism , (15.7%)had central hypothyroidism and (12.8%) had hyperthyroidism that is significantly higher than normal population ($p<0.001$).Patient with acromegaly had significant systolic and diastolic hypertension vs. control ($p=0.015$,0.004 respectively).Age of the patients, diastolic blood pressure ,first GH and history of hypophysectomy were significant risk factors for thyroid dysfunction ($p=0.02,0.008,0.008$ and 0.02 respectively)

Conclusion : Thyroid dysfunction is more prevalent in patient with acromegaly whether hypothyroidism (both primary and secondary) and hyperthyroidism. The Age and diastolic blood pressure are independent risk factors of thyroid dysfunction. There is significant role of hypophysectomy in thyroid dysfunction development while Sandostatin (Octreotide LAR) treatment had no role.

Key-words: *thyroid dysfunction ,acromegaly ,hypothyroidism ,central hypothyroidism, secondary hypothyroidism, hyperthyroidism.*

Introduction

Acromegaly is a chronic endocrine disorder caused by hypersecretion of growth hormone (GH) mostly because of pituitary adenoma (macroadenoma or less commonly microadenoma) .GH induces the formation of Insulin like Growth Factor1 (IGF1) from the liver [1]. GH and Insulin –like Growth Factor 1(IGF-1) act altogether to induce features of acral and visceral enlargement. Acromegaly is caused by tumors arising from anterior pituitary gland that secreting GH or very rarely by extrapituitary disorders[2]. GH secreted in a

pulsatile fashion, while IGF1 levels are relatively stable with little diurnal variation [3]. It is evident through different studies that IGF1 play an important role in thyroidal cell growth .However it may be responsible for pathogenesis of different thyroid related diseases . One study shows that IGF-1 stimulated synthesis of protein and DNA as well as promoted thyroid cells proliferation and differentiation [4].

The thyroid gland is an endocrine organ present at the front and sides of the neck, anterior to the trachea. The thyroid gland produces thyroid hormones that are

responsible for regulation of metabolism as well as the development and differentiation of different body cells^[5].

Acromegaly and thyroid hormonal abnormalities:

There are different factors responsible for thyroid stimulating hormone (TSH) secretion from anterior pituitary gland. The synthesis and secretion of TSH are under the inhibitory effect of T3 and T4 and stimulatory effect of TRH and to a lesser effect of other factors like leptin, dopamine, GH, IGF1 and somatostatin^[6,7]. The thyroid gland sensitivity to TSH can be modulated by autonomous nervous system^[8].

TSH secretion has an important role for producing basic heat and energy homeostasis maintenance in the body^[9].

Studies show that TSH secretion from thyrotrophic cells can be modulated directly or indirectly by GH and IGF-1^[10]. In thyrotrophic cells; somatostatin inhibits TSH secretion through activation of two somatostatin receptor subtypes, SST2 and SST5^[11]. GH under physiological conditions exerts a negative feedback on somatostatin secretion from hypothalamus and this lead to reduce the growth –hormone releasing hormone (GHRH) secretion^[12]. Thus, the increasing of somatostatin secretion has an impact on thyrotrophic cells that inhibit the TSH secretion. On the other hand, The GHRH has a synergistic effect on the TRH and further on TSH secretion both in healthy subjects and in patients with acromegaly^[13]. As well as an increase in intrapituitary conversion of T3 to T4 in thyrotrophic cells because of GH excess can reduce TSH synthesis and secretion^[14]. Moreover, because of the feedback mechanism, the GH excess with somatostatin participation has an inhibition effect on TSH secretion^[6]. The TSH secretion can also be reduced by the presence of a pituitary tumor per se^[10].

Also, acromegaly can cause panhypopituitarism because of compressing effect of the tumor mass on the surrounding tissue, therefore there may be secondary thyroid or adrenal failure hypogonadism or amenorrhea^[15,16].

Patients and method

This is a cross sectional case control study in which seventy patients with acromegaly were enrolled in this study compared with 70 non-acromegalic subjects from

January 2017- December 2017 from 2 endocrinology specialized centers.

An informed consent have been obtained from all patients and control counterparts, signed and dated before participation in this study.

The enrolled subjects were already diagnosed as acromegaly clinically, biochemically and radiologically.

They fulfill the definition of being acromegalic as their IGF1 exceed the cutoff value for their age and sex, GH level above the reference range and GH fail to drop below 1ng/ml in response to glucose tolerance test. The diagnosis was fortified by detection of pituitary adenoma by MRI either microadenoma (<10mm in diameter) or macroadenoma(>10mm in diameter).

When the GH drop to <1ng/ml and the IGF1 level became within the reference range that is age and sex matched on serial follow up period considered as [inactive]; while those who not met these criteria considered as [active]. The information were written in prepared printed forum including the name, age, sex, height, weight, systolic and diastolic blood pressure, duration of acromegaly, size of tumor (micro or macroadenoma), history of hypophysectomy, radiotherapy or gamma knife, medical therapy (type, dose of somatostatin analogue Long Acting Repeatable (LAR), number of injections) GH level in 1st and last visits, IGF1 in 1st and last visits, disease activity (according to last GH, IGF1 clinical assessment), history of smoking, and family history of thyroid disease.

Thyroid function tests were requested (TSH (reference range 0.4-4.2 mIU/L), free T4(reference range of kit 0.7-1.9 ng/dl) and total T3(80-180ng/dl)[measured by electrochemiluminescence immunoassay]. GH level (obtained from the registered data at first and last visit (by chemiluminescent immunoassay)) and IGF1 level (according to sex and age matched limits) (also from the registered data at first and last visit (measured by immunochemiluminometric assay (ICMA)))

Continuous variables were expressed by mean +/-SD while categorical variables as percentage, all these collected data and variables analyzed by using crosstab chi square test for categorical variables or Student's paired t-test for continuous variable and ANOVA test between categorical and continuous variables. The value of <0.05 considered as statistically significant.

Results

The subjects of this study were 70 patients with acromegaly with a mean age 46 +/-11 years .Forty one (58.5%) males and 29(41.5%)females disease duration from time of diagnosis differ with a range from 1year -30years (average 8+/-6). A growth hormone producing macroadenoma was the cause of acromegaly in 62 patients (88.5%) and in the remaining 8(11.5%) had microadenoma .Thirty six (51.4%) underwent neurosurgical treatment in form of hypophysectomy; 2 of them underwent hypophysectomy twice and another 2 underwent hypophysectomy thrice .Six patients (8.5%) exposed to gamma knife and another one to conventional radiotherapy. All of our patients (even who had history of hypophysectomy or gamma knife after the intervention if they didn't achieve a remission immediately) received medical treatment in form of

monthly Octreotide (Sandostatin LAR) injection). Hypophysectomy, radiotherapy and/or medical therapy for acromegaly induced a significant reduction of mean GH and IGF-1 levels (27.83 +/- 25.69 vs. 4.73 +/- 6.72 ng/ml, $p < 0.001$ and 772.15 +/- 521.9 vs. 404.2 +/- 278.6 ng/ml, $p < 0.001$ respectively) that is shown in figure (1), but both GH and IGF-1 values normalized only in 12 (17.2%) at time of collecting the data(5 of them had a remission after surgery and medical treatment , 2 patients had remission after both surgery and gamma knife, one had remission after gamma knife and medical treatment, and 4 patients had remission after medical treatment only) ;while the remainder 58(82.8%) had active disease (including those with partial response ;those who had elevated IGF1 with normal GH or those with elevated GH with normal IGF1).

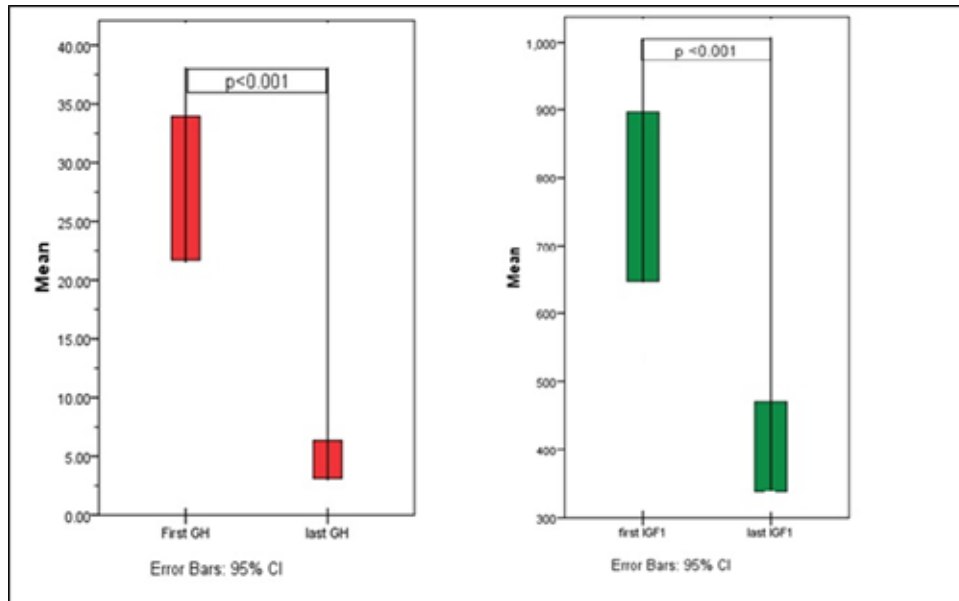


Figure (1) the comparison between the mean first and last result of both GH and IGF1.

The mean basal GH at time of diagnosis was (27.83+/-25.7) and the mean last GH was (4.73+/-6.72) with a percent of reduction were (65.2%). While the mean basal IGF1 was (772.15+/-522) and the mean last IGF1 was (404.26+/-278.62) with a percent of reduction were (35.9%). Twenty eight (40%) of patients were hypertensive, 13(18.5%) were smoker.

Family history revealed thyroid disease or goiter in 17(24.2%).

The control group was composed of 70 non-acromegalic subjects (50% males) with a mean age of 43.54+/-7.17 years.

Table (1):The clinical and analytical comparison between patients with acromegaly and control groups.

		Acromegaly	Control	P value
Number(%)		70(100)	70(100)	
Age mean +/- SD		46.21+/-10.9	43.54+/-7.17	0.07*
Gender	Male	41(58.5)	35(50)	0.46 †
	Female	29(41.5)	35(50)	
Body mass index mean +/- SD		29.03+/-4.92	28.30+/-4.05	0.38*
Systolic BP mean +/- SD		132.55+/-23.73	123.64+/-18.19	0.015*
Diastolic BP mean +/- SD		86.64+/-17.1	79.07+/-14.2	0.004*
Euthyroid		36 (51.4)	67(95.7)	<0.001†
hyperthyroid		9 (12.9)	1(1.4)	
primary hypothyroid		14(20.7)	2(2.9)	
central hypothyroid		11(15.7)	0(0)	
TSH mean +/- SD		12.7889+/-23.3	2.1721+/-1.90	<0.001*
free T4 mean +/- SD		1.149 +/-0.75	1.3737+/-0.34	0.028*
total T3 mean +/- SD		114.3+/-67.2	132.8571+/-22.67	0.027*

* Paired sample T-test

† Cross tabulation Chi-square test

Table (2):the general clinical characteristics of patients with acromegaly subdivided according to thyroid function:

Variables		Euthyroid	hyperthyroid	primary hypothyroid	central hypothyroid	total	P value
Number (%)		36(51.5)	9(12.8)	14(20)	11(15.7)	70(100)	
Age mean+/-SD		46.9+/-11.3	54.6+/-8.2	41.2+/-10.3	43.2+/-8.9	46.2+/-11	0.02*
Gender	Male No.(%)	25(61)	6(14.6)	5(12.2)	5(12.2)	41(100)	0.12†
	Female No.(%)	11(37.9)	3(10.3)	9(31)	6(20.6)	29(100)	
Family history of thyroid disease	Present No.(%)	5(29.4)	3(17.6)	5(29.4)	4(23.5)	17(100)	0.22 †
	Absent No.(%)	13(58.5%)	6(11.3%)	9(17%)	7(13.2%)	53(100%)	
BMI (mean+/-SD)		28.3+/-4.4	30.9+/-4.1	27.9+/-5.3	31.4+/-6	29.+/-5	0.13 *
Hypertension	Hypertensive No.(%)	12(42)	5(18)	7(25)	4(14)	28(100)	0.5 †
	Not hypertensive No.(%)	24(57)	4(9.5)	7(16.6)	7(16.6)	42(100)	
Systolic Blood Pressure (mean+/-SD)		129.4+/-24	140.5+/-24.3	136.42+/-24.6	131.36+/-22.26	132.55+/-23.73	0.57*
Diastolic Blood Pressure (mean+/-SD)		83.47+/-16.42	81.67+/-15	100.35+/-16.6	83.63+/-14	86.64+/-17	0.008*
Smoking history	Smokers No.(%)	9(69.2)	2(12.4)	1(7.7)	1(7.7)	13(100)	0.4 †
	Not smoker No.(%)	27(47.4)	7(12.3)	13(22.8)	10(17.5)	57(100)	
* ANOVA test							
† Cross tabulation Chi-square test							

Table (3):The specific clinical characteristics of patients with acromegaly subdivided according to thyroid function:

Variables		Euthyroid	hyperthyroid	primary hypothyroid	central hypothyroid	total	P value
Adenoma size	microadenoma No.(%)	4 (50)	2(25)	1(12.5)	1(12.5)	8(100)	0.7 *
	macroadenoma No.(%)	32 (51.6)	7(11.3)	13(20.9)	10(16.2)	62(100)	
Activity of Acromegaly	Active No.(%)	28(48.2)	8(13.8)	14(24.1)	8(13.8)	58(100)	0.2 *
	Inactive No.(%)	8(66.7)	1(8.30)	0(0)	3(25)	12(100)	
Duration of acromegaly (Mean +/-SD)		7.5+/-6	8.0+/-7.5	7.1+/-7.3	11.9+/-8.6	8.+/-7	0.2 †
First GH (Mean +/-SD)		25.07+/-23.54	21.36+/-20.43	20.65+/-19.13	51.26+/-32.67	27.83+/-25.7	0.008†
Last GH (Mean +/-SD)		4.53+/-7.02	3.40+/-3.87	5.61+/-7.2	5.34+/-7.54	4.73+/-6.72	0.87†
First IGF1 (Mean +/-SD)		867.83+/-565.88	735.72+/-493.6	810.25+/-529.16	440.34+/-207.7	772.15+/-522	0.12†
Last IGF1 (Mean +/-SD)		432.9+/-285.51	261.34+/-145.82	502.67+/-319.65	302.26+/-232.74	404.26+/-278.62	0.11†
Dose of Sandostatin (Mean +/-SD)		742.77+/-446	677.77+/-512	549.28+/-536	736.36+/-496	694.71+/-476.5	0.63†
History of hypophysectomy	present No.(%)	13(36.1)	4(11.1)	10(27.8)	9(25)	36(100)	0.02*
	absent No.(%)	23(67.6)	5(14.7)	4(11.8)	2(5.9)	34(100)	
History of Radiotherapy	Present No.(%)	4(57.1)	1(14.3)	2(28.6)	0(0)	7(100)	0.66*
	Absent No.(%)	32(50.8)	8(12.7)	12(19)	11(17.5)	63(100)	

* Cross tabulation Chi-square test

† ANOVA test

Table 1 shows the clinical and analytical characteristics between patients with acromegaly and control groups. The systolic blood pressure was higher in patients with acromegaly compared to control subjects (132.55+/-23.73 vs. 123.64+/-18.19 respectively P =0.015). The diastolic blood pressure was also higher in patients with acromegaly compared to control subjects (86.64+/-17.1 vs. 79.07+/-14.2 respectively P=0.004). There is significant thyroid dysfunction in patients with acromegaly compared to control subjects (p value <0.001). As well as there is significant differences in mean TSH, free T4 ,total T3 of patients with acromegaly compared to control subjects (with P value <0.001, 0.028, 0.027 respectively)

In table 2 the acromegalic patients were subdivided into 4 main group according to their thyroid function into euthyroid 36(51.5%), hyperthyroidism 9(12.8%), primary hypothyroidism 14(20%) and central hypothyroidism 11(15.7%).Then the analysis of variance in between subgroups conducted to identify the differences in variables of general clinical characteristics which shows that the age is significant risk factor (p=0.02) and the diastolic blood pressure also significantly different between subgroups (p=0.008).

In table 3 the analysis of variance conducted to the subgroups of patients with acromegaly that were already classify according to their thyroid status to identify the

differences of specific acromegalic characteristics of variables which shows the significance of basal growth hormone level at time of diagnosis as well as the history of neurosurgical treatment (hypophysectomy) on the thyroid status ($p=0.008$, 0.02 respectively). There is no significant correlations between thyroid status from one side and pituitary adenoma size, activity of disease ,duration of disease ,history of radiotherapy treatment, last GH and basal or last IGF1 on the other side.

Discussion

Most of our patients with acromegaly were in euthyroid status (51%) while there is 20% had primary hypothyroidism, in addition to 15.7% had central (secondary) hypothyroidism and only 12.8 %had hyperthyroidism; these findings are accepted if it is compared with Cannavo S. et al study that show the approximate levels of euthyroidism of about (67%) and about 25% have hypothyroidism [17]. As well as we can accept our result regarding hyperthyroidism if we compared it with other study that found in 3.5–26% of patients with acromegaly in previous studies [18]. Thyrotoxicosis is not frequent [18], but it increases cardiovascular risk, particularly when is coupled with high GH and IGF-1 levels, and for that reason it is important to gain euthyroidism as fast as possible. Hyperthyroidism should be taken into consideration in diagnosing a patient with acromegaly and weight loss, after excluding cancer [19].

Lastly we fail to found relationships between thyroid dysfunction from one side and duration of disease , last GH, first or last IGF1 on the other side which are similar to what is found in other studies like Cannavo et al [17].

Conclusion

Thyroid dysfunction is more prevalent in patient with acromegaly whether hypothyroidism (both primary and secondary) and hyperthyroidism. The Age and diastolic blood pressure are significant risk factors of thyroid dysfunction. There is significant role of hypophysectomy in thyroid dysfunction development while Sandostatin (Octreotide LAR) treatment had no role.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

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20. Figure (1) the comparison between the mean first and last result of both GH and IGF1.
21. Table (1):The clinical and analytical comparison between patients with acromegaly and control groups.
22. Table (2):the general clinical characteristics of patients with acromegaly subdivided according to thyroid function:
23. Table (3):The specific clinical characteristics of patients with acromegaly subdivided according to thyroid function:

Simulation of Poly (ADP-ribose) polymerase (PARP) Enzyme with BAI Compound in the for Thyroid Cells

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Abstract

In this study, the simulation for the preparation of pharmacological compound anti-cancer Baicalein (6,7-dihydroxy-2-phenyl-4H-chromen-4-one). These compounds have an importance of the known biologic and its wide medical requests. Our theoretical results dedicated to simulating that acquired for researchers (SE EUN HAN et. al) Practically against cancerous cells in the thyroid gland and matching them through a program (MOE) theoretically. From the illustrious effects, the compound (BAI) is behaving as a good legend when it interacted with amino acid for the enzyme (PARP).

Key words: *Docking, BAI, anticancer, FOR Thyroid cells*

Introduction

Flavonoids contain of a large set of polyphenolic compounds consuming a benzo- γ -pyrone configuration and are ubiquitously current in plants. They are synthesized by phenylpropanoid alleyway. Obtainable reports be likely to show that subordinate metabolites of phenolic environment counting flavonoids are responsible for the variety of pharmacological activities [1, 2]. Flavonoids are hydroxylated phenolic substances and are known to be combined by plants in reaction to microbial infection [3]. Their activities are structure reliant on. The chemical nature of flavonoids be contingent on their structural course, degree of hydroxylation, other substitutions and conjugations, and degree of polymerization [4]. Topical interest in these substances has been motivated by the thinkable health assistances rising from the antioxidant actions of these polyphenolic compounds. Purposeful hydroxyl groups in flavonoids arbitrate their antioxidant effects by scavenging free radicals by chelating metal ions [5, 6]. The chelation of metals be able to vital in the avoidance of radical generation which damage impartial bio-molecules [7, 8]. As a dietary component, flavonoids are supposed to have health-stimulating properties due to their great antioxidant capacity both in vivo and in vitro systems [9, 10]. Flavonoids have capability to induce human protective enzyme organisms. The number of trainings has suggested protective effects of flavonoids in contradiction of frequent infectious (bacterial and biological diseases) and degenerative

infections such as cardiovascular diseases, cancers, and further age-amalgamated diseases [2, 9, 10]. The mechanisms tangled in safety providing by flavonoids are termed separately. Flavonoids also performance as a secondary antioxidant defense system in plant tissues showing to different abiotic and biotic stresses. Flavonoids are situated in the nucleus of mesophyll cells and within centers of ROS generation. They also regulate growth factors in plants such as auxin [11]. Bio-synthetic genes have been accumulated in several bacteria and mushrooms for improved creation of flavonoids [12]. Flavonoids are a set of natural compounds with variable phenolic assemblies and are established in plants. In 1930 a novel substance was quarantined from oranges. At that time, it was supposed to be a member of a new class of vitamins and was selected as vitamin P. Advanced on it converted clear that this substance was a flavonoid (ruin) and till now more than 4000 varieties of flavonoids have been identified [13]. The poly (ADP-ribose) polymerases (PARPs) are an emerging family of enzymes that share the ability to catalyze the transfer of ADP-ribose to target proteins (poly ADP-ribosylation) [14,15]. There are at least 18 members of the PARP family that are encoded by different genes, and stake homology in a preserved catalytic domain.1 Although some isoforms containing PARP1 and PARP2 are finest known for their involvement in DNA reparation routes, it is now clear that these and other PARPs have an important role in several cellular processes including cell proliferation and cell death. A number of cellular

substrates for PARP have been well-defined, and a mainstream of these proteins are nuclear proteins that are complicated in nucleic acid metabolism, modulation of chromatin structure, DNA synthesis, and DNA restoration. PARP also auto transforms itself in the appearance of DNA filament breakdowns, and is one of the chief acceptors of poly ADP ribose in vivo. PARP1 is the first and best described member of the PARP family. PARP2 is supreme cautiously related to PARP1 with 69% match in its catalytic domain, and was predictable on the foundation of the perseverance of PARP activity in PARP1 deficient cells [14,16]. Thyroid tumors are present broadly classified as follicle-derived (thyroid epithelial) neoplasms, other epithelial tumors, non-epithelial tumors and secondary tumors assembled on pathological, clinical and genetic characteristics [17, 18]. These tumors can be benevolent, borderline or malignant, focus on their biological performance within the body. The follicular adenoma, hyalinizing trabecular tumor, encapsulated follicular-patterned thyroid tumors, papillary thyroid carcinoma (PTC), follicular thyroid carcinoma, Hürthle cell tumour, poorly differentiated thyroid carcinoma, anaplastic thyroid carcinoma and squamous cell carcinoma comprise the major thyroid epithelial neoplasms. Some of the other epithelial tumors found in the thyroid gland have medullary carcinoma, salivary gland-type tumors, mucinous carcinoma and thymic tumors, at the same time as tumors like paraganglioma, peripheral nerve sheath, vascular, smooth muscle, solitary fibrous and histiocytic tumors, lymphoma and teratoma fall under the non-epithelial tumors of the thyroid [16-19]. The well separated thyroid cancer such as follicular and papillary carcinomas description for 95% of all thyroid cancer cases and are regularly interrelated with a good prognosis and existence rate when detected early [19]. On the other hand, the injured or undistinguishable anaplastic thyroid carcinoma, albeit a rare cancer, is nearly continually fatal [18].

Materials and Method

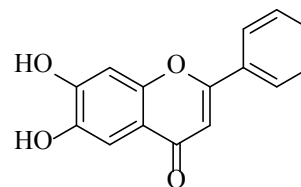
These compound are generally used in pharmaceuticals and their effectiveness has been measured against cancer by advanced programs (MOE).

A-MOE program 2015.

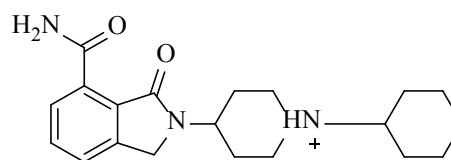
Docking study Ligand: In the field of molecular forming, docking is a method which expects the preferred orientation of one molecule to a second when bound to

each other to form a stable complex. Molecular Network software packages provide Chem 3D, which was used for the generation of 3D coordinates from. Again, using Converter of these same server 2D structures of the drugs was converted into PDB format which is an acceptable form for any standard docking software. Finally using MOE were prepared by the addition of hydrogen atoms. Structures.

B-(BAI) Baicalein (6,7-dihydroxy-2-phenyl-4H-chromen-4-one).



C- 4-(4-carbamoyl-1-methyl-3-oxoisindolin-2-yl)-1- C-cyclohexylpiperidinium.



D- PARP poly (ADP-ribose) polymerases.

Results and Discussion

Docking Analysis, the docking scores were obtained from (Baicalein (6,7-dihydroxy-2-phenyl-4H-chromen-4-one) with against (PARP) receptor. The output of all ligands was given by energy values in kcal/mol as shown in Table 1. Some ligands show good docking scores when compared to standard drug. Docking score of the compounds targeted was compared with the score of the drug Baicalein (6,7-dihydroxy-2-phenyl-4H-chromen-4-one) which is used as a potent drug for the treatment of tumor show higher docking scores in comparison with standard drug. The interactions were stronger for all the ligands which are used for docking simulation table (1-3) Validation of Ligands. The results showed in Tables (1) and (2) that the best correlation with protein and separated from Thyroid cancer was that the strongest correlation of the first compound with amino acidity was found to be strongly linked with the amino acid (GLY 863) was associated with the functional group (hydroxide) H-donor And H-acceptor of protein amino acids as shown in Figures ((1-8)) and the second amino acid is (SER 904) associated with the functional group

(hydroxide) acceptor

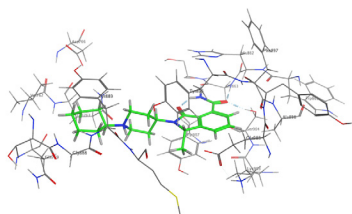


Figure 1 : (Ligand with receptor).

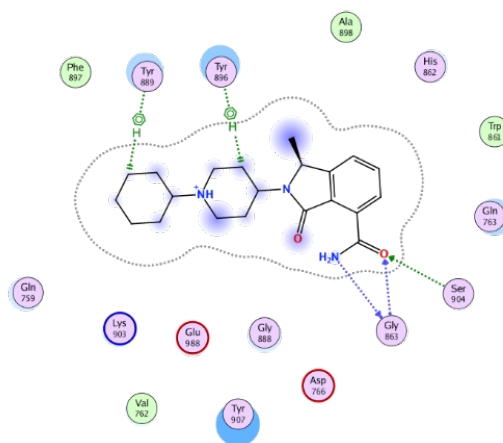


Figure 2: (Ligand with 618M enzyme)

Table. (1): Comparison of Ligand bond strength with BAI compound

<u>Compound number</u>	<u>S (Kcal/ mol)</u>	<u>Amino acid interaction</u>	<u>function group interaction</u>
Ligand	-7.9142	SER 904	Amin
Ligand	-7.9142	GLY 863	OG
BAI	-5.4426	GLY 863	Hydroxide
BAI	-5.4426	SER 904	Hydroxide

Table. (2): Ligand report

<u>Receptor</u>	<u>E (Kcal/ mol)</u>	<u>Amino acid interaction</u>	<u>interaction</u>	<u>Distance</u>
O	-3.0	GLY 863	H-donor	3.17
N	-3.9	GLY 863	H-acceptor	3.07
OG	-1.3	SER 904	H-acceptor	3.10
6-ring	-1.2	TYR	H-pi	3.93
6-ring	-0.6	TYR	H-pi	3.83

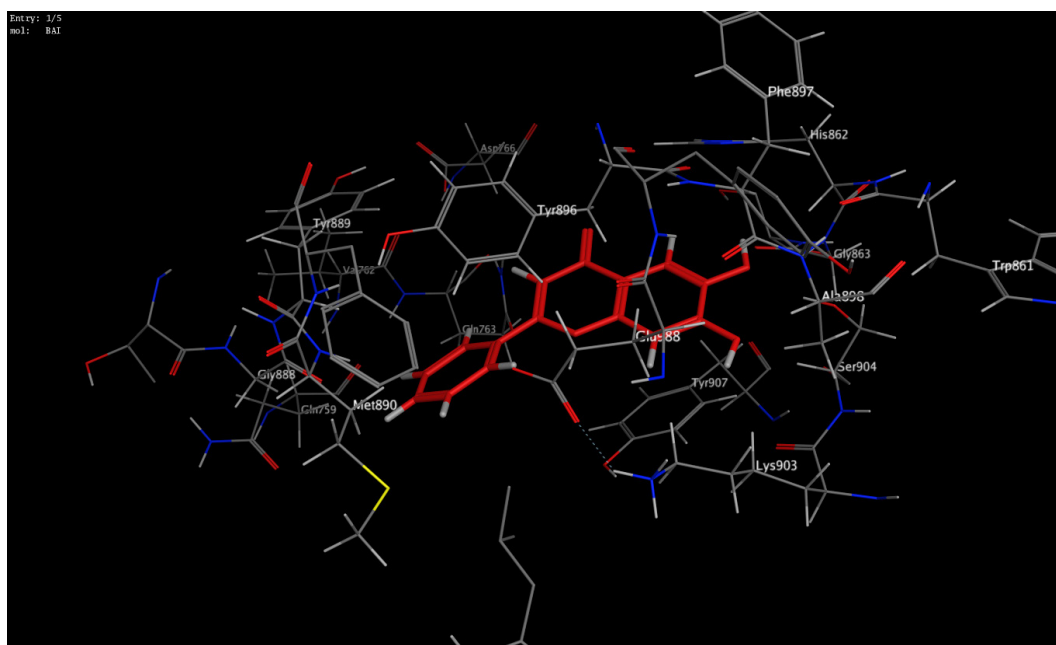


Figure 3: (compound configuration 1 with receptor).

Table. (3): BAI compound

<i>Receptor</i>	<i>E (Kcal/ mol)</i>	<i>Amino acid interaction</i>	<i>interaction</i>	<i>Distance</i>
O	-4.4	GLY 863	H-donor	2.90
N	-5.1	GLY 863	H-acceptor	2.87
OG	-2.7	SER 904	H-acceptor	2.72

Entry: 1/5
mol: 482

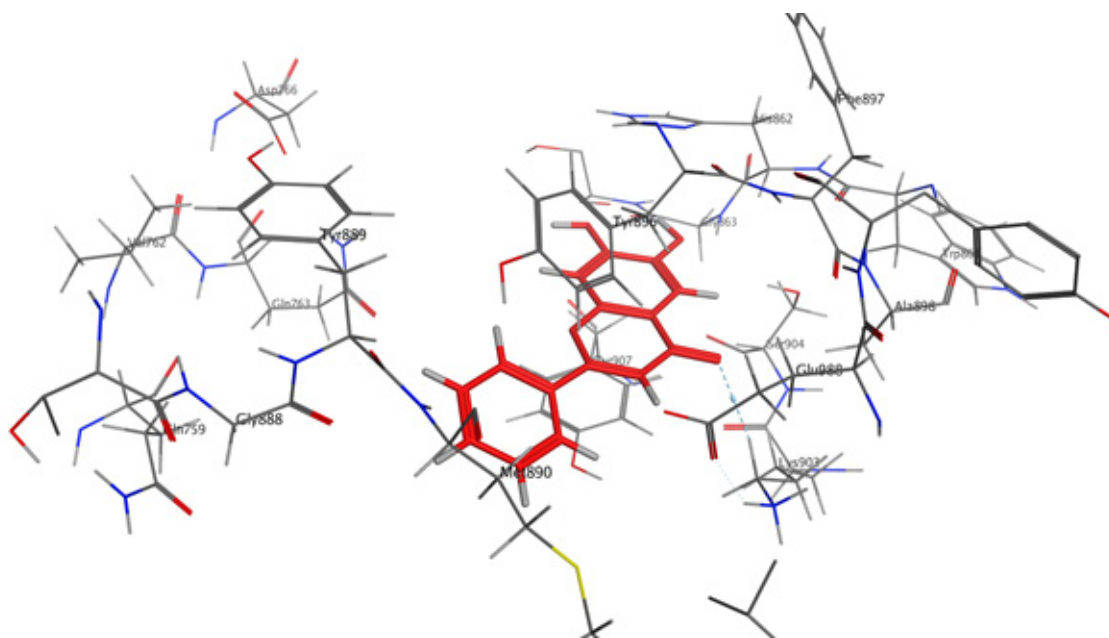


Figure 4: (compound configuration 1 with receptor).

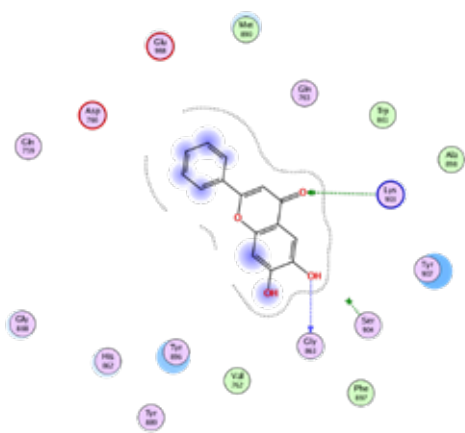


Figure 5:(interaction configuration2 with receptor)

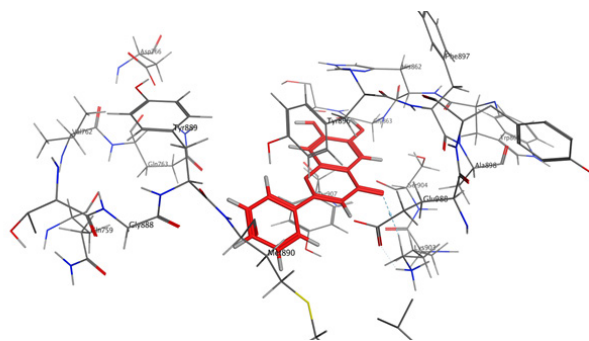


Figure 6: (compound configuration 3 with receptor).

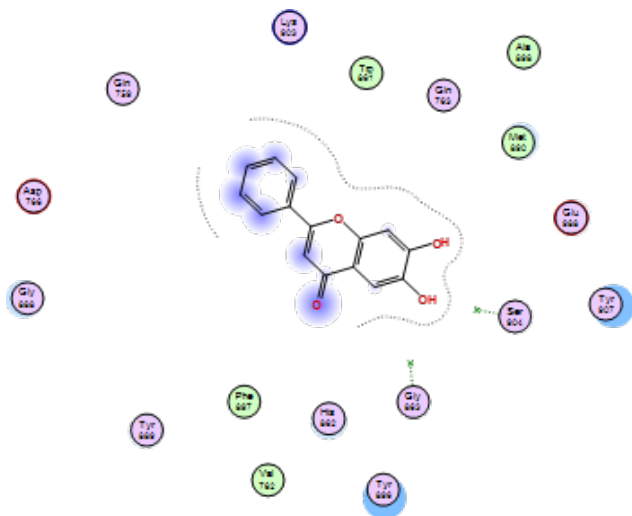


Figure 7 (interaction configuration3 with receptor)

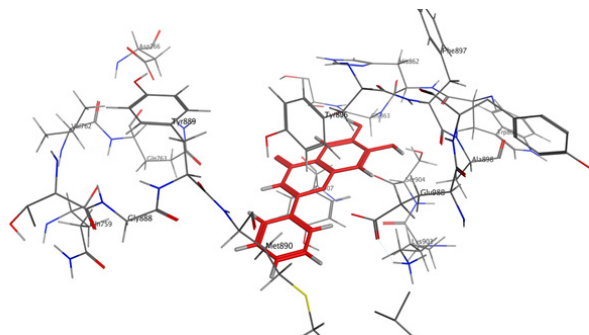


Figure 8: (compound configuration 4 with receptor).

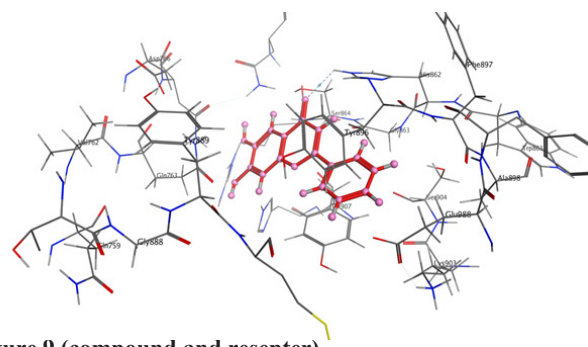


Figure 9 (compound and resepter)

Conclusion

We have computer-generated compound from the former researchers (SEUN HAN et. el) with Baicalein (6,7-dihydroxy-2-phenyl-4H-chromen-4-one) compound. Bendable docking of ligand to receptor molecules is an emerging method and is extensively used to reduce cost and time in drug innovation.

From the results, a process was showed to detect the strength of the link between the compound and the enzyme using the program (MOE), from the previous literature that showed efficacy as anti-fungal and some bacteria and the effect of these compound on thyroid cells cancer and inhibition of the causative enzyme (PARP)

Thus, this study showed that the compound (1) takes the best formula of is alignment more the association with the link with amino acids (GLY 836and SER 904) and gives the best consequences, thus clarifying the best inhibitor of the association with the enzyme.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Advantage of Application of Topical Hyaluronic Acid in Reducing Post Tonsillectomy Pain; Cross Sectional Comparative Study

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Abstract

Introduction: Tonsillectomy is common surgical operation performed in otolaryngology department. Various techniques could be used that include traditional cold dissection, powered instrumentation like electro cautery, harmonic scalpel, laser, and radiofrequency technique. As with any surgery, there are some risks can occur with tonsillectomy, these includes bleeding, pain at the site of surgery and/or referred otalgia, and infection. The aim of our study was to assess the postoperative use of topical hyaluronic acid with regards to safety, pain relief. **Method:** The research was considered a cross-sectional research made on 60 patients needing tonsillectomy from a period began from January to September 2018. The patients had been separated into two groups both from 30 patients, one group (group A) treated by using high molecular weight(HMW) Hyaluronic acid spray on tonsillar beds after operations , and the second group(group B) dealt as control. Early complications were registered in questionnaires and then the data were evaluated for each group. **Results:** The use of high molecular weight (HMW) Hyaluronic acid spray on tonsillar beds after surgery has reduces the pain significantly after 3 – 7 days (p-value = 0.0001) while has no implication on pain reduction within 12 - 24 hours p-value (0.17 and 0.3) respectively . **Conclusion:** The use of (HMW) hyaluronic acid spray can be used safely in post tonsillectomy patients. Hyaluronic acid spray can minimize post tonsillectomy pain.

Keywords: High molecular weight (HMW) hyaluronic acid (H.A.), tonsillectomy, pain

Introduction

The history of surgical removal of tonsils has been returned back to three thousand years ago¹, nowadays, Tonsillectomy is usual operation almost lead to open wound, so, connected with important postoperative pain that may last as long as 2 to 3 weeks period 2–5. This pain constitutes the major morbidity factor leading to poor nutrition, dysphagia, dehydration and delaying time for returning to work or school^{6,7}. Many factors contributes to the post-tonsillectomy pain as mucosal damage, irritation of vagal , glossopharyngeal nerves ,tissue inflammation ,retained debris and spasm of the muscles of the pharynx ^{5,8,9}.

Nonsteroidal anti-inflammatory drugs, codeine and paracetamol are frequently used to minimize the pain occurs following tonsillectomy ^{10,11}.Opioids are

associated with respiratory depression ,nausea, vomiting, depression of cough reflex and sedation^{5,10,12}. So, more safe opioid and non-opioid analgesia are used as pain killer to alleviate pain and discomfort after removal of the tonsils. Ibuprofen now suggested by American Academy of Otolaryngology— Head and Neck Surgery for pain relief following tonsillectomy ^{4,8,13}.

Optimal pain relief after tonsillectomy is challenging .Many researchers use different options for pain reduction whether systemic or topical like bupivacaine ^{14,15}, dexamethasone , lignocaine¹⁵ , sucralfate ¹⁶, etc.

Hyaluronic acid is high molecular weights, hydrophilic glycosaminoglycan that is a naturally component of connective tissue particularly seen in the synovial fluid of joint and inside the extracellular matrix of skin ^{17–19}. It provides a role in wound healing where

its secretion in proliferative phase stimulates fibroblast migration and proliferation 20,21. Finally it shows a suppressive effect on inflammatory mediators, tissue reactions to trauma so could be applied safely as an anti-inflammatory factor 21,22. Hyaluronic acid is a lubricant material with ability to stimulate growth so widely used to be the normally non-immunogenic, biocompatible and anti-inflammatory dressing biomaterial 22. Hyaluronic acid is reported to decrease pain, inflammation with stimulation of wound healing in pressure ulcers 19. It has a role in management of osteoarthritis and tendon problems 17, in burns, and chronic wounds 23,24 as well as in healing of vocal fold wounds 25.

Materials and Method

A cross-sectional study carried out on 60 patients requiring tonsillectomy throughout the period began from January to September 2018. The study certified by hospital ethical committee with written informed consent was taken. The indications of surgery are recurrent attacks of acute tonsillitis, chronic tonsillitis and/or large obstructive tonsil with sleep apnea syndrome. Patients with quinsy, associated adenoiditis or adenoid hypertrophy, tonsillectomy for biopsy were excluded. Our study population was arising from those attended to Al-Sadiq teaching general hospital in Hilla city, Babylon, Iraq. The tonsillectomies have been done under general anesthesia, with placement of oral endotracheal intubation. The tonsils were removed by cold steel dissection method and hemostasis by ligatures, packs or cautery. The study sample were divided into 2 groups each from 30 patients, first group (group A) dealt with postoperative use of high molecular weight (HMW) Hyaluronic acid spray (0.01% topical spray) on tonsillar beds three to five times per day starting 3 hours postoperatively and the second group (group B) considered as a control. Pain assessment was done 12 hours, 24 hours, 3 days and 7 days post tonsillectomy using visual analogue scale from 0-10 (0 represents no pain at all, 10 represents the severe incapacitating pain). Data collected were comprised of age, gender, all data collected for both groups were analyzed by SPSS 22 used Mann - Whitney test for calculate P-value and another statistical analysis.

Results

In our study we take 60 patients all undergone tonsillectomy, 30 patients were used H.A. after tonsillectomy as a (case) and 30 patients not used H.A.

as a (control). 38(63.33%) of patients were female and 22(36.67%) were male as in figure 1.

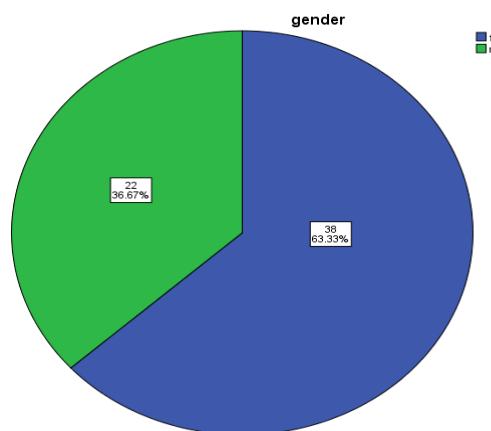


Figure1: gender distribution

Figure 2 shows gender distribution according to the type of sample.

Table 1 shows that the two groups (case and control) are similar regarding the age (p value > 0.05)

Table 1: Mean age of the study sample

	Case Mean ±SD	Control Mean ±SD	Z- test	P value
Age (years)	18.7 ± 3.6	18.9 ± 3	0.3	0.53

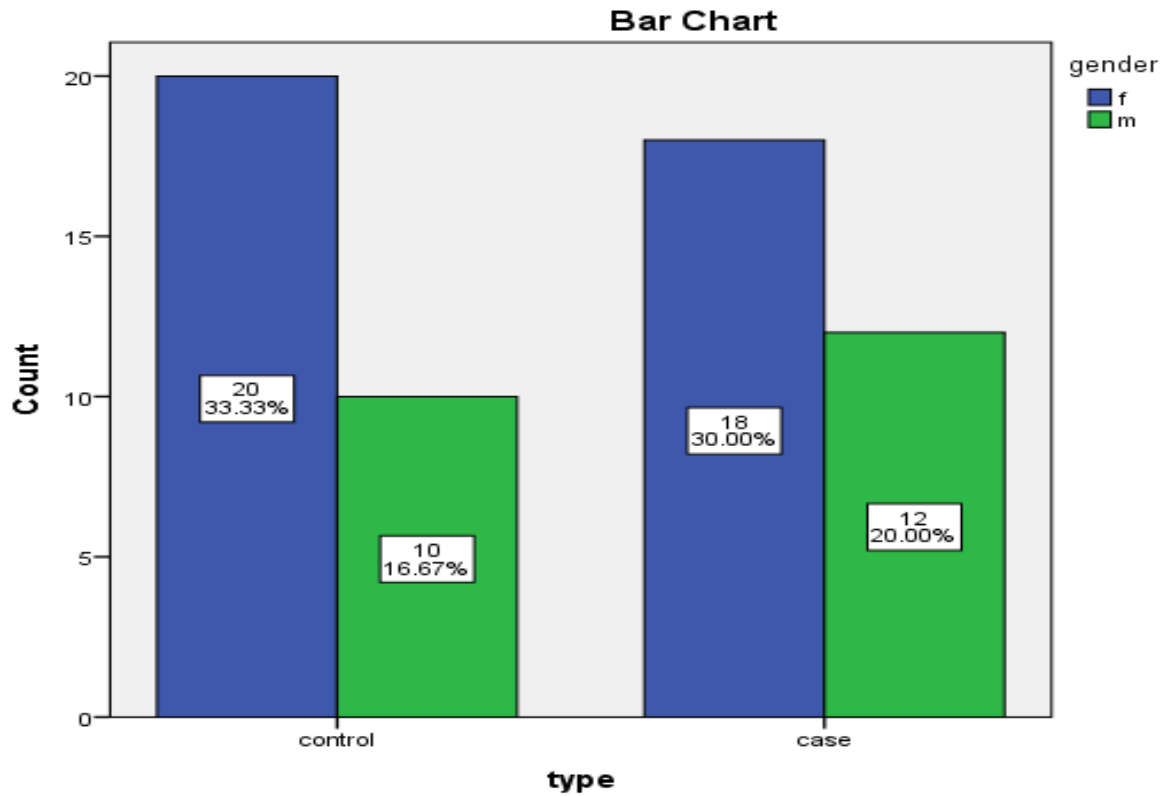
Z: Man-Whitney test; P- value <0.05 =significant.

Gender Chi square = 0.3 with P-value= 0.79 no difference between gender in case and control sample.

Figure 2: gender distribution according to type of sample

Table 2 shows that there is no difference in pain score at 12 hours and 24 hours postoperatively after using H.A. between the case and control group (p - value 0.17 and 0.3) respectively. However the use of H.A. spray post tonsillectomy in case group results in significant decrease in pain after 3 days and 7 days postoperatively (p value <0.05).

Table 2: Pain assessment by visual analogue scale post operatively



Time	Case Mean ±SD	Control Mean ±SD	Z- test	P-value
After 12 hours	7.20±1	7.60±1.1	1.37	0.17
After 24 hours	7.13±1	7.40±1.2	1.078	0.3
After 3 days	4.60±1.2	6.60±1.7	4.491	0.0001**
After 7 days	2.47±1.3	4.07±1.34	4.071	0.0001**

Z: Man-Whitney test; P- value <0.05 =significant.

Discussion

Pain management after tonsillectomy is a crucial factor in decreasing postoperative morbidity and complications like poor oral intake, dehydration, dysphagia and disturbed sleep 10,11,26. The pain and inflammatory reactions following oral surgery may reach its maximum level two days postoperatively and decrease through 7-10 days 27

Hyaluronic acid is a linear polysaccharide found in many tissues especially connective tissues where its responsible for tissue elasticity ,control of hydration of connective tissues and synovial fluid elastoviscosity .It

is an important factor in the process of wound healing 28,29. In our study it was found that postoperative pain following tonsillectomy was dramatically reduced by using topical (HMW) Hyaluronic acid spray especially after 3 days. This may be explained by the fact that this substance has a role in repairing tissue and cover the exposed wound of tonsillectomy as well as its minimize the risk of post tonsillectomy infection .These effects were clearly described to induce healing for pressure ulcers and to increase the rate of healing in diabetic foot30. Hyaluronic acid also has anti-inflammatory effects; decreasing leukocyte infiltration and enhance the angiogenesis31. H.A. is effective in management of osteoarthritis pain17 and pain of temporomandibular joint disorder18, where it used for intra articular

injection²¹. Researchers from turkey studied the effect of applying hyaluronic acid gel during tonsillectomy and found that the pain decrease significantly postoperatively with rapid wound healing. In our study the maximum benefit from applying the H.A. spray was between 3-7 days (p value <0.05) while no significant pain reduction was observed within 24 hours postoperatively. This may indicate that immediate effect of H.A. need time to act as anti-inflammatory, coating material and stimulatory for wound healing.

Several studies test the effect of hyaluronic acid following teeth extraction especially third molar teeth and found significant pain reduction with decrease in analgesics need ^{32,33}. Little researches studied the effect of hyaluronic acid following tonsillectomy so researchers should be encouraged to explore its effects, adverse effects with a larger study samples.

Conclusion

The use of topical (HMW) Hyaluronic acid spray is recommended post tonsillectomy to decrease post tonsillectomy pain and decrease the need for analgesia. Its shows maximum effect after 3 days postoperatively which may help to speed recovery, decrease morbidity and ensure early return to school and work.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

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Atherogenic Index of Plasma among Type2 Diabetic Patients Cross-Sectional Study In Iraq

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Abstract

The study was carried out on (60) males previously diagnosed with diabetes mellitus type2 aged (40-55) years with mean \pm SE of age (48.46 \pm 5.03), who visited the Specialist Center for Endocrine and Diabetes at Baghdad province. The total cholesterol(TC) mg/dl levels were (180.90 \pm 11.68 ,209.60 \pm 14.50 ,203.10 \pm 14.65) respectively showed non significant ($p > 0.05$) variation in diabetic groups ,TG mg/dl levels in normal weight group (172.55 \pm 14.13) decreased significantly ($p < 0.01$) in comparison with over weight and obese (273.95 \pm 22.83) ;(306.95 \pm 25.20) ,respectively. LDL mg/dl levels were (101.50 \pm 9.56; 110.00 \pm 12.71; 105.40 \pm 9.99) respectively showed non significant ($p > 0.05$) variation in diabetic groups. VLDL mg/dl in normal weight group (35.75 \pm 3.31) decreased significantly ($p < 0.01$) in comparison with over weight and obese (59.70 \pm 4.59); (61.30 \pm 5.03).HDL mg/dl levels were (43.20 \pm 2.01 ,42.85 \pm 3.05,40.05 \pm 3.32) respectively showed non significant ($p > 0.05$) variation in diabetic groups. FBG showed non-significant correlation with TC($r = -0.13$),LDL($r = -0.13$),TG ($r = -0.12$),VLDL($r = -0.15$),HDL($r = 0.24$). HbA1C showed positive significant ($p < 0.05$) correlation with TC($r = 0.25$), while showed non significant correlation with TG ($r = 0.10$),LDL ($r = 0.18$),VLDL ($r = -0.01$), HDL ($r = 0.16$).BMI showed non-significant with TC($r = 0.15$),LDL($r = 0.08$),HDL, ($r = -0.08$).While positive significant ($p < 0.01$) , correlation with TG ($r = 0.50$), VLDL($r = 0.39$). The levels of AIP differ significantly ($p < 0.01$) among diabetic groups (0.576 \pm 0.04; 0.800 \pm 0.06 and 0.911 \pm 0.05) but over weight and obese(0.800 \pm 0.06 ; 0.911 \pm 0.05) were not significant ($p > 0.05$). AIP was significantly correlated with body mass index($r = 0.25$), visceral fat ($r = 0.37$), TC ($r = 0.22$), LDL ($r = 0.24$), HDL ($r = -0.72$), TG ($r = 0.84$), glucose ($r = 0.32$). Positive correlation ($P < 0.01$) with BMI($r = 0.36$) ;VLDL ($r = 0.28$)($p < 0.05$) and negative correlation ($p < 0.01$) with HDL-C ($r = -0.32$)was seen .

Keywords:- Diabetes mellitus ,Dyslipidemia,lipid profile,Atherogenic index of plasma(AIP).Insulin resistance(IR).

Introduction

Dyslipidemia in T2DM is characterized by high level Of total cholestrol (TC), low density lipoprotein (LDL-C) ,triglyceride (TG) with low level of (HDL-C)¹.The early detection of lipid abnormalities with their treatment can reduce the risk of atherogenic cardiovascular and cerebrovascular disorders in T2DM patients².Atherosclerotic coronary artery disease and different form of cardiovascular disease (CVA) are the principle causing of morbidity and mortality in T2DM, that alterations in lipid profile lead to atherosclerosis in T2DM³.The deffintion of atherogenic index of plasma AIP is used logarithm(log) of the ratio of plasma concentration of TG/HDL-C. Which was correlated with size of HDL and LDL molcules⁴. The AIP is regarded as astrong marker for plasma atherogenicity

and correlated with (CVD) .The AIP value under 0.11 is associated with low risk of CVD but value between 0.11-0.21 and above than 0.21 causes intermediate and elevated risk respectively⁵. Diabetes (T2DM) and related cardiovascular complication are major public health challenges among world wide. Individuals with T2DM have two to four fold risk of coronary artery disease (CAD) causing death among people of Type2Diabetes mellitus⁶. Dyslipidemia participates in causing of atherosclerosis ,which pathological affects of CVD persons with metabolic syndrome or T2DM exhibit a characterstics pattern of serum lipid abnormalities ,consisting of low HDL-C and increased TG levels with increased LDL particles⁷.Various mechanisms forming the atherogenic lipid disorders in Type2 patients. The increase in breakdown of

intracellular Triglycerides and release of Free fatty acids increased into the blood causing free fatty acids hepatic infiltration, muscle, pancreatic B-cell, predisposing to T2DM. Increased hepatic FFAS contribute to elevation of hepatic TG with subsequently resulting in increased VLDL particles. From other side cholesterol ester transfer protein (CETP) converts Triglycerides from Very low density lipoprotein to cholesterol found in HDL and LDL resulting to cholesterol rich atherogenic VLDL particles. HDL particles that undergo these modifications are cleared by the renal function, resulting in decreased HDL-C levels⁸. Endothelial dysfunction (ED) is another major factor for the development of atherosclerosis. It might be caused by dyslipidemia, oxidative stress, inflammation, lipid abnormality regard the major cause of ED, especially LDL particles are more susceptible to oxidation, oxidized LDL particles reduce the availability of nitric oxide (NO) and impair endothelial function. This creates a positive feedback loop in which inflammatory factors promote monocyte and T cell adhesion, foam cell formation, extracellular matrix digestion and vascular smooth muscle migration and proliferation leading to atherosclerosis⁹. The prostacyclin and Nitric oxide production by normal endothelial inhibition with platelet reactivation and relaxation vascular smooth muscle improving circulation normally. Diabetic patients showed reduction in release of prostacyclin and Nitric oxide with chronic defects of endothelial Nitric oxide synthesis action, which is a predictor of dyslipidemia and explain partly the accelerated atherosclerosis in DM¹⁰. In diabetes long term hyperglycemia causes generalized vascular endothelial damage which reduced function of lipoprotein lipase leading to increase TG, TC, and LDL¹¹.

Material and Method

Collection of Information and Patients Selection

The study was carried out on (60) males previously diagnosed with diabetes mellitus type 2 aged (40-55) years with mean \pm SE of age (48.46 \pm 5.03), who visited the Specialist Center for Endocrine and Diabetes at Baghdad province. The study was begun from 1/ November 2018 to 30/January 2019. Informed consent was obtained from patients cross sectional study to fill the questionnaire form them before venipuncture which was used for recording the necessary information that concerning with subject groups which included name, age, length, body weight, and duration of diabetes onset.

Study design:-

The subject study included group (60) patients as diabetic group (cross sectional study). The diabetic group was divided into three subgroups according to BMI

Normal weight BMI (18.5-24.9) Kg/m².

Over weight (OV) BMI (25-29.9) Kg/m².

Obese BMI (\leq 30) Kg/m².

2-Collection of blood samples:-

Eight milliliters of blood were drawn from each patient after (12- 14) hours fasting via venipuncture, by using 10 ml disposable syringes between (8.00 –10.30 A.M). Blood specimen used in two aliquots; two and three ml. The first one was put in a tube have ethylene diamine tetra acetic acid (EDTA K3) as anticoagulant and stored at (2-8°C) for analyses of HbA1c, while the second aliquot was transferred into gel tubes without anti-coagulant; blood was left to clot for 20-30 minutes at (37°C) in an incubator. Serum were separated by centrifugation at 3000 rpm for 10 minutes used for the determination of FBG, lipids profile, serum was stored in Eppendorf tubes at (-20°C) for analyses later.

Lipid profile calculation:-

Measurement of serum total cholesterol (TC) Cholesterol was determined by using the Mindray Bs-200¹². Measurement of Triglycerides (TG) Concentration. Triglyceride was determined by using the Kit SPINREACT according to the method by mindray¹². Measurement of Serum High Density Lipoprotein (HDL) Concentration. MINDRAY BS-120 / 200E Autoanalyzer use SPINREACT kit¹³. Measurement of Low Density Lipoprotein (LDL). Mindray BS-120 / 200E Autoanalyzer use SPINREACT kit¹³. VLDL(mg/dl)=

Atherogenic index of plasma was measured using base 10 logarithm of the ratio Triglycerides to HDL, formula = $\log(TG/HDL-C)$. (Dobiášová and Frohlich, 2001). **AIP =Log.**

Results and Discussion

Table (1) Effect of different groups of diabetic subjects in lipid profile.(Mean ± SE)

Parameters (mg/dl)	Groups			LSD value
	Normal weight	Over weight	Obese	
Total cholesterol	180.90 ± 11.68 a	209.60 ± 14.50 a	203.10 ± 14.65 a	38.747 NS
Triglyceride	172.55 ± 14.13 b	273.95 ± 22.83 a	306.95 ± 25.20 a	60.221 **
LDL	101.50 ± 9.56 a	110.00 ± 12.71 a	105.40 ± 9.99 a	30.722 NS
VLDL	35.75 ± 3.31 b	59.70 ± 4.59 a	61.30 ± 5.03 a	12.390 **
HDL	43.20 ± 2.01 a	42.85 ± 3.05 a	40.05 ± 3.32 a	8.081 NS

** (P<0.01), NS: Non-Significant.
Means having with the different letters in same row differed significantly

From the result table (1), the TC mg/dl levels were (180.90±11.68, 209.60±14.50, 203.10±14.65) respectively showed non significant (p>0.05) variation in diabetic groups. TG mg/dl levels in normal weight group (172.55±14.13) decreased significantly (p<0.01) in comparison with over weight and obese (273.95±22.83); (306.95±25.20) respectively. LDL mg/dl levels were

(101.50±9.56; 110.00±12.71; 105.40±9.99) respectively showed non significant (p>0.05) variation in diabetic groups. VLDL mg/dl in normal weight group (35.75±3.31) decreased significantly (p<0.01) in comparison with over weight and obese (59.70±4.59); (61.30±5.03). HDL mg/dl levels were (43.20±2.01, 42.85±3.05, 40.05±3.32) respectively showed non significant (p>0.05) variation in diabetic groups.

Table (2) Correlation coefficient between lipid profile with FBG,

HbA1c and BMI in diabetic patients.

Parameters	Correlation coefficient-r		
	FBG	HbA1c	BMI
Total cholesterol	-0.13 NS	0.25 *	0.15 NS
Triglyceride	-0.12 NS	0.10 NS	0.50 **
LDL	-0.13 NS	0.18 NS	0.08 NS
VLDL	-0.15 NS	-0.01 NS	0.39 **
HDL	0.24 NS	0.16 NS	-0.08 NS

* (P<0.05), ** (P<0.01), NS: Non-Significant.

From the result table (2), FBG showed non-significant link with TC (r=-0.13), LDL (r=-0.13), TG (r=-0.12), VLDL (r=-0.15), HDL (r=0.24). HbA1c showed positive significantly (p<0.05) correlated with TC (r=

0.25), and showed non significant correlation with TG (r=0.10), LDL (r=0.18), VLDL (r=-0.01), HDL (r=0.16). BMI showed non-significant with TC (r=0.15), LDL (r=0.08), HDL (r=-0.08). positive significantly (p<0.01)

correlated with TG (r=0.50) ,VLDL(r=0.39). The dyslipidemia means to change in lipid profile involving elevating serum TC , TG, decreased HDL, elevation LDL and VLDL. Dyslipidemia is present to be accompany with both, insulin resistance and coronary heart disease⁸. Studies lipids profile in T2DM and control subjects in overweight and obese groups in Saudi Arabia was seen high incidence of dyslipidemia in T2DM patients (Our results showed non significant increase of TC in overweight and obese diabetic patient >200mg and significantly higher TG and VLDL levels; while LDL and HDL levels were non-significant this attributed to that excess acetyl CoA from lipolysis of fat to free fatty acids (FFA) gets converted to more and more cholesterol and its concentration in blood rises in T2DM.VLDL increased either because of increased hepatic production of VLDL or decreased removal of VLDL circulation. Serum concentration of TG also increases because of decreased removal from circulation.The increased TG in our study was agreed with (Taskinen,2003). who reported the increased serum TG levels in T2DM patients are widely because of an elevation VLDL, specially large VLDL1 molecules.Both rising production and late catabolism of VLDL are responsible for the rising VLDL.Insulin resistance is accompanied with reduction activity of hormone-sensitive lipase in adipose tissue by insulin, resulting lipolysis increasing and, portal flux of NEFA to hepatic cells to stimulate synthesis of TG in hepatic cellsThe role of increasing in TG levels in hyperglycemic patients also includes decrease of lipoprotein lipase (LPL) activity. It has been recorded that LPL activity is reduced in patients with T2DM.(Nikkila and Taskinen,1981).LPL hydrolyses TG of chylomicrons and (VLDL). The FFA flux into glycogen rich hepatocytes stimulates TG synthesis, which produced of VLDL-cholesterol..Obesity and T2DM are accompanied by elevation deposition of TG in non-adipose tissue, like heart, liver, pancreas, and skeletal muscle. Obesity, fat accumulated in the under skin, abdominal and visceral depots, which is have affinity in risk of metabolic and heart blood vessels complications; Obesity is positively affecting risk the developing of T2DM,dyslipidemia, IR and hypertensive. It characterized by adipose tissue defects growth resulting in increasing size of fat cell (hypertrophic obesity) or fat cell number (hyperplastic obesity), or both. Obesity is known as body mass index (BMI). As we observed mean serum TG levels higher in diabetics groups .As BMI showed high significant correlation with TG(r=0.50) and VLDL (r=0.39). Higher HbA1c

concentrations in our study were associated significantly correlation with higher TC(r=0.25) (P<0.05 reported that significant linear positive correlation with HbA1c and lipid parameters except HDL in T2DM group.

Table (3) Effect of different groups in Atherogenic index of plasma

(AIP) in diabetic patients.

Groups	Mean ± SE of AIP
Normal weight	0.576 ± 0.04 b
Over weight	0.800 ± 0.06 a
Obese	0.911 ± 0.05 a
LSD value	0.154 **
** (P<0.01).	

The levels of AIP differ significantly (p<0.01) among diabetic groups (0.576 ± 0.04; 0.800 ± 0.06 and 0.911 ± 0.05) but over weight and obese(0.800 ± 0.06 ; 0.911 ± 0.05) were not significant (p>0.05), table (12-3), Figure 1.

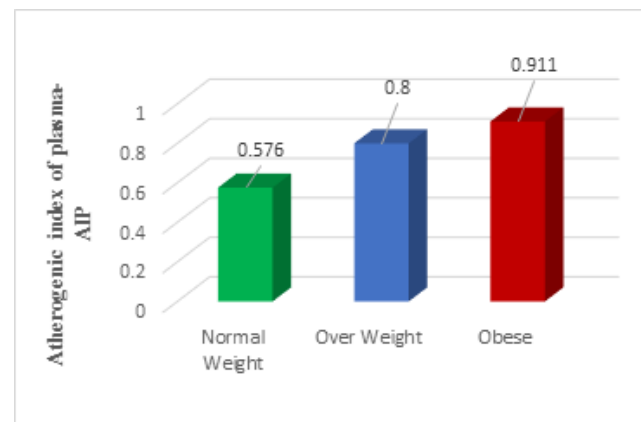


Figure 1 showing Atherogenic index among diabetic patients

AIP values were above normal values (under 0.11) while 0.11 and 0.21 values of AIP associated with intermediate and high risk of CVD (5). Previous researchers they concluded that AIP was elevated in diabetic and neuro diabetic and could be used a marker for predicting CVD in patients groups. AIP showed the presence of atherogenic minute LDL and HDL molecules, is a marker prediction of heart atherosclerosis and cardiovascular dangerous as an alternative for IR.^{4,14}The AIP was significantly higher in 300 T2DM patients in Bangladesh and revealed dyslipidemia with increased TG and decreased serum HDL-C levels . AIP showed correlation BMI(r = 0.25), visceral fat (r = 0.37),

TC ($r = 0.22$), LDL ($r = 0.24$), HDL ($r = -0.72$), TG ($r = 0.84$), glucose ($r = 0.32$). Other Researchers the found TG to HDL was a strong prediction of heart infarction. That atherogenic index of plasma was an index of highest sensitivity for predicting the acute coronary events. That AIP correlation with BMI ($r = 0.182$, $P < 0.001$), (FBG ($r = 0.153$)). AIP is used for detection of Type 2 Diabetic Mellitus with high risk of complications¹⁵.

Conclusions

AIP is used clinically for prediction of Type Diabetic Mellitus with higher risk of complications and this correlated with lipid profile, BMI.

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The relation between Serum Vitamin C and D, Calcium Intake With Obese Type 2 Diabetic Patients

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Abstract

This study took place at Al-kindy hospital on 30 men with type 2 diabetes mellitus aged between (35-52) years old and 30 control men aged between (37-48) years old.

In addition, the body mass index, vitamin D and C, serum calcium were measured.

It was noticed that the body mass index increases in diabetic group (28.9 kg/m²) in comparison with the control group (24.2 kg/m²).

Besides, serum calcium, vitamins C&D showed a significant decrease in diabetogenic patients (7.601mg/ml, 0.61ng/ml,16.48ng/ml respectively)

Compared with the control ones (9.871mg/dl, 1.21ng/ml, 28.104ng/ml respectively)

Key Words: *Obese type 2 diabetic patients, antioxidant, vitamin C and D, Serum Calcium.*

Introduction

Gaining weight is a medical issue that has been expanding over the most recent couple of years because of increment of fast food causing cautions among numerous nations⁽¹⁾.

Vitamin C is viewed as an antioxidant agent, and auxiliary comparability among nutrient C and glucose makes it of enthusiasm for diabetes ⁽²⁾. Oxidation pressure can prompt aggravated glucose digestion and hyperglycemia ⁽³⁾. Along these lines, an advantage of cell reinforcements to counteract diabetes or to accomplish positive outcomes in type 2 diabetes mellitus (T2DM) is organically conceivable.

Vitamin D assumes fundamental job through entire body calcium homeostasis by applying exemplary impacts on the duodenum, bone and kidney ⁽⁴⁾ and modify intracellular calcium singles and in this manner assumes a job in pancreatic insulin discharge and insulin affectability, the two of which identify with Ca²⁺ levels. It has potential in the counteractive action of type 2 diabetes mellitus . A job of it in insulin opposition has been considered broadly and Vit.C is nutrient for whom

researchers have shown relationship with high glucose level⁽⁵⁾.

The blend of decreased serum 25-hydroxyvitamin D (25[OH]D) and lacking calcium admission has been related with heart and blood vessels hazard factors, for example, hypertension, overweight, metabolic disorder and type 2 diabetes mellitus ⁽⁶⁾. Vitamin D inadequacy and low calcium administration are accounted for, alittle is thought about the impact of those micronutrients in the avoidance of numerous infections, for example, heftiness ⁽⁷⁾. Be that as it may, a few examinations propose Ca and vit D admission don't avert nontransferable chronic ailments ⁽⁸⁾.

Point of this study is to know the impact of vit C and vit D as defensive measures in aversion of obesity and TDM2, and diminish its danger, additionally to think about the part of Ca admission take to diminish the danger of TDM2.

Material and Method

The study carried out on 30 men diabetic patients aged (35-52) years who visited the specialist center for endocrine and diabetes at Al-Kindy hospital in Baghdad,

and 30 men control aged (37-48) years were included in this study, the study was begun from January,2019 to march, 2019.

The body weights of individuals were measured by balanced and body heights of them were measured

by paper tape. Body mass index was calculated as weight(w) in Kilograms divided by height (H) in meters squared ⁽⁹⁾ with following formula

$$BMI = W/H^2$$

the values for BMI showed in table 1.

Table 1: measuring of Body weight

Risk of disease	Body mass index (Kg/m2)	obesity	Weight classification
Low	< 18.5		Under weight
Normal	18.5-24.9		Normal
Increased	25 -29.9		Over weight
High	30-34.9	Obese	Obesity
Very high 35 -39.9		Sever obese	
Extremely high	> 40	Morbidly obese	

Five milliliters of blood were drawn from each patient after (10-12) hours fasting via venipuncture , by syringes between (8-10 A.M), the blood sample was transferred into Gel tubes without anticoagulant serum were separated by centrifugation a 3000 rpm for 10 minutes used for the determination calcium, vitamin C and D.

The normal sufficiency of vitamin D is 10-44 ng/ml. However, the normal value of Ca is 8.5-10.2 mg/dl and to vitamin C is 0.4-1.8 mg/dL.

Table 1: weight classification by body mass index (WHO)

The statistical Analysis system SAS ⁽¹³⁾ program was implied for effect variation factors in study parameters. T-test was used to significant comparability between means.

Results and Discussion

The BMI showed highly significant increase (P<0.01) in adiabatic group (30.73) comparison with control group (24.2). Also, the age showed non-significant increase in diabetic group (45.09+2.86) in comparison with control group (44.89+3.21).

Table 2 showed that the diabetic patients BMI with overweight. ⁽¹⁰⁾.

Table 2. The means of Age and BMI in diabetic and control groups.

Groups	Mean + SD	
	Body mass index (Kg/m2)	Age group (year)
Control	44.89+3.21	24.2±0.87
Diabetic	45.09±2.86	28.9+1.21
T- test	0.29 NS	3.23
P-value	0.623	0.0005

NS=non significant **P<0.01

Overweight^[10] demonstrated that the most reduced danger of diabetes happens in people who have BMI under 21, expanding frequency of T2DM predominance was been found when obesity levels expanded . Nevertheless, abundant fat tissue adds to a chronic diseases, the use of unsaturated fats decreasing the utilization of glucose as a cellular vitality weight ^[11].

Despite the fact that age did not indicate noteworthy distinction among diabetic and control (Table 2). Expanded concentration of free fatty acids in blood builds glucose formation, and this will restrain insulin that takes apart in glucose take-up ^[12].

Obesity is viewed as a general medical issue that has been progressively arriving at disturbing extents in all districts of the world^[1].

Table 3 shows the changes in calcium, Vitamin D and Vitamin C, Calcium level was increased significantly (P<0.01) in control group 9.871 mg/dl compared with diabetic group 7.601 mg/dl.

Furthermore, the data were showing significant (P<0.01) elevation of vitamin D in control group (28.104 ng/ml) with the diabetic group (16.48 ng/ml). On the other hand, vitamin C was increased significantly (P<0.01) in control group (1.21mg/dL) compared with diabetic group (0.61mg/dL).

Table 3. Levels of Calcium, Vitamin D and Vitamin C (Mean± SD) in control and Diabetic Groups.

Groups	Mean ± SD		
	Calcium(mg/dl)	Vitamin D (ng/ml)	Vitamin C (ng/ml)
Control	9.871±0.862	28.104±3.572	1.21±0.053
Diabetic	7.601±0.973	16.48±4.104	0.61±0.035
T- test	1.283**	6.218**	0.42**
P-value	0.001	0.0052	0.001

** P<0.01

It is accounted for that 1.25 (OH)2D3 can control insulin emission out of pancreatic β-cells ^[14]. Quick increment in intracellular calcium [Ca²⁺], triggers insulin discharge. The job of 1.25(OH)2D2 in insulin emission gets from its impacts on Ca²⁺deluge assembly and buffering in pancreatic β-cells ^[15].

Moreover 1.25(OH)D3 has a significant job in the guideline of cell Ca²⁺ signaling that is connected to cell reactions, signaling and secretion^[16]. Supported Ca²⁺sign activated by 1.25(OH)2D2 inquired about to the guideline of apoptosis a procedure that can decide cell passing in diseases , for example, obesity and type 2 diabetes ^[17].

Besides, 1.25(OH)2D3 induces Ca⁺² signals (Ca⁺² motions) can manage insulin discharge from pancreatic β-cells [18]. Vitamin D status has been connected to insulin resistance and T2DM in observational studies^[19]

The complete calcium substance diminished in clear human lens between 18-55 years, it at that point expanded with age between 55-75 years ^[20].

Lack of 25-hydroxy vitamin 25(OH)D3 has been described as value of (20ng/ml) and has been perceived as a reason for childhood rickets and adulthood osteomalacia since the mid nineteenth century. Extreme insufficiency has been characterized as under 10ng/ml (25nmol/l) over the most recent 40 years, observational examinations have connected 25(OH)D lack to the advancement of chronic conditions including cardiovascular diseases and diabetes mellitus ^[21] . Vitamin D inadequacy is related with diabetes mellitus in elder working adults ^[22].

Vitamin D dissolve in fats actually, while vitamin C liquefy in water. Vitamin C is a cancer prevention agent and the auxiliary similitude between nutrient

C and glucose makes it of enthusiasm for diabetes [23]. Oxidative pressure can prompt disturbed glucose digestion and hyperglycemia [24;25]. Subsequently, an advantage of cancer prevention agents to counteract diabetes or to accomplish positive results in T2DM is organically conceivable. Inadequacy of vitamin C brings about blemished development of collagen and connective tissues in the skin, ligament, dentine, bone and blood, vessels, patients with diabetes should all get dietary guidance about good dieting and vitamin C dietary sources, including crisp leafy foods, the prescribed a dietary admission of the vitamin C is 45mg every day for grown-ups, vitamin C levels are lower among individuals with T2DM and not totally clarified by a distinction in dietary vitamin C consumption, various systems fundamental the abatement in vitamin C levels and expanded necessities in T2DM have been proposed expanding endogenous degree of vitamin C and D can be accomplished by dietary modifications^[26].

Conclusion

Vitamin D and C along with calcium are essential protective micronutrients to reduce and control type 2 diabetes mellitus especially in those suffering from obesity. Doctors should recommend a diet rich with those elements.

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Assessment of Anti-Mullerian Hormone and Anti Ovarian Antibody in the Sera of Patients with Polycystic Ovarian Syndrome in AL-Najaf Al-Ashraf Province

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Abstract

Polycystic ovarian syndrome(PCOS)is the most common endocrinopathy,that affects 5 to 20% of women in age of(12-45year)and cause a widespread of reproductive disorder in women and it is a major cause of hirsutism,acne,hormonal disturbance and infertility. Women with PCOS may associated with health conditions obesity,amenorrhea, oligomenorrhea,hyperandrogenemia and insulin resistance.The PCOS patients are with increased risk for type 2diabetes mellitus,diabetic complications,dyslipidemia and cardiovascular disease .

Objective: Aim of the study to investigate the pathogenicity,disease severity and early diagnosis roles anti-Mullerian hormone and anti-ovarian antibody in ladies with PCOS.

Conclusion: Polycystic ovarian syndrome was related to the increase level of AMH in different age of PCOS patients,which comprised 55.0% in PCOS patients that cause defect in ovulation and resulting fertility problem,while no relationship between anti-ovarian antibody and patients with PCOS.

Key words: AMH, AOA, PCOS and infertility.

Introduction

Polycystic ovarian syndrome(PCOS)is a common and complex endocrine issue and hormonal abnormalities which influences whole body,that affected 5 to 20% of regenerative age ladies,occurred in age of(12-45)year,and it is a main reason for hirsutism and fertility problem⁽¹⁾. PCOS is more typical than other conceptive infection; it is related with metabolic issue,for example,type 2 diabetes mellitus,dyslipidemia,hypertension and expanded risk of cardiovascular disease⁽²⁾.

The investigators between young adult and adolescent patients with PCOS found a few phenotypic differences ,where the more severe component of the phenotype was in young adults was obesity,with the mean body mass index(BMI)and prevalence of obesity and morbid obesity being higher in young adult compared with adolescent patients⁽³⁾. The etiology of PCOS not clear,but rather numerous elements might be related with PCOS,which include obesity,hyperandrogenism, insulin resistance that lead to compensatory hyperinsulinemia , increment discharge of luteinizing hormone (LH) and disappointment ovarian follicular improvement because

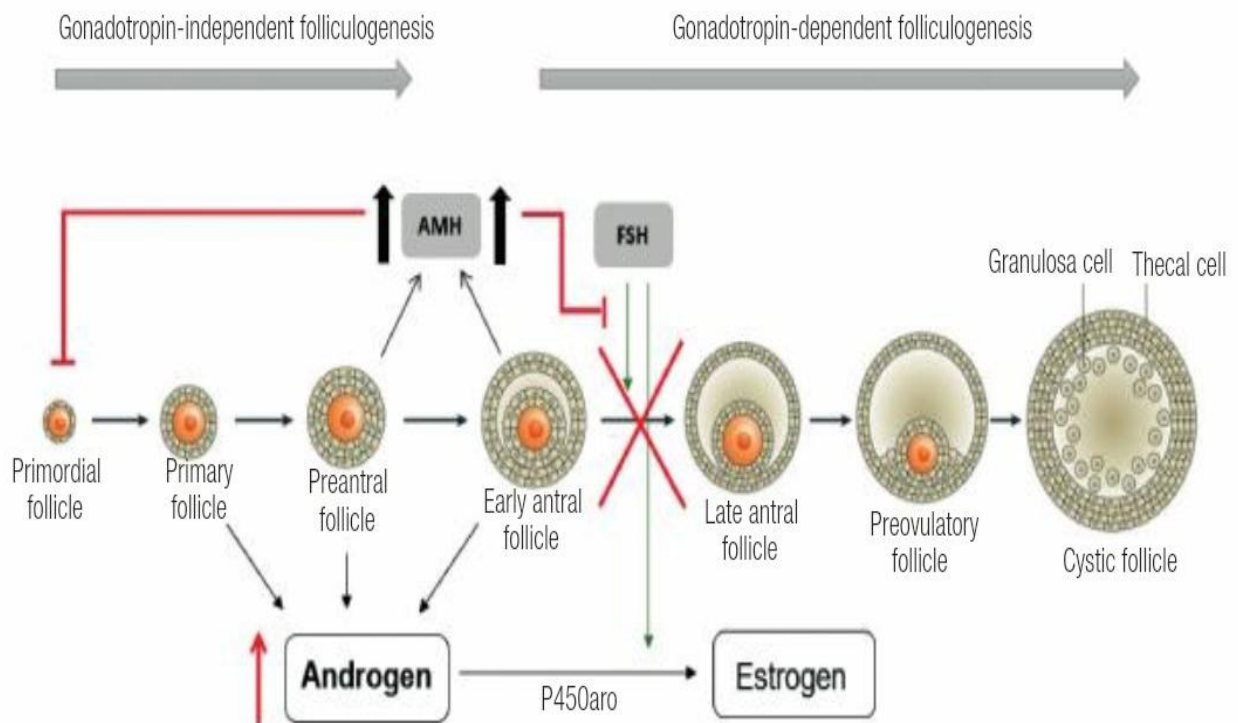
of expanded follicular advancement blocker paracrine factor , such as anti mullerian hormone (AMH) that produce from granulosa cell of follicles in size under 8 mm⁽⁴⁾.

The diagnosis of PCOS in ladies is ordinarily as indicated by the European society of human reproduction and embryology/American society of reproductive medicine(ESRHE/ASRM) criteria known as Rotterdam criteria, which rely upon nearness at any rate two of three highlights of oligo-ovulation/anovulation(menstrual dysfunction), hyperandrogenism and appearance of polycyclic ovaries in ultrasound look like the pearl string⁽⁵⁾.

Anti -Mullerian hormone:-

Anti-Mullerian hormone(AMH)also define as Mullerian-inhibiting substance,Mullerian inhibiting factor and Mullerian-inhibiting hormone.It is a glycoprotein dimer,it belongs to the member of the transforming growth factor beta superfamily,it is produced from the 36th week of gestation, by the granulosa cells of growing follicles of the ovary,primary,

secondary, preantral and antral, start produced at elevated values by the last two and has an a specific role in the evolution and maturation of follicles⁽⁶⁾. It has two main mechanisms of ovarian dysfunction by disrupting folliculogenesis through: suppress the initial induction of primary follicles from primordial follicles, and suppress the responsiveness of antral follicles to (FSH) through period induction (Fig.1).



Figure(1): Anti-Mullerian hormone(AMH)and folliculogenesis⁽⁷⁾.

The AMH stops the premature exhaust of follicle⁽⁷⁾. AMH level higher value at age 25 years, after that decreased to the menopause⁽⁶⁾. Circulating AMH levels in serum is high two or three times in the patients with PCOS than healthy women, and not influenced by the menstrual cycle nor changed through the use of oral contraceptives, thus it can be applied as a potent parameter for detection PCOS. AMH measurement is valuable because, it can be useful in predicting ovarian hyperstimulation, multifollicular complications and may be a novel marker for ovarian aging as well as evaluating treatment efficacy in PCOS. The starting of folliculogenesis is suppressed because increased values of AMH, in women with PCOS, increased AMH value have harmful role in disruption of ovarian physiology and worse fertility outcomes⁽⁸⁾. AMH also block the action of the aromatase enzyme, suppose that the AMH participate in the severity of PCOS, therefore can AMH may can be applied as a delegate parameter of classical hyperandrogenism. AMH has two receptors type I receptor (AMHR-I) is a non specific and type two receptor (AMHR-II) is specific by the AMHR2 gene

present on the AMH target organs such as mullerian duct and granulosa cells of ovary, binding of AMH to AMHR2 inhibit follicle development by suppressing recruitment of primordial follicles into the pool of developing follicles⁽⁹⁾.

AMH protein expression initiate at the primary follicle phase, very raise expression is determined in FSH-dependent preantral and small antral follicles of <4mm in diameter and AMH reduced and absent in follicles larger than 8mm. The distinctive feature of PCOS is failure of follicular development, causing anovulation and aggregation of preantral and small antral follicles, which may be contributed to high introduction of AMH⁽¹⁰⁾. Hyperandrogenism quickens preantral and antral follicle growth in the ovary, and expanded LH causes in premature luteinization resulting follicular arrest leading elevated values of AMH. It is likewise proposed the obesity had an extra prohibitory impact on gonadotrophin discharge because of an expansion in convert androgens to estrogens in fat tissue bringing about the concealment of LH and the subsequent restraint

of the dominant follicle⁽¹¹⁾.

level of AMH in women benefit as a biomarker of ovarian storage and refer to the small follicles cannot growth,if low in the clinical state of decreased ovarian store,indicating that presence a little number of follicles in the ovary.AMH block the premature evolution of follicles and eggs,this happen by decreasing the number of FSH receptors on ovaries and preventing the premature egg maturation by FSH in each cycle⁽⁶⁾.

Other importance of this hormone in various pathological conditions of ovaries not only the diagnosis and follow up of ovarian tumors of granulosa cell origin, but also prognosis of ovarian hyperstimulation syndrome and PCOS⁽¹²⁾.

AMH prevent the secretion of FSH and impact on growth of follicle by suppress the expression of aromatase enzyme dependent FSH and luteinizing hormone (LH) receptor.In PCOS ladies,there is a partition that keep the follicles to turn into the predominance follicle.In addition to the reduced value of FSH,increase values of AMH slower the responsiveness of follicles to FSH,therefore the follicles stop development into a predominance follicle,that cause an aggregation of several small antral follicles less than (9) mm in diameter in the ovary⁽¹³⁾.

Anti -ovarian Antibody: -

Polycystic ovarian syndrome is the endocrinopathy and disturbance that cause menstrual impairment and infertility through propagative age,genetic and hormonal status have important function in the pathogenesis of PCOS.Decrease secretion of progesterone in PCOS give rise to over-stimulation of immune system that increase oestrogen secretion that lead to different autoantibodies,have been reported in PCOS, for such as anti-nuclear antibodies(ANA),anti-thyroid,anti-histone,anti-islet cell and anti-ovarian antibodies (AOA)⁽¹⁴⁾.AOA is a group of auto-antibodies against ovarian antigens, include anti-oocyte plasma,oocyte membrane(zona pellucida),different parts of the ovary granulosa,theca interna and lutein follicular cells.Many causes for AOA formation,may be include chronic inflammation of the ovaries, laparoscopic abdominal surgery,the collection of oocytes for assisted reproductive techniques(ART)and also the presence of auto-antibodies against human heat-shock protein 90- β (anti-HSP90 β)in the sera of infertile women,this protein causes ovarian autoimmunity and is considered to be a marker of ovarian damage also associated with POF⁽¹⁵⁾.AOA

disrupt the development and function of oocytes and result a decline in the fertilization rate,thus they could likewise be an autonomous marker for possible ovarian failure.The AOA have antagonistically influence on egg quality or hinder the luteal stage and implantation. Presence of AOA either against tissues ovary or oocytes and presence of these AOA proposes detection of autoimmune process that might be the primary or secondary response to an ovarian combination,found high level of AOA in women after follicular puncture of unsuccessful in vitro fertilization(IVF) trials may be in charge of for the pathophysiology of unprompted miscarriages,additionally found with, endometriosis,other reproductive disorders such as adrenal failure,polyglandular autoimmune disorders,unexplained infertility and PCOS associated with anti-ovarian autoimmunity⁽¹⁶⁾.Another cause in the production of anti-ovarian antibodies may be an autoimmune process of POF.The anti-ovarian antibody are reported in premature ovarian insufficiency(POI),more found of an AOA(30-67%) autoantibodies has been reported in POI patients.A few antibodies in the aggregation of AOA are thought to connect with an immediate activity on ovarian tissue, while others have no such impacts, comparably to autoantibodies in the other autoimmune diseases, therefore it is conceivable that few various antigens are include in the ovarian autoimmunity on the grounds that both ovarian cell and zona pellucida,oocyte antibodies have been documented.The production of AOA in some cases was activated by hormonal incitement of ovaries and coordinated against(LH)receptors,or human chorionic gonadotrophin(HCG)receptors,or both of them,the AOA appraisal,demonstrates that AOA are particular coordinated to theca interna cells.Ovarian antibodies have been appeared to be available in infertile ladies in spite of the fact that demonstrating ordinary level of FSH and inhibin-B,recommending that ovarian antibodies are free indicators of potential of autoimmune ovarian defeat,the pathological importance for presence ovarian antibodies to different cell parts of the ovary can (a)diminish fertilization rates (b)decline pregnancy rates (c)create a poor reaction to gonadotropin prompting (d) influence egg and embryo improvement (e)could be in charge of implantation defeat⁽¹⁷⁾.

Materials and Method

Subjects

The present study consist of 120 women (80

PCOS patients and 40 control) attended from Al-Furat teaching hospital and fertility center of Al-Sadder medical city in Al-Najaf province. They were seen from (June/2018– October/2018). All these patients and healthy control were examined for PCOS diagnosis by ultrasound, measuring parameters including AMH and AOA. The AMH detected by (ELFA) technique by using minividas instrument (Biomerieux, France) and AOA measured by ELISA technique (Human, Germany).

Sample collection:

Venous blood samples (5mL) were collected from all patients and healthy controls by using disposable syringe, the specimens were taken during (2nd–7th) day of the menstrual cycle from those of patients and healthy control. The samples were collected by venous puncture and pushed slowly into a gel tubes, then centrifuged directly by centrifugation at (4000 rpm) for 10 minutes. Serum of AMH was measured immediately before stored and the remaining of the sera were stored at deep freeze in disposable plain plastic tubes, until the time of the analysis of AOA.

A. Inclusion criteria:

All patients must fulfill the international diagnostic criteria for PCOS.

All patients and control group should be more than (15 and less than 40) year.

The PCOS is diagnosed for not than one year ago.

B. Exclusion criteria:

Patients that do not fulfill the international diagnostic criteria for PCOS.

Any diagnosed case of PCOS under current medication.

Control with a previous history of PCOS and recovered

Patients of unexplained causes of infertility

Patients with other chronic disease .

Results and Discussion

Table (1) : Levels of AMH and AOA in sera of studied groups .

Parameters	Patients n=80	Control n=40	Statistics t test	p value	Sig.
	Mean ± SD	Mean ± SD			
AMH	7.75 ± 2.49	2.63 ± 1.21	t = 12.28, df = 118	0.001	HS
AOA	4.92 ± 2.52	4.52 ± 0.29	t= 4.875, df = 118	0.08	NS

The level of AMH in patients and healthy control.

Table(1) and figure(2) explained a highly significant elevation (P<0.01) in the mean concentration of AMH in sera of patients in comparison with the mean serum concentration of control [AMH (7.75 ± 2.49 ng/mL) and (2.63 ± 1.21 ng/mL)], respectively with a highly significant difference (P<0.01). At an optimal cut-off value of (1.19) ng/mL, AMH showed the sensitivity and specificity as 61.0 % and 85.0 % respectively, with a AUR (0.575) (95% CI: 0.471-0.679), as showed in table(2) below and figure(3) below. The current study appeared increased result of AMH in (55.0%) of PCOS patients more than normal value.

Table (2): ROC for studied parameters.

Parameters	Cutoff	AUR	95%CI	Sensitivity%	Specificity%
AMH	1.19	0.575	0.471- .679	61	85
AOA	1.5	0.651	0.552-0.750	88	85

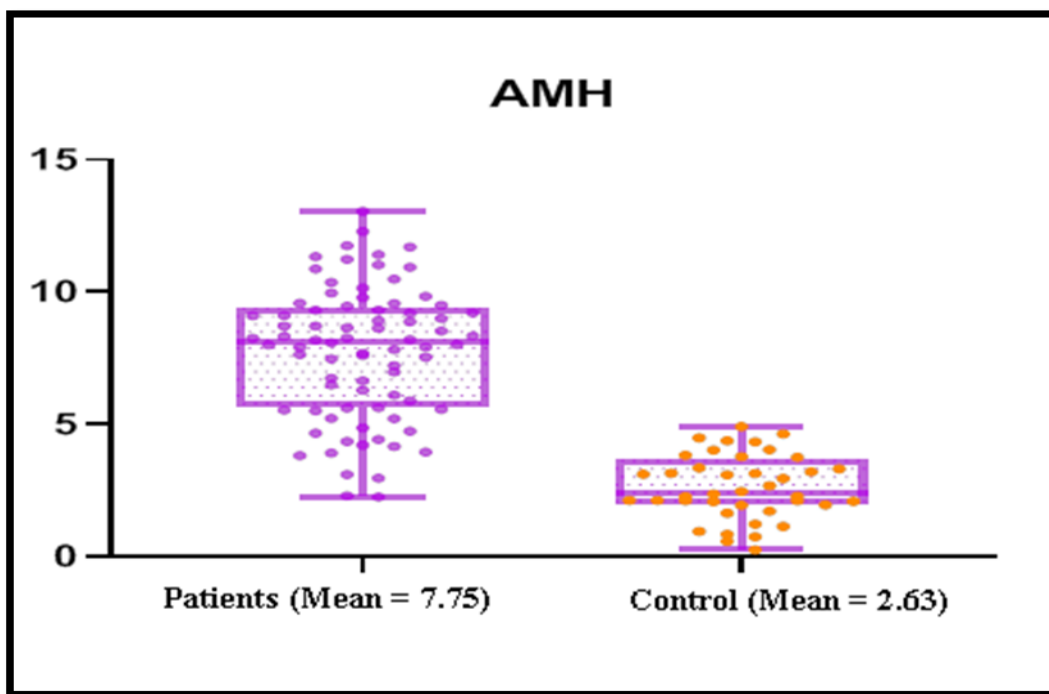


Figure (2): Boxplot of AMH levels in studied groups.

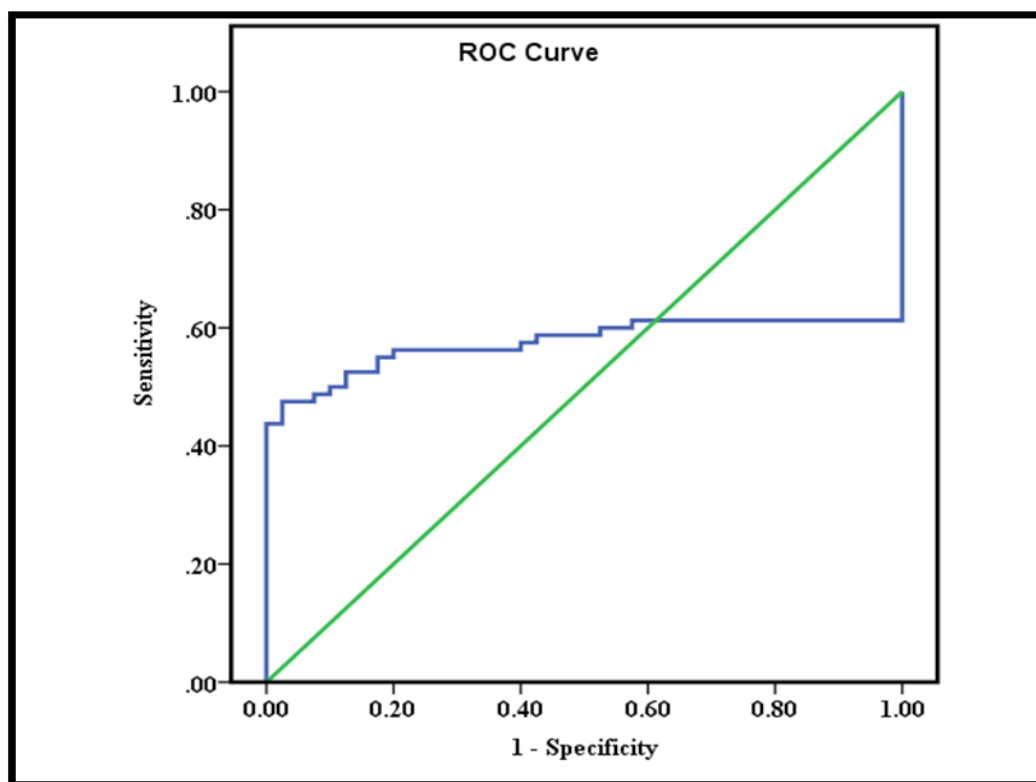


Figure (3): ROC curve analysis of AMH to discriminate the studied groups.

This study agreed with recent Iraqi study finished by (Mohaisen *et al.*,2019)⁽¹⁸⁾ in Misan city. Several recent studies confirmed by (Deshmukh *et al.*,2019)⁽¹⁹⁾ in England and by (Cela. *et al.*,2018)⁽²⁰⁾ in Italy, that

reported increased AMH level in PCOS ladies than healthy ladies. The increase level of serum AMH in PCOS refer to the fact that AMH level indicate the count

of small antral follicles and increased secretion of AMH per follicle and therefore the increased AMH expression has been indicated in the phase of preantral and small antral follicle size (4-8mm) and dissolve in follicle size more than 9 mm⁽²¹⁾.

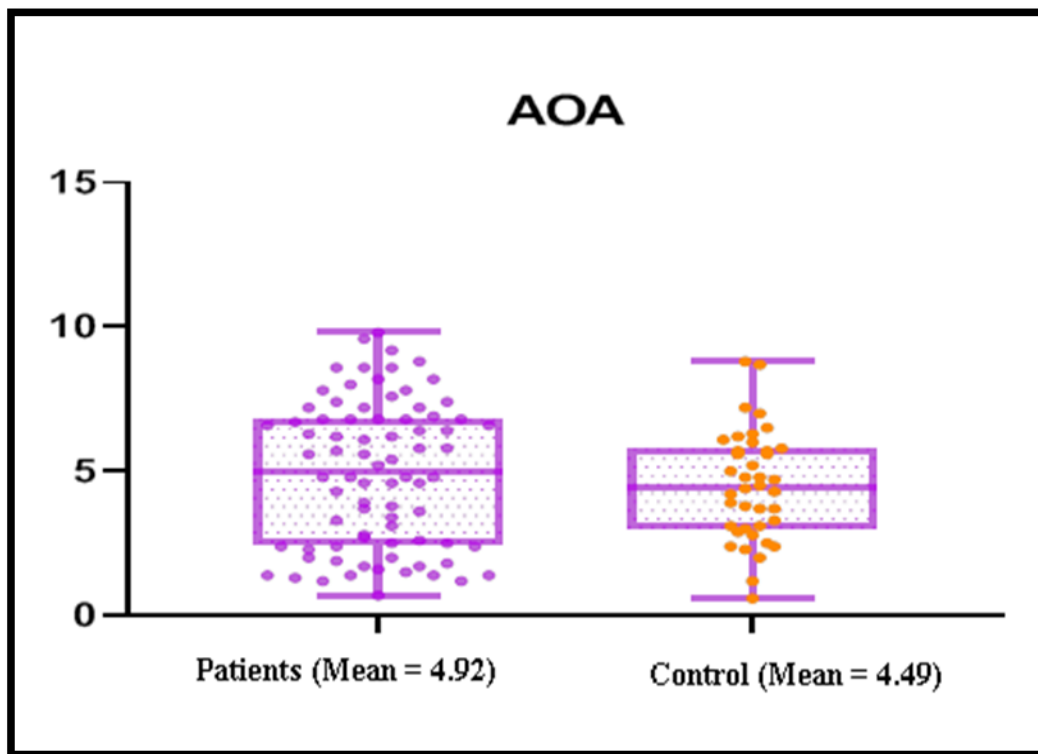
The increase of production of AMH prompt the decrease in the sensitivity of follicles to FSH at levels of receptors, which is very necessary for growing of this follicles, it leads to an increase of the numbers of antral follicles on the detriment of their size and the number of small antral follicles size(2-5mm) increases, therefore failure the selection of the dominant follicle and anovulation occur with oligo or amenorrhea⁽²²⁾.

Other cause for elevation AMH associated with the raise insulin levels that participate to hyperandrogenemia in (PCOS) that result a defect in folliculogenesis, then participate of polycystic morphogenesis of the ovaries

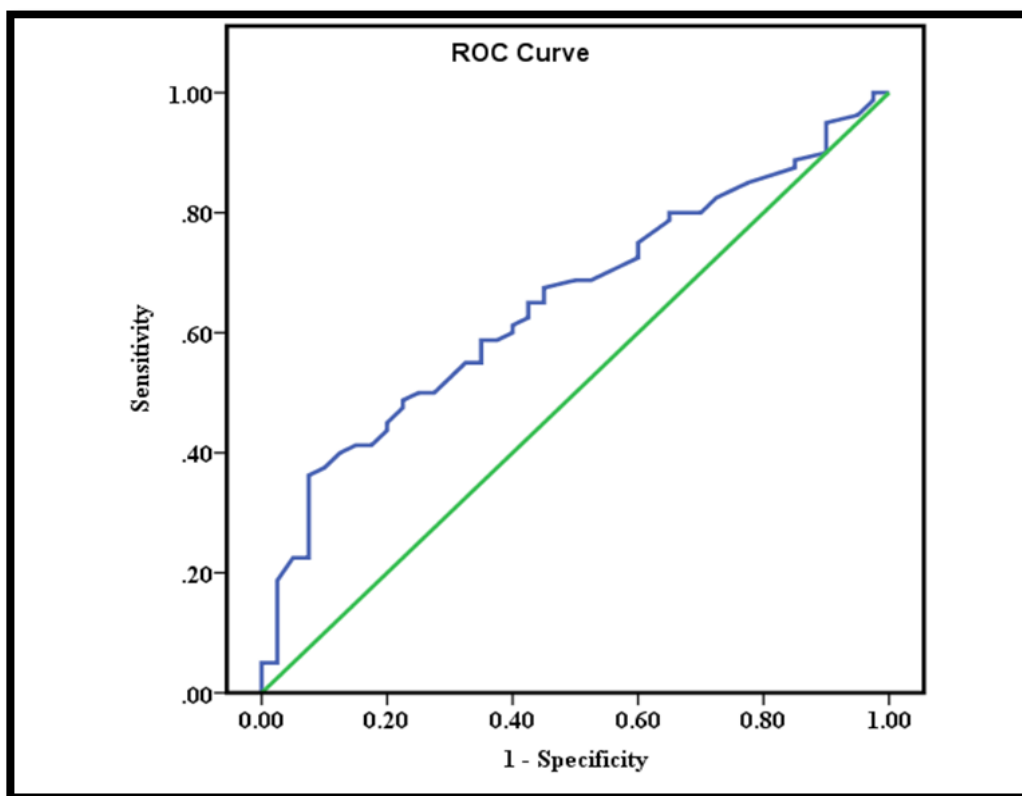
and increased AMH level than normal. An increase level of AMH is indicate either to inflexible anovulation or refer to ovarian hyperstimulation syndrome. Therefore, it is suggested that the apply of insulin sensitizers will decrease insulin resistance, hyperandrogenemia, and also lower AMH level in serum and will alter the anovulatory cycles to ovulatory⁽²³⁾.

Level of AOA in sera of patients and healthy control.

The serum AOA(U/mL) in table(1) and figure(4) illustrated a non significant difference ($P > 0.01$) in the mean concentration of AOA in sera of patients [serum AOA (4.92 ± 2.52) U/mL] in comparison with mean sera concentration of control group [serum AOA (4.52 ± 0.29) U/mL]. At an optimal cut-off value of (1.5) U/mL, AOA showed the sensitivity and specificity of 88 % and 85 % respectively, with a AUR (0.651) (95% CI: 0.552-0.750), as showed in table(2) above and figure(5) below.



Figure(4): Boxplot of AOA level in studied groups.



Figure(5):ROC curve analysis of AOA to discriminate patients from control.

The result of this study explained no correlation between the AOA and PCOS, where all the concentration of the AOA within normal value in patients and healthy control and no significance difference between them.

The studies about the relationship between AOA and PCOS very little, although the AOA is very important analytical tool to detect and explain the mechanism of disease development, evolution and resultant disrupt in the ovary.

The current result of this study agreed with study in USA occurred by (Aritro *et al.*, 2014)⁽²⁴⁾ which failed in different investigations to affirm presence of AOA in PCOS ladies. The study done by (Beata *et al.*, 2016)⁽²⁵⁾ in Poland confirmed a high prevalence of anti ovarian antibodies (AOA) about (30-67%) has been observed in patients with premature ovarian failure (POF).

Other study accomplished by (Pires *et al.*, 2015)⁽²⁶⁾ in USA reported presence of AOA as an auto immune antibody, after failure several attempts of in vitro fertilization (IVF) and also presence of it causes reduce IVF success.

The reason of not detect the presence of high level of AOA in PCOS patients may be due to presence hyperandrogenemia, which considering a protective function, high levels of androgen play a role in PCOS cases and prevent the development of autoimmune diseases⁽²⁷⁾.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Cervical Spinal Stenosis and Risk of Pulmonary Dysfunction: Case Control Study

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Abstract

Background: Cervical spinal stenosis is well-defined as debility in the volume of the spinal canal. Consequently, distracting in the descending neural pathways at any level in the cervical spine lead to impaired smooth and effective breathing under normal conditions .

Objective: To assess the effect of cervical spinal stenosis (C5 and above) on pulmonary function tests , to assess the sensitivity and specificity of pulmonary function tests in patient with cervical spinal stenosis(C5 and above).

Methods: This is a case-control study which included 40 patients divided into two groups 30 females and 10 males patients with cervical spinal stenosis (C5 and above) and 60 healthy volunteers with body mass index < 30 (Kg/m²). Pulmonary function tests has been done for all subjects.

Results: The results demonstrate the comparison between all patients and controls show that VC EX% ,FEV1% ,FVC% ,PEF% ,MVV% , were significantly lower in patients in comparison to control groups as well as VC EX % ,FEV1% ,FVC % were significantly lower in male patients in comparison to controls and in female patients as compared to female controls and MVV% were significantly lower in female patients in comparison to male patients ,while no significant difference has been identified between patients and controls regarding age ,weight , height , BMI,VC IN% and FEV1\FVC % . Sensitivity and specificity and cut off value for pulmonary function tests parameters show FEV1% is the highest specificity and sensitivity.

Conclusion: The respiratory dysfunction that is established in patients with cervical spinal stenosis usually subclinical not overt defect that compromised respiration ,this pulmonary dysfunction is a type of restrictive lung disease since phrenic nerve is affected. . FEV1% is most essential among other parameters of spirometry in patients with cervical spinal stenosis.

Keywords: Cervical spinal stenosis, pulmonary function tests, Spirometry

Introduction

Stenosis of cervical spine is well-defined as a waning in the volume of the canal of spine.^[1] Even though stenosis of the central canal can transpire everywhere alongside the length of the spine, this condition is deliberated more threatening with greater forthcoming for serious neurological sequelae when it occurs in the cervical spine.^[2,3,4]

Degenerative cervical myelopathy DCM is judged to be the most common cord of spine illness, and is predictable to have an increasing prevalence with the aging population in the work world.^[5]

Respiratory function has been well-ordered by the phrenic (C3–5) nerves, the intercostal (T2–10) nerves, and autonomic nerve, especially the sympathetic (T1–L3) nerves. Consequently, distracting in the descending neural pathways at any level in the cervical spine lead to impaired smooth and effective breathing under normal conditions. The effect might lead to the worsening of pulmonary function even if the impairment of neural function was subclinical.^[6,7,8]

Method

This is case control, nonrandomized, single-center study evaluating pulmonary function tests in patients

with cervical spinal stenosis (C5 and above) who attend orthopedic and neurosurgical consultations in AL-Imamian AL-Kadhymiyian medical city during period from November 2018 to May 2019.

40 patients divided into two groups 30 females and 10 males patients with cervical spinal stenosis (C5 and above) with age range from (25 to 70) years and body mass index < 30 (Kg/m²). The duration of their illness ranges from (1 to 24) months.

All patients were clinically examined and diagnosed by MRI with or without CT scanning and X ray of the cervical spine to determine the level of compression. The diagnosis was supported by trans cranial magnetic stimulation (TMS) technique. Smokers and (x) smokers for at least six months, systemic disease known to cause peripheral neuropathies (Diabetes Mellitus), Spinal tumor, chronic pulmonary disease. Central obesity (WC ≥94 cm for men and ≥80 cm for women),^[9] or waist-to-hip ratio (WHR)≥0.90 in men and ≥0.85 in women and a WHTR of >0.50^[9], BMI ≥ 30(Kg/m²) had been excluded from the study. Sixty apparently healthy peoples aged and sex matched nonsmoker nor centrally obese as volunteers control group thirty males and thirty females .Their age ranges from (30-75) with BMI < 30 (Kg/m²).

Pulmonary function tests have been done for all subjects, the result was presented on a discrete paper in a special form. The tests incorporated the following: Vital capacity in inspiration VC IN, Vital capacity in expiration VC EX, Forced expiratory volume in

1st second FEV1, Forced vital capacity FVC, Forced expiratory flow between 25-75 of the FVC or Forced mid –flow (FEF25-75%,FMF), Peak expiratory flow rate PEFR , Mean voluntary ventilation (MVV), ratio of FEV1 to FVC (FEV1/FVC). Predicted values of the Spiro metric parameters were based on the patient's height, age, and sex. The percentage of predicted values was used for comparison.

$$\% \text{ predicted} = \text{measured} \div \text{predicted}^{[10]}$$

The study approved by the Institutional Review Board (IRB) of the college of Medicine, Al-Nahrain University and informed consents were obtained from all the participants.

Statistical analysis

Statistical analysis was performed with SPSS V23. (statistical package for social sciences) and also Excel 2007 programs. Data analysis was done using t-test and the values were considered statistically significant when p-value < 0.05. For each parameter the sensitivity and specificity by ROC analysis.

Results

Table 1 shows that VC EX%, FEV1%, FVC%, PEF%, MVV%, were significantly lower in patients in comparison to control groups (P<0.001), (P<0.001), (P<0.001), (p=0.042), (P=0.037), respectively .While there were no significant difference has been identified between patients and controls regarding age ,weight , height , BMI,VC IN% and FEV1\FVC%.

Table (1): Comparison of data between all patients and all controls by unpaired t test

Parameter	All Patients N=40 Mean±SD	All Controls N=60 Mean±SD	P value
Age (yr)	50.05+12.5	49.92+11.04	0.955
Weight (kg)	67.05+8.04	70.42+9.36	0.066
Height (cm)	159.93+8.99	162.28+9.49	0.217
BMI (kg/m2)	26.21+2.29	26.71+2.29	0.282
VC IN%	90.48+14.35	94.33+13.58	0.177
VC EX%	79.23+11.24	90.86+11.8	<0.001
FEV1%	89.16+15.59	105.53+14.04	<0.001
FVC%	77.26+13.1	90.56+12.69	<0.001
PEF%	85.21+14.82	93.21+21.32	0.042
FEV1\FVC%	95.72+4.08	96.56+3.89	0.302
MVV%	98.42+16.77	106.14+18.55	0.037

Table (2) shows that VC EX %, FEV1%, FVC % were significantly lower in male patients in comparison to controls (P=0.001) (P=0.004), (P=0.002) respectively. While there were no significant difference has been identified between male patients and male controls regarding age, weight, height, BMI, VC IN %, PEF%, FEV1\FVC%, and MVV%.

Table (2): Comparison of data between male patients and male controls by unpaired t test

Parameter	Male Patients N=10 Mean±SD	Male Controls N=30 Mean±SD	P value
Age (yr)	55.5+12.07	52.9+11.38	0.541
Weight (kg)	75.0+6.38	73.87+10.46	0.749
Height (cm)	170.5+5.97	168.4+7.89	0.446
BMI (kg/m ²)	25.78+1.44	25.94+2.43	0.850
VC IN%	84.7+14.11	89.94+12.36	0.269
VC EX%	74.71+7.51	88.32+11.71	0.001
FEV1%	88.18+12.5	105.81+16.36	0.004
FVC%	73.51+9.75	88.9+13.08	0.002
PEF%	89.59+14.02	92.1+16.41	0.667
FEV1\FVC%	95.36+3.11	95.9+4.33	0.715
MVV%	119.11+11.67	119.2+15.24	0.987

Table (3) shows that: VC EX%, FEV1%, FVC % were significantly lower in female patients in comparison to female controls (p<0.001), (p<0.001), (p<0.001) respectively. While there were no significant difference has been identified between female patients and female controls regarding age, weight, height, BMI, VC IN%, PEF%, FEV1\FVC%, MVV%.

Table (3): Comparison of data between female patients and female controls by unpaired t test

Parameter	Female Patients N=30 Mean±SD	Female Controls N=30 Mean±SD	P value
Age (yr)	48.23+12.3	46.93+10	0.655
Weight (kg)	64.4+6.73	66.97+6.65	0.143
Height (cm)	156.4+6.8	156.17+6.59	0.893
BMI (kg/m ²)	26.35+2.52	27.48+1.86	0.051
VC IN%	92.4+14.14	98.73+13.49	0.082
VC EX%	80.74+11.96	93.4+11.53	<0.001
FEV1%	89.48+16.67	105.25+11.54	<0.001
FVC%	78.5+13.96	92.21+12.29	<0.001
PEF%	83.74+15.02	94.32+25.55	0.056
FEV1\FVC%	95.84+4.39	97.22+3.33	0.177
MVV%	91.52+11.79	93.08+10.72	0.594

Table (4) shows that : weight, height, MVV% were significantly lower in female patients in comparison to male patients, ($p < 0.001$). While there were no significant difference has been identified between male and female patients regarding age, BMI, VC IN%, VC EX%, FEV1%, FVC %, PEF%, FEV1\FVC%.

Table (4): Comparison of data between male and female patients by unpaired t test

Parameter	Male Patients N=10 Mean±SD	Female Patients N=30 Mean±SD	P value
Age (yr)	55.5+12.07	48.23+12.3	0.112
Weight (kg)	75.0+6.38	64.4+6.73	<0.001
Height (cm)	170.5+5.97	156.4+6.8	<0.001
BMI (kg/m ²)	25.78+1.44	26.35+2.52	0.507
VC IN%	84.7+14.11	92.4+14.14	0.144
VC EX%	74.71+7.51	80.74+11.96	0.144
FEV1%	88.18+12.5	89.48+16.67	0.823
FVC%	73.51+9.75	78.5+13.96	0.303
PEF%	89.59+14.02	83.74+15.02	0.286
FEV1\FVC%	95.36+3.11	95.84+4.39	0.747
MVV%	119.11+11.67	91.52+11.79	<0.001

Table (5) shows:

Cutoff value of VCIN%, VCEX%, FEV1%, FVC%, PEF%, FEV1\FVC%, MVV%

In ROC were estimated and consequently the sensitivity and specificity were evaluated FEV1% show the highest specificity and sensitivity.

Table (5): Area under curve, sensitivity, specificity and cutoff value for pulmonary function tests parameter

Parameters	AUC	Sensitivity	Specificity	Cut-off value
VC IN%	0.573	53.3%	55.0%	91.25
VCEX%	0.779	70.0%	70.0%	82.2
FEV1%	0.813	75.0%	75.0%	95.1
FVC%	0.784	66.7%	67.5%	82.6
PEF%	0.623	56.7%	60.0%	86.75
FEV1\FVC%	0.554	56.7%	57.5%	97.02
MVV%	0.624	61.7%	62.5%	100.06

Discussion

Patients with compressive cervical spinal stenosis designated by the spirometric data as mild but considerable impairment of respiratory function. Lesion in the cervical spinal cord can lead to respiratory insufficiency by disturbing the descending pathways.^[11]

The present study show no significant differences between age ,height ,weight of patient and control groups and this resembling to study done by (Toyoda et al).^[11]

Pulmonary functions endure the major biologic variable that is affected by aging. There has been great individual variation in the extent of the aging process in the lungs. Even in individuals with good health, there are quantifiable decrements in function of the respiratory system with age.^[12]

The weight is another factor that have been with adverse effect on lung function which showed by various studies.^[13,14] Congregation validation designates that the association between increase in weight and both lung volume and lung function , the lung volume and capacity that reduced in overweight subjects compared with healthy subjects.^[13]

The present study showed that VC%, FVC%, PEF%, FEV1%, MVV% of patients were significantly lower than controls.

The probable explanation for the pathomechanism of this may embrace that the phrenic nerve has been partial injured, decrease in the strength of the respiratory muscle, and the intercostal muscle tone loss. In healthy individuals the parasympathetic activity has been prime, so in the mild respiratory dysfunction imbalance of the autonomic nervous system has been arise.^[11] Consequently, sympathetic activity has been predominant in the chronic compression of the cervical spinal cord in addition to diminish in peripheral airway resistance.

The present study show no significant difference between FEV1\FVC % of patients and controls and this agreement with Bhagavatula et al,^[10] since in our study the result of spirometric data involve normal and restrictive lung function values ,so according to study done by Pellegrino et al^[15] which state that restrictive ventilation disorders are characterized by a reduced TLC with normal FEV1/FVC , Spirometry can confirm that FVC is reduced, while FEV1 may be reduced secondarily to a reduction in FVC, or relatively maintains as normal.

As a result, FEV1/FVC is normal or may increase slightly.

The present study show MVV % was significantly lower in females in comparison to males' patients. This is in accordance with the study done by Budhiraja et al;^[16] this can be attributed to the fact that the men have bigger lungs for the same height as compared to females. Another contributing factor could be the greater strength of respiratory muscles in males.^[17]

The present study shows that FEV1% has the highest specificity and sensitivity among other parameters of spirometry in patients with cervical spinal stenosis since the classification of the severity of obstructive and restrictive impairments based upon the grade of reduction in FEV1 and VC respectively^[18] otherwise the categorizing of restrictive impairment stated by ERS(European respiratory society) in 2005 has been established based on predicted FEV1% ^[15], the categorization of both obstructive and restrictive impairment has been recommended by ERS using FEV1 due to easiness compared to ATS method , the reasonable for such a suggestion, in disorders presenting with restrictive defects, is because the FEV1/VC ratio is conserved (normal or increased) and therefore the reduction in FEV1 has been correlated with the analogous reduction in VC .

Conclusion

The respiratory dysfunction that is established in patients with cervical spinal stenosis usually subclinical not overt defect that compromised respiration ,this pulmonary dysfunction is a type of restrictive lung disease since phrenic nerve is affected. . FEV1% is most essential among other parameters of spirometry in patients with cervical spinal stenosis.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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Molecular Study of *spy1258* gene in *Streptococcus Pyogenes* Isolated from Pharyngitis Patients in Fallujah City

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Abstract

Background : *Streptococcus pyogenes* (GAS) strict human pathogen that give rise to a wide range of diseases. GAS is the most current bacterial cause of pharyngitis and firstly effect school-age children 5-15years of age. SPY1258 gene is a specialized gene group in GAS and its considered specific for GAS and can be used for its detection as a markers.

Method : A total of 300 throat swab were collected from patients suffering from pharyngitis referred to Fallujah general teaching Hospital, Fallujah taeching Hospital for women and chiladren and Amerya general Hospital , Iraq during a peroid between 2018-2019.

Theses samples were submit for bacteriology and molecvular tests.

Results : Out of all samples screened 43 isolates (14.3)were identified as β – hemolytic streptococci and only 13 isolates were detected as streptococcus pyogenes by bacteriology and biochemical test and also by PCR GAS isolates exposed in order to detect the particular gene (SPY1258). Antibiotic sensetivity test showed a high incidence of bacterial resistance to macrolids.

Conclusion : Bacitracin sensetive is non- specific test for the identification of *Streptococcus pyogenes*, and should be used further test, for best result should confirmed by SPY1258 gene. The SPY1258 gene can be used for accurate molecular diagnosis of *Streptococcus pyogenes* .

Key words: *Streptococcus pyogenes*, SPY1258, pharyngitis

Introduction

Streptococcus pyogenes , a group A streptococci (GAS), is strict human pathogen that give rise to a wide range of diseases , from moderate to acute invasive diseases . *Streptococcus pyogenes* is countable for over than 500000 death each year ⁽¹⁾.

β - hemolytic *streptococci* produce a toxin that forms a clear zone of hemolysis on blood agar, confirmation its strength to devastate red blood cells. This hemolysis is referred to toxins created by *Streptococcus pyogenes* called “Streptolysins” which can destroy the red blood cells and also the white blood cells which is responsible for destroying pathogen ⁽²⁾

The skin and mucus membranes of the human host are the only reservoirs for *Streptococcus pyogenes* in nature . The major reservoirs of *Streptococcus pyogenes* are the school aged children (5-15) years ⁽³⁾ .

Pharyngitis(sore throat) is one of the most widespread situation encountered by the family practitioner ⁽⁴⁾.

Streptococcus pyogenes is the most current bacterial cause of pharyngitis and firstly affect school-age children 5 – 15 years of age ⁽⁵⁾ .

The universal development of antibiotic resistance between GAS strains , and the economic crisis emerge out of it in healthcare industries has presupposed the need for an alternative agent with novel texture features⁽⁶⁾

SPY1258 gene is a specialized gene group in *Streptococcus pyogenes* which encodes transcriptional regulators. As transcriptional regulators represent fundamental molecular combination in the adaptation and existence of *Streptococcus pyogenes* (7).

Materials and Method

Three hundred swabs were collected from children with pharyngitis ranging in age from 4 to 14 years, who referred to Fallujah General Teaching Hospital, Fallujah Teaching Hospital for Women and Children, The Health Center of the Primary Health Care Sector in Fallujah, Health Centers in Refugee Camp and Special Medical Clinics in the Fallujah City. During the period from November 2018 to May 2019.

Throat swab was taken from the pharynx of each patient, and immediately placed in a trypton soya broth with 5% blood and transferred to TSA, the plates were incubated at 37°C for 18 to 24 hours under 5-10% CO2, in the candle jar (8).

Identification of streptococcus pyogenes :

The identification of the colonies were confirmed based on morphological and growth features, including the phenotypically discrete colonies, beta-hemolysis on blood agar plate. Biochemical test and Bacitracin discs susceptibility were used in order to confirm streptococcus pyogenes. GAS diagnosis was confirmed by using Vitek 2 Compact.

Antimicrobial susceptibility testing :

The standard disc diffusion method on Muller-Hinton agar supplemented with 5% blood was done in order to confirm GAS isolates and Antimicrobial

susceptibility. Incubated for at least 24 hours at 37°C in air enrichment with 5-10% carbon dioxide. The appropriate discs with known concentrations were used such as Penicillin G, Ceftriaxone, Vancomycin, Azithromycin, Erythromycin, clindamycin, Levofloxacin, chloramphenicol, Ampicillin sulbactam.

The interpretation of the results for the sensitivity testing were done depending on clinical and laboratory standard institute (CLSI).

Effect of Trans-cinnamic acid and 4-amino-2-hydroxybenzoic acid as antibacterial agent :

In our study we tested the effectiveness of some ligands (Trans-cinnamic acid and 4-Amino-2-hydroxybenzoic acid) against the viable cells of different strains of *Streptococcus pyogenes*. The method of Agar diffusion by wells was followed to prove the inhibitory activity of ligands. In this study, four different concentrations (25mg/ml, 50 mg/ml, 75mg/ml, 100mg/ml) of each ligand were applied on five sensitive and resistance strain of *Streptococcus pyogenes* and the inhibitory activity of these ligands determined by measurement of the zone of inhibition.

DNA Extraction :

GAS isolates were inoculated on Brain heart infusion broth and incubated at 37°C for 24 hours. After then genomic DNA extracted from a fresh brain heart infusion broth by using the instructions above.

SPY1258 gene polymerase chain reaction :

SPY1258 gene were synthesized from Alpha DNA (Alpha DNA Co., CA, USA) which were designed according to (7) Table(1).

Table (1) : Sequence of primer sets used for PCR amplification of SPY1258 gene.

Gene	Primer name	Primer Sequence	Product length
SPY1258	SPY1258 (F)	5' AAAGACCGCCTTAACCACT3'	407bp
	SPY1258 (R)	5' TGCCAAGGTAACTTCTAAAGCA 3'	
Company		Alpha DNA / Montreal	

The PCR reaction kit (Gotaq gene master mix) was chosen from the promega and the PCR program which are used in amplification of the DNA target were included in a total volume of 25 µL in 0.5 mL eppendorf tube containing 5 µL templet DNA, 12.5 µL PCR master mix, 2.5 µL of each primer, 2.5 µL PCR water. The reaction for *eaeA* was included in a total volume of 25 µL in 0.5 mL eppendorf tube containing 2 µL templet DNA, 12.5 µL PCR master mix, 2 µL of each primer, 6.5 µL PCR water.

The PCR amplified products were detected and analyzed in 1.3gm% agarose gel electrophoresis with presence of (0.5mg/ml) ethidium bromide , and the detection of the specific band 407bp in UV transluminater.

Results

The results of our study showed that from 300 throat samples from children with pharyngitis , 43 (14.3%) samples were β – hemolytic streptococci , 73 (24.4%) isolates of Alpha – hemolytic streptococci , 87 (29%) isolates of Staphylococcus spp. , 23(7.6%) isolates of candida and 74 (24.7%) throat swab were no growth , table (2) .

Table (2) :Number and percentage of isolated bacterial isolates .

Type of Microorganism	Number of isolate	%
β – hemolytic streptococci	43	14.3%
α-hemolytic streptococci	73	24.4%
Staphylococcus.spp	87	29%
Candida.spp	23	7.6%
Negative throat swab	74	24.7%
Total isolates	300	100%

Out of 43 β- hemolytic streptococci isolates , GAS were detected in 13(4.3%) . The isolates of *streptococcus pyogenes* were identified according to the phenotypic identification criteria . The streptococcus pyogenes isolates belonged to 10(3.3%) male and 3(1%) female patients .

Out of 43 β– hemolytic streptococci there 30 isolates belonging to bacteria other than *Streptococcus pyogenes* were diagnosed , such as *streptococcus Salivarius* , *Streptococcus alactolyticus* , *Streptococcus agalactiae* and *Granulicatella adiacens* .

The results from susceptibility test of *streptococcus pyogenes* are presented in figure (1) , showing that chloramphenicol revealed high activity with 92% of the strain susceptible . In the present study observed the good activity of β – lactams antibiotic against the streptococcus pyogenes with 84% and 70% of the isolates were susceptible to the Ampicillin sulbactam and Penicillin G respectively .

As for Ceftriaxone, it showed greater activity than Penicillin were 76% of strain were sensitive. In this study of clindamycin and Vancomycin were also good active against *streptococcus pyogenes* with susceptibility rate 76% of isolates.

Levofloxacin also revealed good activity 69% of isolates were susceptible.

In this present study *streptococcus pyogenes* revealed high resistance to macrolid antibiotic, the percentage of resistance for Erythromycin and Azithromycin of *streptococcus pyogenes* were 69% and 38% respectively .

The result depicted in figure (1) showed the percentage of bacterial resistant to antibiotic .

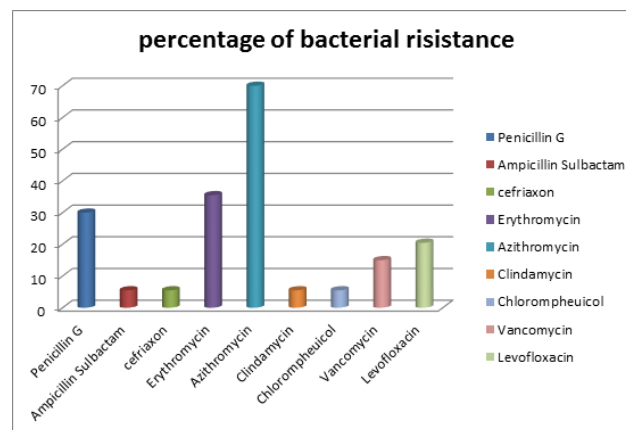


Figure (1) : percentage of bacterial resistant to Antibiotic .

The results revealed high effect of Trans – cinnamic acid and 4-amino-2-hydroxybenzoic acid. Trans-cinnamic acid showed good activity at concentration 75mg/ml and the concentration 100mg/ml . figure (2) .

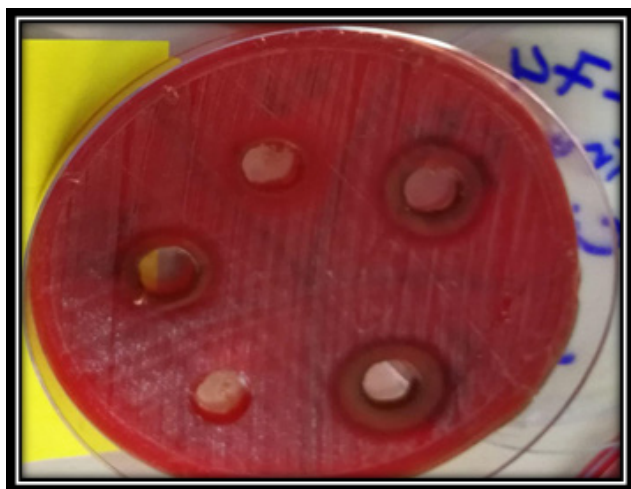


Figure (2) : The results described as high sensitive to the new ligands at concentration 75mg/ml and 100mg/ml .

While 4-amino-2-hydroxybenzoic acid revealed very good activity against *Streptococcus pyogenes* at all concentration figure (3) .

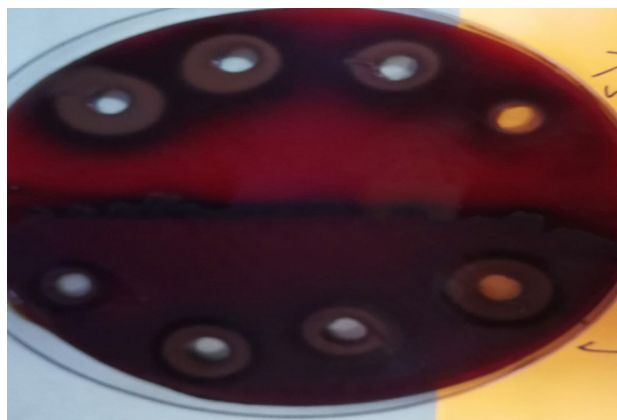


Figure (3) : Excellent activity of 4- amino -2-hydroxybenzoic acid .

The results in the current study were shown that the occurrence of *streptococcus pyogenes* 13 from the total 300 isolates. In the present study, the diagnosis of *streptococcus pyogenes* isolates was confirmed by conventional PCR .

The results depicted in figure (4) reveals the presence of the diagnostic bands of the SPY1258 gene, which has a molecular weight of 407 base pairs in all 13 isolate 100% , that gave positive result to vitek examination .

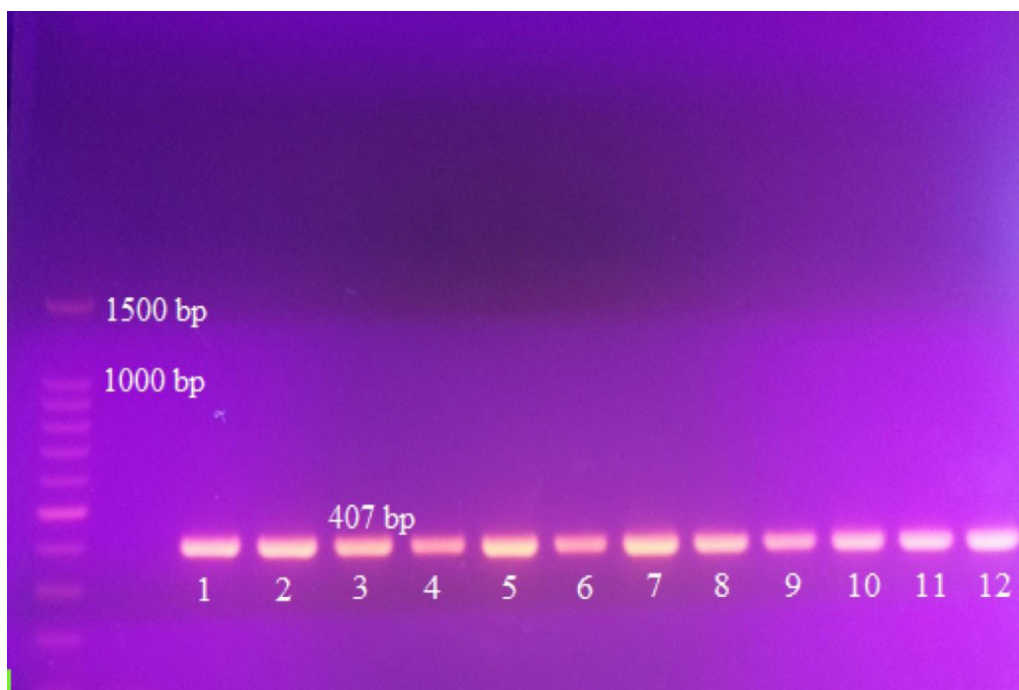


Figure (4) : Gel electrophoresis for PCR product of SPY1258 gene.

Discussion

Our study revealed that *Streptococcus pyogenes* was detected based on bacteriological methods (Bacitracin procedure and vitek compact 2) and identified by PCR

technique. In our study observed that the SPY1258 gene was generated from whole 13 *Streptococcus pyogenes* strains only, but not from all 43 β -hemolytic streptococci isolated, this results confirm that SPY1258 gene was

definit gene only for *Streptococcus pyogenes* and can be used as a marker for its detection⁽⁹⁾. These results were in agreement with studies conducted by⁽¹⁰⁾ this study revealed that SPY1258 gene was particular for GAS only. But not from another species of the genus *Streptococcus*.

And also a agreement with results of⁽¹¹⁾ showed that the SPY1258 gene was present in all *Streptococcus pyogenes* isolates our study finding were disagreement with⁽⁹⁾ who reported that out of 24 *Streptococcus pyogenes* isolate only 21 isolates had this gene.

This study shows that the prevalence of (3.3%) in males was higher than that recorded in females (1%).

These results agreed with that reported by Al-Gebori⁽¹²⁾ in Iraq that indicated male have more prevalence of infection than females. While our study results was in disagreement with⁽¹³⁾ who reported the females were more susceptible and response for infection with males ti ratio (3:1) the prevalence of *streptococcus pyogenes* infection in this study was (4.3%) this is in agreement with finding of⁽¹⁴⁾ who reported a prevalence of 5.3% for *streptococcus pyogenes* pharyngitis. This results were approach to the ration 2.96% obtained by the researcher⁽¹⁵⁾ who reported the prevalence of *streptococcus pyogenes* infection was (2.5%). The results in this study was higher than the results of (1.96%) reported by⁽¹⁶⁾.

The result is lower than a percentage (15.3%) reported by⁽¹⁷⁾.

The lower prevalence of GAS reported in this study, may be due to the fact that major of the patients examined were found to be on antibiotic as most pharyngitis is viral in origin, streptococcus pyogenes pharyngitis is responsible for around 15% over all cases and 80-90% of cases are caused by viruses.

Our study finding that the percentage of resistance for the Erythromycin and Azithromycin were 69% and 38% respectively. This result agreement with findings of⁽¹⁸⁾ who reported high macrolid resistance (40-70%) in Taiwan. This result is dramatically different from that has been reported in Saudi Arabia showed that the resistant was only 6.3%⁽¹⁹⁾.

The main reason for this high rate of resistance that found in the current study, could be attributed to high misuse of Macrolid antibiotic in Iraq.

The present study revealed excellent activity of trans-cinnamic acid and 4-amino-2-hydroxybenzoic acid against *Streptococcus pyogenes*.

This result is in agreement with a work carried out by⁽²⁰⁾ who reported that the cinnamic acid is considered and interesting for the evolution of novel antimicrobials.

This finding is in agreement with a research done by⁽²¹⁾ who revealed that the paraaminobenzoic acid is one of a series of propargyl-linked antifolates, which is very active against GAS and dihydrofolate reductase enzyme from bacterial.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Design in line LMA-10 Photonic Crystal Fiber MZI for Detection and investigation of Beta Thalassemia

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Abstract

Consequent to the scarcity of removable rapid diagnostic examines for detecting the thalassemia, specially beta thalassemia trait or Cooley's Anemia, present detection methods include the collection of the blood, which then required being more tests before reports can be made by the treating physicians. Traditional methods like hemoglobinopathy tests and blood picture are time expending, needing specialized technical personnel, extra huge and costly laboratory instrument. Here, we simulated and demonstrated micro-hole collapsing, type of Mazh-Zehnder interferometer (MZI) that formed using LMA-10 fiber, with a laser beam for detection the most common type of anemia, beta thalassemia trait or Cooley's Anemia. This interferometer made-up of two conventional optical fibers splicing to apart of photonic crystal fiber (PCF). This method makes a high sensitive regions for the optical characteristics in the blood sample. Biological changes in the blood sample consequent to the presence the beta thalassemia trait lead to changes optical characteristics (refractive index and absorption) of the blood sample the demonstrated laser biosensor has the ability for use as a removable, rapid diagnosis examines and the high sensitive which rises to 24.367 ABS/RIU.

Keywords: *Beta Thalassemia; Crystal Fiber MZI; LMA-10 Photonic*

Introduction

DUE TO the special characteristics of optical fibers, they are used in a wide variety of applications specially as a biosensor for high precision measurement⁽¹⁾. These have a large role in different biological applications after production a new design of these fibers, fiber Bragg grating and photonic crystal fiber,^(2,3). Designing Laser biosensor needs a new modification of fiber core either using a new material to produce a fiber Bragg grating (FBG) or by using a new fiber cladding that has many holes arranged in a honey comb with either hollow or silica core⁽⁴⁻⁷⁾. Different techniques must be used for producing in line fiber sensor that are scraping, cleaving and fusion splicing either solid or hollow cores photonic crystal fiber may be with 19 or 7 cells^(8,9,10). Laser biosensors have a many roles in different fields, such as immunoassays and drug detection due to their high precision and sensitivity^(11,12). In general, optical sensors can be distributed into four classes based on changing in light parameters such as polarization modulation intensity modulation, wavelength modulation, and phase modulation.

Intensity modulation was used in early optical sensor development due to its low cost, simplicity, and reliability^(13,14). This intensity modulated signal comes from Fiber Bragg grating as a sensing head that may be used as optical band pass or notch filters^(15,17). The traditional tests of beta thalassemia trait is by hemoglobinopathy analysis and complete genotype which identified the beta thalassemia trait. Beta thalassemia trait also is an important manner for decreasing the expression of HbA2 with level as low as 3.6% on high performance liquid chromatography (HPLC). This type of anemia needs regular blood transfusions and special medical care through their life. The beta thalassemia trait is the most widespread anemia in the south chinees populations. This type of anemia may be not easy to do correct diagnostic who examined on HPLC^(18,19). In this study, we present invasive beta thalassemia trait detection biosensor using in-line PCF MZI and laser beam. This type of sensor depends on light intensity measurement through a modified optical fiber.

LASER BIOSENSOR BASED ON MICRO-HOLE COLLAPSING METHODS: DESIGN AND PRINCIPLE

At the beginning, single mode fiber (SMF-28) had been spliced with an inexpensive 1.5cm solid core photonic crystal fiber length, LMA-10, with cladding diameter: 125 μm and core diameter: 7.0 μm . The cross section of the PCF (LMA-10).

The splicing was done by using Fujikura (FSM-60S) splicing machine according to trial and error. The fusion power and fusion time have been changed.

After the fusion splicing, the air holes of PCF collapsed and an elliptical air cavity was created in the tapering region. The schematic diagram and image of the microscope of the MZI are shown in Fig. 1

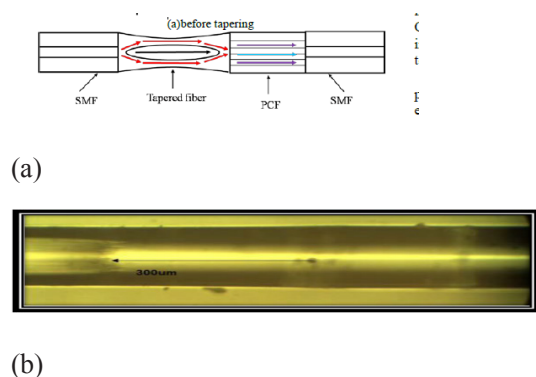


Fig. 1. schematic and microscope image of MZI.

As we know, the output intensity of this interferometer is given by [20]:

Where I represent the intensity of the interference signal, λ is the wavelength, L denotes the interference length, Δn_{eff} denotes the effective refractive index difference between two interference arms. The shift in the output transmission spectrum is caused due to the optical path difference $\Delta n_{\text{eff}} L$ (14,16-19). The MZI after tapering is based on the combination of two types of in-line-fiber Mach-Zehnder interferometer (14-16,18,19).

The interference in the air cavity. At the collapsing region, the beam of the input light is split into two beams. One of these beams transmits through the silica wall, while the other travels along the internal air cavity, and the interference obtains when two output beams recombine at the collapsing region on the other side of the air cavity. In this case, the effective refractive index difference (marked as Δ) can be given as: $\Delta = n_{\text{core}} - n_{\text{cladding}}$, where n_{core} and n_{cladding} Refer to the effective RI of the silica wall and the air

cavity, respectively.

The interference in the photonic crystal fiber. The incident beam gradually expands in the collapsing region between the air cavity and the PCF, and lots of high order modes are excited, including the cladding modes. The high order modes are recombined by the collapsing section on the second side of photonic crystal fiber and interference with the fundamental core mode. Thus, the effective refractive index difference (marked as Δ) can be expressed as: $\Delta = n_{\text{core}} - n_{\text{cladding}}$, where n_{core} and n_{cladding} Refer to the effective RI of the core mode and the cladding mode of the photonic crystal fiber. Finally, Δ are sensitive to the external refractive index while n_{core} and n_{cladding} are not. So Δ of both types of interference will change with external refractive index.

sample testing:

The Absorption Spectrum Measurement of the Blood Sample

A spectrophotometer (SP-8001) which runs in wavelength range from (190-1100) nm has been used to find the UV-Visible absorption spectrum of blood sample. Figure 6. shows the set-up of UV-Visible-IR Spectrophotometer. Sample of blood had been filled in the quartz cuvette and the absorption spectrum found. The selection of the light sources is done according to absorption spectrum have been obtained.

The Refractive Indices Measurement of the Blood Samples

The refractive indices of health and patient blood samples were measured by using Abbe refractometer.

The experimental measuring can be calculated by using the following equation:

Where n_{air} is the experimental RI value measured at temperature, T .

In this study, difference blood samples lead to change the modes effective refractive index of the clad of the fiber. This change of the cladding refractive index (n_{cladding}) due to the change in refractive index value of blood samples changes transmission intensity.

Results and Discussion

The Absorption Spectra for the Blood Sample

The absorption spectra for blood sample and

urine sample are measured by using (T60 UV-VIS) Spectrophotometer to select the suitable wavelength of laser source for the detection set-up. A figure 2.shows the absorption spectra for the blood sample.

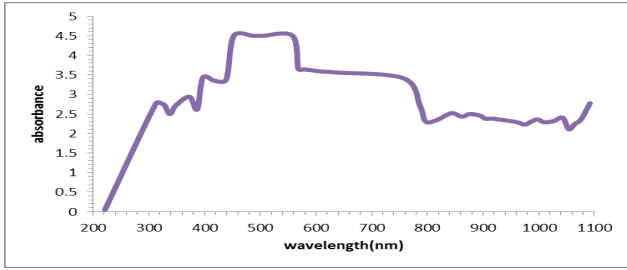


Figure 2.the maximum absorbance of the blood sample is for wavelengths in the range (470-590) nm. Thus, using green laser 532nm as laser source for laser biosensor for blood test is quite convenient.

Detection of Beta Thalassemia Trait by Using Laser Biosensor

As mention previously laser source is used (532nm wavelength, power 12.2nw) which chosen according to the blood absorption spectrum. PCF (LMA-10) with 1.5cm length is used in this experiment. The transmitted intensity of this laser without any blood sample is shown in the figure below:

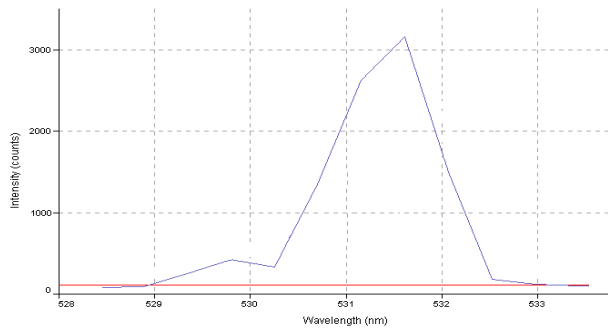


Fig. 3.The output spectrum of the green laser 532nm.

The maximum output reference intensity before immersing sensor with any blood sample was 3159. Blood samples were taken from healthy and patients with beta thalassemia trait. The patient samples were diagnostic from pathological analysis. According to the changes in the intensity modulation of the transmission laser, different blood tests are investigated. The sensor is embedded with these blood samples and the transmission spectra are shown in Fig. 4

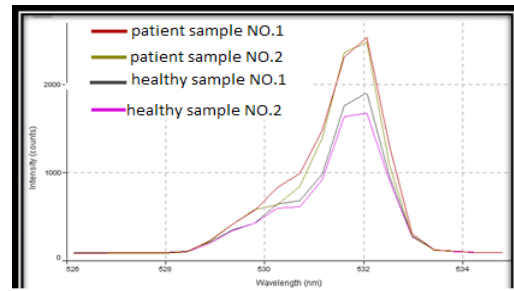


Figure (4): transmission spectra of laser biosensor for blood samples at 1.5cm LMA-10 PCF length.

The refractive indices and absorbance of each blood samples which is measured according to the reference intensity and the maximum intensity are tabulated in Table 1.

Table 1. The values of maximum intensity and absorbance for the blood samples with different Hb concentration at (1.5) cm PCF length.

Blood sample	Refractive Index n	Maximum intensity I ₀ (a.u)	Absorbance $A = \text{Log}_{10} \left[\frac{I_{ref}}{I_0} \right]$
Patient No.1	1.34354	2488	0.1036
Patient No.2	1.34591	2470	0.1068
Healthy person No.1	1.34893	1886	0.224
Healthy person No.2	1.35192	1619	0.2903

As a final result, the calibration curve of laser biosensor for detection beta thalassemia trait is shown in Figure below.

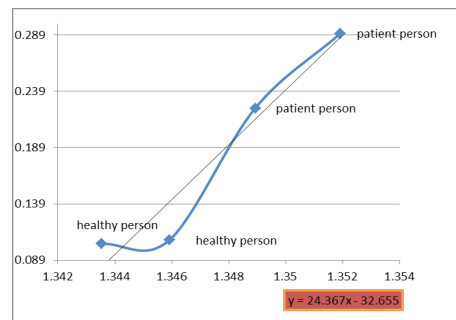


Fig. 5. The calibration curve of laser biosensor for detection beta thalassemia trait at 1.5cm LMA-10 PCF length (sensitivity = 24.367 ABS/RIU).

It's shown from Figure 5 that the presence of beta thalassemia trait leads to decreasing the refractive index and then decreasing in the absorbencies of the blood samples to (0.1036 and 0.1068) comparing with absorbencies of the blood samples of healthy people (0.224 and 0.2903).

Conclusions

According to the results found in this study, by using 1.5 cm PCF length, a fabricated laser biosensor based on MZI for detection beta thalassemia trait shows sensitivity of 24.367 ABS/RIU .the maximum absorbance of the normal blood sample is at wavelengths from (470-590) nm. The presence of beta thalassemia trait shows a decreasing in the refractive index of blood sample. Moreover, the absorbance of blood sample for healthy people showed higher values than those for the sample with anemia.

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The Effect of Oral Magnesium Supplements on Lipid Profile and Oxidative Stress in Adult Albino Female Rats

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Abstract

The present study was designed to show the effect of magnesium on lipid profile and oxidative stress. The present study used 30 adult albino female rats that distributed to following groups (each group consist 6 rats); control group received ad libidum, second group administrated magnesium (orally, 35.7mg /kg) for eight weeks, third group administrated magnesium (orally, 71.4mg /kg) for eight weeks, fourth group (pregnant rats) administrated magnesium (orally, 35.7mg /kg) for eight weeks, fifth group (pregnant rats) administrated magnesium (orally, 71.4mg /kg) for eight weeks, and then killed. The results showed high significant increased ($P < 0.05$) in levels of lipid profile (total cholesterol, total glyceride, high density lipid (HDL), low density lipid (LDL) very low density lipid (VLDL)), especially in pregnant female rats (third and fifth groups) compared with control group. On the other hand, the results showed significant changes ($P < 0.05$) in levels of malondialdehyde (MDA), *Superoxide dismutase (SOD)* and catalase especially in pregnant female rats (third and fifth groups) compared with control group. It was concluded that the prolong using and overdose of magnesium lead to elevated the lipid profile and oxidative stress in rats especially in pregnant female rats.

Keywords: Magnesium; Lipid profile; Oxidative stress.

Introduction

Magnesium (Mg²⁺) has several functions in the human body. It acts as a cofactor for more than 300 enzymes, regulating a number of fundamental functions such as muscle contraction, neuromuscular conduction, glycemic control, myocardial contraction, and blood pressure [1]. Intracellular Mg stores are found in high concentration in mitochondria [2], where this element plays a pivotal role in the synthesis of ATP (adenosine triphosphate) from ADP (adenosine diphosphate) and inorganic phosphate [3]. About 60% of the magnesium is present in bone, of which 30% is exchangeable and functions as a reservoir to stabilize the serum concentration. About 20% is found in skeletal muscle, 19% in other soft tissues and less than 1% in the extracellular fluid [4]. Magnesium levels in the blood are higher than 1.1 mmol in general hyperglycemia which can be clinically observable in patients with nausea, vomiting, lethargy, headaches. When magnesium reach above 3.0 mmol, it may cause acute cardiac disorders such as low blood pressure, lengthening of QRS, PR

and QT intervals. Excessive hyperglycemia can lead to coma, stunting, and death by cardiac arrest [5-8]. So, the aim of study is detecting the toxicity effect of Hypermagnesemia in female adult rats.

Materials & Methods

Animal model

30 adult female rats (*Rattuss norvegicus*), (wt: 240-280 with age: 4-6 Mon) obtained from Veterinary college/Baghdad, and kept on standard pellet diet and water for two weeks before experiment.

Experimental design

30 adult female rats were used and distributed in five groups (six rats in each group) as following and administrated orally:

Control group received normal saline and normal diet for seven days.

Second group administrated magnesium (orally,

35.7mg /kg) for eight weeks, and then killed.

third group administrated magnesium (orally, 71.4mg /kg) for eight weeks, and then killed.

Fourth group (pregnant rats) administrated magnesium (orally, 35.7mg /kg) for eight weeks, and then killed.

Fifth group (pregnant rats) administrated magnesium (orally, 71.4mg /kg) for eight weeks, and then killed.

Prepare of blood solution

5 ml of blood collected by cardiac puncture under anesthesia and put in test tubes. Then using centrifugation 5000 cycle/min for 15 min. Sera were taken and stored by deep freezing to estimate the biochemical measurement.

Measurements

Lipid profile

Total cholesterol and triglyceride were measured by technique according to the instructions of manufacturer company kit (Randox) [9].

Table (1): levels of lipid profile in all groups

Parameters Groups	S.Cholesterol mmol/L	S. Triglyceride mmol/L	HDL mmol/L	LDL mmol/L	VLDL mmol/L
Control group	2.15 ± 0.34 b	1.29 ± 0.27 b	1.07 ± 0.23 b	0.82 ± 0.50 a	0.26 ± 0.05 b
Second group	2.47 ± 0.23 b	2.19 ± 0.81 b	1.20 ± 0.18 b	0.84 ± 0.18 a	0.44 ± 0.16 b
Third group	2.66 ± 0.59 b	2.09 ± 0.43 a	1.23 ± 0.19 b	1.01 ± 0.61 a	0.42 ± 0.09 a
Fourth group	3.45 ± 0.92 a	1.89 ± 0.33 a	2.19 ± 0.05 a	1.09 ± 0.77 a	0.38 ± 0.07 a
Fifth group	3.78 ± 1.01 a	2.11 ± 0.28 a	2.16 ± 0.16 a	1.40 ± 0.32 a	0.42 ± 0.06 a

Oxidative stress and antioxidants

MDA, SOD and catalase in second and fourth groups show non-significant changes ($P < 0.05$) compared with control group. Also, MDA, SOD and catalase in third

Oxidative Stress and Antioxidant Parameters

MDA (malonedialdehydied) was measured based on the colorimetric reaction with thiobarbituric acid (TBA) using spectrophotometer [10]. SOD and Catalase was measured by using the procedure of Biovision-USA kits.

Statistical Analysis

Data of study were analyzed by using a statistical program known as Minitab. data Means were compared using Duncan's Multiple Range test. Probability levels of more than 0.05 were regarded as statistically non-significant, whereas values less than 0.05 were considered as significant [11].

Results

Lipid profile

Lipid profile (TC, TG, HDL, LDL and VLDL) in second and fourth groups show significant changes ($P < 0.05$) compared with control group. While, Lipid profile in third and fifth groups (pregnant rats) show high significant changes ($P < 0.05$) compared with control group as shown in table (1).

and fifth groups (pregnant rats) show non-significant changes ($P < 0.05$) compared with control group as shown in table (2).

Table (2): levels of MDA, SOD and catalase in all groups

Parameters Groups	Malondialdehyde $\mu\text{mol/L}$	SOD mmol/l	S. catalase U/L
Control group	1.79 \pm 0.39 a	147.40 \pm 7.3 a	126.60 \pm 13.28 a
Second group	2.30 \pm 0.63 a	187.20 \pm 55.93 a	118.00 \pm 14.46 a
Third group	1.85 \pm 0.35 a	194.20 \pm 53.4 a	119.60 \pm 14.31 a
Fourth group	2.43 \pm 0.63 a	153.20 \pm 29.138 a	122.60 \pm 14.83 a
Fifth group	1.98 \pm 0.35 a	155.80 \pm 26.58 a	124.20 \pm 14.70 a

Discussion

The results of present study show significant changes in lipid profiles and oxidative stress. Hypermagnesemia has often been described with the use of magnesium containing cathartics for treatment of drug overdose, in patients taking magnesium-containing cathartics and antacids for therapeutic purposes [12]. Arpaci et al referred in their study there was no correlation between magnesium level and levels of cholesterol, LDL and triglycerides [13], that is not agreement with results of the present study. On the other hand, Philips et al, referred that hypermagnesiumemia lead to necrosis and collapse of liver parenchyma, perivenular hepatocellular and canalicular cholestasis with mild macrovesicular steatosis [14], that explain the increased the levels of lipid profile in the present study. About oxidative stress in this study. The present results show non-significant changes between groups that administrated with magnesium and control group. Same findings reported by Barbagallo et al. who established a strong, direct correlation between RBC Mg levels and GSH/GSSG concentration (circulating reduced/ oxidized glutathione) [15]. In another study, a negative correlation between Mg levels and OS stress markers (plasma superoxide anions and malondialdehyde) was observed in groups of the population chronically exposed to stress [16]. Interestingly, no correlation between Mg intake and antioxidant capacity has been found among Korean adults [17].

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and

scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Evaluation of Amateur and Professional Tattoo Removal by the Q Switched Nd:YAG Laser

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Abstract

Background: A tattoo is visible and permanent pigmentation of the skin secondary to the deliberate or accidental deposition of exogenous pigment within the dermis. A variety of procedures have been used to remove tattoos, such as laser therapy, surgical excision, and dermabrasion. QS laser treatment can result in good cosmetic outcomes and complete or near-complete removal of many unwanted tattoos.

Objective: to evaluate the QS Nd:YAG laser effects for amateur and professional tattoos removal.

Materials & Methods: The study was done on 293 tattoo lesions from 176 patients (in both genders), there were 239 amateur tattoos (136 patients) and 54 professional tattoos (40 patients). Tattoos on a wide range of body sites (limbs, feet, face, chest, shoulders and legs) were treated. Ages were between 17- 60 years. In this work, tattoos were divided to amateur and professional tattoos. A Q-switched Nd:YAG laser system was used throughout this study. All tattoos containing black and blue pigment were treated at 1064 nm. Tattoos containing red pigment were treated at 532 nm. Treatment was scheduled at 4-6 weeks intervals and continued until maximum clearance of the tattoo was achieved, and the number of sessions varies from one to five sessions. For assessment of degree of lightening the method proposed by Lanigan was used: grade 1, complete response (> 95% lightening); grade 2, excellent response (76–95% lightening); grade 3, good response (51–75% lightening); grade 4, fair response (26–50% lightening); grade 5, poor response (0–25% lightening).

Results: Amateur tattoos were often more numerous than professional tattoos. Eighty per cent of tattoos (198 of 239) were clinically clear at the time of analysis, this included 70.7% (169 of 239) which were ≥ 95% clear. Overall 56.6% of amateur tattoos were clinically clear after two treatments, and 82% (110 of 134) were clinically clear after 2-3 treatments, while the clinical clearance rate was 40% after six treatments for professional black tattoos. It is anticipated that response rates will increase when tattoos at an early stage of treatment receive further treatments, and P value was (0.004) which means that there is significant difference between two groups.

Conclusion: Amateur tattoos generally require fewer treatment sessions and the response is better than professional tattoos.

Keyword: *Q-switched Nd: YAG laser, Amateur tattoo, Professional tattoo.*

Introduction

Tattoo removal is an increasingly common office procedure often performed by dermatologists with special training in tattoo removal. A variety of procedures have been used to remove tattoos, such as laser therapy, surgical excision, and dermabrasion. Quality-switched (Q-switched, QS) lasers are the standard of care for tattoo removal and treatment can result in good

cosmetic outcomes. A tattoo is visible and permanent pigmentation of the skin secondary to the deliberate or accidental deposition of exogenous pigment within the dermis. There are five major subtypes of tattoo [1,2]:

- **Professional tattoos** – are decorative tattoos placed by professional tattoo artists using a handheld tattoo gun that delivers uniformly deep dense dermal injections of ink. Pigment is deposited more deeply in

the dermis than most amateur tattoos, which can make professional tattoos more difficult to remove. Over time, the ink colors fade as a result of pigment migration into the deeper dermis and to regional lymph nodes via lymphatic's.

●**Amateur tattoos** – are decorative tattoos performed by nonprofessionals, and are often placed by using a handheld needles that deliver India ink or carbon injected at variable depths into the skin . Amateur tattoos are most often black and may contain ingredients such as charcoal, soot, or pen ink and are more superficially placed than professional tattoos.^[2-4]

Cosmetic tattoos - are often applied freehand by cosmetologists to provide permanent makeup in areas where one would apply eyeliner, lip liner, or eyebrow pencil.

Medicinal tattoos- are small gray or blue-black markings placed by medical personnel to designate radiotherapy fields or port placement sites. Similar to amateur tattoos, they are typically composed of a sparse amount of India ink or carbon pigment.

Traumatic tattoos- result from deposits of foreign particles such as metal, glass, dirt, and carbon-containing particles into the skin following mechanical penetration, often follow blast injuries or trauma.^[4,5]

Laser tattoo removal is based on the concept of selective photothermolysis. This theory, first described in the early 1980s by Anderson and Parrish, revolutionized the landscape for laser therapy by allowing for precise tissue targeting, thus ameliorating the risk of dyspigmentation and scarring associated with earlier therapies such as depigmenting agents, cryotherapy, and dermabrasion^[6-10]

The longer wavelength of the Q-switched Nd:YAG laser at 1064 has proven to be more effective in removal of black tattoo, with better penetration of the dermis, less likelihood of absorption by epidermal melanin, and a reduced risk of hypopigmentation. The improved efficacy is attributed to the longer wavelength, higher fluence, and shorter pulse width, and the Nd/YAG laser, at 532nm, has also been used successfully on red tattoos.^[4,11,12]

Patients and Method

262 consecutive tattooed patients were treated at my private dermatology clinic, between June 2010 and

December 2018. From these 262 patients, 66 were excluded because they did not come back after the first laser appointment; therefore a total of 176 patients (159 male and 17 female), and 293 tattoos was included in our study. The patients were aged 17-60 years with skin types III-IV. There were 239 amateur tattoos (136 patients) and 54 professional tattoos(40 patients). Tattoos on a wide range of body sites (limbs, feet, face, chest, shoulders and legs) were treated.

A Q-switched Nd:YAG laser system was used throughout this study. The operating characteristics of the laser were as follows: wavelength 1064nm and 532nm, with spot sizes 3mm in diameter and frequency 6 Hz. The pulse duration was ≤ 15 ns and the energy output 800mj and 500mj respectively. Radiation was delivered via an articulated arm and hand-piece, at a fixed energy density of 10 J/cm². This energy level was selected on the basis of a previous report which showed that energies of 10 or 12 J/cm² cleared tattoos more effectively than lower energy levels^[13].

All tattoos containing black and blue pigment were treated at 1064 nm. Tattoos containing red pigment were treated at 532nm. Treatment was scheduled at 4-6 weeks intervals and continued until maximum clearance of the tattoo was achieved, and the number of sessions varies from one to five sessions. .

Pretreatment evaluation included a clinical description of the site, shape, color and density of each tattoo and photographs taken at each visit, progress was assessed by estimating the percentage area of the tattoo that visibly clear.

For assessment of degree of lightening the method proposed by Lanigan^[14] was used: grade 1, complete response (> 95% lightening); grade 2, excellent response (76–95% lightening); grade 3, good response (51–75% lightening); grade 4, fair response (26–50% lightening); grade 5, poor response (0–25% lightening). The occurrence of adverse events, such as itch, pain, infection, hyperpigmentation and hypopigmentation, were recorded at each visit.

The Nd/YAG laser pulse, at 1064 nm produces an immediate ash white discoloration and slight elevation of the tattooed skin at the site of impact. These changes are accompanied by an audible cracking sound, a brief flash of white light at the target site, and a shock wave which is palpable in the surrounding skin. A typical

wheel and flare reaction follows and the residual erythema fades over 24 hour, and protective shielding of the operator and patient are required. Although transient hyperpigmentation is common, the normal texture of the skin and epidermal markings are retained. The 1064 nm pulse has no significant effect on normal non-tattooed skin.. The Nd/YAG laser pulse at 532nm produces an immediate pure white discoloration and elevation of the skin at the impact site. There is a marked reduction in the auditory component and palpable pressure wave, compared with the 1064nm wavelength. Hypopigmentation occurs commonly at the treatment site, due to the absorption of the 532 nm pulse by epidermal melanocytes.

After laser treatment antibacterial cream was applied, and the patients were advised not to scrub the area, and if a scab should form, it should not be picked, scratched, or removed prematurely.

Results

The age of all patients was ranged from 17-60 years. Amateur tattoos were, in general, acquired at an older age (mean age 33.02 ± 7.9 , range 17-60) than professional tattoos (mean age of 31.12 ± 7.16 , range 19-45 years).

Amateur tattoos were often more numerous than professional tattoos, the patients had two or more tattoos, and one had five tattoos **Table 1**. The majority of tattoos were on the arms 127 (43.3%), forearms 91 (31%), hands 37 (12.6%), Face 17 (5.8%), chest 8 (2.7%) , shoulders 6 (2%), legs 5 (1.7%), and feet 2 (0.6), **Table 2**

Table 3 shows the current status of 239 amateur black tattoos after treatment at 1064 nm. A clinical clearance was defined as a $\geq 75\%$ area clearance of the tattoo. Eighty per cent of tattoos (198 of 239) were clinically clear at the time of analysis. This included 70.7% (169 of 239) which were $\geq 95\%$ clear as shown in **figure 1**. **Figure 2** shows the clearing of a typical amateur tattoo following a one session of treatment.

Table 4 shows the progressive clearing of a typical amateur tattoo following a series of treatments and the cumulative response by the number of treatments, for 136 amateur tattoo patients. The average number of treatments to achieve clinical clearance was two. The higher number of treatments associated with lower percentage clearance in this group suggests that some tattoos are relatively slow responders. Tattoos achieving

less than 50% clearance had received less treatment than the other groups. Overall, 56.6% of amateur tattoos were clinically clear after two treatments, and 82% (110 of 134) were clinically clear after 2-3 treatments.

Table 4 shows the responses of 54 professional black tattoos after treatment. Seventy-four per cent (40 of 54) were clinically clear, including 50% (27 of 54) which were $\geq 95\%$ clear. The progress of a professional tattoo after six treatments is shown in **table 3** and **figure 1**. The cumulative response by number of treatments for 40 professional tattoo patients is shown in **table 4**. Overall, the clinical clearance rate was 40% after six treatments for professional black tattoos. **Figure 2** shows the progressive clearing of a professional tattoo following a third session of treatment.

It is anticipated that response rates will increase when tattoos at an early stage of treatment receive further treatments and the P value was (0.004) which mean that there is significant difference between two groups.

Table (1) Details of 293 tattoos (239 amateur, 54 professional) in 167 patients.

No. of tattoos per patient	Amateur	Professional
1	64	26
2	43	11
3	19	2
4	7	-
5	1	-

No. = number

Table (2) Site involved and number of tattoos.

Site involved	Amateur	Professional	Total
Arms	101	26	127 (43.3%)
Forearms	79	12	91 (31%)
Hands	31	6	37 (12.6%)
Face	12	5	17 (5.8%)
Chest	6	2	8 (2.7%)
Shoulders	5	1	6 (2%)
Legs	3	2	5 (1.7%)
Feet	2	0	2 (0.6%)

Table (3) Current status of 239 amateur and 54 professional tattoos after laser treatment.

Area cleared	Amateur	Professional
≥ 95	168 (70.29%)	27 (50%)
75-95	29 (12.13%)	13 (24.07%)
50-75	17 (7.11%)	12 (22.22%)
25-50	12 (5.02%)	0
0-25	13 (5.43%)	2 (3.7%)

Table (4) Number of laser treatments used for different tattoo types.

No. of sessions	Amateur	Professional
2	77 (56%)	3 (7.5%)
3	33 (24.2%)	4 (10%)
4	14 (10.2%)	6 (15%)
5	2 (1.4%)	10 (25%)
≥ 6	8 (5.8%)	16 (40%)

No. = number

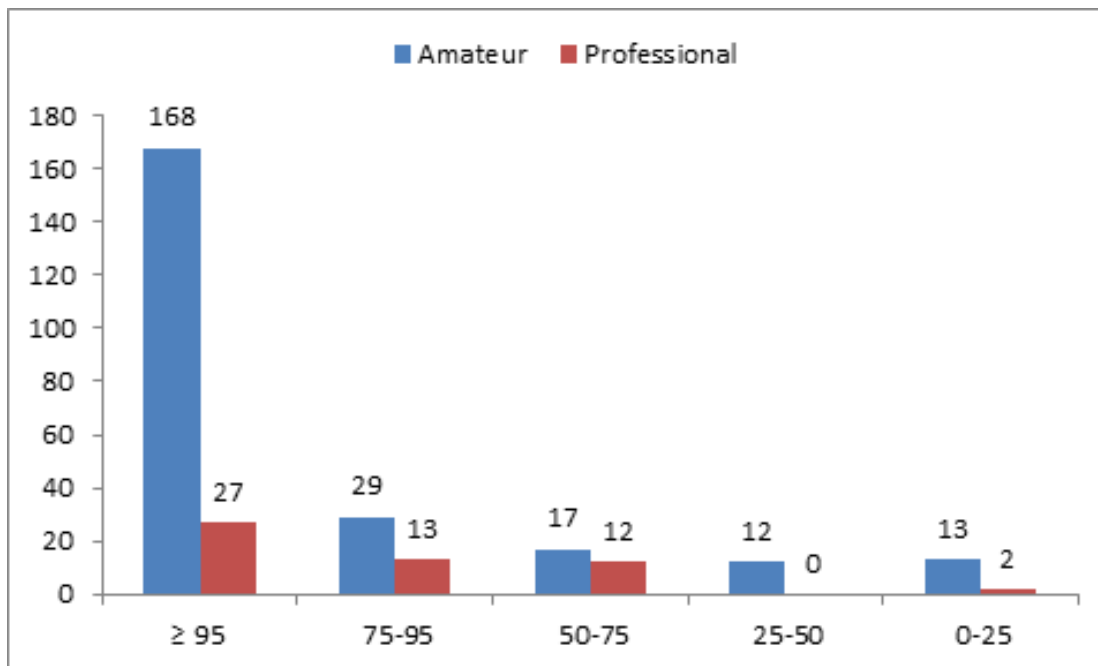


Figure (1) Area cleared of 239 amateur and 54 professional tattoos after laser treatment.

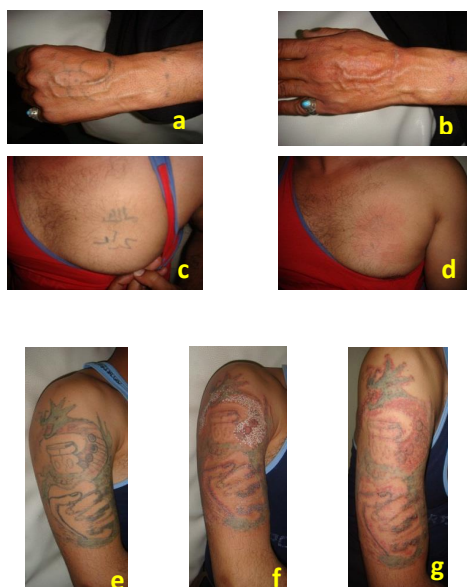


Figure 2 Amateur tattoo on the back of the hand: (a) before treatment: (b) 1 month after the first treatment. And amateur tattoo on the chest: (c) before treatment: (d) 1 month after treatment. Both Show $\geq 95\%$ clearance of tattoo. Professional tattoo on the right arm: (e) before treatment: (f) immediately after first session: and (g) 1 month after the third treatment. Showing slight clearance of black and red tattoo and persistence of green tattoo.

Discussion

Complete laser tattoo removal requires multiple treatment sessions, typically spaced at least 4- 6 weeks apart. At each session, some but not all of the tattoo pigment particles are effectively fragmented, and the body removes the smallest fragments over the course of several weeks. The result is that the tattoo is lightened overtime. [15, 16] Immediately after laser treatment, a slightly elevated, white discoloration with or without the presence of punctuate redness is often observed. This white color change is thought to be the result of rapid, heat-formed steam or gas, causing dermal and epidermal vacuolization. Pinpoint bleeding represents vascular injury from photo acoustic waves created by the laser's interaction with tattoo pigment. [17]

We evaluated in our clinic the efficacy of a laser system providing QS lasers with the wavelengths of 1064 nm and 532 nm treat various types of tattoos. The Nd:YAG laser is an effective treatment for amateur black tattoos and has a low incidence of side effects.

We did not use topical anesthesia in our study because our patients tolerated well to procedure. The energy that selected is 600-800mj because at this range

this energy is enough to cause immediate whitening without punctuate bleeding or immediate blistering to target tattoo lesions at 3 mm spot size. [4,18] And this explains no scar formation i.e. in higher energy density may cause skin damage and subsequently scarring.

Previous study regarding amateur tattoo show that the majority (60%) attain an excellent response after 1 or 2 treatments, but a minority (3.3%) require up to five treatments. Those tattoos with a $< 50\%$ response had received very few treatments. [4]

In our study also show that the majority of patients (82%) attained excellent response in 2-3 sessions, and the minority of patient (5.8%) require more than six sessions in amateur tattoo. While professional tattoo about 40% of patients need more than six sessions, the increasing response with the increasing number of treatments suggests that this group are likely to respond to further treatments.

In other previous study was showed those ten amateur tattoos and two professional tattoos. Of these, amateur tattoos showed an improvement of 69% by GAS and 58% by the PA. In contrast, professional tattoos showed a 40% lightening by GAS scoring and 35% improvement by PA. [19]

Similar finding was seen in our study, an average improvement $\geq 95\%$ in 168(70.29%) patients with amateur tattoos, while response in professional tattoo was 50% (27 patients) .

Amateur tattoos had a quicker clearance rate than professional tattoos. Professional tattoos may require 4-6 sessions more for clearance as compared to amateur tattoos, and this goes with many previous studies. [20-22] Amateur tattoos are less dense with more superficial location of pigment, which is easier to clear. However, few amateur tattoos have deeply placed ink and may be difficult to remove.

In comparison between two group professional and amateur tattoo in response to Nd:YAG laser the P value was (0.004), which means that there is a significant difference between two groups .

Conclusion

The Q switched Nd/YAG laser is an effective treatment for both black and red tattoos with a low incidence of significant adverse effects and provides excellent cosmetic results. Amateur tattoos generally

require fewer treatment sessions and the response is better than professional tattoos.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Serum Levels of Novel Biochemical Marker (Irisin) in Relation to the Duration of Type 2 Diabetes & in Cases of Type 2 diabetes with Coronary Artery Disease in Iraqi Patients Aged (40- 60 year)

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Abstract

Background: Type 2 diabetes mellitus (T2DM) is a metabolic syndrome that affects a large proportion of the population, if not well controlled; this will lead to serious metabolic problems, including atherosclerosis, predominantly coronary artery disease (CAD).

Irisin is a peptide hormone, secreted mainly by the heart and skeletal muscle. It has a role in converting white adipose tissue to brown adipose tissue. It is one of the novel biochemical markers that link diabetes with CAD.

Objective : To explore the relationship between serum Irisin level and duration of diabetes, in cases of presence and absence of CAD, As well as the possibility of using it as a marker for the assessment of the severity of the disease.

Method: One hundred sixty-one volunteers aged [(40-60 year), body mass index (20- 25Kg/m²)], with normal blood pressure. They divided into six groups, that distributed as [(I_a = control (negative catheterization without DM), I_b = control (apparently healthy), II_a = DM (with negative catheterization) II_b = DM (diagnosed by history and clinical examination), III_a = CAD (without DM, positive catheterization), III_b = CAD + DM (positive catheterization)]. The diabetic groups with and without CAD had been divided depending on the duration of the diabetic onset into three periods (<5, 5-10, and > 10 years). The parameters that measured were FPG, HbA1c and fasting serum (Irisin, lipid profile).

Results: The present findings showed the Means (\pm SD) value of Irisin levels was a significant decrease in (II_a, II_b, III_a, III_b) groups as compared with control groups (I_a, I_b). In addition, there is an inverse relationship between serum Irisin and the duration of DM in the total DM groups (II_a +II_b) and the CAD + DM group (III_b). Moreover, higher statistical decrease in mean serum level of Irisin with duration of DM was found in CAD + DM group as compared with the total DM group. Also, there was a significant decrease in mean serum level of HDL-C for (II_a, II_b, III_a, III_b) groups than in (I_a, I_b) groups. Besides, there was a significant decrease in the mean of serum HDL level in CAD groups (III_a, III_b) than in DM groups (II_a, II_b). While the means of FPG level, HbA1c, serum cholesterol level, were significantly elevated in groups (II_a, II_b, III_b) as compared with (I_a, I_b) groups. Also, there was a significant increase in the mean serum levels of triglyceride, VLDL-C and LDL-C for (II_a, II_b, III_a, III_b) groups than in the control groups.

Conclusion: Irisin was lower among patients with long-standing diabetes (with or without CAD) as compared to those with short duration of T2DM that can be included as a marker for assessment the severity of diabetes and prediction of CAD.

Keywords: Irisin, duration of T2DM, CAD.

Introduction

TYPE 2 Diabetes Mellitus (T2DM) is a heterogeneous syndrome, manifested by abnormalities in carbohydrate and fat metabolism. It is characterized by insulin resistance, a relative deficiency of insulin secretion and abnormal insulin action as a result; abnormal glucose homeostasis ⁽¹⁾.

Abnormality of insulin secretion and insulin action at the target tissues associated with a defect in management leads to hyperglycemia. When hyperglycemia persists for prolonged periods, patients can develop various complications, including both microvascular like, nephropathy, retinopathy, and peripheral neuropathy, and macrovascular, e.g., cardiovascular disease (CVD) ⁽²⁾.

In January 2012, Bostrom and colleagues identified a new muscle tissue secreted peptide, which they named Irisin. It is a cleavage product of fibronectin type III domain-containing protein FNDC5 ⁽³⁾.

Irisin containing (112 amino acid), acts as a hormone (glycosylated protein- hormone), that is released from skeletal muscle following exercise. Irisin secreted by the response of peroxisome proliferator-activated receptor-gamma co-activator (PGC-1 α) activation via training ⁽⁴⁾.

Irisin is mainly produced in the heart, skeletal muscle, kidney, and liver. It is essential to convert white adipose tissue to brown adipose tissue ⁽⁵⁾.

Irisin affect glucose homeostasis. It had also been regarded as an anti-inflammatory marker, in correlation with diabetes and insulin resistance ⁽⁶⁾. Circulating Irisin is positively associated with endothelium-dependent vasodilation in diabetic patients without clinical angiopathy, indicating that low level of circulating Irisin tightly related to endothelial dysfunction and could be a marker for atherosclerosis in T2DM ⁽⁷⁾.

Subjects & Methods

Subjects

One hundred sixty-one voluntaries from (The specialized center for endocrinology and diabetes) and (Cardiologic clinics of Ibn- Al-Bitar hospital) were encountered in this study (September 2017 - September 2018). They were divided into six groups, table (1).

Table (1): Groups numbers and distributions

Groups	Criteria	Voluntaries NO.
I _a	Control / negative catheterization without DM	28
I _b	Control /apparently healthy	25
II _a	DM / with negative catheterization	30
II _b	DM / diagnosed by history and clinical examination	25
III _a	CAD without DM / (positive catheterization)	20
III _b	CAD + DM / (positive catheterization)	33

Method

Two methods have been used:-

Enzyme-linked immunosorbent assay (ELISA) for measuring Irisin (after three months stored in deep freezing -80°C) in the central health laboratory, using the kit supplied by my biosource/USA.

Enzyme colourimetric methods for measuring FPG, HbA1c, Lipid profile, by a spectrophotometer using kits provided by Human Gesellschaft fur Biochemica and mbHMax- Planck Germany.

Besides [the electrocardiogram (ECG), ECHO, tread mill] were done for the groups (I_b, II_b) while groups (I_a, II_a, III_a, III_b) diagnosed by clinical examination of coronary computed tomography angiogram (CCTA), and they undergo catheterization (either diagnostic or therapeutic), this is according to their cardiologist decision (Regardless of search requirements).

Statistical Analysis

The statistical package for social sciences version (SPSS-23) has been used. The statistical significance of the difference in mean of a normally distributed quantitative variable was assessed by the analysis of variance (ANOVA) test, and the statistical significance of the difference in mean between all possible pair of groups was assessed by the least standard deviation (LSD) test. P-value ≤ 0.05 considered being statistically significant.

Results

There was a significant decrease in means serum levels of Irisin for overall groups when compared with that found in control groups [P-value = 0.003]. While the results showed no significant difference in mean of Irisin level [between control groups (I_a and I_b), between diabetic groups (II_a and II_b), and among groups (II_a, II_b, III_a, III_b)], table (2), figure (1).

Table (2): The difference in means of serum Irisin		
Parameter Groups	Serum Irisin (ng/ml) (mean ± SD)	
I _a	A 29.341± 16.213	
I _b	A 30.149 ± 16.032	
II _a	B 9.014 ± 2.009	
II _b	B 9.675 ± 1.931	
III _a	B 5.777 ± 0.450	
III _b	B 3.728 ± 1.283	
LSD	7.427	
P- value	Sig. 0.003	
The Letters (A, B, C) are significant at P ≤ 0.05 (comparison among groups)		

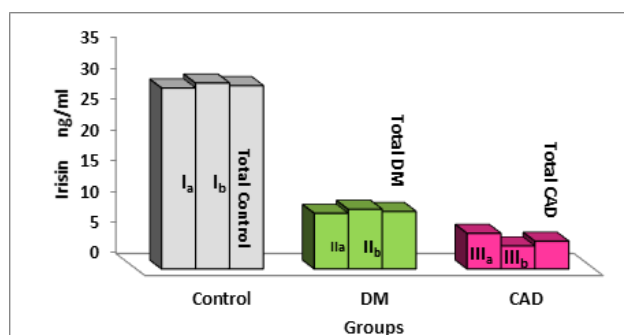


Figure (1): Bar chart showing the difference in mean of serum Irisin

There was an inverse relationship between serum Irisin level and the duration of incidence of T2DM in the [total DM groups (II_a + II_b) and CAD + DM group (III_b), table (3) figure (2).

In the total DM group, the mean serum level of Irisin was [(12.347±0.712ng/ml), (10.922±1.316 ng/ml) and (8.295±1.259ng / ml) when DM duration [($<5y$), (5-10y) and ($>10y$), respectively], There were significantly decreased in mean of serum Irisin levels when the duration of DM was increased (LSD =0.954) [P- value (0.0018)].

In the (III_b) group, the mean serum level of Irisin was [(4.9527±0.3178 ng/ml), (4.0562±0.5580 ng / ml) and (2.4649±0.9561ng / ml)] when DM duration [($<5y$), (5-10y) and ($>10y$), respectively], The results show significant difference in mean of serum Irisin level between duration ($<5y$, 5-10y) compared ($>10y$) (LSD >1.07). While there was no significant difference in mean of serum Irisin level between duration ($<5y$) and (5-10y). (LSD < 1.07), [P- value (0.0026)].

The highest statistically difference in mean serum levels of Irisin with a duration of DM was found in (III_b) group as compared with (total DM) groups, [P- value (0.00031, 0.00046, 0.00053)] for duration [($<5y$), (5-10y) and ($>10y$), respectively], as shown in table (3), figure (2).

Table (3): The difference in mean between serum levels of Irisin and the duration of T2DM in Total DM group & in CAD + DM group

Group Duration (year)	Total DM (II _a + II _b) (mean ± SD)	CAD+DM (III _b) (mean ± SD)	LSD	P-value
<5	A,a 12.347±0.712	A,b 4.9527±0.3178	3.281	0.00031
5-10	B,a 10.922±1.316	A,b 4.0562±0.5580	2.185	0.00046
>10	C,a 8.295±1.259	B,b 2.4649±0.9561	2.966	0.00053
LSD	0.954	1.07	0.0026	
	P-value	0.0018		

The Letters (A, B, C) are significant at $P \leq 0.05$ (comparison in the same group)
 The Letters (a, b) are significant at $P \leq 0.05$ (comparison between Total DM group and CAD + DM group)

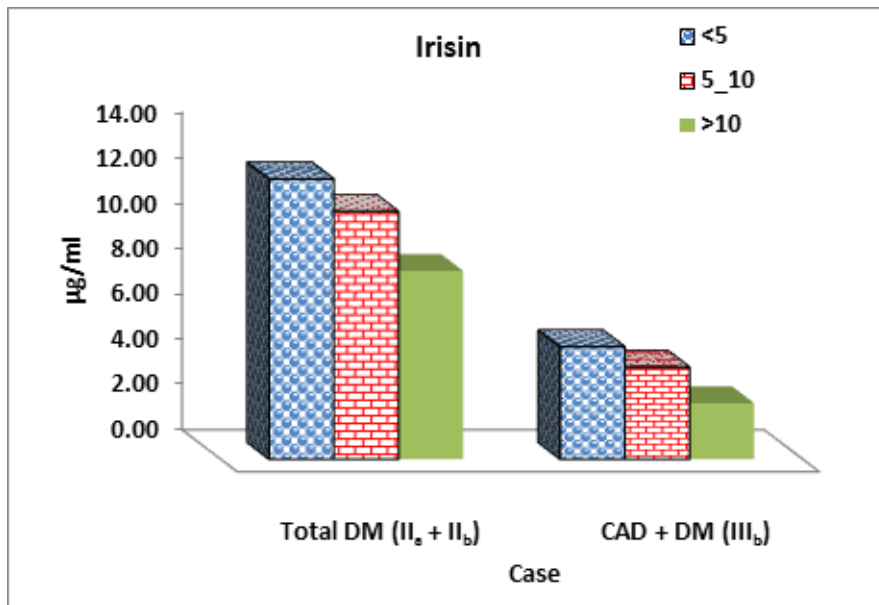


Figure (2): Bar chart showing the difference in means between serum Irisin level and duration of T2DM in total DM and in CAD + DM group

There was a significant increase in means of FPG and HbA1c for overall groups when compared with that found in control groups except in (III_a group), it was no significant difference. The results showed no significant

difference in mean of FPG and HbA1c levels [between control groups (I_a and I_b), between diabetic groups (II_a and II_b), and among groups (II_a, II_b, III_b)], table (4).

Table (4): The mean serum level of fasting plasma glucose and HbA1c

Parameters Groups	FPG (mean \pm SD)	HbA1c (mean \pm SD)
I _a	A 94.68 \pm 6.99	A 5.146 \pm 0.453
I _b	A 95.08 \pm 6.37	A 5.392 \pm 0.526
II _a	B 215.13 \pm 79.85	B 8.497 \pm 2.015
II _b	B 214.24 \pm 85.59	B 8.360 \pm 2.324
III _a	A 95.10 \pm 5.73	A 5.125 \pm 0.343
III _b	B 229.76 \pm 99.44	B 8.615 \pm 1.528
LSD	52.649	1.170
P- value	Sig. 0.00027	Sig.0.00014
The Letters (A, B, C) are significant at P \leq 0.05 (comparison among groups)		

There was a significant increase in means of serum cholesterol and triglyceride for overall groups when compared with that found in control groups except in (III_a group), it was no significant difference. The results showed no significant difference in mean of cholesterol and triglyceride levels [between control groups (I_a and I_b), between diabetic groups (II_a and II_b), and among groups (II_a, II_b, III_b)].

There were a significant decrease in means serum levels of HDL-C for overall groups when compared with that found in control groups. While there was a significant increase in means of serum LDL-C and VLDL-C for overall groups when compared with that found in control groups. The results showed no significant difference in mean of HDL-C, LDL-C and VLDL-C levels [between control groups (I_a and I_b), between diabetic groups (II_a and II_b), and among groups (II_a, II_b, III_b)], table (5).

Table (5): The mean serum level of lipid profile

Parameters Groups	Cholesterol (mg/dl) (mean \pm SD))	TG (mg/dl) (mean \pm SD)	HDL-C (mg/dl) (mean \pm SD)	LDL-C (mg/dl) (mean \pm SD)	VLDL-C (mg/dl) (mean \pm SD)
Ia	A 99.07 \pm 23.37	A 151.93 \pm 29.13	A 46.143 \pm 6.559	A 85.93 \pm 32.42	A 19.857 \pm 4.625
Ib	A 94.16 \pm 35.60	A 152.72 \pm 28.98	A 46.920 \pm 12.926	A 85.68 \pm 26.08	A 18.880 \pm 7.114
IIa	B 173.20 \pm 28.54	B 210.70 \pm 36.07	B 35.667 \pm 9.319	B 141.10 \pm 41.23	B 34.667 \pm 5.809
IIb	B 174.16 \pm 66.11	B 212.96 \pm 48.19	B 37.680 \pm 9.728	B 136.92 \pm 45.42	B 34.920 \pm 13.260
IIIa	A 128.95 \pm 29.68	B 237.20 \pm 35.96	C 28.200 \pm 9.950	C 182.90 \pm 39.81	C 25.750 \pm 5.946

Cont... Table (5): The mean serum level of lipid profile

IIIb	B 168.61 ± 66.73	B 238.64 ± 46.73	C 22.606 ± 6.113	C 179.12 ± 55.57	B 33.758 ± 13.339
LSD	36.840	30.683	7.289	33.328	7.380
P- value	Sig.0.00011	Sig.0.00011	Sig. 0.00009	Sig. 0.00017	Sig. 0.00024
The Letters (A, B, C) are significant at $P \leq 0.05$ (comparison among groups)					

Discussion

There was a significant decrease in mean serum level of Irisin for (II_a, II_b, III_a, III_b) as compared with that found in (I_a, I_b) groups. Also, when compared the serum levels of Irisin between DM subgroups with and without CAD showed that Irisin decreased when CAD existed but did not reach the significant level (maybe due to small sample size) as shown in the table (2), figure (1).

A study performed by Zhang *et al.* supports the current study the authors found a significant decrease in serum Irisin in T2DM, which further confirmed the potential role of Irisin in glucose metabolism and diabetes. Additionally, when compared the serum levels of Irisin between diabetic patients with and without macrovascular disease, they had found that Irisin significantly decreased when macrovascular disease existed. So they suggested that Irisin would be a potential target for monitoring and intervention of T2DM and its associated vascular complications such as CAD (8). Besides, the founding of the current study resembles those found by El-Lebedy *et al.*, who reported that serum Irisin was significantly lower in diabetic patients and CVD as compared to the control group. Also, Deng reported that serum Irisin level was lower significantly in patients with CAD as compared with healthy controls (9).

The above results were in agreement with more recent results, by Khorasani *et al.*, who found that serum Irisin level was lower in diabetic patients with cardiovascular complication compared with uncomplicated diabetic patients (10).

Studies that have been done to compare the levels of circulating Irisin with the healthy control group have shown a protective effect of Irisin against the development of CVD. Several potential mechanisms have been proposed for this issue. Irisin plays a vital

role in the preservation of endothelial cell function and reduces endothelial damage by inhibiting inflammation, and oxidative stress, so the low levels of Irisin affect the endothelial function and increase the incidence of atherosclerosis. Besides lower circulating, Irisin levels can increase the accumulation of advanced glycation end-products (one of the causes of vascular complications in diabetic patients) (11).

The data and the results in this research did not show any significant difference between the two DM groups (II_a, II_b) for all measured parameters in this study. Therefore, they can be merged and deal with as a single group (total DM) as shown in table (3), figure (2).

The present study showed a significant inverse relationship between serum Irisin and the duration of incidence of T2DM in the [total DM group (II_a + II_b)] and the [CAD+DM group(III_b)], Irisin decreases significantly as the period of diabetes increases as shown in table (3), figure (2).

These results resemble the finding of Liu *et al.*, who pointed out that long-term diabetes is associated with a significant reduction in levels of Irisin (12). Also, the results confirmed those found by two previous studies in which there was a negative correlation between duration of diabetes and Irisin level (13).

Conclusion

The serum level of Irisin is affected inversely by the persistence of diabetes with or without coronary artery disease for an extended period, and the level of decline is significant decrease with an increase in the period of diabetes. Therefore it can be used as a prognostic marker for estimation of the severity of the T2DM.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and

scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Study the Effect of Temperature Variable on the Patient with Jaundice Stay Period inside the Incubator

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Abstract

This study is used for measuring the temperature of incubator during its used in the treatment of newborns who suffering from jaundice. The present system is characterized as low cost, easy to use and does not require a highly skilled operator, in which that used of DHT22 sensor based on the Arduino hardware platform. This system facilitates the continuous monitoring and the true knowledge of the temperature of the incubator for determination the period of stay of the child with jaundice in the hospital. In addition, the current system represents not only the possibility of knowing the temperature of the incubator but also a tool to assess the incubator's performance, and find out the percentage of error in the temperature and the difference between the required temperature and the real temperature.

Keywords: Jaundice ; Patient ; physical parameters;

Introduction

Newborns are at raised risk of jaundice, a condition during which excess bilirubin accumulates in the blood. Left untreated, jaundice will result in neurological impairment and death. Jaundice ensuing from unconjugated hyperbilirubinemia is well treated with exposure to blue light¹.

Immediately once giving birth, the child is transferred to a new and completely different surroundings for the mother's womb environment. This setting is certainly not protected and isn't appropriate initially for the child's life because of the changing factors surrounding the newborn particularly the temperature. The premature newborn is homoeothermic, however over a long amount, he cannot maintain the thermal processes. The energy he provides is employed within the following order of priority: for the functioning of important organs, for thermoregulation and growth². Thus it should give a healthful hydrothermal environment to decrease the risk of body hypothermia or hyperthermia for newborn infant³.

The process of measurement the temperature of the therapeutic environment and so understand the perfect conditions for the treatment process is one among the

most necessary things that should be of high interest, because it's an excellent link between the conditions and factors related to the treatment method, and therefore facilitate the study of the impact of temperature alone or combined with different factors in effecting on diagnosing and treatment method.

The Arduino system is considered one among the simplest and most versatile electronic solutions in terms of easy use and speed of learning still as low price of producing components as well as simple to connect and programming by computers, additionally the availability of those electronic components in the local markets, permitting the research worker to work in a very wide space of ideas to dynamical developing and therefore let to get output a lot of comprehensive solutions and optimality.

The main goal of this study is to manufacture an easy system which will provides a precise perception of measurement the temperature within the incubator and therefore facilitate to calibrate and determine the appropriate degree of treatment.

Theory

Neonatal jaundice is one among the foremost

common conditions needing medical attention in newborn babies. About 60% of term and 80% of preterm babies develop jaundice within the 1st week of life, and concerning 10% of breastfed babies are still jaundiced at age one month. Neonatal jaundice is usually harmless, however high concentrations of unconjugated bilirubin could occasionally cause kernicterus (permanent brain damage)⁴.

Neonatal jaundice is common, as a result of physiological jaundice or breastfeeding. In some neonates, unconjugated bilirubin concentration, in addition to different risk factors, is sufficient to permit free bilirubin to cross the blood-brain barrier and cause kernicterus. Another subgroup of infants is jaundiced as a result of elevated conjugated bilirubin; a marker for several pathological conditions. Bilirubin measuring should determine those infants in danger⁵.

Bilirubin is produced from the catabolism of heme within the reticuloendothelial system as shown in Fig. (1). This unconjugated bilirubin is released into the circulation wherever it's reversible however tightly bound to albumin. When the bilirubin-albumin complicated reaches the liver cell, it's transported into the hepatocyte wherever it combines enzymatically with glucuronic acid, manufacturing bilirubin mono- and diglucuronides. The unconjugated bilirubin is reabsorbed into the bloodstream by way of the enterohepatic circulation, adding bilirubin load to the already overstressed liver. This enterohepatic circulation of bilirubin is a crucial contributor to neonatal jaundice⁶.

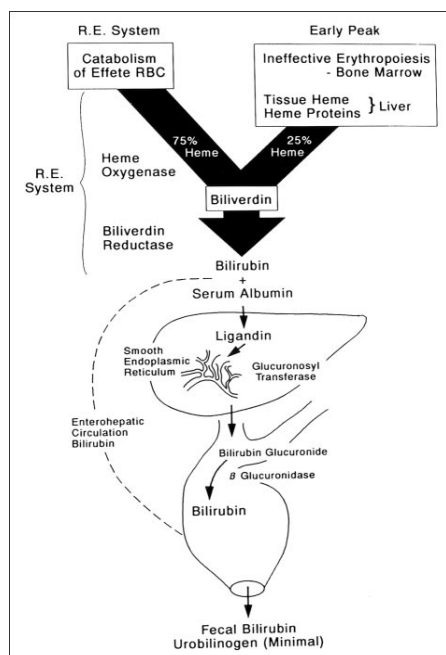


Fig. (1) Bilirubin Cycle.

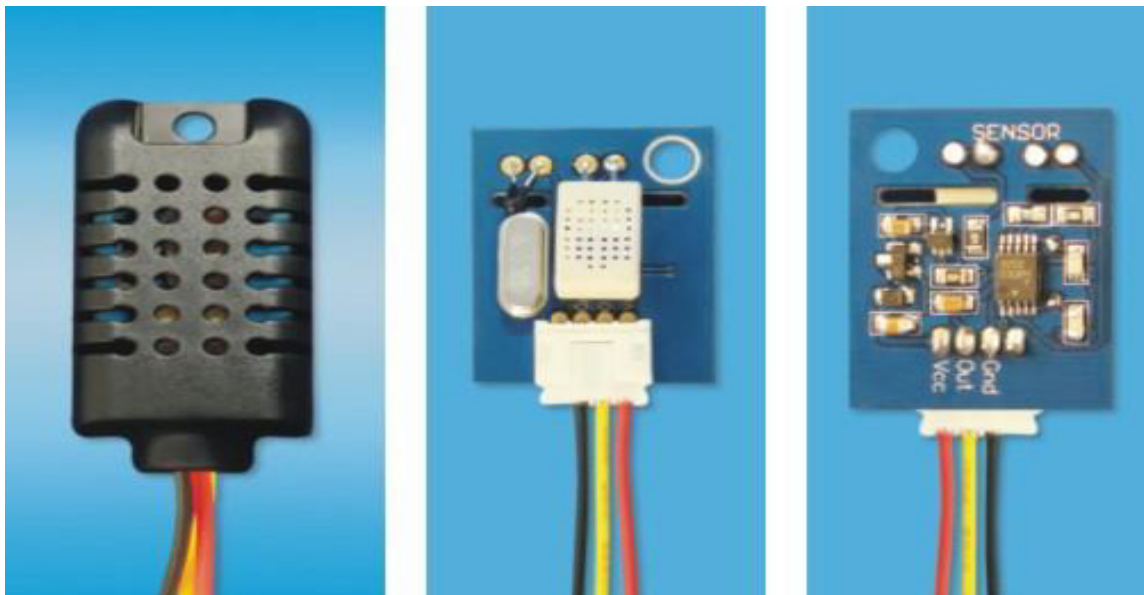
Materials and Method

The hardware and software are the main components of this technique, the hardware consists of two elements that are the AM2301 thermal sensing element and also the Arduino Uno platform.

The incubator was in the hospital which has its heat supply, through this sensing circuit the temperature of incubator is measured during treated the newborn with jaundice.

DHT21

The AM2301 thermal sensing element, that sensing digital temperature which contains the compound that has been calibrated the digital signal output of the temperature sensor. Application of a dedicated digital modules collection technology and also the temperature sensing technology, to make sure that the merchandise has high reliability and wonderful long-term stability. The sensing element includes a capacitive sensing element wet components and a high-precision temperature measuring devices and connected with a high-performance 8-bit microcontroller. The merchandise has wonderful quality, quick response, sturdy anti-jamming capability, and low price. The shape of procedures, the standardization coefficients hold on within the microcontroller, the sensor among the process of the heartbeat to call these calibration coefficients. Standard single-bus interface, system integration fast and simple. Small size, low power consumption, signal transmission distance up to twenty meters, creating it the most effective selection of all types of applications and even the most demanding applications. Product for the 3-lead (single-bus interface) connection convenience. Special packages in keeping with user wants⁷. Fig. (2) Illustrates the DHT21



sensor.

Fig. (2) The configuration of DHT21 sensor.

ARDUINO UNO

The Arduino Uno has shown in fig. (3) utilized in this study, that is a microcontroller board grounded on the ATmega328 (datasheet) was chosen as the microcontroller for this study. This was a perfect choice, as the processor is extraordinarily strong and cost-effective. It contains of 14 digital input/output pins (out of that 6 is utilized as PWM outputs), six analog inputs, a 16 MHz ceramic resonator, facilitation for USB connectivity, a power jack, an ICSP header, and a button. Its styles comprise of help that supports the microcontroller in each possible way. To induce to figure with it one has to merely connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery⁸.

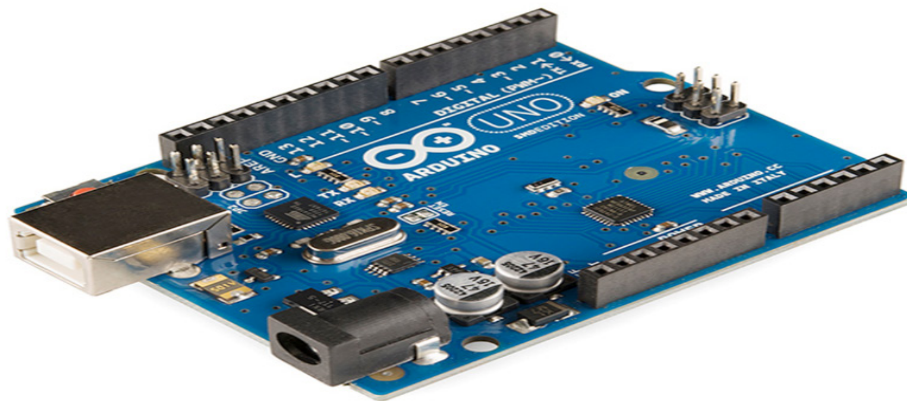


Fig. (3) The Arduino (Uno) type.

A systematic strategy was used for the design of this study, during which the obtained temperature of the incubator was to be detected for 135 patients with jaundice.

So, the information collected from the external sources that are the incubator were obtained employing a sensor. The strategy of management used is a microcontroller, that reads the results obtained from the sensing element to be then mentioned and show the impact on the speed of the healing process for a patient with jaundice.

Results

The measurement system that used in this study enables a real perception of temperature in the incubator environment during the presence of the newborn with jaundice, thus the results obtained represent exactly the conditions experienced by the newborn with jaundice during the treatment, which directly affect the speed of treatment.

To check the real readings of the proposed approach, the temperature of 135 patients with jaundice was compared to the time spent in the hospital is shown in table (1), and also see fig. (4) Which represent the relationship between the time which the child spent at the hospital and the incubator temperature range (° C) for all patients.

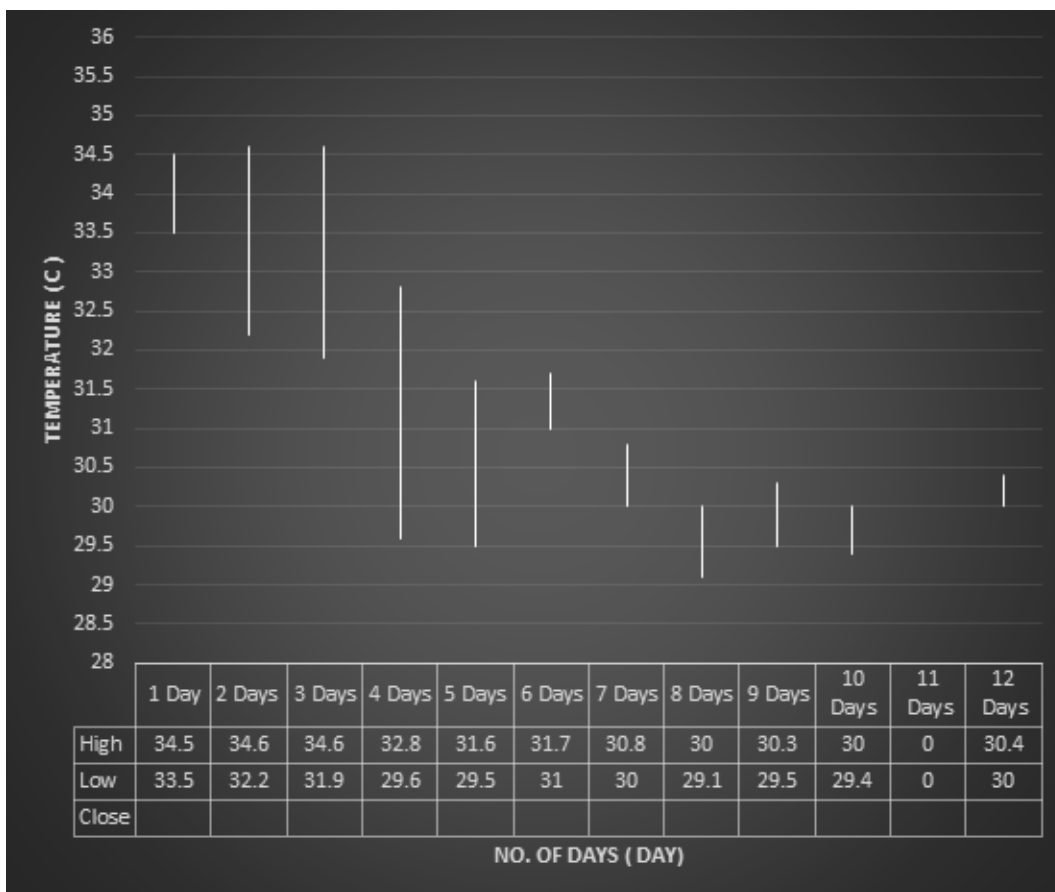


Table (1) Illustrates the relationship between incubator temperature ranges with staying period in the hospital.

NO.	Period of staying in hospital	Incubator temperature range (
1	1	33.5-34.5
2	2	32.2-34.6
3	3	31.9-34.6
4	4	29.6-32.8
5	5	29.5-31.6

6	6	31-31.7
7	7	30-30.8
8	8	29.1-30
9	9	29.5-30.3
10	10	29.4-30
11	11	-
12	12	30-30.4

Fig. (4) The relationship between the period of staying in hospital and corresponding temperature ranges.

Discussion

The incubator is considered an artificial womb and

will have the most vital effect of protecting newborn. One of the most important duties of the incubator is to control the temperature of the newborn to achieve thermal neutrality, which is achieved by control temperature stability in the incubator. However, this study shows that there is a large swing in the temperature from one to another, although the fixed value is the same, and that is due to the difference in efficiency of each incubator parts because of its operational life and its ability to work such as heat source and heat radiator and efficiency of thermal insulation of the incubator walls, In addition to the external effect of room temperature at the temperature of the incubator.

This work opens the way for comprehensive study on the conditions affecting the temperature in the incubator to design an ideal incubator that provides ideal conditions that will help to actually reduce the treatment period for patients with jaundice.

Conclusions

The concluding observations of this study explain the effect of the temperature which is the most popular variable affected on the patient stay period in hospital.

It was clearly found that the performances of the fixed environment factors including temperature, humidity and other factors in the mother's womb will disappear immediately after birth. This situation places the newborn in a state of sudden environmental change which requires a necessary and quick adaptation. The child who cannot cope with the new environment and if the mother is different in the blood group and RH factor in addition to children who born before 37 weeks (pre-term) the baby will suffer from jaundice disease.

It is obvious that the changes in baby temperature from the mother's womb temperature is considered as one of the conditions causing or helping diseases and therefore difficult to cure.

It is clear that the patient stay period of the children with jaundice inside the incubator was closely related to the incubator's high temperature, for example the incubator temperature of the children who had been cured in a short period varied between 1 and 3 days were at its lowest rates of 31.9 ° C and at its highest rates of 34.6 ° C.

It was found that the speed of recovery for children with jaundice which the temperature in its incubator

environment is higher than those no closer to the temperature of the mother's womb. This is due to the thermal regulation of the newborn inside the incubator is closer to the degree of the mother womb.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

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The Role of Global Longitudinal Strain in Early Detection of Doxorubicin Induced Cardiotoxicity in Breast Cancer Patients

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Abstract

Objective: Cardiotoxicity is a recognized side effect of many antineoplastic drugs, particularly anthracyclines which used for breast cancer treatment. The identification of patients at high risk for developing cardiotoxicity would be a good strategy to decrease mortality. the aims was to assess the incidence of chemotherapy induce cardiotoxicity and identifying the reduction in global longitudinal strain in various treatment cycles for the early detection of cardiotoxicity, prior to ejection fraction reduction.

Method: A prospective cohort study of confirmed and newly diagnosed breast cancer patients, who attend the Babylon oncology center in Marjan medical city between the fifth of January and the first of July of 2019.

Results: The mean patient's age was 51.3(±10.5) years, There is no association difference in systolic function during the follow up period. The reduction in global longitudinal strain by 8%-15% from baseline was found in 8 patients, while reduction $\geq 15\%$ from baseline was found in only 2 patients during the follow up period.

Conclusions: Global longitudinal strain drop was observed three weeks after chemotherapy onward without significant reduction in ejection fraction.

Keywords: breast cancer; Doxorubicin; longitudinal strain

Introduction

Breast cancer is the high frequent cancer among women, effecting 2.1 million women yearly, it also causes the highest number of cancer-related deaths among women⁽¹⁾. As result of that the breast cancer is presently a important public health and economical problem and many research on new therapies and monitoring their safety use, should be a priority ⁽²⁾. Cancer therapy has studied in a recent years and it has been proved to risen average of cure in breast cancer, as well as to decrease the recurrences.

However the cardiac toxicity from antineoplastic therapy has become a notable risk of morbidity and mortality in cancer pateints. In patients who develop heart failure from chemotherapy, the mortality rate is increase to 60% by 2 years ⁽³⁾. Cardiotoxicity may appear early or late in the course of the disease, and have different clinical feature from subclinical myocardial dysfunction to irreversible heart failure or even death⁽⁴⁾. The cardiotoxicity refers to a direct influence of the chemotherapy on the entire CVS and

also to an indirect effect by a thrombogenic status or to a hemodynamic flow alteration⁽⁵⁾. In 2016, the European Society of Cardiology has published a position paper recommending the diagnosis of cardiotoxicity occur when the ejection fraction (EF) reduction $>10\%$ for values below normality (53%)⁽⁶⁾.

Early detection of cardiotoxicity has frequently depended upon many cardiac imaging to identify a reduction in LV function without signs or symptoms of heart failure (stage B heart failure)⁽⁷⁾. The use of ejection fraction has important limitations.

The measurement of left ventricular ejection fraction is subject to technique-related variability, which can be higher than the thresholds used to define cardiotoxicity ⁽⁸⁾.

The decreasing in left ventricular ejection fraction is often a late phenomenon, with failure to recover systolic function in up to 58% of patients despite intervention ^(9, 10).

The common measurements allow only the late diagnosis of cardiac dysfunction, which might be mostly irreversible. Therefore, there is major need for other precise and reproducible parameters, able to diagnose the early, subclinical, LV dysfunction and can detect the patients at risk for rapid progression toward irreversible cardiac failure and who can benefit from early therapeutic treatment⁽¹¹⁾. The using of tissue Doppler-based strain imaging and GLS has most constantly determined early myocardial changes during therapy, whereas STE in form of GLS appears to be the best measure⁽¹²⁾.

Global longitudinal strain (GLS) is used in clinical practice aimed at the early detection of changes in myocardial contractile function. However, neither GLS use nor its cutoff value determined to predict cardiotoxicity have been standardized⁽¹³⁾.

The American Society of Echocardiography and the European Association of Cardiovascular Imaging have pointed that deformity changes prior ventricular dysfunction. A reduction > 15% in GLS, immediately after or during anthracycline treatment, was the most informative parameter to predict cardiotoxicity, while a reduction < 8% might exclude its diagnosis. However, there is a grey zone between those two values⁽¹⁴⁾.

Doxorubicin is an anthracycline widely used in many cytostatic treatment regimens, but has limited applicability due to cardiotoxic effect. This cardiotoxicity increases patient morbidity and mortality. The mechanisms of cardiotoxicity induced by anthracyclines include the formation of oxygen free radicals, destruction directly to the DNA, apoptosis, activation of immunological reactions in the myocardium, changes in calcium ions transport, histamine release, and activation of coagulation with the formation of thrombus in coronary arteries⁽¹⁵⁾. Doxorubicin-induced cardiotoxicity may be augmented by increased cumulative dose, association with other cytotoxic drugs, and patients' advanced age⁽¹⁶⁾. In spite of this toxicity, anthracyclines stay the cornerstone of treatment in a lot type of malignancies, including lymphomas, leukemias, and sarcomas, and are still widely used in both advanced and early-stage breast cancer⁽¹⁷⁾. This study was palliated the early global longitudinal strain changes in breast cancer patients.

Patients and Method

This is a prospective cohort study included a convenient patients conducted in the fifth of January and the first of July of 2019 and who came to Babylon

oncology center were asked to participate in this study. Sample size of 40 patients was included. The patients with Age \geq 18 years, newly diagnosis of breast cancer with neither antineoplastic treatment nor radiotherapy, Normal baseline echocardiography study and Antineoplastic treatment planning with doxorubicin. Exclusion patients with Lacking of accurately assessing GLS because of an inappropriate acoustic window, cardiac arrhythmias and/or non-sinus rhythms, Usage of beta-blockers and/or angiotensin-converting-enzyme inhibitors and/or angiotensin receptor blockers, Moderate or severe heart valve disease or Ischemic heart disease and Prior history of treatment with cardio toxic drug and thoracic radiotherapy

The baseline information was recorded in form of patient's age, medical history of DM, HT and dyslipidemia, smoking history, oncological history (side and type of cancer), weight and height was measured by researcher.

Heart rate was measured manually and blood pressure was measured by sphygmomanometer then patient underwent Doppler echocardiogram at the baseline, before initiating the doxorubicin (60 mg/m² IV infusion), three weeks after the first dose and three weeks after the second dose (according to the protocol of Breast cancer chemotherapy). Data was analyzed using SPSS version 23 and used ANOVA test used to find association between variables. Echocardiographic examination was performed with the patient at rest in the left lateral position, using the Vivid E9-GE device (GE, Vingmed Ultrassound Horten, Norway), LCD 17" monitor, with image acquisition with a M5Sc transducer and harmonic imaging. All tests were performed with the same device. Sector and depth were adjusted to optimize the image. The measurements and image acquisition followed the recommendations of the American Society of Echocardiography and the European Association of Cardiovascular Imaging

The following echocardiographic variables were assessed: EF, calculated by using of the biplane Simpson's method, considering the normal value of EF > 54% for the female sex⁽¹⁸⁾.

According to the current recommendations ;diastolic function, evaluated by use of mitral flow with anterograde values of E wave and A wave, tissue Doppler of lateral mitral annulus, measures of S' wave (systolic velocity of the mitral ring) and ; indexed left

atrial volume (mL/m²); tricuspid annular plane systolic excursion (TAPSE).

The GLS was acquired by use of Automated Functional Imaging (AFI) of three clips with images of the left ventricle on three apical views, so that all myocardial segments could be well visualized: 4-chamber, 2-chamber and 3-chamber views. The events

of aortic valve opening and closure were marked. The images were acquired at a frame rate of 40-90 fps (> 70% of heart rate).

Results

40 patients was included. No loss to follow up, the baseline information was showed in table -1-.

Table -1- Patients baseline characteristics.

Variable	Mean(±SD)	Maximum	Minimum
Age in years	51.3(±10.5)	76	32
BMI in Kg/m ²	20.5(±4.1)	33.6	11.9
BSA in m ²	1.7(±0.1)	1.9	1.4
HR in b/m	78(±7.3)	95	64
SBP in mm Hg	13.4(±0.7)	140	120
DBP in mm Hg	83.1(±7.3)	95	60

History of diabetic was found in 12.5% of patients, 10% had a history of Dyslipidemia, 70% of patients had left breast cancer. Most of patients had invasive ductal type of breast cancer (82.5%), table -2-.

Table -2- Patient medical history.

Variable		NO.	Percentage
History of DM	Yes	5	12.5%
	No	35	87.5%
History of Dyslipidemia	Yes	4	10%
	No	36	90%
Laterality	Right	12	30%
	Left	28	70%
Type of cancer	Invasive ductal	33	82.5%
	Lobular	5	12.5
	Others	2	5%

The baseline ejection fraction reading was 66.2% (±5.9) and there was no significant difference in mean between the three readings (p value >0.05). Also for LAVI, TDI, TAPSE and GLS there were no significant difference in mean between the three readings (p value >0.05), table -3-.

Table -3- Comparison of echo parameters changes during follow up period.

Variable	Mean ±SD			P value
	Reading at base line	Reading after 3 week from first dose	Reading after 3 week from second dose	
EF%	66.2%(±5.9)	66.8%(±5.5)	67.5%(±5)	0.58
LAVI	26(±3.8)	26.7(±3.9)	26.4(±3.9)	0.72
TDI(s-)	8.9(±1.3)	9.1(±1.2)	9(±1.1)	0.84
TAPSE in mm	22.1(±2.6)	22.9(±2.4)	22.5(±2.5)	0.39
GLS%	-19.3(±2.4)	-19.8(±2.3)	-19.4(±2.2)	0.59

ANOVA test.

Regard GLS, the reduction in GLS after 3 week from the first dose by 8%-15% from baseline was found in 6(15%) patients, while reduction $\geq 15\%$ from the baseline GLS was found in 2(5%) patients only figure -1-.

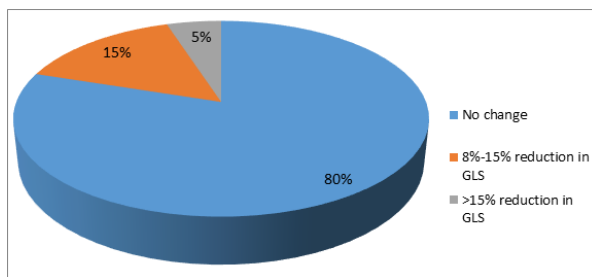


Figure -1- PIE chart for the percentage of reduction in GLS after 3 weeks from the first dose.

The reduction in GLS after 3 week from the second dose by 8%-15% from baseline was found in 2 additional patients , while reduction $\geq 15\%$ from baseline GLS wasn't found in any additional patients, figure -2-.

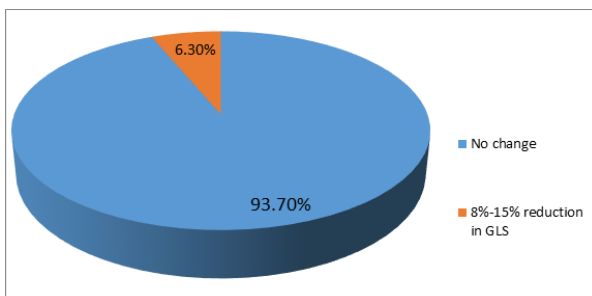


Figure -2- PIE chart for the percentage of decreasing in GLS 3 weeks after the second dose.

Discution

This study was considered as low morbidity profiles and the risk factors that could be related to cardiotoxicity

was relatively low(mean age 51 years, mean BMI was 20.5 Kg/m² , history of DM only in 12.5%, history of dyslipidemia only in 10%, no hypertension, no smoking, no arrhythmia, no previous chemotherapy or radiation). The incidence of cardiotoxicity is fundamental, because it is not uniform in different studies. The cardiotoxicity incidence in a systematic review published in 2014 ranged from 13% to 32%⁽¹²⁾. Studies published by US at 2011⁽¹⁹⁾ and at 2013⁽²⁰⁾ have found an incidence of 20%. Other study found a cardiotoxicity incidence of 10%, lower than that reported by those studies⁽¹⁴⁾. That could be explained by the different morbidity profile of population studied and different age, type of cancer, strain technique and timing of follow up. Despite this hetrogenicity, all uniformly demonstrate that changes in myocardial deformation occur earlier than change in LVEF.

In this study, reduction in the longitudinal strain level was found in 20% of patients three weeks after the first dose and in 6.3% of additional patients three weeks after the second dose and without any decrease in systolic function were noted via conventional echocardiography this similar to many other studies like Iranian study that show considerable reduction in GLS in 13% of patients⁽²¹⁾, Ireland study showed, 18 (26%) of the chemotherapy group, global longitudinal strain was below the lower limit of the control group⁽²²⁾.

Early initiation of heart failure treatment appears important for the recovery of the Left ventricular function in patients who experience a significant reduction in LVEF due to anthracyclines⁽³⁾. Therefore, early identification of impaired systolic function is vital.

Furthermore, given that many breast cancer patients first treated with anthracyclines will then receive trastuzumab, identifying patients at greater risk of developing cardiotoxicity is of considerable advantage. Early identification of those with significant reductions in strain would enable targeted monitoring, together with the institution of supportive therapy with angiotensin-converting enzyme-inhibitors or β -blockers, should further treatment with trastuzumab be required ⁽²³⁾.

In this study, there was no significant reduction in global longitudinal strain with preserved LVEF, this compatible to result of Australian study ⁽²³⁾ and this contrary to other study which showed considerable reduction in GLS after chemotherapy like Iranian study which found considerable reduction in GLS before and after treatment ⁽²⁴⁾ and European study which also found Global systolic strain was significantly reduced immediately after, and 6 months after anthracyclines ⁽²⁵⁾. the reason behind this may be due to short follow up period 6 week only, we studied patients after anthracycline treatment only (with no radiotherapy or adjuvant trastuzumab) and the patients received only 120 mg/m² cumulative dose of doxorubicin where the Cardiotoxicity related to anthracycline treatment has strong positive correlation with a cumulative dose.

Conclusion: There was a reduction in GLS between 8%-15% from the baseline in 8 patients and a reduction in GLS between >15% from the baseline in 2 patients throughout study period and there were no significant differences in the ejection fraction.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Personal Hygiene and Safety among governmental Hospitals Nurses Staff in Mosul City

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Abstract

Objective: The present study aimed to knowing weak points which is lead to negligence it could be transmission of nosocomial infection.

Material and Method: The sample of the study included 100 nurses were selected randomly from the pediatric, surgical, emergency, I.C.U and operation room departments in AL-Salam and AL-Jamhory Teaching Hospitals in the Mosul City during a period which extended from the 1/10/2018 to 20/1/2019, the data were collected through an observation of each subject of the sample during working with the patients and fulfill in the checklist sheet.

Result: The findings of this research revealed significant values between gender and personal hygiene practices to the advantage of female, also there is significant relationship between level of education and personal hygiene practices to the advantage of colligate nurses.

Conclusion: the present study demonstrated that there was negligence in some personal hygiene practices among nurses such as (hand washing, use protective devices, use protective measures, and hepatitis B vaccination).

Keywords: *hygiene, safety, nurses staff*

Introduction

we can be prevented and controlled Transmission of infections in health care system through the implementation of special precautions which can be standard and basic precautions, which must be applied to all cases from the admission to hospital until discharge, regardless types of diagnosis or infectious degree , and addition (transmission-method) .⁽¹⁾ The patient's care managements in the health facility should be the same level of a "Standard precaution" applied work practices that are essential to formulate a high level of patient's protection, patient's visitors, and health care practitioner.

Warnings points to prevent infection transmission include the following:

hand washing and antisepsis (hand hygiene),use of personal protective like gloves, masks and equipment when handling blood samples and body secretions pay attention when handling of surgical care equipment and soiled linen, protection of needle stick and knife sharp

injuries, environmental management, cleaning from pollution ; and recycled of waste.⁽²⁾ the Infection can be control for most factors which that influencing to the transmission of infection between patients or health workers by using a prophylaxes method starting from hand washing, to all body hygiene and vaccination ⁽³⁻⁹⁾ Many researchers and studies have been seeking over the world health centers about nosocomial infection which are reviled careless to nosocomial infection control and no standards precaution in multi countries. Our research aimed to study the personal hygiene of health care giver staff. In addition the objective was to identify weak points which could lead to transmission of nosocomial infections.

Methodology

Descriptive study design depended to, 100 nurses were selected randomly from the pediatric and carried out that study in, surgical, emergency, I.C.U and operation room departments in (AL-Salam and AL-Jamhory Teaching Hospitals in the Mosul City

during a period which extended from the 1/10/2018 to 20/1/2019. Data were collected by checklist, which is as a guidelines and reference to established (8, 9). A questionnaires format consists of multiple fields and items as the purpose of this study. Checklist papers tested to pilot study in two hospitals on ten nurses to discover any problems and modified according to results. Data

were collected through an observation of each subject of the sample during working with the patients and fulfill in the checklist sheet. To describe and analyze the findings of the study, SPSS program (version 17) was used to analyze the data by using mean, percentage, and ANOVA test at $P=0.05$.

Results

Table (1) Demographical characteristics of the study sample

Sex	No.	%
Male	53	53%
female	47	47%
Age	No.	%
Less than 25	5	5%
25-29	44	44%
30-34	19	19%
35-39	13	13%
More than 40	19	19%
Place of work	No.	%
I.C.U	20	20%
Pediatric	20	20%
Surgical	20	20%
Emergency	20	20%
Operation room	20	20%
Years of experiences	No.	%
Less than 5	38	38%
5-10	32	32%
More than 10	30	30%
Graduate of	No.	%
Nursing school	4	4%
preparatory nursing	18	18%
Institute	38	38%
College	40	40%

Table-1- reveals that (53%) of the sample were males, (44%) of the sample were between (25-29) years of age, (38%) of them had experiences less than (5 years), and (40%) of them had bachelor degree in nursing science

Table (2) checklist scores for personal hygiene practices among nurses

Practice	Frequency	
	Yes	No
Use uniform according to hospital policy	96	4
Uniforms are clean	78	22
Use proper shoes (not slippers)	96	4
Have short fingernails	80	20
Do not wear jewellery (rings/bracelets)	78	22
Use needle-cutter or specific container to discard used syringes, needles and other sharp items	100	0
Wash hands before contact with patients	40	60
Wash hands after each step of working	80	20
Wash hands after contact with patients	40	60
Wear gloves when needed	40	60
Use protective devices (gown, mask, gloves and goggles) when in contact with infectious patients or if there is possibility of splashing blood or other drainages	40	60
Use protective measures if drawing blood (gloves, masks and goggles)	22	78
Hepatitis B vaccination complete (3 times)	50	50

Table -2- shows that 96% of the sample wear uniform according to hospital policy, 78% from them own uniform are clean, 96% use proper shoes, 80% of keep short fingernails, 78% not wear jewellery, 100% from the sample uses specific container to discard used syringes, 60% from them didn't wash their hand before contact the patients, 80% from them wash hands after contact the patients, 60% didn't wear gloves and never use protective devices when contact with infectious patients, 78% of nurses didn't use protective measures when drawing blood, Finally 50% from the sample didn't take Hepatitis B vaccine.

Table (3) Comparison of the differences between nurse's practice regarding hand hygiene rate and their gender.

Practice	sex	No	X	SD	DF	T.obs	P.value
Personal hygiene	Male	53	3.3	1.4	98	1.5	N.S
	female	47	3.5	1.4			
Hand wash	Male	53	3.4	2.2	98	0.04	S
	female	47	3.5	2.1			
Contact with patients	Male	53	4.3	1.7	98	0.03	S
	female	47	4.8	1.8			
Protective measurement	Male	53	1.6	1.0	98	0.8	N.S
	female	47	1.4	1.0			
Vaccine	Male	53	2.9	1.9	98	1.6	N.S
	female	47	3.2	1.6			

T critical=1.9

Table (3) shows that there was statically significant differences between hand hygiene rates and the gender of staff at p value= 0.05.

Table (4) one – way analysis of variance for the difference between hand hygiene practice by nurses and their age

Practice	S.O.V	SS	DF	MS	F.obs
Personal hygiene	Between Groups	1.630	4	6.157	1.011 N.S
	Within Groups	16.530	95	1.753	
	Total	17.160	96		
Hand wash	Between Groups	1.712	4	18.893	1.053 N.S
	Within Groups	22.288	95	5.269	
	Total	24.000	96		
Contact with patients	Between Groups	1.712	4	18.893	1.053 N.S
	Within Groups	22.288	95	5.269	
	Total	24.000	96		
Protective measurement	Between Groups	1.359	4	14.165	0.843 N.S
	Within Groups	15.801	95	3.432	
	Total	17.160	96		
vaccine	Between Groups	1.936	4	18.893	2.585 N.S
	Within Groups	24.064	95	5.269	
	Total	26.000	96		

F critical=3.32

Table -4-demonstrate that there were no statically differences with regards nurse’s hand hygiene rates and their age at p value= 0.05.

Table -5-one – way analysis of variance for the difference between nurse’s practice regarding hand hygiene rates and their level of education.

Practice	S.O.V	SS	DF	MS	F. obs
Personal hygiene	Between Groups	3.712	3	8.720	5.011 S
	Within Groups	22.288	96	1.003	
	Total	26.000	99		
Hand wash	Between Groups	9.132	3	3.044	19.653 S
	Within Groups	14.868	96	0.155	
	Total	24.000	99		

Cont... Table -5-one – way analysis of variance for the difference between nurse’s practice regarding hand hygiene rates and their level of education.

Contact with patients	Between Groups	9.132	3	3.044	19.653 S
	Within Groups	14.868	96	0.155	
	Total	24.000	99		
Protective measurement	Between Groups	1.392	3	1.464	13.875 s
	Within Groups	15.768	96	0.164	
	Total	17.160	99		
vaccine	Between Groups	8.26	3	2.675	15.132 s
	Within Groups	16.974	96	0.177	
	Total	25.000	99		

F critical=3.78

Table -5- reveals that a significant difference for nurse’s hand hygiene rates and their level of education at (p value= 0.05). The majority of staff had a bachelor degree in nursing science.

Table (6) one – way analysis of variance for the difference between nurse’s hand hygiene rates and their years of experience.

Practice	S.O.V	SS	DF	MS	F. obs
Personal hygiene	Between Groups	3.330	2	6.975	6.311 S
	Within Groups	16.830	97	2.987	
	Total	20.160	99		
Hand wash	Between Groups	0.163	2	113.907	10.653 S
	Within Groups	23.837	97	10.454	
	Total	24.000	99		
Contact with patients	Between Groups	9.132	2	3.044	19.653 S
	Within Groups	14.868	97	0.155	
	Total	24.000	99		
Protective measurement	Between Groups	0.181	2	8.500	5.166 S
	Within Groups	16.979	97	1.645	
	Total	17.160	99		
vaccine	Between Groups	0.219	2	29.565	5.536 S
	Within Groups	24.781	97	5.341	
	Total	25.000	99		

F critical=4.6

Table -6- shows that there were significant differences between nurse’s hand hygiene rates and the years of experience at p value= 0.05.

Discussion

Since the era of Islamic message, Islam religion encouraged people to maintain personal hygiene especially hand washing before and after eating, before and after use of toilet to prevent transmission of disease from one person to others. ⁽²⁾, Florence Nightingale in 1854 was stated the relationship between nursing performance and infection control that was first identified during the Crimean war, when she worked at a military hospital in Scutari/ Italy, the services in that hospital was too bad . Nightingale's notes and her believes in this health facility led her to believe the enhancing hygienic conditions would decrease the number of deaths. "championed the cause of improved hygiene, food, and living conditions for the hospitalized soldiers she attacked the hospital conditions and called for basic public health, infection control measures, cleanliness, hygiene and education about the importance of the issue" . The confirmation was come from Jean Lawrence, which is chairman of the Infection Control Nurses Association (ICNA) he also said that Florence Nightingale was maybe the first nurse mentioned to infection control without recognized it ⁽⁸⁾. Now the nursing staff are the key which are players the important role during health care to ensure the survival of infection control. ⁽⁷⁾. Nosocomial infection control is conceder important for three main cusses : the first one to avoiding transmission of infections from patients to health care provider staff and from them to patients ,second one to development the bacterial support and resistance, finally to limitation of financial consuming resources ^[9,10]. in 3 ways could be Transmission of nosocomial infections in hospitals, from patient to patient, patient to health staff and health caregivers to patients ^[11]. A huge reason for transporting of microorganisms is because forgetting hand washing, protective devices such as gloves and masks and a weak of personal hygiene in HCWs, in particularly improper disposal of sharp tools, ^[12]. The major findings of this study were as follows: hand washing compliance was significantly higher among female nurses ($p=0.04$) than male nurse (see Table-3).This finding is supported by the study of (Askarian, 2014) which concluded" that the Female nursing staff in CCU unit pay attention to hand washing significantly more than males after patient care contact.⁽⁴⁾ [Malekzadeh, 2015], said that inter gender behaviours differences with regard hand washing may be as a result of basic differences in the education of parents on hand hygiene for girls and boys. However females were more look after. Which also add more support to this result. Similar findings have been

stated, that led us to think females were more likely to wash their hands than male in HCWs ^[5]. The study also revealed slightly significant relationship between the level of education and hand washing ($p=0.04$), majority of the staff (%40) were staff nurses which had bachelor degree (see Table-4). This results is a similar with the study did in Italy ^[6] which stated that "nurses how are graduated from a higher level of education and with a higher knowledge of risk a transmitting and infectious disease as well as during working were more focusing to doing appropriate antisepsis of the surgical wound with hand washing pre and post medication care ^[13]. [Health centre, 2016] suggested that to be careful a high level of hand cleanses adherence, HCWs need education, clear guide notes, and some understanding to infection complications. This study reveals also that there were statistically significant difference between years of experience and hand washing practice (see Table-6). While the exact reasons for these observed patterns are not clear, several possibilities exist. The first, are that of all health care settings put a lot of effort to make sure that all staff should compliance with WHO Quid lines of hand washing whenever contact with the patients., the second is that the dramatically increase in the number of high educated nursing staff.

Conclusion

Hand washing is important. This study has shown that there was negligence in some personal hygiene practices among nurses such as (hand washing, use protective devices, use protective measures, and hepatitis B vaccination).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Molecular Detection for Nosocomial *Pseudomonas aeruginosa* and its Relationship with multidrug Resistance, Isolated from Hospitals Environment

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Abstract

Pseudomonas aeruginosa is an important pathogen in hospitalized patient's causative to their morbidity and mortality due to its multiple resistance mechanisms. Therefore, as a therapeutic option becomes restricted, the search for a new agent is a priority. So *Pseudomonas aeruginosa* is an extremely versatile Gram-negative bacterium capable of thriving in a broad spectrum of environments, and this performs main problems to workers in the field of doctors and nurses. One hundred and fifty samples were collected from different sources from Al-Kut hospitals, divided into two main groups: clinical (80) samples and (70) samples as a Nosocomial, collected from October to the December of the year 2018. All of these samples were cultured by specific and differential media, Forty (40) isolates of *P.aeruginosa* bacteria were identified by using microscopic examination, biochemical tests. The identification of (40) isolates of *P.aeruginosa* confirmed VITEK-2 system. The antibiotic sensitivity test recognized for all bacterial isolates and the results showed high sensitivity to amikacin, gentamicin, ciprofloxacin and Chloramphenicol, and high resistant to oxacillin and Cefoxitin. A molecular diagnosis is recognized by conventional PCR technique to detect the specified gene amplification products of the *bla*OXA-1 gene for *Pseudomonas aeruginosa*.

Keywords: Hospitals ; *Pseudomonas aeruginosa* ; multidrug Resistance.

Introduction

Pseudomonas aeruginosa is a Gram-negative bacillus, straight or slightly curved rods, non-spore forming, capsulate; it is usually motile by one polar flagellum (monotrichous), measuring about 1-5 µm long and 0.5-1.0 µm wide. It occurs as single bacteria, in pairs and occasionally in short chains possess mucous layer due to material alginate slime layer as well as, multi-layers of extracellular polysaccharide⁽¹⁾. The bacterium is ubiquitous in soil, a variety of aqueous solutions, including disinfectants, soaps, eye drops, as well as sinks and respiratory equipment, some strains hemolysis blood completely (β-hemolysis) by producing hemolysis toxin. *P. aeruginosa* forms smooth round colonies and irregular edge with a fluorescent greenish to yellow pigment pyoverdine. It also produces the non-fluorescent bluish pigment pyocyanin, which diffuses into the agar. Many types of media may be used for selective isolation of *P. aeruginosa* like cetrимide agar which promotes pyocyanin, pyoverdine, and pyourubin red colour and pyomelanin black colour production⁽²⁾.

Pseudomonas aeruginosa is one of the most important secondaries of the hospital-acquired infection in burnt patients⁽³⁾, and it is leading to the nosocomial pathogen, causing infections that usually accrue late during hospital stay⁽⁴⁾. *P. aeruginosa* groups have a tendency to form biofilms, which are compound bacterial groups that stick to a variety of surfaces together with plastics, medical transplant materials, and tissue. They are very difficult to destroy^(5, 6). *P. aeruginosa* produces the resource of virulence factors, as well as pili, flagella exopolysaccharides, proteases, elastase, lipases, iron chelators and a variety of various toxins, including pyocyanin, chemical compound, exotoxin A, and the Type III Secretion System (T3SS) toxins ExoS, ExoT, ExoU, and ExoY⁽⁷⁾.

Materials and Method

Specimens' Collection:

Through the period prolonged from October to December of the year 2018, One hundred and fifty specimens were collected from some hospitals including

80 clinical samples from hospitalized patients and 70 samples from Nosocomial sources. The clinical samples included four main clinical sources: Urine samples, exudate samples from wounds of the burn units patients, stool samples, Sputum samples from Cystic Fibrosis(CF) patients and Ear Swabs. The nosocomial samples included many hospital nosocomial sources: ICU, Operations Hall, Birth Hall, burning gowns, Devices and medical equipment, hand wash and hospital bed rooms.

Bacterial Isolation

Both of the clinical and Nosocomial samples were cultured on MacConkey agar, Nutrient agar, Blood agar, and Cetrimide agar, incubated for 24 hours at 37°C. this isolates may belong to *Pseudomonas aeruginosa* growth on Cetrimide agar for characterization of *Pseudomonas aeruginosa* such as blue-greenish colour, mucoid colony, smooth in shape, and have a fruity odour. colonies were picked and re-cultured on another MacConkey agar plates in order to be appeared as pale greenish and lactose non-fermenter colonies, while on Blood agar they appeared as large, opaque irregular colonies with butyrous consistency(shiny) give fruity odour and *B*-hemolytic colonies. and on Nutrient agar appeared as yellowish green, smooth in shape with flat edges and elevated center. Further identification tests included the morphological characteristics and biochemical tests were carried out depending on Forbes *et al.* (8).

Bacterial Identification:

Colonial morphology on MacConkey agar, Nutrient agar, blood agar, and Cetrimide agar was depended initially to identify bacterial isolates, colony shape, texture, colour and edges were examined. In addition to macroscopic characteristics; microscopic examination of a gram-stained slide was examined under a light microscope with special regard towards cell shape and arrangement. Biochemical tests and VITEK 2 system were depended to complete the identification of *P. aeruginosa* isolates.

PCR amplification:

DNA template of all bacterial isolates was prepared by boiling method (30 min in 100°C). The DNA of isolates was targeted only for the *bla*_{OXA-1} gene using the primer (Z. Tavajjohi, *et al* Iran (9) listed in Table 1. A reaction mixture (25 µl) contained 2 µl of DNA, 1 µl of each primer, 12.5 µl of Master Mix 2X (Z.Tavajjohi, *et al* ., 2011), and 8.5 µl of nuclease free water. The experiment was sustained according to the following program: initial denaturation at 95°C for 5 minutes, followed by 30 cycles at 95°C for 30 Sec. , 55°C for 30 Sec. , 72°C for 30 Sec. and a final extension at 72°C for 7 minutes. The PCR products were analyzed using gel electrophoresis (1% agarose) and stained with safe dye and visualized by Gel Doc apparatus (BioRad, USA) (Table 2).

Table (1): Primers used in this study.

Gene	Primer Sequence		Product size (bp)	References
bla OXA-1	F	5'-AGCCGTTAAAATTAAGCCC-3'	908	Z.Tavajjohi, et al ., 2011
	R	5'-CTTGATTGAAGGGTTGGGCG-3'		

Table (2): Condition of PCR Reaction for the gene *bla* OXA-1 of *Pseudomonas aeruginosa*.

Steps	Temperature	Time	Number of Cycle
Initial Denaturation	95°C	5 min.	1
Denaturation	95°C	30 Sec.	30
Annealing	55°C	30Sec.	
Extension	72 °C	30Sec.	
Final extension	72 °C	7 min.	1
Hold	10 °C	10 min.	1

Results and Discussion

Isolation and Identification of *Pseudomonas aeruginosa*:

Out of One hundred and fifty samples, clinical and Nosocomial specimens were analyzed for the presence of *Pseudomonas aeruginosa*, the results of bacterial isolation and identification revealed the detection of forty (40) isolates of *Pseudomonas aeruginosa*.

Biochemical Tests:

Some biochemical tests were performed for more validation. showed 40 isolates of *P. aeruginosa* provided by some biochemical tests, results showed positive results for oxidase test, catalase test, motility test, , and production of β -hemolysis while (40) isolations negative results to citrate utilization tests, indole production and urease production tests negative to Gram's stain and capable of growing on cetrimide agar as blue greenish colonies (at 37°C for 24 hrs.). (figure 1, table 3).

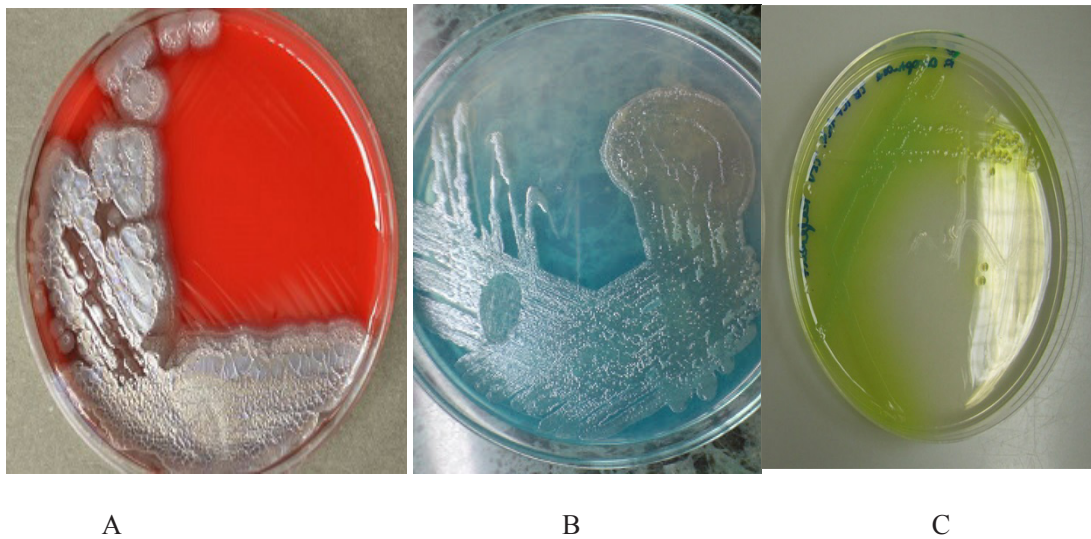


Figure (1): *Pseudomonas aeruginosa* colonies on (A) Blood agar r and (B) Cetrimide agar and (C)Nutrient agar, after 24 hours of incubation at 37°C.

Table (3): The biochemical tests of *Pseudomonas aeruginosa*

Biochemical test	Result
Gram stain	G- rods
Kligler's iron agar	K/K
Growth at 42°C	+
Motility	+
Oxidase production	+
Catalase production	+
Hemolysis(β -hemolysis)	+
Indole production	-
Urease production	-
Methyl-red	-
Voges-Proskauer	-
Lactose fermentation	-
Simmon's citrate	+

(+) Positive result, (-) Negative result

P. aeruginosa has a wide growth temperature range, optimum growth at 37°C. Slower growth rates are seen at 4°C. *P. aeruginosa* is distinguishable from other clinically *Pseudomonas* spp. by its capability for growth at 42°C. They also grow well at pH range 6.6-7.0. It was tolerant of a wide variety of physical conditions, including temperature and pH. Also, it was resistant to high concentrations of salts and dyes. It is typically given a positive result to the oxidase test and catalase. It does not ferment carbohydrates, but many strains oxidize glucose⁽¹⁰⁾. The identification was performed with the automated VITEK-2 system using the GN-ID cards which contains 64 biochemical tests, from (40) isolate of *P. aeruginosa* (40) positive result of the *P. aeruginosa* demonstrated.

Distribution of *P. aeruginosa* according to Type of Specimens :

A percentage of about 50% (40) isolates belonged to *P.aeruginosa* from total 80 isolates, 28(70%) isolates were positive to clinical *P. aeruginosa* and 12(30%) isolates were positive for Nosocomial sources. The percentage of the positive results from burns, ears and wounds were 5 %, 27.5% and 12.5% respectively (table 4).

Table (4): Distribution of *Pseudomonas aeruginosa* isolates in Nosocomial samples

Site of samples	Numbers of sample and Percentage
ICU	2 (5%)
Operations Hall	4 (10%)
Birth Hall	2 (5%)
Burn Hall	2 (5%)
Devices and medical equipment	2 (5%)
Total	12 (30%)

The low percentage was found in burn specimens which accomplished 5%. Results obtained reported that the highest percentage of *Pseudomonas aeruginosa* from ear swab (27.5%). In comparison with Nosocomial isolates of *Pseudomonas aeruginosa* the highest percentage isolation of Operations Hall (4%) where are the isolates reported low present in burn hall, birth hall

and Devices and medical equipment (2%) in comparison with clinical findings.

P. aeruginosa is well-adapted to the respiratory tract environment, especially in patients with the chronic obstructive bronchopulmonary disease, who are hospitalized in intensive care units or immunocompromised,⁽¹¹⁾ *Pseudomonas aeruginosa* is very hard to kill because of its ability to build resistance to many cleaners and medicines. *Pseudomonas aeruginosa* is accountable for 16% of healthcare facility respiratory disease cases, 12% of hospital-acquired UTI, 8% of surgical wound contaminations, and 10% of blood stream infections.⁽¹²⁾ Vandealet al. (2005)⁽¹³⁾ studied the epidemiology of *P. aeruginosa* in cystic fibrosis rehabilitation centre, sixty-seven isolates of *P. aeruginosa* were isolated from patient's sputum, the infection by patient-to-patient-transmission could have happened in the past, the risk of patient-to-patient transmission during the study period (63day) was relatively (10%) and the risk of persisting colonization with a newly acquired strain during the study period was (4%).

Antibiotics Resistance in *P. aeruginosa*

In the present study the in vitro antibiotic sensitivity test of isolated

P. aeruginosa strains examined revealed Amikacin and Gentamicin to be the most effective antibiotic followed by Ceftriaxone, Ciprofloxacin & Cefotaxime-clavulanic acid in decreasing order as reported in the table(5).

Table (5): Antibiotic resistance and sensitivity of *Pseudomonas aeruginosa* to antibiotics

Antimicrobial Agent	Pseudomonas aeruginosa (40 isolates)			
	S		R	
	No.	%	No.	%
Amikacin(AK)	40	100%	0	0%
Gentamicin(GN)	40	100%	0	0%
Cefotaxime-clavulanic acid (CEC)	30	75%	10	25%
Aztreonam(AT)	20	50%	20	50%
Cefoxitin(CX)	3	7.5%	37	92.5%
Ceftriaxone(CTR)	35	87.5%	5	12.5%
Oxacillin(OX)	0	0%	40	100%
Ciprofloxacin(CIP)	35	87.5%	5	12.5%

Antibiotic sensitivity testing is an essential tool for treatment. *P. aeruginosa* is considered as one of UTI infection, burn, CF, otitis ear and wound infection is resistant to a range of antibiotics due to the permeability barrier provided by its outer membrane for hydrophilic substances, although using sometimes surfactant as a permeabilizing agent to enhance the interaction of hydrophilic material with the hydrophobic cell wall did not enhance the antibacterial activity of some agent against *P. aeruginosa*⁽¹⁴⁾. Malla *et al*⁽¹⁵⁾ reported that *P. aeruginosa* were susceptible 100% to Amikacin and Gentamycin which are similar to our study.

Another study by V. Saegeman *et al.*, (2010)⁽¹⁶⁾ stated that *P. aeruginosa* had shown high sensitivity to a β -lactamase antibiotic with 100% for Amikacin(AK), 95% to Gentamicin(GN) and 87.5% to Ciprofloxacin(CIP). Osazuwa *et al.*, (2011)⁽¹⁷⁾ in Nigeria recorded 100% resistance for both oxacillin and Cefoxitin(CX). These results agree with the percentages in this study.

Resistance to some antibiotics such as cefotaxime, neomycin and kanamycin showed an increase in comparison with previous studies, this might be due to the variation in the usage of antibiotics⁽¹⁸⁾.

Genomic DNA Extraction:

Using a genomic DNA purification kit (Promega), Genomic DNA was extracted from *Pseudomonas aeruginosa* isolates. Extraction genomic DNA from 40 isolates that were confirmed as bands by gel electrophoresis. The DNA concentration and purity were measured by Nanodrop spectrophotometer, all the isolates had DNA concentration between (50-100 ng/ μ l) and purity of the DNA.

Molecular Detection of *Pseudomonas aeruginosa* by *bla_{oxa1}* like gene:

The result of PCR analysis concerning of the found the *bla_{oxa1}*, showed that studies *P. aeruginosa* possess the gene *bla_{oxa1}* like gene from 40 isolates, 10(25%) isolates positive *bla_{oxa1}* like gene showed 4 (40%) from clinical isolates and 6 (60%) from nosocomial (figures not shown).

From 10 positive isolates, 4 strains of clinical isolates; urine and ear isolates were multi-drug resistant. The prevalence of *bla_{oxa1}*-1 positive isolates of ESBL *P. aeruginosa* occurred in 40% of isolates and MDR phenotype was common in *P. aeruginosa*. The most

prevalent gene among ESBL producers were *bla_{OXa}*-1 which compromises the efficacy of MDR bacteria especially in clinical(urine, ear, and stool samples) and nosocomial samples (operation hall, burning gown, and ICU) according to the results in this study and tend to be geographically limited.

The *bla_{OXa}*-1 ESBLs provide *P. aeruginosa* with an additional powerful resistance mechanism with potentially serious clinical implications, including limitation of the therapeutic options. ESBLs manufacturing organisms create distinctive challenges to clinical microbiologists, clinicians, infection control professionals and scientists engaged in finding new antibacterial agents⁽¹⁹⁾. In this study, the prevalence of *bla_{oxa}*-1 of *P. aeruginosa* isolates was 25% that less than values reported in different studies like in Iran; Malaysia; and Pakistan

This study reported 10 isolates (25%) of *bla_{OXa}*-1 ESBL of *P. aeruginosa* in clinical and nosocomial isolates from 40 isolates. The studies conducted by others depicted low rates, 7.7% (J Jacoby GA)⁽²⁰⁾, 3.7% (Neil Woodford *et al*)⁽²¹⁾, 4.2% (Lim *et al.*,⁽²²⁾ respectively, of ESBL production of *P. aeruginosa*.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Knowledge Assessment of Working Women Regarding Breast Cancer / Control and Prevention in Kirkuk Technical Institute

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Abstract

Breast cancer is the most common cancer in women both in the developed and less developed world In Iraq, it is the commonest type of female malignancy, accounting for approximately one-third of the registered female cancers according to the latest Iraqi Cancer Registry.

A descriptive cross-sectional study was conducted on working women in Kirkuk Technical Institute during the period from 1st April till 30th June / 2016 to assess their knowledge regarding breast cancer prevention and control methods.

The total number of included studied women was 71 from different scientific departments after distributing a special questionnaire form and face to face interview was done after receiving the written agreements to participating in the study.

Majority of working women are technical (52.2%), married (74.7%) aging above 40 years (47.8%) with employment years above 15 years (50.0%).

Both electrical and survey dept. go with the establishing of breast cancer prevention at adulthood after fully matured (44%, 45%) respectively in comparison to 57.7% of study women from electronic dept. go with the starting of cancer prevention at the birth of a first child .

The main recommendation of the study is that further researches should be done because there is a need for increased efforts towards developing and widely available cancer educational program that focuses on the main preventive measures and encouraging the women with breast disease, not only providing them with information but also for the ability to make her decision to control the disease

Key words : *Knowledge, breast cancer, assessment, control and prevention.*

Introduction

Women play a critical role in maintaining the health and well being of their communities because families and communities health is tied to the health of women. Woman illness or death has serious and far-reaching consequences for their children, families, and communities ⁽¹⁾.

Among women, breast cancer is the most common cause of cancer mortality accounting for 16% of cancer deaths in adult women ⁽²⁾. Breast cancer is a serious life-threatening public health problem of great concern. Increases in the incidence of breast cancer are

being observed in both industrialized and developing world ⁽³⁾.

WHO promotes breast cancer control methods within the national cancer control program which is directed for both non- communicable diseases and other related health consequences his program includes (prevention, **early detection of the disease, diagnosis, treatment, rehabilitation with the assistance of palliative care**) ^(3, 4).

The key strategies for population-based breast cancer control are :

1- Increasing the awareness of the general public about this health problem.

2- Appropriate policies and health programs ⁽⁵⁾.

Nowadays countries with low and middle income facing a double burden of breast cancer which is regarded as a top killer in women aging over 30 years old. These countries need further specific strategic methods that concentrated for effective ways of disease prevention ⁽⁵⁾.

A study was done by Nada *etal* during 2014 mentioned that breast cancer constitutes about one fourth of the reported cancer cases among Iraqi population which is regarded the main cause of death and each year many women are exposed to the vicious ramifications of breast cancer which include death if left untreated or the negative outcomes that would experience, cosmetically and psychologically, after exposure to surgical intervention ⁽⁶⁾.

Another study was done in Iraq about the breast cancer incidence trends from 2000- 2009 which reported that the disease incidence of all female breast cancer in Iraq (all ages) has risen and there is a rapid increase in the age-specific incidence rate among the age group 60-69. However, this disease among Iraqi women still affects younger age groups than their counterparts in developed countries ⁽⁷⁾.

Reduction in the incidence of breast cancer needs control of both modifiable risk factors with the effective integrated preventive measures that promote (intake of the healthy diet, daily physical activity, alcohol, and weight control) which eventually have a direct impact for the future outcomes. ^(8,9).

In more recent years, many studies have indicated the effect of diet and other behaviors on the occurrence of breast cancer. These additional risk factors are environmental factors such as tobacco use, radiation, endocrine disturbance and shift work ⁽¹⁰⁾.

The main three important screening tests usually considered for controlling and preventing the disease which is 1- clinical breast examination (CBE) 2-X-ray mammography 3- breast self-examination (BSE). In industrial countries, breast cancer mortality is declining where screening mammography is the standard for care. BSE is appealing as a patient-centered, non-invasive screening procedure which allows women to become more comfortable with their own bodies ^(11, 12).

The aim of the study: to assess the knowledge of working women regarding breast cancer control and prevention methods

Methodology-

1- Ethical issues

Official agreements were taken from Kirkuk Technical Institute before establishing the study

2- Study design and setting:-

A descriptive cross-sectional study was carried out in Kirkuk Technical Institute on three scientific departments (Electronic, Electrical, and Survey).

3- Study sample and sampling method:-

A randomly selected sample from 71 working women (25 from the electronic department and 26 from the Electrical department and 20 from the Survey Department).

A specific special questionnaire form was distributed to them after receiving their written consent and the data was collected by interviewing with the study women after complete explanation of the main objectives of the study.

4- Study period :

The study was conducted during the period from 1st April till 30th June / 2016.

5- Data collection tool:-

Certain designed prepared questionnaire form has been conducted by the investigator utilizing a recent updated related literature to the study subject included three main parts:-

Part-1- Demographic characteristics like (age, employment year, type of work, and martial status).

Part-2- Information about their knowledge regarding disease control and preventive measures with the main risk factors). Part -3- Their knowledge about the specific time for starting the prevention of breast cancer.

6- Reliability of the questionnaire form:-

The data was presented to (4) experts in different fields, they were (2) Clinical physicians, (1) Community physicians and (1) statistical experts.

Inclusion criteria: Any married woman

Exclusion criteria: History with chronic diseases such as hypertension, Diabetes’s mellitus, or renal disease.

7- Statistical analysis of data:-

The information regarding each participant was transferred into a code sheet and the data entry was done

using a computer Pentium IV and the statistical analysis was calculated by mine tab program /2016⁽¹³⁾.

All the statements with Yes and No answer, number and percent will be calculated.

Chi-square test was used to detect the relation between the studied variables and the level of significance is taken at level 5% (P < 0.05).

Results

The total number of working women are 89 distributed among three scientific departments.

The number of women responded to study was 71 and the response rate was (79.7%).

Table (1): Socio- demographic characteristics of the study women

Socio- demographic parameter		Number(N=71)	Percent
Age group in year	<20	8	11.2
	20-25	10	14.3
	25-30	19	26.7
	35-40	24	33.8
	>40	10	14.0
Employment years	5- 10 years	9	12.6
	11- 15 years	23	32.4
	> 15 years	39	55.0
Type of work	Official	12	16.9
	Technical	37	52.2
	Teacher	22	30.9
Marital status	Single	18	25.3
	Married	53	74.7

Table 1 shows that most of the study women are technical (52.2%) aging between 35-40 years (33.8 %) with employment years above 15 years (55.0%), married (74.7%).

Table (2): Frequency distribution of study women according to family history and type of relationship

No.	Items	Yes		No		Total	
		No.	%	No.	%	No.	%
7	1-Family history of breast cancer	9.8	64	90.2	71	100.0	
4	2- Relation of breast cancer with the relatives	Mother	Sister		Aunt		Grand mother
		3	0		0		

Table 2 indicated that 90.2 % of study women had a negative family history of breast cancer and only 9.8 % of them had a positive history of breast cancer with a first degree (mother and sister).

Table (3): Study women distribution according to their knowledge about the risk factors, preventive and control measures for breast cancer.

Knowledge parameter	Number of working women (=71)				*P value
	yes	%	No.	%	
Risk factors of breast cancer					0.000
a- Aging factor	12	26.1	11	44.0	
b- Contraceptives pills	21	45.6	7	28.0	
c- Life style	10	21.8	5	20.0	
d- Family history	3	6.5	2	8.0	
Total	46	100.0	25	100.0	
Control measures :					0.240
a- Advanced educational program	19	48.7	12	37.5	
b- Raised general public awareness	10	25.6	8	25.0	
c- Control risk factors like contraception	8	20.6	5	15.6	
d- Regular cheek up	2	5.1	7	21.8	
Total	39	100.0	32	100.0	
Preventive guidelines :					0.000
a- Screening by mammography	18	29.4	6	30.0	
b- Modifying healthy life style	20	39.2	3	15.0	
c- Regular breast self exam	13	25.5	4	20.0	
d- Breast clinical exam	3	5.8	7	35.0	
Total	51	100.0	20	100.0	

Table 3 shows that there was a statistically significant agreement among study women knowledge regarding risk factors was for contraceptive pills (45.6%), (48.7%) for the advanced educational program as a control measures and (39.2%) for modifying healthy life style as a preventive measure for breast cancer prevention with a P value = 0.000 .

Table 4: Frequency distribution of study women according to their knowledge about the specific time for starting the prevention of breast cancer

Specific time for starting the prevention of breast cancer	Study women N=71						Total	P* value
	Electronic dept. N= 26		Electric dept. N= 25		Survey dept . N=20			
	No.	%	No.	%	No.	%		
1- Child hood before and during breast development	2	7.7%	7	28%	4	20%	13 (18.3%)	0.166

Cont... Table 4: Frequency distribution of study women according to their knowledge about the specific time for starting the prevention of breast cancer

2- Young adult hood before fully maturation of the breast	5	19.3%	1	4%	5	25%	11 (15.5%)	0.124
3- Adult hood after the breast fully mature	4	15.3%	11	44%	9	45%	24 (33.9%)	0.045
4- The birth of a women first child	15	57.7%	6	24%	2	10%	23 (32.3%)	0.015

* χ^2 – test was used

Table 4 shows that both electrical and survey dept. go with the establishing of breast cancer prevention at adulthood after fully matured (44%, 45%) respectively in comparison to 57.7% of study women from electronic dept. go with the starting of cancer prevention at the birth of a first child with a P value = 0.015

Discussion

Regarding the family history of breast cancer, the study shows that most of the working women had a negative family history of breast cancer. This result goes with the American cancer society (ACS) report about the disease / 2007⁽¹⁴⁾ The report stated that any women who had a history of breast cancer in her family is more prone to be a risk factor for it and this will lead gradually to increase the level of education about the disease occurrence

Shambhavi *etal* conducted a study in Mangalore, Karnataka / India to assess the teacher's knowledge regarding breast cancer and to find the association between the level of knowledge and some selected demographic variables. They found that the highest number of school teachers (60%) were in the age group between 25 -35 years and least were about > 55 years of age (6%)⁽¹⁵⁾.

Concerning the general knowledge of the breast cancer , the current study show the about half of study women knowledge regarding risk factors was for contraceptive pills and for the advanced educational program as a control measures. This result may be explained because of better information sources from the scientific references and the declaration of the Ministry of health on the television about the danger and risk factors of the disease.

Samir /2011⁽¹⁶⁾ conducted a study in the college of nursing / University of Sulaimani who found that the general informative background of study students regarding breast cancer, clinical manifestation, risk factors and control measures were ranged between highly significant and moderate. He explained that because of the student scientific study and general information in their college.

Another study was prepared by Alkhasawneh /2007⁽¹⁷⁾ at Pamukkale University Denizli hospital / Jordan among nurses. He found that 74 (57.6%) of them were correctly knew at least four risk factors of the disease and the increasing age 72%, familial history 94.4%, childlessness 85.6%, absence of breastfeeding 82.4%, and taking birth control pill or hormone replacement therapy 50.4% were well-known risk factors. However, a small percentage of them believed that early menarche 23.2% and late menopause 28.8% were the risk factors of breast cancer. He discussed these results because of breast cancer is being considered as a disease of the developed countries and much efforts with strong emphasis had been given to this issue in addition to that further preventive and control measures was conducted against breast cancer.

A similar study was conducted by Nada *et al.* / 2012⁽¹⁸⁾ in Kirkuk University about knowledge, attitude and practice towards breast cancer and breast self-examination as the most effective preventive measure towards breast cancer.

They found that the general knowledge about breast cancer and the practice of breast -self-examination was relatively well in Kirkuk yet the positive attitude towards learning the screening techniques and the intention to teach others were fairly encouraging they recommended

for promoting public health awareness campaigns through various media.

Dr. Golditiz *et al* / 2015⁽¹⁹⁾ published a study about the prevention of breast cancer mentioned that control and prevention should start early in life because nearly 25% of breast cancer patient is diagnosed in women younger than age 50 years in developed countries and 22% of it is diagnosed in premenstrual women and is often aggressive than cancer diagnosed in postmenopausal women . They recommended for adaptation of a specific strategy to decrease cancer risk by calculated how much the differences would occur in a sample of women .

A study was done by Coleman / 2008 ⁽²⁰⁾ to assess the survival rate of breast cancer. He found that the disease range was from 80% or more in North America, Sweden, and Japan to reach up to 60% in Middle income- countries and very low in low income-countries which reach to 40% and they explained these differences because of lack of preventive measures like early detection health programs which later on lead to increase the proportion of women complaining of late and advanced stage of the disease with the lack of adequate specific diagnosis of the disease .

Conclusion

Informative background for studied women was good but still, there is a defect in disease prevention and time for early detection.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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The Effect of Esomeprazole on Cell Line Human Cervical Cancer

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Abstract

Esomeprazole is an inhibitor of the proton pump that reduces gastric acidity and is used in indigestion treatment; Esomeprazole is a promising treatment for tumors, such as melanoma and B cell leukemia, through several mechanisms, including rapid cellular acidification and activation of many types of caspase enzymes, which in turn lead to the activation of cellular apoptosis

This work was designed to assess the toxicity of the (Esomeprazole) on (HeLa cell line) in vitro at concentrations starting from one - ten thousand µg/ milliliter and compared with cytotoxicity of vincristine and methotrexate at concentrations between one - ten thousand µg/ milliliter In 3 incubation periods

The results showed that the cellular toxicity of one µg / milliliter was a lot of more than the cellular toxicity of ten and a hundred µg / milliliter. The results additionally showed that toxicity of esomeprazole was considerably more than vincristine and methotrexate on HLA cells at seventy two hours.

Key word: *esomeprazole, vincristine, Hela cancer cell line.*

Introduction

Cervical malignant tumor is a common categories of cancer between female, lead to women's sexual ability and fertility ⁽¹⁾. Chemotherapy is that the backbone strategy for cancer treatment especially in the early stage in case of cervical cancer, is treated by surgery or irradiation with chemotherapy ⁽²⁻⁵⁾. Chemotherapy kills both cancer cells and normal cells with a high split rate ⁽⁶⁻¹⁴⁾, Common side effects of chemotherapy are nephrotoxicity, which usually associated with vincristine and methotrexate therapy

Several approaches to solve the toxicity of conventional cancer treatments have been developed, like using of natural agents as plant extract that may show a promising anticancer activity ⁽¹⁵⁻²³⁾.

Investigation about the efficacy of some drugs that already used to treat diseases other than cancer. it show a hopeful role in the handling of malignancy, such as aspirin, which acts as a protective agent for various types of Cancer (colorectal cancer), through a mechanism like suppress platelets aggregation ⁽¹⁹⁾, also acetaminophen at the therapeutic dose was capable of killing liver

cancer cells by turn activate apoptosis ⁽²⁴⁾. On the other hand, Omeprazole has the ability to rise the sympathy of the immune B-cell leukemia cell line to the vinblastine by several mechanisms, including an increase in cellular acidity ⁽⁴⁾.

Omeprazole have been shown to have potential to reduce resistance of tumor cell to chemotherapy by altering the pathway of the transfer of lysosomes contains and autophagy that activate programmed cell death mechanism ⁽³⁾. A mixture of esomeprazole and amygdalin reveled ability to suppress the growth of cervical cancer cells in vitro ^(5; 23).

Martial and Method

Proton pump inhibitor: Esomeprazole (nexium) ® 40 mg (AstraZeneca) was used in different concentrations ranging from one to 10000 µg / mL. These concentrations were set by thinning of the medication with bovine serum unrestricted medium.

Chemotherapeutics agent; a) Vincristine sulphate 1 mg/ml vial (hospira UK.) was used at different concentration ranged between (1-10000) µg/ml, after

dilution with bovine serum free medium

Methotrexate vial (50 mg/5cc - kocak / turkey) was used at different concentration ranged between (1-10000) µg/ml, after diluted with bovine serum free medium

$$\text{Inhibitor rate \%} = \frac{\text{The optical density of control} - \text{The optical density of test.}}{\text{The optical density of control}} \times 100$$

Cell line culture:

The human cervical cell line cancer gotten from the unit of tissue culture in the Iraqi Center for Cancer and Medical Genetics Research . It were planting in tissue culture flasks with size 75 cm 2 and with controlled conditions involving 5% of humidified, carbon dioxide on 37 ° C in RPMI-1640 media (Kigma Chemical, England) with fetal bovine serum at 10% (FBS), with add some anti biotic include pen.-strep. With concentration 1% ⁽¹⁰⁾.

Cytotoxicity Assay:

Human cervical cancer cells grown in microtiter plate (96wells) have been handled with a range of concentrations of each (esomeprazole, vincristine and methotrexate), cell density increases throughout the development period and also the cytotoxic effect of analytical agents strongminded once many incubation periods, ⁽¹⁰⁾ each milliliter contains 1X10⁵ cells / ml, serum calf medium (10 percent) Used for seeding, plates were then incubated at 37CO for 24 hours to achieve cell attachment, followed by various serial dilution (1-10000 µg / ml) for esomeprazole, vincristine and methotrexate by victimization maintenance medium.

After twenty-four hours of incubation, cells were exposed (for each concentration tested, six replicates at 200µl), two hundred µl of maintenance medium in

addition to each control group well, the days of exposure were twenty-four, forty-eight, and seventy-two hours. The cultures were wrapped with self-adhesive paper, then transferred to incubators and then colored cells with MTT stain. Each well’s optical density was scanned via a micro-ELISA at a wavelength of 550 nm (17 ; 10) ; the measurement of the substance frequency by using the subsequent equation⁽¹¹⁾

Statistical Analysis

The Statistical Analysis System (SAS) ⁽¹⁸⁾ used it to determine the outcome of varying parameter factors in the study.

Results and Discussion

Esomeprazole cytotoxic effect:

The findings of esomeprazole productivity inhibition of Hela cancer cells show an increase in productivity inhibition with an increase in the concentration of esomeprazole ranging from (10-10000) µg / ml, for every 3 incubation periods, except (1 µg / ml) wherever growth inhibition was significantly higher than 10 µg / ml to all incubation cycles, whereas there was no significant variation between the development reserve of (1 µg/ml) with (1000 µg/ml) for 24hr. and (1 µg/ml) with (100 µg/ml) for 48hr. and 72hr. incubation periods table (1).

Table (1) Effect of concentration and time in growth inhibition rate for Esomeprazole on Hela cancer cell line

Concentration (µg/ml)	Time (hr.)			LSD value
	24	48	72	
1	B 44.50 ± 7.03 a	A 32.46 ± 9.08 a	B 25.76 ± 6.87 a	26.754 NS
10	C 9.66 ± 2.28 a	B 6.86 ± 3.43 a	C 3.93 ± 1.45 a	16.012 NS

Cont... Table (1) Effect of concentration and time in growth inhibition rate for Esomeprazole on Hela cancer cell line

100	C 16.20 ± 1.10 a	A 14.90 ± 8.02 a	B 29.40 ± 3.14 a	17.356 NS
1000	B 35.30 ± 6.36 b	A 23.83 ± 2.45 b	A 89.66 ± 0.66 a	13.70 **
10000	A 83.63 ± 0.24 b	A 32.56 ± 2.31 c	A 88.76 ± 0.97 a	5.037 **
LSD value	13.845 *	20.198*	11.828 *	----
* (P<0.05).				

*Capital letter to compare among column means.

**Small letter to compare among row means,

Hormesis will explain the fluctuated growth inhibition of esomeprazole; hormetic result may be a common biological development in pharmacological medicine characterized by a reverse action of low concentrations compared with high concentration ⁽¹⁶⁾. The carbon-based biochemical pathway by hormesis action aren't well clear, it's imagined that low amounts of poisonous ingredient might start the healing process in the body ⁽⁶⁾. This compound might increase the activity of anticancer agent whereas others may forestall the carcinogenic effect of some genotoxic compound ⁽⁹⁾

Several recommended mechanisms will explain the toxicity of esomeprazole on Hela cancer cells, because the ability of esomeprazole to induce a lysosomes membrane permeabilization, inflicting increase outflow of lysosomes contains to the cytoplasm, inflicting lysis of cellular elements then death, additionally to hydrolytic activity, the lysosomal enzymes also can offer acidic atmosphere that encompasses a role in killing tumor cells ^(8 ; 13 ; 15). Another mechanism in vitro via a fast intracellular acidification and activation of many caspase enzyme ⁽⁵⁾, esomeprazole has ability to produce ROS in B cells neoplasm by many ways ⁽⁴⁾.

Comparison among the cytotoxic effect of Esomeprazole, Vincristine and Methotrexate:

As shown in table (2) the manner of vincristine growth inhibition is dose and time dependent reflecting the fact of increase in vincristine cytotoxicity occurred with increase in time of its persistence inside cancer cells which occurred by several mechanisms including

mitosis blocking in metaphase, and blocks the ability of tubulin to polymerize to form microtubules binding by binding of microtubule protein, (tubulin) with esomeprazole then. Consist of Tubulin dimers

that resulting from paracrystalline aggregates, leading to Spindle apparatus dysfunction, frozen in metaphase, impaired chromosomal segregation and cellular proliferation.

Permeabilization of lysosomal membrane is one of the vincristine anticancer mechanisms which Causing increase of lysosomes contains leakage to the cytoplasm and occurrence of cell death by the Degenerative activity of lysosomes contains and acidic conditions which equip by lysosomes acidic ambience.

When comparing between the growth inhibition of vincristine with esomeprazole as shown in table (4,5,6), the results establish the development reserve of esomeprazole was more than vincristine growth inhibition on Hela cancer cells, especially at 24 hr. and 72hr. incubation periods . reflecting the ability of esomeprazole to enhance permeabilization of lysosome membrane was more than the vincristine ability , that may related to the development of resistance toward vincristine action by efflux of vincristine through the special transport system P-glycoprotein ⁽²⁰⁾ leading to less in persistence time of vincristine inside cancer cells , producing less in antineoplastic activity of vincristine which including inhibition in microtubules formation , with less ability to induce lysosomes membrane permeabilization as compared with the inducing ability of esomeprazole , where esomeprazole has a superiorities on vincristine to induce lysosomes membrane permeabilization which mainly related to the less resistance development toward esomeprazole activity.

While the result of methotrexate. Growth inhibition as shown in table (3) the growth inhibition at 72hr. was less than the growth inhibition at 24 hr. especially at 10,100 and 1000 µg/ml, this result reflecting the developments of resistance toward methotrexate Cytotoxicity ,where there is several mechanism by

which cancer cells follow to resistance the cytotoxicity of MTX included (weakening in methotrexate moving into cells, making of altered form of DHFR that have a fewer affinity for the dysfunction, intracellular height of intracellular DHFR, by quality enhancement or modified quality guideline and diminished capacity to combine methotrexate polyglutamate) ⁽⁷⁾.

when comparing between the cytotoxicity of esomeprazole and methotrexate as shown in table (4,5,6) and, the result of comparison demonstrated the growth inhibition of esomeprazole was more than the growth inhibition of methotrexate, that may relate to less resistance development toward esomeprazole.

Table (2) Effect of concentration and time in growth inhibition rate for Vincristine on Hela cancer cell line

Concentration (µg/ml)	Growth inhibition			LSD value
	24 hr.	48 hr.	72 hr.	
1	C 12.00 ± 2.54 a	B 18.00 ± 2.54 a	B 20.00 ± 2.54 a	8.791 NS
10	BC 17.00 ± 1.73 b	B 19.00 ± 1.73 b	A 36.00 ± 3.46 a	8.476 *
100	BC 18.00 ± 4.04 b	B 23.00 ± 4.04 b	A 40.00 ± 4.04 a	13.985 *
1000	B 24.00 ± 4.73 b	B 25.00 ± 4.73 b	A 45.00 ± 5.19 a	16.932 *
10000	A 36.00 ± 3.17 b	A 45.00 ± 3.17 ab	A 47.00 ± 1.73 a	9.616 *
LSD value	10.758 *	10.758 *	11.343 *	----
(P<0.05), NS: Non-significant.				

Table (3) Effect of concentration and time in growth inhibition rate for methotrexate on Hela cancer cell line

Concentration (µg/ml)	Inhibition effect of Methotrexate on cell viability %			LSD value
	24 hr.	48 hr.	72 hr.	
1	C 0 ± 0.00 a	C 0 ± 0.00 a	C 0 ± 0.00 a	0.00 NS
10	B 17 ± 0.62 a	C 4 ± 0.06 b	C 0 ± 0.00 b	7.95 *
100	B 19 ± 0.59 a	BC 10 ± 0.37 b	C 0 ± 0.00 c	9.53 *
1000	A 30 ± 1.24 a	AB 14 ± 0.51 b	B 17 ± 0.55 b	7.69 *
10000	A 37 ± 2.49 a	A 19 ± 0.62 b	A 31 ± 1.07 a	7.85 *
LSD value	8.531 *	8.336 *	4.602 *	-
(P<0.05), NS: Non-significant.				

Table (4) Effect of Esomeprazole, methotrexate and Vincristine on Hela cancer cell line at 24hr .

Concentration ($\mu\text{g/ml}$)	Treatment			LSD value
	Esomeprazole	Vincristine	MTX.	
1	B 44.50 \pm 7.03 a	C 12.00 \pm 2.54 b	C 0.00 \pm 0.00 b	14.942 *
10	C 9.66 \pm 2.28 b	BC 17.00 \pm 1.73 a	B 17.00 \pm 1.73 a	6.688 *
100	C 16.20 \pm 1.10 a	BC 18.00 \pm 4.04 a	B 19.00 \pm 3.46 a	10.86 NS
1000	B 35.30 \pm 6.36 a	B 24.00 \pm 4.73 a	A 30.00 \pm 4.04 a	17.79 NS
10000	A 83.63 \pm 0.24 a	A 36.00 \pm 3.17 b	A 37.00 \pm 2.30 b	7.85 *
LSD value	13.845 *	10.758 *	8.531 *	----
(P<0.05).				

Table (5) Effect of concentration and time in growth inhibition rate for Esomeprazole, methotrexate and Vincristine on Hela cancer cell line at 48hr .

Concentration ($\mu\text{g/ml}$)	Treatment			LSD value
	Esomeprazole	Vincristine	MTX.	
1	A 32.46 \pm 9.08 a	B 18.00 \pm 2.54 a	C 0.00 \pm 0.00 b	18.850 *
10	B 6.86 \pm 3.43 ab	B 19.00 \pm 1.73 a	C 4.00 \pm 1.15 b	14.335 *
100	A 14.90 \pm 8.02 a	B 23.00 \pm 4.04 a	BC 10.00 \pm 2.30 a	18.52 NS
1000	A 23.83 \pm 2.45 a	B 25.00 \pm 4.73 a	AB 14.00 \pm 4.04 a	13.36 NS
10000	A 32.56 \pm 2.31 b	A 45.00 \pm 3.17 a	A 19.00 \pm 3.46 c	10.46 *
LSD value	20.198 *	10.758 *	8.336 *	----
(P<0.05).				

Table (6) Effect of concentration and time in growth inhibition rate for Esomeprazole, methotrexate and Vincristine on Hela cancer cell line at 72hr .

Concentration ($\mu\text{g/ml}$)	Treatment			LSD value
	Esomeprazole	Vincristine	MTX.	
1	B 25.76 \pm 6.87 a	B 20.00 \pm 2.54 a	C 0.00 \pm 0.00 b	14.64 *
10	C 3.93 \pm 1.22 b	A 36.00 \pm 3.46 a	C 0.00 \pm 0.00 b	9.761 *
100	B 29.40 \pm 3.14 b	A 40.00 \pm 4.04 a	C 0.00 \pm 0.00 c	10.23 *
1000	A 89.66 \pm 0.66 a	A 45.00 \pm 5.19 b	B 17.00 \pm 2.31 c	11.43 *
10000	A 88.76 \pm 0.97 a	A 47.00 \pm 1.73 b	A 31.00 \pm 2.31 c	6.086 *
LSD value	11.828 *	11.343 *	4.602 *	----
(P<0.05).				

*Capital letter to compare among column means.

**Small letter to compare among row means,

Conclusion

This study prove that Esomeprazole have a promising anticancer activity against human cervical cancer cells with superiority above vincristine and methotrexate cytotoxicity.

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Evaluation of Salusin β in Patients with Prediabetes and Type 2 Diabetes Mellitus

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Abstract

Background: Type 2 Diabetes mellitus is a group of metabolic disease characterized by increase blood glucose level (hyperglycemia) resulting from either defect in insulin production by pancreas or increase insulin resistance that lead to decrease insulin effect in the body. prediabetes It is stage before diabetes mellitus including impaired fasting glucose (IFG) where the fasting glucose level (6.1-7.0 mmol/L) and impaired glucose tolerance (IGT after glucose load) glucose level (7.8-11 mmol/L). (**salusin- β**) It is a newly glass of peptide it is synthesized in many body tissues, like (skeletal muscle, human vascular smooth muscle cells, and endothelial muscle) it have important role in Diabetes pathogenesis it has been reported to involve in vascular inflammation and the relation between salusin β and diabetes through endothelial injury, salusin β increase inflammation in diabetes. It have essential role in pathological endothelial dysfunction. **Method:** by using ELISA kit, we measured serum level of salusin β in 30 patients with prediabetes and 30 patients with type 2 DM compare with 30 healthy volunteers enlisted as normal controls. **Result:** serum salusin β level in patient with type 2 DM were significantly higher than prediabetes group and normal subjects. Salusin β in prediabetes group no significant higher than in healthy control subjects. **Conclusion:** Serum Salusin β level in patients with type 2 DM are expressed at significantly high levels were no difference in Salusin β level of prediabetes group and normal control subjects.

Keywords: Salusin β , diabetes mellitus, prediabetes, ELISA.

Introduction

Diabetes mellitus is a group of metabolic disease characterized by increase blood glucose level (hyperglycemia) resulting from either defect in insulin production by pancreas or increase insulin resistance that lead to decrease insulin effect in the body. Feature of hyperglycemia include polyuria, weight loss, polyphagia, polydipsia, unclear .

Prediabetes It is stage before diabetes mellitus including impaired fasting glucose (IFG) where the fasting glucose level (6.1-7.0 mmol/L) and impaired glucose tolerance (IGT after glucose load) glucose level (7.8-11 mmol/L), to forms of prediabetes in which increase glucose level more than normal range but below the renal threshold of diabetes level, the HbA1c range in the two. state . The presence of prediabetes is associated with the presence of β cell dysfunction and insulin resistance and about 5-10% of population are

development to. Salusin β It is a newly glass of . salusin- β have special physicochemical properties, It is present in biological fluids such as human plasma , urine and vascular .the bioactive peptide (salusin- β) is synthesized in many body tissues, stomach, bone marrow, small intestine, thymus, lymph, salivary glands, adrenal medulla, adrenal cortex, spleen, liver, brain, skeletal muscle, testes, human vascular smooth muscle cells, and endothelial muscle. salusin β it have important role in the diabetes. it has been reported to involve in vascular inflammation and the relation between salusin β and diabetes through endothelial injury, salusin β increase oxidative stress, cardiac dysfunction and inflammation in diabetes. It have essential role in pathological endothelial.

The aim of the present study was to evaluate serum level of Salusin β in patients with type 2 DM , Prediabetes, and compare this group with control healthy group as well as to investigate whether it can be used as

a biomarkers for detection of diabetes.

Materials and Method

Study design case control study

The present study include 90 Iraqi participants (30 with type 2 DM, 30 with prediabetes, 30 normal healthy control group) the Age range (30-65)years, the age and gender matched to the patients and control group. Blood sample collected between September 2018 and april 2019. The following biochemical parameters have been studied. Salusin β , hs- CRP by ELISA method, fasting blood sugar (FBS), HbA1c, blood urea, serum creatinine, Lipid profile by colorimetric method by (cobas C111). Measure body mass index (BMI), and measure (WC). Fasting serum Samples were collected from patients and control by taking eight (8) ml of venous blood will be collected in plane tube (without anticoagulant). Blood are stand for 30 minutes then centrifuged in 1800 RPM for 15 minutes. Serums are transferred to new tube and keep in -20 C until assay.

Salusin ELISA

A total 100 μ l serum was analyzed using a commercially available ELISA kit Salusin β (melsin) according to manufactures recommendations. Prepare all reagents before starting assay procedure. It is recommended that all Standards and Samples be added in duplicate to the Microelisa Stripplate. Add standard: Set Standard wells, testing sample wells. Add standards 50 μ l to standard wells. Add 10 μ l of testing sample of sample wall .Then add 40 μ l of sample diluent to testing sample well, doesn't add anything to the Blank well. Add HRP-conjugate reagent 100 μ l to each well, covering with an adhesive strip , incubate for 60 minutes

at 37°C. Aspirate each well and wash, repeating the wash 4 times for a total of 5 washes. Wash by filling each well with Wash Solution (400 μ l) using a squirt bottle, manifold dispenser or auto washer. Removal of liquid completely at each step is essential to good results. After the last wash, remove any remaining Wash Solution by decanting or aspirating. Invert the plate and blot it on a clean paper towels. Add 50 μ l of chromogen solution (A) and added 50 μ l of chromogen solution B to each well. mix Gently and incubate for fifty minutes (15) minutes at 37°C. and Protect from light. Add 50 μ l from Stop Solution to each well. The color should change from blue to yellow of the walls. If the color in the wells is green or the color change does not appear uniform, gently tap the plate to ensure thorough mixing. Read the Optical Density (O.D.) at wave lengths 450 nm and using a microtiter plate reader within 15 minutes.

Statistical Analysis

Statistical analysis was carried out by using SPSS version 20 and Microsoft excel 2013.the numerical data expressed as mean \pm SD. Comparison between mean serum Salusin β concentration and (IFG, DM) groups were performed. Receiver Operating Characteristics (ROC) Curve was calculated to estimate the sensitivity and specificity of the used Salusin β .

Result

There was highly significant difference in mean Salusin- β among study groups ($P < 0.001$); the level was highest in diabetic patients with highly significant difference ($P < 0.001$) in comparison with that of both prediabetics and control subjects; however, there was insignificant difference between control and prediabetic groups ($P = 0.736$),

Table 1. Salusin- β in patients and control groups

Characteristic	Control		Prediabetic		Diabetic		P	P1	P2	P3
	Mean	SD	Mean	SD	Mean	SD				
Salusin- β (pg/ml)	5.12	1.15	5.27	0.83	7.80	2.47	<0.001 † HS	0.736 ¥ NS	<0.001 ¥ HS	<0.001 ¥ HS

n: number of cases; data were presented as either mean and standard deviation; †: One way ANOVA; ¥: post hoc LSD test; HS: highly significant at $P \leq 0.01$; NS: not significant at $P \leq 0.05$; S: significant at $P \leq 0.05$; P1: Control vs prediabetic; P2: Control vs DM; P3: Prediabetic vs DM

Result

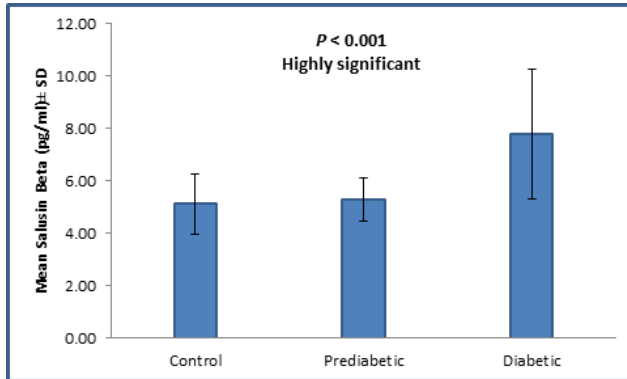


Figure 1. Bar chart showing the mean serum salusin beta in diabetics, prediabetics and control subjects

Because of the highly significant difference in the level of salusin-β in diabetic patients when compared to prediabetics and control groups, the authors of the current study suggested the presence of a cutoff value that can predict a diagnosis of diabetes with certain level of accuracy. For that reason, receiver operator characteristic (ROC) curve analysis was carried out and the results are shown in figure 3.1 and table 3.6. The cutoff value was > 6.5 with an accuracy level of 88.2 %, a sensitivity level of 80 % and specificity level of 93.3 %, table 3.6.

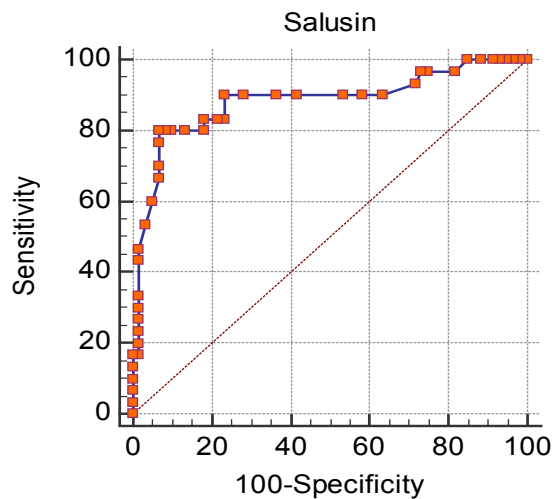


Figure 2. Receiver operator characteristic (ROC) curve to predict the Salusin β cutoff value with a diagnosis of diabetes mellitus

Table 2. Cutoff value , sensitivity and specificity of Salusin- β.

Characteristic	Salusin-β
Cutoff value	> 6.5
AUC (95 % CI)	0.882 (0.796 - 0.940)
Accuracy	88.2 %
P	<0.001
Sensitivity	80.00
Specificity	93.33

Discussion

It is a peptide that present in endothelium tissue and in cell membrane it is play important role in endothelial function and pathogenesis of diabetes the increase level of salusin β in patients with type -2 diabetes mellitus related with the complication of diabetes due to endothelial injury (7). In the present study found increase in Salusin β concentration in diabetes group and high significant deference between diabetes group and another two groups at p value (<0.001) and normal level of prediabetes and control group . And this agreement with study done by (7) salusin β was higher in level with high glucose (diabetes group). Salusin beta was positively correlated to female gender There was no significant correlation among markers in all three study groups, as shown in table (3.3) Because of the highly significant difference in the level of salusin-β in diabetic patients when compared to prediabetics and control groups, the authors of the current study suggested the presence of a cutoff value that can predict a diagnosis of diabetes with certain level of accuracy. For that reason, receiver operator characteristic (ROC) curve analysis was carried out and The cute off value was > 6.5 with an accuracy level of 88.2 %, sensitivity level of 80 % and specificity level of 93.3 %, result show in table (3.6). Salusin beta was negatively correlated to age, positively correlated to FBS, positively correlated to HBA1c, negatively correlated to cholesterol and negatively correlated to LDL, in the present study the result show there was positive correlation between salusin-β and FBS. And no correlation between salusin-β and adiponectin, no correlation with lipid bound sialic acid and no correlation with lipid profile.

Table 3. Correlations of biochemical markers to demographic, disease characteristic lipid profile and renal function in prediabetic group

Characteristic	salusin (pg/ml)	
	<i>r</i>	<i>P</i>
Age	0.312	0.094
Gender	0.449	0.013*
BMI	0.171	0.365
Waste (cm)	-0.134	0.479
FBS	0.103	0.587
HbA1c	0.025	0.896
cholesterol (mg/dl)	-0.194	0.305
TG (mg/dl)	-0.206	0.276
HDL (mg/dl)	0.048	0.801
LDL (mg/dl)	-0.312	0.093
VLDL (mg/dl)	-0.205	0.278
UREA (mg/dl)	-0.122	0.52
creatinine (mg/dl)	0.223	0.237

* significant at $P \leq 0.05$; ** highly significant at $P \leq 0.01$

Conclusion

Salusin β was significant increase level in patients with type -2 diabetes mellitus as a compared with prediabetes and control healthy group with high sensitive and Specific of cutoff value for diagnosis type 2 DM, there was significant correlation between salusin β and FBS and HbA1c. no significant deference of salusin- β level in prediabetes and control groups.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of

both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Vitamin D and its Association with the Severity and / or the Control of Asthma among Adult Iraqi Asthmatics

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Abstract

Background: asthma is one of the common chronic diseases with variable presentations and pathogenetic mechanisms. Vitamin D is thought to influence the expression as well as the severity, control and treatment responses in some asthmatic patients. Aim of study: to examine the possible association between asthma severity and level of control with vitamin D level in a sample of Iraqi adult asthmatics. **Method:** randomly selected 50 patients with asthma diagnosis were evaluated for medical factors of asthma harshness and control with measurement of 25-hydroxyvitamin D serum level (mean age \pm SD: 48.5 \pm 14.05 years, 30% males, FEV1: 1.44 \pm 0.63 L, 60 % severe, 60% poorly controlled). **Results:** most of asthmatic patients (96%) were found to have vitamin D level of less than 30 ng/ml (17.66 \pm 7.06 ng/ml) and this was related to severity of airway obstruction (mild: 28.71 \pm 5.52 ng/ml, moderate: 19.9 \pm 4.56 ng/ml, severe: 13.81 \pm 4.22 ng/ml, $p < 0.001$) as well as control of asthma (controlled: 27.13 \pm 6.12 ng/ml, partly controlled: 20.62 \pm 4.21 ng/ml, uncontrolled: 17.66 \pm 7.06 ng/ml, $p < 0.001$). In addition, the 25(OH)D level was significantly associated with history of ER visits and hospitalizations. No significant association between the gender, age, BMI, the presence of allergic rhinitis and the status of vitamin D level. **Conclusions:** low levels of 25(OH)D were common in this sample of Iraqi adult asthmatics and was most prevalent and severe in those with severe and/ or uncontrolled asthma. This finding supports the hypothesis of possible vitamin D role in asthma.

Key words: vitamin D, severity and / or the control, asthma, Iraqi asthmatics.

Introduction

asthma is a common chronic illness with growing prevalence in many parts of the world for many years. More than 300 million persons from all ages, and different ethnics, grieve from asthma and its burden on patients, the families, and economy of the health authorities and is increasing internationally. It is defined by “a history of symptoms including wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airflow limitation”.⁽¹⁾

It has been suggested that there is heterogeneity in asthma expression and phenotypes and these respond differently to treatment options which suggests different pathogenetic mechanisms. In most asthmatics, i.e. the classical type, the symptoms are well controlled by beta 2 agonists and inhaled corticosteroids. However, some phenotypes of asthma do not exhibit similar response to corticosteroids and those patients are labelled as steroid – refractory and are challenging to manage clinically.⁽²⁻⁶⁾

Vitamin D affects the pathophysiology of asthma by effect on several mechanisms. It may help in maintaining the immune homeostasis especially the innate immunity by the direct stimulation of the expression of the gene responsible for the production of the antimicrobial peptide cathelicidin, which is known to be active against viruses, bacteria and fungi, and its deficiency may predispose to infections and consequent asthma exacerbations.⁽⁷⁾

In addition, vitamin D can reduce inflammation and smooth muscle proliferation by inhibiting the synthesis and release of cytokines related to the Th1 immune response and it may decrease the expression of TNF- α which lead to enhanced inflammatory response in asthmatics. In addition, it has been suggested that the level of 25(OH)D may facilitate steroid response in asthmatics.⁽⁸⁾ The purpose of study is to find any link between vitamin D level and the severity and / or the control of asthma in a sample of adult Iraqi asthmatics.

Method

This is a cross sectional study of randomly selected 50 patients (35 females and 15 males) with asthma who regularly attend the respiratory medicine outpatient clinic at Al-Imamein Kadhimein Medical City. Patient interviewing and testing period was from the first of December 2014 till 31st of December 2015. **Inclusion criteria:** confirmed asthma diagnosis, age 18 years and above

Exclusion criteria: presence of smoking history, use of supplemental vitamin D, presence of co-morbid chronic condition like chronic renal failure, diabetes mellitus, heart failure and use of prolonged daily systemic steroids in the last year.

Asthma severity and control: the level of control and asthma severity were assessed via the simple questions suggested by Global Initiative for Asthma (GINA)¹ by asking about the frequency of daytime symptoms, night symptoms, use of rescue inhalers and limitation of activity. Patients were grouped as well controlled, partly controlled and poorly controlled. Patients were grouped according to the forced expiratory volume in one second (FEV₁) percentage of predicted into mild intermittent/persistent ($\geq 80\%$ predicted), moderate persistent ($\geq 60\%$ but $<80\%$ predicted) and severe ($<60\%$ predicted).⁽¹³⁾

Spirometry: according to the American Thoracic Society guidelines⁽¹⁴⁾, by a practiced operator using Masterscreen system (Jaeger Co., Höchberg, Germany) at the pulmonary function test laboratory in Al-Imamein Kadhimein Medical City. FEV₁ and forced vital capacity (FVC) were recorded. For those with FEV₁ of less than 70% predicted, reversibility testing using nebulized salbutamol 2.5 mg for 5 minutes and repeating the spirometry testing after 5 minutes was done. Reversibility was documented with both 200 ml increase in FEV₁ and 12% increase in FEV₁.

Vit D level assessment: vitamin D level was determined using Vidas[®] 25 OH Vitamin D Total test (bioMérieux SA, USA) according to the manufacturer recommendation. Levels of < 20 ng/ml considered deficiency, 20 – 29.9 ng/ml considered insufficiency and ≥ 30 ng/ml were considered as sufficient according to the previous recommendations.⁽¹⁴⁾

Other measurements: height and weight were recorded by a trained personnel during spirometry and

the body mass index was calculated using the standard equation weight (kg)/height (m)².

Statistical Analysis : done by SPSS 22 , data were presented in simple measures of frequency, percentage, mean, standard deviation, and range (minimum-maximum values). Chi square test was used for categorical variables and Pearson's Correlation two tailed test was used for parametric variables. P value was equal or less than 0.05 mean significant results.

Results

50 patients involved in the study, mean age was 48.5 ± 14.05 years (range 19 – 72). There were 35 (70%) females and 15 males (35%). Body mass index (BMI) was 30.72 ± 7.86 (range 15.79 - 53.69). The mean level of vitamin D was (17.66 ± 7.06) ng/ml and range from 8.1 – 39.80 ng/ml. The FEV₁ mean was 1.44 ± 0.63 L with a range from 0.53 to 3.7 L. as in table (1).

Table 1: Age, BMI, FEV₁, FVC and 25 (OH) D level in relation to gender (mean \pm SD)

Variable	Female	Male
Age (mean \pm SD) years	48.17 \pm 14.56	49.27 \pm 14.83
BMI (mean \pm SD)	32.76 \pm 7.90	25.94 \pm 5.4
FEV ₁ (mean \pm SD) L	1.33 \pm 0.46	1.69 \pm 0.88
FVC (mean \pm SD) L	2.07 \pm 1.72	2.34 \pm 0.98
25(OH) level(mean \pm SD) ng/ml	17.01 \pm 6.75	19.16 \pm 7.77

In this study, only 8 patients (16%) had mild persistent asthma, and only 9 patients (18%) had well controlled asthma. Figures 2 and 3 display the control and severity of asthma among this study sample respectively. Regarding treatments used for patients, 34 patients (68%) were using beta agonist inhalers, 19 (38%) were on inhaled corticosteroids (ICS) and 17(34%) on combination ICS and long acting beta agonist (LABA). There was no significant association between the treatment use and the level of 25(OH)D. There is a significant positive correlation between the level of 25(OH)D and FEV₁, $r(50) = 0.772$, $p < 0.001$. There was negative significant correlation between the level of vit D and the number of emergency visits, $r(50) = -0.749$, $p < 0.001$. Other correlations are shown in table 2.

Table 2 - Correlations of parametric variables with 25(OH)D level

25(OH)D correlations		
Variables	Pearson's Correlation (r)	Significance (p)
Age	-0.109	0.452
BMI	0.195	0.174
FEV1	0.772	<0.001
FVC	0.224	0.118
FEV1/FVC	0.557	<0.001
Emergency Visits	-0.749	<0.001
Hospitalizations	-0.465	0.001

The level of asthma control was found to be significantly related to the severity of asthma ($p < 0.001$) with 60 % ($n=30$) of patients having poorly controlled asthma, of whom 86.7% ($n=26$) having severe persistent asthma (Figure 1). In addition, the severity of asthma was significantly related to the status of vitamin D ($p < 0.001$) with 81.8% ($n=27$) of patients with severe asthma having deficiency of 25(OH) (level < 20 ng/ml) (Figure 2). Moreover, the level of control was also significantly related to the status of vitamin D ($p < 0.001$) with 96.7% ($n= 29$) of poorly controlled asthmatics having deficiency of vitamin D (Figure 3).

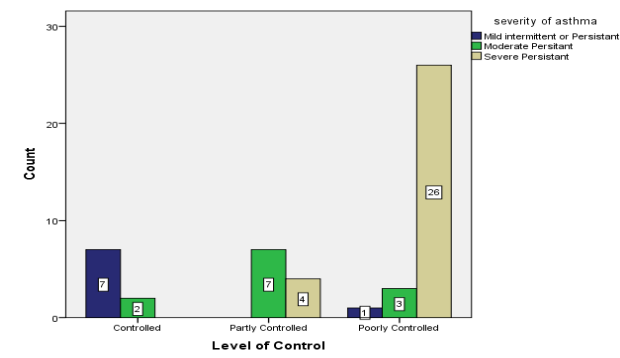


Figure 1: Level of asthma control and its severity

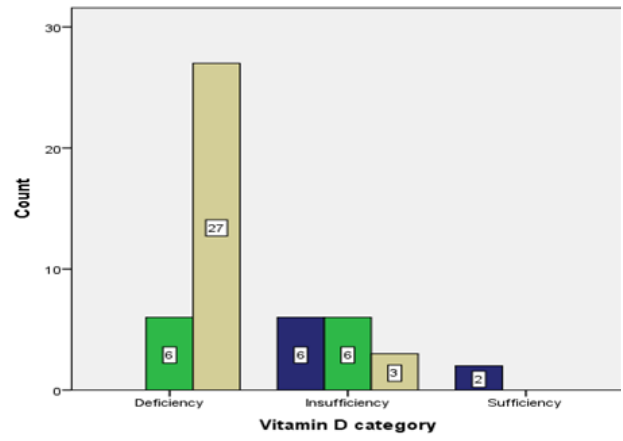


Figure 2: Level of asthma severity and Vitamin D status

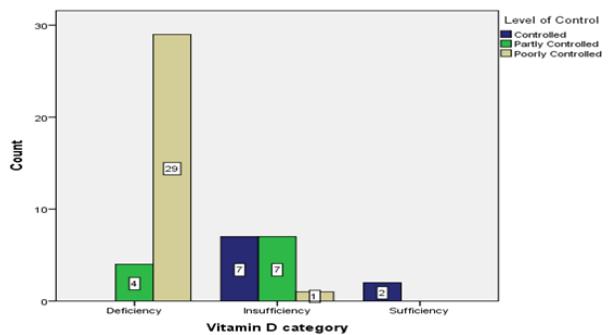


Figure 3: Level of asthma control and Vitamin D status

Mean and SD of levels of 25(OH)D, FEV1, FVC, FEV1/FVC according to the level of asthma severity and control are presented in tables 3 and 4.

Table 3 - means, standard deviations of 25 (OH) D level, FEV1, FVC, FEV1/FVC and patient numbers in relation to the level of asthma control.

Asthma Control Level	25 (OH) level (ng/ml)	FEV1(L)	FVC (L)	FEV1/FVC
Controlled (n=9)	Mean ± SD			
	27.13±6.12	2.1±0.68	2.51±1.01	85.57±10.63
Partly controlled (n=11)	Mean ± SD			
	20.62±4.21	1.67±0.55	2.12±0.59	74.69±8.72
Poorly Controlled (n=30)	Mean ± SD			
	17.66±7.06	1.15±0.45	2.02±1.87	67.00±13.63

Table 4 - means, standard deviations of 25 (OH) D level, FEV1, FVC, FEV1/FVC and patient numbers in relation to asthma severity

Asthma Severity	25(OH)D(ng/ml)	FEV1 (L)	FVC (L)	FEV1/FVC
Intermittent / Mild Persistent	28.71± 5.52	2.2 ± 0.68	2.5 ± 1.06	89.72 ± 9.77
Moderate Persistent	19.9 ± 4.56	1.7 ± 0.54	2.4 ± 0.66	72.97 ± 7.87
Severe Persistent	13.81 ± 4.22	1.1 ± 0.36	1.9 ± 1.85	66.94 ± 13.0

There was no significant association between the age, gender, BMI, the presence of allergic rhinitis and the status of vitamin D level.

Discussion

In this study, high prevalence of vitamin D deficiency and inadequacy among this sample of Iraqi adult asthmatics (96%, n=48). This high ratio is similar to that stated in Chinese (90%) and Costa Rican (90%) adult asthmatics but is higher than that recorded in German adult asthmatics (64%).⁽¹²⁻¹⁴⁾ However, this percentage is much higher than that seen in childhood asthma reported in previous studies; 20% in Iranian, 28% in Costa Rican, 38% in Egyptian, and 44% in Puerto Rican childhood asthmatics.⁽¹⁵⁻¹⁸⁾ These discrepancies between adults and children asthmatics may be related to behavioral variables seen in areas with plenty of sunny days as by avoiding sunlight, dress habits and racial difference in skin color. Importantly, in Iraq the cultural and religious background may play a role in limited sun exposure. Other variables for low vitamin D level like being overweight or female gender can also play a role but there was no significant association. In this study, the level of vitamin D was not associated with markers of allergy; namely the presence of allergic rhinitis used in our study. This lack of association of vitamin D level and markers of allergy has been described in some studies.^(9,12,13) However, such associations have been reported in other studies^(10,14,15,18) These contradicting results may be related to the different populations studied, the difference in allergen exposure between regions and the variability in outdoor exposure to sun in different parts of the world. These findings need cautious interpretation since the sample size is small and the other parameters of allergic response (like IgE level, sputum eosinophilia, allergen specific IgE antibodies, IL-4, and IL-5) have not been studied in this study. The major result of this study was the presence of significant correlation between the levels of vitamin D and the FEV1, FEV1 percent of predicted (as a marker of asthma severity), and FEV1/

FVC ratio (as a marker of airway obstruction), $p < 0.001$ for all parameters. This finding has been recorded in most of the studies in both adults and children.⁽¹¹⁻¹⁹⁾ Moreover, vitamin D level was significantly associated with the level of asthma control, patients with higher level of vitamin D tend to have better asthma control (27.13±6.12 in controlled, 20.62±4.21 in partly controlled and 17.66±7.06 in uncontrolled, $p < 0.05$). This finding was also observed in a cross-sectional studies in Italian children and German adults.^(11,14)

In this study, the risk of emergency department visits and hospitalizations were found to be significantly associated with vitamin D level, $p < 0.001$ for both. These findings are consistent with the results obtained from other studies, both in adults and children.^(9,10, 12-14, 16-18)

However, a causal relationship between asthma and vitamin D deficiency cannot be established due to the sample size and cross-sectional project. In specific, the possibility of reverse causation cannot be eliminated as the patients with severe, poorly controlled asthma are more likely to be home bound with less exposure to sun and may be exposed to frequent steroid rescue courses that might have induced the deficiency state in vitamin D. Additional issue is the selection bias as there was unbalanced male to female ratio (30% males vs. 70% females). However, comparable gender inequality in asthma have been recorded in previous studies conducted on Iraqi adult asthmatics.^(19, 20) Also This study was conducted in a tertiary center and in a specialized respiratory unit, which may not reflect the overall population of asthmatics in Iraq. Additional limitation of this study is the absence of control group of well persons to regulate that the level of vitamin D has a solid association with asthma or this observation of low vitamin D level is just a coincidence.

Conclusion

this study demonstrates that a low level of vit D is related with clinical parameters of poor asthma control plus severe asthma as predicted FEV1.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Determination *Enterococcus faecalis* in Asymptomatic Urinary Tract Infection Associated with Diabetes Type 2 Patients in Suwayrah General Hospital-Iraq

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Abstract

Background: Asymptomatic Urinary Tract Infection is common in diabetes type-2 patient and predisposes these patients to more severe urinary tract infections (UTIs). Enterococci have been documented to cause infection of the urinary tract and other sites. Although several species of *Enterococcus* have been recognized, *Enterococcus faecalis* has been considered one of the major agents of urinary tract infections.

Objectives: To determine the percentage *Enterococcus faecalis* of ASB , antimicrobial resistance in diabetics and non-diabetics in urine sample and detection of enterococcal surface protein (*esp*) gene .

Method: The study involved a total of 611 participants including 197 diabetes mellitus patients and 414 non-diabetics in Suwayrah-Wasit-Iraq. Mid-stream urine was collected from consented subjects and dipstick , general urine examination and bacterial culture were conducted for each sample. Isolates were identified using standard biochemical tests and VITEK-2 system .

Results: All collected samples are asymptomatic bacteriuria. There was a significant difference in the percentage of asymptomatic bacteriuria (ASB) between diabetics and non-diabetics ($P = 0.010$). There was no significant difference in resistance between diabetics and non-diabetics ($P > 0.05$). *Enterococcus faecalis* isolates showed (50%) resistance to Erythromycin and Levofloxacin. The *esp* gene was observed in all *Enterococcus faecalis* isolates .

Conclusion: The females of age more than 60 years old have the higher percentage of asymptomatic UTI. Erythromycin and Levofloxacin were more resistance in Enterococci isolated .

Keywords: Diabetes mellitus, percentage, asymptomatic bacteriuria, antimicrobial resistance.

Introduction

Diabetes type-2 has been recently associated with urinary tract infections. The mechanism of pathogenesis for this association is not fully elucidated , however, it is suggested that high glucose concentration in urine may favor the growth of pathogenic microorganisms and stimulate urinary tract infection⁽¹⁾ . Asymptomatic bacteriuria is a form of UTI characterized by the presence of significant amount ($>10^5$ cfu/ml) of bacteria in urine ⁽²⁾.

Several studies have documented the association of asymptomatic UTIs with diabetes; however, reports on the prevalence of ASB appear contradictory ⁽³⁾.

Most studies reported the percentage to be higher in people with diabetes than people without diabetes (4). On the contrary, another study reported no significant difference in the percentage of ASB between diabetic and non-diabetic ($P > 0.05$) ⁽⁵⁾, others report that *Enterococcus spp.* are more often associated with UTI among diabetics and cause 13% of asymptomatic bacteriuria in diabetics compared to 4.9% in non-diabetics ⁽⁶⁾.

The incidence of urinary tract infections due to *Enterococcus faecalis* has risen steadily over the years and *Enterococcus faecalis* urinary tract infection now outnumbers *Enterococcus faecium* urinary tract infection 5:1 ⁽⁷⁾.

Recent results indicate that *Enterococcus faecalis* can not only adhere to epithelial cells in the urinary tract, but also invade cells, leading to formation of intracellular bacterial communities in the bladder. The combination of these multiple virulence mechanisms, the ability to survive in harsh conditions, and both intrinsic and acquired resistance to many antibiotics explains the high frequency of infection by *Enterococcus faecalis* ⁽⁸⁾.

The enterococcal surface protein (Esp) is a high-molecular-weight surface protein of unknown function whose frequency is significantly increased among infection-derived *Enterococcus faecalis* isolates. Esp is another surface protein and has been shown to promote colonization and persistence in bladder (but not kidneys) Esp also influences, at least in some strains, biofilm formation in vitro ⁽⁹⁾.

Method

This work has applied on 611 asymptomatic UTI patients (197 of them had diabetes mellitus and 414 were non-diabetic), 208 males and 403 females, their ages ranged from 20 – 70 years old attended to emergency and consulting unite in the Suwayrah general hospital in Wasit province during the period from November 2018 to October 2019. Out of 197 asymptomatic UTI diabetic patients, seven showed *Enterococcus faecalis* culture results. And five out of 414 asymptomatic non-diabetic patients showed *Enterococcus faecalis* culture results which considered as a control group.

The study participants were educated on how to collect a “clean-catch” midstream urine specimen and the importance to avoid contamination. They were advised on washing of hands prior to collection and labia separation, especially in females. Participants who had difficulties collecting their specimens were assisted by trained personnel. Urine samples were collected into sterile containers, placed in a cool box (0 °C) and transported to the laboratory within 2 hours. The samples were then stored in a refrigerator and analysed within 8

hours of collection. Each sample was separated into two parts under sterile conditions; one part for urinalysis and the other for culture. The dip stick test was performed using urine test strips as described by the manufacturer (Condor-Teco, Beijing, China). Wet preparation of centrifuged urine was observed using 40 times objective lens to detect blood, pus and other cells. A calibrated 10µl wire loop was used to inoculate uncentrifuged urine into MacConkey, blood and plates incubated aerobically at 37°C for 24 hours. Significant ASB was defined as urine culture of > 10⁵ cfu/ml without symptoms of cystitis. Isolates were identified using standard biochemical techniques and VITEK-2 System .

Antimicrobial susceptibility testing was performed with the automated VITEK-2 compact system by using AST-P580 cards. These included; Levofloxacin ,Erythromycin , Linezolid ,Teicoplanin ,Vancomycin ,Tetracycline ,Tigecycline and Nitrofurantoin (BioMérieux , France).

The PCR technique was also used detection virulence gene of *Enterococcus faecalis* after DNA Extraction from all bacterial isolates.

Results

Of the 611 participants enrolled into the study 208 were males while 403 were females. Majority of participants were in the age group more than 60 years , while the least age range was less than 40 years as showed in Table (1). The overall percentage of ASB in this study was (1.96 %). There was a significant difference in the percentage of ASB between diabetics and non-diabetics (P = 0.010) .

Table 1 shows the distribution of ASB with respect to age and sex. There was no significant difference in the distribution of ASB with age (P = 0.357) among the study participants. However, women demonstrated a higher percentage than men in both diabetic and non-diabetic groups.

Table 1: Distribution of *Enterococcus faecalis* asymptomatic UTIS with respect to age and sex .

Age	No.	Diabetics with ASB No. (%)	Non-diabetics with ASB No. (%)	Total with ASB No. (%)
Sex				
20-30 year	102	0(0 %)	0(0 %)	0(0 %)
30-40 year	130	1(0.77 %)	1(0.77 %)	2(1.54 %)
40-50 year	121	1(0.82 %)	1(0.82 %)	2(1.64 %)
50-60 year	120	2(1.66 %)	1(0.84 %)	3(2.5 %)
60 +	138	4(2.89 %)	1(0.72 %)	5(3.62 %)
X ² ,P value		4.681 , 0.322 (NS)	0.823, 0.935 (NS)	4.379, 0.357 (NS)
Male	208	2(0.96 %)	1(0.48 %)	3(1.44 %)
Female	403	6(1.48 %)	3(0.74 %)	9(2.23 %)
X ² ,P value		0.295, 0.587 (NS)	0.147, 0.702 (NS)	0.446, 0.504 (NS)
Overall Percentage	611	8\197 (4.06 %)	4\414 (0.96 %)	12\611 (1.96 %)

X² chi-square value , NS : Non-significant difference (P >0.05) , ASB : Asymptomatic Bacteriuria .

All *Enterococcus faecalis* isolates were (100%) sensitive to Linezolid ,Teicoplanin ,Vancomycin ,Tetracycline ,Tigecycline and Nitrofurantoin antibiotics while they were (50%) resistant to Levofloxacin and Erythromycin in both diabetes and non-diabetes patients as showed in Table (2).

Table 2: Antibiotic resistance of urinary *Enterococcus faecalis* in diabetics and non-diabetics

Antimicrobial agent	Diabetics	Non-Diabetics
Levofloxacin	4(50%)	2(50%)
Erythromycin	4(50%)	2(50%)
Linezolid	0(0 %)	0(0 %)
Teicoplanin	0(0 %)	0(0 %)
Vancomycin	0(0 %)	0(0 %)
Tetracycline	0(0 %)	0(0 %)
Tigecycline	0(0 %)	0(0 %)
Nitrofurantoin	0(0 %)	0(0 %)

enterococcal surface protein (*esp*) virulence gene of *Enterococcus faecalis* was detected in all 12 *Enterococcus faecalis* isolates showed in Figure (1).

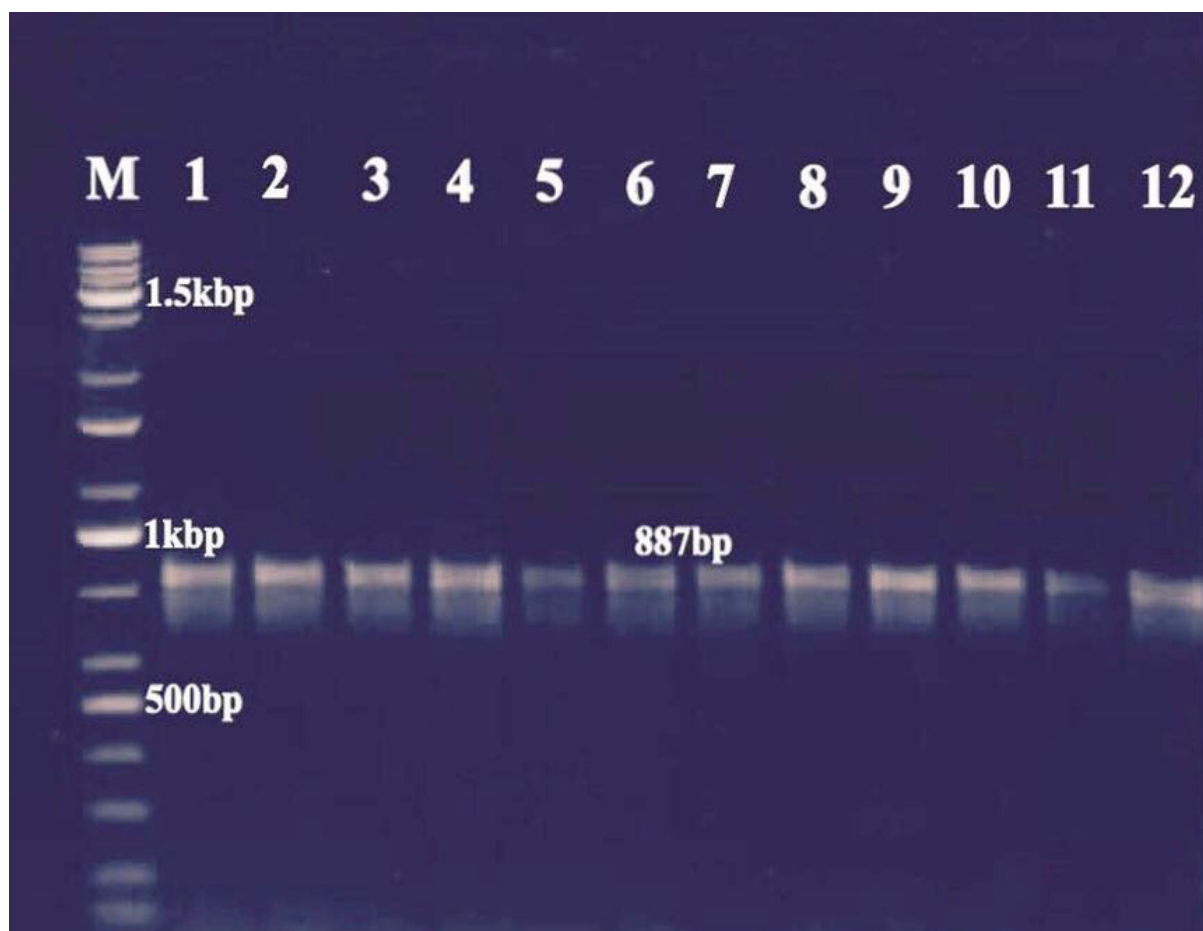


Figure (1) : Agarose gel electrophoresis (1.5%) showing PCR product of a partial fragment of *esp* gene under U.V. light after staining with ethidium bromide. M: 100 bp marker; lane 1-12: *Enterococcus faecalis* isolates. The size of product is 887 bp.

Discussion

The association of diabetes mellitus and urinary tract infections is increasingly being reported. Especially, infection by *Enterococcus* bacteria. Asymptomatic bacteriuria is common among diabetic patients and may lead to serious complications if not properly managed⁽¹⁰⁾. ASB has been identified as a risk factor for acquiring symptomatic UTIs especially in diabetic women⁽¹¹⁾. UTIs are more severe in diabetic patients involving life-threatening complications such as emphysematous pyelonephritis and renal papillary necrosis. The present study revealed an overall percentage of ASB of 1.96%; 4.06% in diabetics and 0.96% in non-diabetics (table 1).

This result is concurrent with that of earlier reports which recorded prevalence of high percentage in diabetics and low percentage in non-diabetics⁽¹³⁾. In other earlier reports which recorded percentage low percentage in diabetic and high non-diabetic⁽¹⁴⁾. Consequently, the issue of prevalence of ASB remains debatable. This

inconsistency has been attributed to variations in sample size, geographical location, culture or screening method. In the present study, ASB was significantly higher in diabetics than non-diabetics ($P = 0.010$). This is in line with majority of previous reports⁽¹²⁾. However, it is suggested that high glucose concentration in urine may favor the growth of pathogenic microorganisms and stimulate urinary tract infection⁽¹⁵⁾. The females are more susceptible to UTI than males, because their urethra is shorter and closer to anus more than in males, so that the intestinal flora which may ascend to urinary tract and cause UTI⁽¹⁷⁾. The most affected age group in females were these of more than 60 years, it may be due to Estrogen deficiency, diabetes mellitus, gynaecological diseases (cystocele) and operations, urological diseases (incontinence, residual urine, cystopathy), operations, immunological changes and diabetic cystopathy⁽¹⁸⁾.

Results of the antibiotic susceptibility test revealed no significant difference ($P > 0.05$) in the resistant

pattern between diabetics and non-diabetics (Table 2). Resistance to Levofloxacin and Erythromycin may be due its frequent use in our study area to treat UTIs and other infectious diseases ⁽¹⁶⁾.

In figure (1) , shows all isolated have *esp* gene , the ability of enterococci to adhere the epithelial cells of urinary tract is a key initial step in UTI pathogenesis due to encoded by the *esp* gene facilities colonization and persistence of *Enterococcus faecalis* in urinary tract infections ⁽¹⁹⁾.

Conclusion

The study revealed diabetic patient have a higher percentage of asymptomatic UTI than non-diabetic patients. Females of age more than 60 years old have the higher percentage of asymptomatic UTI. Erythromycin and Levofloxacin were more resistance in *Enterococcus* isolated . Therefore the need to speed up sensitization against antibiotic abuse in Suwayra -Wasit – Iraq.

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Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Oral Desmopressin as an Add-on Therapy for Men with Benign Prostate Hyperplasia they Suffering from Persistent Nocturia

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Abstract

Background: men with benign prostate hyperplasia suffer from urinary tract infection especially in lower part of the tract and common manifestation of this infection is nocturia. Treatment of nocturia depends mainly on α -blockers; however, these drugs have limited success in relieving this symptom. **Aims:** This study aims to assess the efficacy of desmopressin (0.2mg) as an add-on therapy with α -blockers in relieving refractory nocturia for men with BPH. **Patients and Methods:** Inclusion criteria for this prospective, non-randomized, open-label trial included men ≥ 60 years old with LUTS due to BPH; a total IPSS of ≥ 14 points; and persistent nocturia with ≥ 2 voids/night despite using α -blockers for at least 10 weeks prior to inclusion. Patients with diabetes mellitus, known neurogenic bladder dysfunction, uncontrolled hypertension, congestive heart failure, and those using diuretics were excluded from the study. Fifty one patients were included and categorized into two groups; those who continued on α -blocker treatment (n=22), and those for whom oral desmopressin (0.2 mg) was used as an add-on therapy (n=29). After four weeks of treatment, the International Prostate Symptom Score (IPSS), storage and voiding subs-scores, nocturia episodes, maximal flow rate (Q_{max}) and bother score were measured and compared with their respective baseline values. **Results:** there were no difference significantly between the two groups in all measured demographic and clinical parameters (all p -values > 0.05). After four weeks of treatment, the total IPSS, storage sub-score, nocturia episodes, and bother score were all significantly better in the group were desmopressin add-on (P-values ≤ 0.05). No significant differences were observed in the voiding sub-score and Q_{max} value between the two groups (both p -value > 0.05). **Conclusion:** adding desmopressin to α -blockers is active therapy for men with BPH and suffering nocturia and no initial response to α -blockers.

Keywords: nocturia, desmopressin, benign prostate hyperplasia, lower urinary tract infection

Introduction

Benign prostatic hyperplasia is one of the most common causes of lower urinary tract symptoms (LUTS) in ageing men. BPH can cause nocturia via different mechanisms including detrusor overactivity and a high post void residual (PVR), both of which can result in decreased voiding volume and frequent voiding ⁽¹⁾. However, LUTS is not the sole cause of nocturia. Rather, nocturia is considered as a multifactorial condition and five main causes have been identified including nighttime polyuria, worldwide polyuria, decrease bladder volume, sleep problems and circadian clock illnesses ⁽²⁾. It is very common to find a patient with more than one of these factors involved ⁽³⁾. Nocturia is a critical condition that

necessitates clinical attention. Persistent nocturia can result in chronically disturbed sleep, with a negative effect on patient's class of life (QoL) and general health. In elderly, frequent voiding during night can particularly expose the patients to slipping and fractures ⁽⁴⁾. Moreover, the impact of nocturia extends beyond being a medical issue. For example, the annual direct cost of managing nocturia in Germany, including the costs of medical consultations, investigations, medicines and treatments of falls and fractures, is about 2.32 billion euros and the annual indirect costs, by loss of labor due to diminished efficiency or absence at the workplace, is about 20.76 billion euros ⁽⁵⁾. The treatment approaches for nocturia usually depends on pharmacological therapy

that is assigned principally for BPH, namely α -blockers, 5α -reductase inhibitors, and anticholinergics. However, in most cases with BPH, using these drugs is not associated with satisfactory results in reducing voiding frequency⁽⁶⁾. Thus, this study aims to assess the efficacy of desmopressin (0.2mg) as an add-on therapy with α -blockers in relieving refractory nocturia for men with BPH.

Patients and Method

A prospective study for four weeks single center, open-label, non-blinded comparative study. Inclusion criteria were men ≥ 60 years old with LUTS due to BPH; a total IPSS of ≥ 14 points; and persistent nocturia with ≥ 2 voids/night despite using α -blockers for at least 10 weeks prior to inclusion. Patients with diabetes mellitus, known uncontrolled hypertension, neurogenic bladder dysfunction, congestive heart failure and those using diuretics were excluded from the study. From February 2018 to February 2019, patients who attended the Urosurgery department at Al-Imamain Al-Kadhumain Medical City in Baghdad were assessed for inclusion. After excluding ineligible cases, a total of 51 patients were included and assigned into two groups, those who remained on an α -blocker (n=22), and those who received oral desmopressin 0.2 mg add-on therapy with an α -blocker (n=29). All included patients were assessed

at baseline and after four weeks for IPSS, including storage and voiding sub-scores, as well as bother scores and Q_{max} levels. A consent form explaining the aims of the study was obtained from all patients. The study was approved by the ethical committee of Al-Imamain Al-Kadhumain Medical City. **Statistical Analysis:** Statistical Package for Social Sciences (SPSS) was used for data analysis. Paired student t-test was used to compare means of total IPSS, voiding and storage sub-scores, and Q_{max} at baseline and 4 weeks after the onset of treatment within the same group, while independent t-test was used to compare the means between the two groups. A p-value of ≤ 0.05 was considered as significant.

Results

Baseline Characteristics of the Patients: continuous data were subjected for normality test (Shapiro Wilk test) and were found to be normally distributed. The mean age and stander deviation of the patients on α -blockers alone is (63.95 \pm 10.15) years compared to (62.43 \pm 10.72) years for those patients using desmopressin add-on with no significant difference (P-value = 0.607). Likewise, no significant differences between the two groups in IPSS total score, storage and voiding sub-scores, nocturia episodes, bother score, PSA level, prostate size and Q_{max} (all P-values >0.05) (Table 1).

Table 1: Baseline characteristics of patients

Variables	α -blocker alone (n=22)	Desmopressin add-on (n=29)	p-value*
Age (years)	63.95 \pm 10.15	62.43 \pm 10.72	0.607
IPSS total score	24.18 \pm 3.69	25.75 \pm 4.94	0.221
IPSS voiding sub-score	11.8 \pm 1.8	12.1 \pm 2.4	0.306
IPSS storage sub-score	13.1 \pm 1.9	13.65 \pm 2.6	0.903
Nocturia episodes	3.95 \pm 0.78	4.0 \pm 0.75	0.835
Bother score	4.64 \pm 1.0	4.52 \pm 1.05	0.685
PSA (ng/ml)	1.7 \pm 1.0	1.66 \pm 0.98	0.874
Prostate size (cm ³)	52.5 \pm 13.86	54.11 \pm 12.97	0.675
Q _{max} (ml/s)	17.68 \pm 5.54	15.59 \pm 4.32	0.135

Data presented as mean \pm SD; IPSS: international prostatic symptom score;

PSA: prostate specific antigen; Q_{max}: maximum urine flow rate

*Using independent sample t-test.

Effect of desmopressin add-on on IPSS scores, bother score, and Q_{max}:

As seen in table (2), when each treatment group was assessed separately before and after treatment, the total IPSS, storage sub-score, voiding sub-score, bother score, and nocturia episodes were significantly lower following treatment in both groups (all p-values ≤0.05). However, Q_{max} values were significantly higher only in the desmopressin add-on group (p-value=0.025). In a head-to-head comparison for the same parameters following four weeks of treatment (table 2), the mean IPSS

score for the desmopressin add-on group (14.07±3.66) was significantly lower than that of α-blocker alone group (17.09±4.5), with P-value of (0.012). Similarly, desmopressin add on-treated group had a better IPSS storage sub-score compared to α-blocker alone group (6.92±1.71 vs. 7.98±2.87, P-value 0.018), with a significantly lower bother score (2.83±0.96 vs. 3.91±1.19, P-value 0.001) and a significantly less nocturia episodes (1.59±0.82 vs. 3.32±0.99, p-value 0.0001). On the other hand, there was no significant difference between the two groups in the voiding sub-score (P-value 0.366) and Q_{max} (P-value 0.074).

Table (2): Effects of desmopressin add-on on IPSS scores, sub-scores, and Q_{max}

Variables	Status	α-blocker alone	Desmopressin add-on	p ^(a) -value
IPSS total score	Baseline	24.18±3.69	25.75±4.94	0.012
	After treatment	17.09±4.5	14.07±3.66	
P^(b)-value		< 0.001	< 0.001	
IPSS voiding sub-score	Baseline	11.8± 1.8	12.1±2.4	0.336
	After treatment	9.12±2.7	7.15±2.2	
P^(b)-value		<0.001	<0.001	
IPSS storage sub-score	Baseline	13.1± 1.9	13.65±2.6	0.018
	After treatment	7.98±2.87	6.92±1.71	
P^(b)-value		<0.001	<0.001	
Nocturia episodes	Baseline	3.95±0.78	4.0±0.75	0.0001
	After treatment	3.32±0.99	1.59±0.82	
P^(b)-value		0.001	0.0001	
Bother score	Baseline	4.64±1.0	4.52±1.05	0.001
	After treatment	3.91±1.19	2.83±0.96	
P^(b)-value		0.014	0.0001	
Q _{max} (ml/s)	Baseline	17.68±5.54	15.59±4.32	0.074
	After treatment	16.91±3.2	18.35±5.58	
P^(b)-value		0.289	0.025	

IPSS: International Prostate Symptom Score; Q_{max}: maximum flow rate

p^(a): Designed using independent t-test; p^(b): Designed using paired t-test

Discussion

For greatest knowledge, this study is the first study that show usage of desmopressin in management of patients with benign prostate hyperplasia and suffering from nocturia. The current results confirms the efficiency of desmopressin as an add-on therapy in the alleviation of nocturia through reducing the total IPSS, storage sub-score, nocturia episodes, and bother score after four weeks of treatment compared to those treated with an α -blocker alone. Several previous studies have reported similar findings.

Shin et al. (2014) enrolled 405 men with persistent nocturia due to BPH in a large prospective randomized trial to investigate the role of desmopressin (0.2 mg) as add-on therapy in reducing LUTS in those patients. It was found that the number of episodes of nocturia, nocturnal urine volume, and nocturnal index were significantly decreased using an α -blocker plus an antidiuretic agent (7). In a cross sectional study including 136 patients, Chen et al. (2016) reported that long-term treatment with low dose desmopressin, 0.05 mg increased to 0.2 mg as required, was effective in the treatment of nocturia in Chinese patients with LUTS/BPH with or without nocturnal polyuria (6). In another study, Kim et al. (2017) divided a total of 86 men with persistent nocturia in spite of the usage of α -blocker therapy for 8 weeks into two collections, one of this collection of patients treated with desmopressin (0.2 mg) and another collection of patients take placebo. The desmopressin added group was significantly improved when compared with placebo group in the no. of nocturnal occurrences, nighttime urine volume, entire IPSS, nocturnal polyuria index, and International Consultation on Incontinence Questionnaire score. Furthermore, the authors found that the adverse events in desmopressin add-on group were not different from that in the placebo group. Regarding QoL, no significantly differences between 2 groups in the variation of IPSS QoL score, so the International Consultation on Incontinence Questionnaire-Nocturia Module (ICIQ-N) agreed with this results that there was significant improved when used desmopressin add-on compared to the group not used it (8). More recently, Taha et al. (2018) published a systematic review that included 3072 patients with BPH/LUTS and persistent nocturia. The study demonstrated that a combination of α -blockers and desmopressin add-on resulted in a 64.3% reduced in the occurrence of nocturnal voids compared to 44.6% of patients used α -blockers a lone (9). On the other hand, a Turkish study by Koca et al

(2012), which is similar to our study, found that there was no significant difference in terms of IPSS, Q_{max} , and QoL between alfuzosin-alone and desmopressin add-on treatment after a treatment duration of three months, although both groups had a significant improvement in these parameters when compared to their baseline measurements (10). The effect of desmopressin can be explained by the fact that in most cases nocturia is considered as an associated condition within LUTS, and accordingly treated with drugs allocated for BPH or overactive bladder. Usually, these drugs include α -blockers and (or) 5 α -reductase inhibitors. However, the response to such treatment was not satisfactory in most cases which could be due to the multifactorial nature of nocturia (6). Furthermore, nocturia can be improved by some behavioral performs such as decreasing fluid intake at bedtime, thus several non-pharmacological factors can interfere with the drug activity (Km et al., 2017). Desmopressin acetate (Minirin®) is an artificial equivalent of arginine vasopressin, alike antidiuretic action but have no vasopressor actions. Have active effects in the management of conditions with polyuria: such as primary nighttime enuresis and essential diabetes insipidus. Therefore, it can be expected to possess a dual activity when it is used as an add-on therapy beside α -blockers in reducing nocturia as well as other LUTS (11). Collectively, these data support the use of oral desmopressin (0.2 mg) as an add-on treatment to α -blockers for the management of men with BPH/LUTS they suffering from refractory nocturia. The present study has limitations including: absence of blinding and randomization, small sample size, the lack of input from a bladder diary or from a nocturia-specific questionnaire and not addressing the side effects of desmopressin. Further studies that include women with LUTS are required to popularize the use of desmopressin as essential element for treatment of this disorder.

Conclusions

Adding desmopressin to α -blockers is active therapy for men with BPH and suffering nocturia and no initial response to α -blockers.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

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The Practicing and Attitude of Some Medical Students at Al-Nahrain College of Medicine Towards Cosmetic Rhinoplasty

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Abstract

Background: Rhinoplasty in universal is connected with cosmetic surgery carried out to produce alterations in the interior and exterior components on the nose for merely cosmetics good reasons to get better look. It was common cosmetic procedures around the world because the nasal deformities effect on the psychology of the person as a negative impact on their self-confidence and social interaction with others.

Objectives: The study is an attempt to display the practicing and attitude of some medical students towards cosmetic rhinoplasty and its relation to some studied variables.

Methods: A cross-sectional study was conducted at Al-Nahrain medical college, during March 2016. A total of 200 undergraduate students were given a semi constructed questionnaire .The sample selected randomly by systematic random sampling.

Results: The practicing of rhinoplasty among this sample was 10.5%. Most of them happy with their nose appearance. 56.5% of the sample see this surgery socially accepted in Iraq. There was significant relation between person undergoing rhinoplasty and presence of family history of it.

Conclusion: More than half of the medical student found cosmetic rhinoplasty is socially accepted in Iraq. Despite the majority of them had no family history of undergoing rhinoplasty but there was significant difference between doing such surgery and the presence of family history. More than two third of the students included in this study like more awareness program on cosmetic surgery.

Recommendation: Encouragement for more studies to be done for this subject, and developing an educational program to increase awareness about rhinoplasty.

Keywords: *rhinoplasty, attitude, cosmetic.*

Introduction

Among males and females the nose aesthetic is become occupied, the nose due to it's central prominent part of the face, so when the nose is taller than other facial part of face or not complement the face, it can affect self-perception and confidence.⁽¹⁾

Rhinoplasty in universal is connected with cosmetic surgery carried out to produce alterations in the interior and exterior components on the nose for merely cosmetics good reasons to get better look.⁽²⁾

Currently there is always a developed picture attention among a variety of racial and ethnic communities around the world. Possibly because individuals living longer, a larger feeling of self-stem driven by way a person's looks are suffering from, ⁽³⁾ and the nasal deformities effect on the psychology of the person as a bad effect on their self-confidence and public communication with others ⁽⁴⁾. Rhinoplasty presently increasing everywhere in the world, particularly in the Gulf countries, according to the statistics done worldwide; it is become the fifth most usually done plastic technique international.⁽⁵⁾ While

in Saudi Arabia it is the second most common plastic surgery.⁽⁶⁾

Plastic rhinoplasty customized to repair, reconstruct or replace any physical defect due to: (Birth disorders, Trauma, Burns, Developmental abnormalities, Infections, Tumors, Preference and self-choice).⁽⁷⁾

Complications of Rhinoplasty include: (Complications of anesthesia. Epistaxis, Septal perforation and hematoma, Unsatisfactory appearance and deformity, Infection, Worsening rather than improvement in shape or in the nasal functions).⁽⁸⁾

In Iraq despite their lifestyle was largely dedicated by costumes, traditions and some religious interpretation, there has been growing interest in the past few years in cosmetics procedures, especially in rhinoplasty. And their plastic surgeons have gained huge experiences and skills in reconstructive and cosmetic surgery to help rehabilitate many thousands of people wounded by bombs or bullets.⁽⁹⁾

Subjects and Method

A cross-sectional study was adopted at Al-Nahrain College of medicine. The sample selected randomly by systematic random sampling and choose 200 students, during March and April 2016, were given a semi constructed questionnaire especially prepared for this study and collected by the fourth year students, which include **Demographic information** e.g. age in years, gender, stage order, father and mother education in years and **attitude questions like:**

(How do you feel about your nose?, In the past , Have you had cosmetic Rhinoplasty ?, Do you think cosmetic Rhinoplasty are necessary ?, Family history of having cosmetic procedures?....)

Data was translated into a computerized data base structure .Statistical analysis was done by using SPSS Version (20) computer software and Microsoft Excel 2010 used to draw figures present in this study .

Table(1):- Attitudes of the sample of Al-Nahrain medical students towards cosmetic rhinoplasty .

Questions	Attitude	Numbers (%)
1- feeling about Your nose	Happy	96 (48%)
	Not happy	37 (18.5%)
	Don't care	67 (33.5%)

Verbal consent was taken from all participants before they answered the questionnaire.

Result

Among 200 students there were 86 (43%) males and 114 (57%) females. The percent of students whom practicing rhinoplasty among this sample was 10.5%. See figure 1

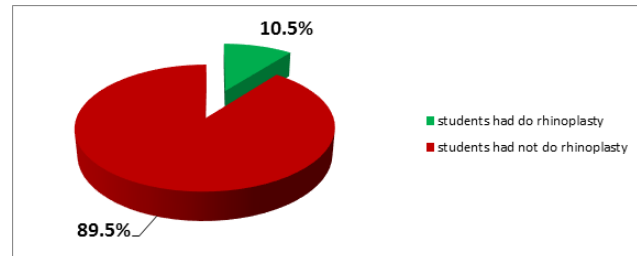


Figure-1- The percent of students whom practicing rhinoplasty among the sample from Al-Nahrain medical students,2016.

-All college stages were included in this study according to their total numbers, first stage= 33(16.5%), second stage 37(18.5%), third stage 39(19.5%), fourth stage 34(17%), fifth stage 30(15%) and sixth stage 27(13.5%). See figure -2-

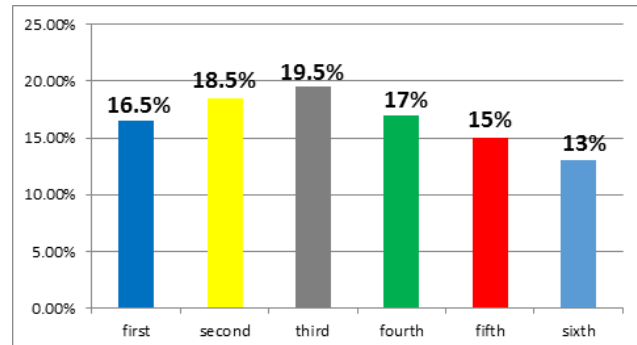


Figure-2- Distribution of the sample according to the student's stages in Al-Nahrain medical college, 2016.

-The age of the study group ranged (17 – 25) years with mean ± SD (21.2 ± 1.76)years.

-Concerning the questions about the attitudes of AL-Nahrain Medical Students towards cosmetic rhinoplasty. See table 1

Cont... Table(1):- Attitudes of the sample of Al-Nahrain medical students towards cosmetic rhinoplasty .

2- any previous cosmetic Rhinoplasty?	Yes No	21 (10.5%) 179 (89.5%)
3-are rhinoplasty necessary?	Yes No Not sure	57 (28.5%) 76 (38%) 67 (33.5)
4-any family history of cosmetic intervention?	Yes No	30 (15%) 170 (85%)
5-your friend has previous cosmetic surgery?	Yes No	102 (51%) 98 (49%)
6- you embarrassed from cosmetic procedures if anybody identified about it?	Yes No	59 (29.5%) 141 (70.5%)
7- You support your friends experiencing cosmetic procedures if they told you?	Yes No Uncertain	96 (48%) 51 (25.5%) 53 (26.5%)
8-If cosmetic surgeries were done free, would you go for any cosmetic operation ?	Yes No Not sure	55 (27.5%) 94 (47%) 51 (25.5%)
9-If you were cognizant that somebody did cosmetic surgery, this effect on relationship with him?	Yes No Not sure	16 (8%) 141 (70.5%) 43 (21.5%)
10-it is socially accepted in Iraq?	Yes No Not sure	113 (56.5%) 29 (14.5%) 58 (29%)
11-If (10) yes, to how much it is acceptable?	Widely Averagely Not acceptable	29 (14.5%) 135 (67.5%) 36 (18%)
12-any awareness program on cosmetic operation ?	Yes No Not sure	142 (71%) 32 (16%) 26 (13%)

Comparing students, who had rhinoplasty and those had not:-

There was no significant association regarding the gender of the students and the history of doing rhinoplasty (P=0.36). See table (2).

-Table (2) Rhinoplasty according to the gender of Al-Nahrain medical students.

Gender	Do rhinoplasty	Don't do rhinolasty	Total	Significance
Male	11 (12.8%)	75 (87.2%)	86(100%)	X ² = 0.842 P=0.36
Female	10 (8.8%)	104 (91.2%)	114(100%)	

-While there was significant difference between gender of students and the attitude of their relation with a person who undergo rhinoplasty (P=0.002). See table (3).

Table (3) Negatively effect of operation on the student relation according the gender.

Gender	Yes	No	Not sure	Total	Significance
Male	13 (15.1%)	60 (69.8%)	13 (15.1%)	86(100%)	X ² = 12.422 P= 0.002 2
Female	3 (3.6%)	81 (71.1%)	30 (26.3%)	114(100%)	

-Finally there was significant relation between undergoing rhinoplasty and the presence of family history of doing such surgery at (P= 0.002). See table (4).

Table (4) Family history association of undergoing rhinoplasty and doing such surgery.

	Family history	No family history	Total	Significance
Had rhinoplasty	8 (38.1%)	13 (61.9%)	21 (100%)	X ² = 9.816 P= 0.002 Df= 1
Had not rhinoplasty	22 (12.3%)	157 (87.7%)	179 (100%)	

Discussion

The concerning about the appearance is progressively increase both in the developed and the developing countries, so this lead to increase in cosmetic surgeries done yearly⁽¹⁰⁾. The mean age of student involved in our study was similar to study done by Ahmed M... et al in Pakistan⁽¹¹⁾ and by Tanthry D...et al in India⁽¹²⁾, this is due to the sample take in our study and samples of them is taken from the college whom their age closely in the same variety.

The prevalence of rhinoplasty was 10.5% in this study and this more than the global percentage 8.2%⁽⁵⁾ and this may be due to selection of the sample from medical students whom more aware about this surgery, also the age of them which had tendency to do such procedure.

Regarding their satisfaction about their nose appearance, it was found that less than half of the sample were happy about their nose appearance like what was found in Iran Aliasghar M...et al.⁽⁸⁾

Most of the students included in this study see rhinoplasty surgery as not necessary like what Rozin... et al found, as they preferred the natural things over unnatural things.⁽¹³⁾

The majority of this sample 70.5% were not embarrassed about undergoing cosmetic procedures and this like what was found in London by Swami V ...et al.⁽¹⁴⁾.

Regarding socially acceptance of rhinoplasty more than half found it socially accepted in Iraq and this like what found by Swami V.et al.⁽¹⁴⁾This may represent the opinion of medical students and not all Iraqi's people. Concerning the students relationship with a person undergoing rhinoplasty, about two third of them their relation were not affected negatively ,and this like what found by Swami V...et al in London,⁽¹⁴⁾ while Delinsky in United States found there was a negatively affect on relationship with such person.⁽¹⁵⁾

Less than third of the included students in this study like to do cosmetic surgery if it was done free in Iraq, and this nearly like what found by AL Mohanna Sh. ... et al in Saudia Arabia.⁽¹⁶⁾

2/3 of the defendants suggested the need for more consciousness of beautifying operation in the culture like what was originate in Nigeria by Opeyemi A.... et al in 2014.⁽¹⁷⁾

Regarding the gender there was no significant difference in doing rhinoplasty and this like what found in Nigeria,⁽¹⁷⁾ while in other study done in Saudia found significant relation between both gender⁽¹⁶⁾ and this may be due to take the sample whom had nearly same socio-demographic and educational levels.

Also there was significant relation between male and female according to their relationship with a person who undergo rhinoplasty, this like what Swami V. ... et al.⁽¹⁴⁾

Finally this study found a significant relation between doing rhinoplasty and the presence of the family history of rhinoplasty and this like what was found in Iran ⁽⁸⁾ and in Saudia. ⁽¹⁶⁾ And this means friends and relatives influence a major motive for undergoing cosmetic rhinoplasty.

Conclusion

As the number of rhinoplasty operations are increase, so further research concerning the reason of this increase. It also recommend doing more movements to increase consciousness toward rhinoplasty problems.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

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The Level of Serum Progesterone on the day of HCG Administration in Assisted Reproduction Cycles

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Abstract

Introduction: During stimulated IVF- ET cycle spontaneous LH surge occur in about 20 – 50 % of cycle stimulated with gonadotropin without the pituitary suppression of GnRH agonist. This has been related to maturation and recovery of oocyte together decrease fertilization and implantation rate, this spontaneous LH surge is associated with increase in serum progesterone , so without pituitary suppression with GnRH , the rise of serum progesterone in the per ovulatory period may indicate the occurrence of spontaneous of LH surge, the aim of study is to indicate cutoff point of progesterone in the day of HCG administration. **Method:** This was a retrospective, non-interventional cohort study of patients undergoing ICSI at Tiba infertility center in Babylon, from period 2015 - 2019, all patient age from 20 – 45 years old under long protocol, had at least one grade I embryo transferred, total amount of patients was 1457. At second day of menstrual cycle we stimulate by used recombinant FSH, measured on second day of menstruation serum FSH, LH and estrogen levels, transvaginal ultrasound used to monitored the follicles. when follicle became 14 mm in size we used antagonist. 3 or more follicles gotten 18 mm in diameter. Activation gave either hCG alone or mixture of hCG and agonist. After 14 days from embryo transfer we checked HCG and after that after 10 days transvaginal ultrasound was done. **Results:** In our study showed the significant association between positive pregnancy outcome and progesterone level at day of HCG trigger were 79.2 % of female with positive pregnancy at progesterone level < 1.5, while 9.3 % of female with positive pregnancy at progesterone level > 2.5, There is a significant differences of LH at day of HCG activate rendering to progesterone level day of HCG activate, progesterone level (< 1.5) had more chief level at day of HCG activate with mean and SD (5.38 ± 2.52), and reduction when the level progesterone rise. **Conclusion:** pregnancy cannot depend on progesterone level at day when HCG administration for assisted reproduction cycles treated with GnRH agonists and gonadotrophins. So cutoff point of progesterone can reach to above 1.5 ng/ ml and expected of pregnancy at this level.

Key word: *serum progesterone , HCG , IVF, estrogen, HCG trigger.*

Introduction:

During stimulated IVF- ET cycle spontaneous LH surge occur in about 20 – 50 % of cycle stimulated with gonadotropin without the pituitary suppression of GnRH agonist (1,2). This has been related to maturation and recovery of oocyte together decrease fertilization and implantation rate (3–5), this spontaneous LH surge is associated with increase in serum progesterone , so without pituitary suppression with GnRH , the rise of serum progesterone in the per ovulatory period may indicate the occurrence of spontaneous of LH surge (6), with the use of GnRH agonist to suppress pituitary gonadotropin increase in serum progesterone in the day of HCG administration has been reported sporadic cases (7), in such cases the usage of plasma progesterone as a conception predictor is controversial with some studies reported that peri- ovulatory rise in progesterone has negative outcome, some studies reported that peri-ovulatory rise in progesterone has negative outcome in pregnancy rate during assisted reproductive cycle (8,9), while other studies disagree and consider the rise in progesterone in the daytime of HCG management as unconnected to the proportion of pregnancies in assistant reproductive cycles(7), premature progesterone elevation during IVF cycles and its effect of endometrium respectively (10–12), the exact mechanism of peri-ovulatory plasma progesterone increase during stimulation IVF cycle is not fully clear as the rise proceeds the HCG administration for the final maturation of

oocyte and is not associated with LH surge during IVF cycles relatively high dose of exogenous FSH require to achieve multiple follicular maturation (13), some study contribute the premature progesterone elevation FSH stimulation (14,15). Recently publish study on sample of humen ovary cortices shows that FSH stimulate the enzymatic activity of 3B- HSD which are salting increase conversion of progesterone to progesterone (16). Different cutoff points have been used to difine the progesterone elevation during stimulation IVF cycle that is range from 0.8 – 2 ng / ml (10,17), significant decrease in pregnancy rate with 1.5 ng/ ml or above progesterone level at the day of HCG administration (18,19). The aim of study is to indicate cutoff point of progesterone in the day of HCG administration.

Materials and Method

This was a retrospective, non-interventional cohort study of patients undergoing ICSI at Tiba infertility center in Babylon, from period 2015 - 2019, all patient age from 20 – 45 years old under long protocol, had at least one grade I embryo transferred, total amount of patients was 1457. At second day of menstrual cycle we stimulate by used recombinant FSH, measured on second

day of menstruation serum FSH, LH and estrogen levels, transvaginal ultrasound used to monitored the follicles. when follicle became 14 mm in size we used antagonist. 3 or more follicles gotten 18 mm in diameter. Activation gave either hCG alone or mixture of hCG and agonist. After 14 days from embryo transfer we checked HCG and after that after 10 days transvaginal ultrasound was done, pregnancy occur when at least one gestational sac and detectable cardiac pulse. Progesterone measurement on the day of hCG administration. Samples were tested with electrochemiluminescence immunoassay. Statistical analysis: Progesterone 1.5 ng/ ml; this cut-off on the day of hCG administration. Comparisons were made by Student's t test and Chi square analysis where applicable. P <0.05 was considered statistically significant

Results:

In our study showed the significant association between positive pregnancy outcome and progesterone level at day of HCG trigger were 79.2 % of female with positive pregnancy at progesterone level < 1.5, while 9.3 % of female with positive pregnancy at progesterone level > 2.5 as show in table 1.

Table 1: Association between progesterone level at day of HCG trigger and pregnancy outcome (age 20-45)

Study variables	Pregnancy		Total	X2	P-value
	Positive	Negative			
Progesterone level at day of HCG trigger					
Less than 1.5	570 (79.2)	537 (72.9)	1107 (76.0)	8.226	0.042 *
1.5- 2	52 (7.2)	75 (10.1)	127 (8.7)		
> 2- 2.5	31 (4.3)	39 (5.3)	70 (4.8)		
More than 2.5	67 (9.3)	86 (11.7)	153 (10.5)		
Total	720 (100.0)	737 (100.0)	1457 (100.0)		

*p value ≤ 0.05 was significant.

In our study the distribution of patients with infertility according to pregnancy outcome. Those patients those get pregnant represent (49.4%) of study sample. (age 20-45).

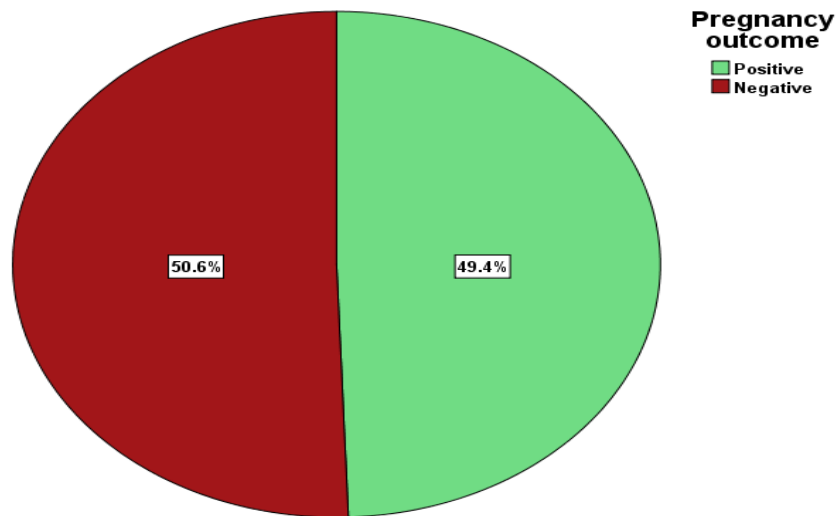


Figure 1: Show distribution of patients with infertility according to pregnancy outcome

The mean differences of age (years) according to pregnancy outcome including (positive and negative). There were significant differences between means of age between these two groups (N= 1457, t= -7.316, and P=<0.001*). Were 30.9% get pregnant at age 20-40 years as show in fig (2)

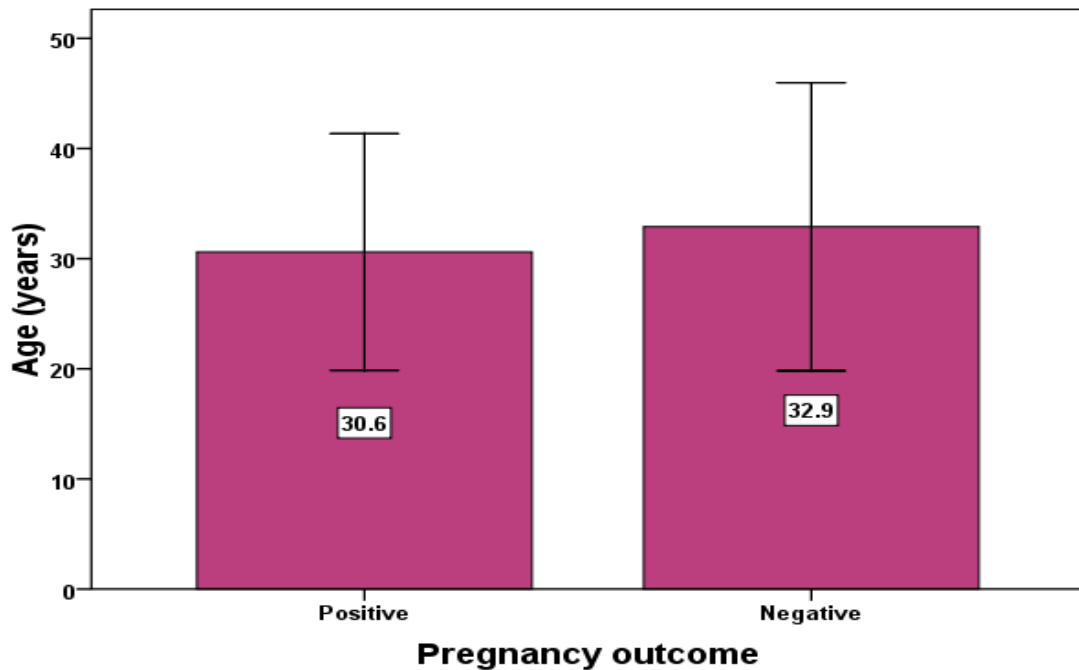


Figure 2: The mean differences of age according to pregnancy outcome.

The mean significant differences of estrogen at day of HCG activate rendering to progesterone level day of HCG activate, progesterone level (>2 - 2.5) had more predominant level at day of HCG trigger with mean and SD (2625.73 ± 65.62), as show in table 2.

Table 2: The mean differences of estrogen at day of HCG trigger according to progesterone level day of HCG trigger.

Progesterone level at day of HCG trigger	N	Mean	SE	P-value
Less than 1.5	1107	1870.16	23.20	<0.001*
1.5 - 2	127	2231.16	72.35	
>2 - 2.5	70	2625.73	65.62	
> 2.5	153	1849.71	72.50	
Total	1457	1935.78	21.00	

There is a significant differences of LH at day of HCG activate rendering to progesterone level day of HCG activate, progesterone level (< 1.5) had more main level at day of HCG activate with mean and SD (5.38 ± 2.52), and decrease when the level progesterone increase as show in table 3. while in table 4; There is no significant differences of LH at day of HCG activate rendering to progesterone level day of HCG activate, progesterone level (< 0.9) .

Table 3: The mean differences of LH level at day of HCG trigger according to progesterone level day of HCG trigger.

Progesterone level at day of HCG trigger	N	Mean	SE	P-value
Less than 1.5	1107	5.38	2.52	<0.001*
1.5 - 2	127	3.60	0.32	
>2 - 2.5	70	3.43	0.50	
> 2.5	153	2.47	0.23	
Total	1457	4.83	1.91	

Table 4: Association between progesterone level at day of HCG trigger and pregnancy outcome (age 20-45)

Study variables	Pregnancy		Total	X2	P-value
	Positive	Negative			
Progesterone level at day of HCG trigger					
Less than 0.9	358 (49.7)	353 (47.9)	711 (48.8)	8.144	0.086
0.9-below 1.5	210 (29.2)	184 (25.0)	394 (27.0)		
1.5- 2	56 (7.8)	75 (10.1)	131 (9.0)		
> 2- 2.5	31 (4.3)	39 (5.3)	70 (4.8)		
More than 2.5	65 (9.0)	86 (11.7)	151 (10.4)		
Total	720 (100.0)	737 (100.0)	1457 (100.0)		

*p value ≤ 0.05 was significant.

Discussion

During IVF/ICSI and embryo transfer, the rise of progesterone in late follicular parts of cycles has controversial affect (7,8,10,12), in our study significant association between positive pregnancy outcome and progesterone level at day of HCG trigger were 79.2 % of female with positive pregnancy at progesterone level < 1.5, while 9.3 % of female with positive pregnancy at progesterone level > 2.5, similar to study done by Jawa Ashmita and similar the study done by Ze Wu in China (20,21). In our study the distribution of patients with infertility according to pregnancy outcome. Those patients those get pregnant represent (49.4%) of study sample. (age 20-45), The pregnancy rate in 45% (65/143) in study done by Kinnari Vilaschandra Amin (22). The mean differences of age (years) according to pregnancy outcome including (positive and negative). There were significant differences between means of age between these two groups (N= 1457, t= -7.316, and P=<0.001*). Were 30.9% get pregnant at age 20-40 years, similar to study done by Jawa and study done by Ze Wu in China (20,21). In our study mean significant differences of estrogen at day of HCG trigger according to progesterone level day of HCG trigger, progesterone level (>2 - 2.5) had more predominant level at day of HCG trigger with mean and SD (2625.73 ± 65.62) , in difference to study done by Francisca Martínez; no significant differences in progesterone /estrogen ratio between conception and no conception cycles (23). Un obvious mechanism responsible for increasing plasma progesterone, exposure to FSH lead to increase sensitivity of granulosa cells (GCs) to LH this occur after hMG treatment this lead to premature Latinization even low plasma LH (24). IVF-ET have been lesser during the existence of pre-hCG rise in plasma P, lead to decrease embryo and oocyte quality, when increase in plasma progesterone the oocyte got from follicular have this rising lead to pregnancy rate decrease (24,25). So in our study 1107 women get pregnancy when level of progesterone < 1.5 ng/mL, 127 get pregnant in level of 1.5- 2 ng/mL, 70 get pregnant in level of >2 - 2.5 ng/mL, and the no. increase in level > 2.5 ng/mL to 153 women get pregnant. a premature elevation of progesterone 0.9 ng/mL was observed in 62% of 166 IVF cycles pretreated with GnRH-a. We do not see an obvious explanation for the discrepancy between Loughlin's results and hose reported by other investigators (24).

Conclusion

Pregnancy cannot depend on progesterone level at day when HCG administration for assisted reproduction cycles treated with GnRH agonists and gonadotrophins. So cutoff point of progesterone can reach to above 1.5 ng/ ml and expected of pregnancy at this level.

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Protective Role of Quercetin plus Vitamin C on Infection of Rats with *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*

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Abstract

This study was performed on fifty adult male laboratory rats (*Rattus norvegicus*) of 175 – 200 grams weights. The animals were randomly allocated into five equal groups of ten rats each. The groups of rats were: First, control group where the animals were fed on a standard diet along the experiment period; the Second and Fourth groups, where also maintained on a standard diet while the Third and Fifth groups were also maintained on a standard diet and they were orally dosed with Quercetin (20 mg) and vitamin C (500 mg) daily. Suspension in phosphate buffer solution (PBS) was made for the bacteria and colony forming unit (CFU) count was done after making 10-folds serial dilutions. The rats of the second and third groups were intramuscularly injected with 16×10^6 (CFU) of *Klebsiella pneumoniae* while those of fourth and fifth groups were intramuscularly injected with 20×10^5 (CFU) of *Pseudomonas aeruginosa*. After 48 hours of challenge with bacteria, all the rats of the second group and 4 rats of the third group died. On the other hand, all the rats of fourth group and 3 rats of the fifth group died. The organs of died animals of all groups like the stomach, spleen, liver, and thigh muscle were immediately picked up and weighed after death and well homogenized with (PBS) to obtain counting of (CFU) in the organs mentioned. Passing 3 days later, the survived 6 rats of third group and the survived 5 rats of fifth group were euthanized and their organs were treated as the same as the process mentioned before to gain the organs (CFU) count. The results in this study clarify that the use of Quercetin plus vitamin C has led to increase the survival of rats challenged with bacterial infection and the organs bacterial count of them was significantly less than those rats maintained without supplementation with Quercetin and vitamin C at ($P \leq 0.05$).

Keywords; Quercetin, Vitamin C, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*.

Introduction

Opportunistic microbial pathogens are serious challenging obstacle in fields of human or veterinary medicines and *Pseudomonas aeruginosa* comes in the queue of these pathogens ⁽¹⁾. The other paramount pathogen is *Klebsiella pneumoniae* which is considered as a major problem in patients who suffer from malignancies and who are dwelling in hospitals ⁽²⁾. Vitamin C is well proved for its fantastic features in defending against diseases, protecting and promoting all bodily functions. Of these effects relating to vitamin C are its role as an antioxidant agent, collagen and bone formation assistant, and assistant in enzymes and coenzymes models ⁽³⁾. In addition, vitamin C was approved to be protective in different ways and in different systems of the body and it can be gained

naturally by consuming different vegetables and fruits especially citrus fruits, berries, tomatoes and others ⁽⁴⁾. Furthermore, vitamin C was clearly reported to cause healing, repairing and protection against heavy metals intoxication in the vital organs like liver and kidney of laboratory animals ⁽⁵⁾.

Polyphenolic compounds are a vast family spreading in the world of plant kingdom and comprise flavonoids as a member of them ⁽⁶⁾. Quercetin belongs to the family of flavonoids and it is of highly antioxidant capacity ⁽⁷⁾ and it is fluently found in apples, beans, broccoli and onions in particular ⁽⁸⁾. The antioxidant potency of quercetin was found to be as four times as that of tocopherol ⁽⁹⁾. The effects of quercetin were linked to its antioxidant potency and its modulating effects on antioxidant enzymes beside its genomic stability effect

(10). Vast range of beneficial features of quercetin were reported like anticancer, anti-inflammatory, antiulcer, antibacterial, antiviral, cataract preventing role, cardiovascular system protector and other (11). Quercetin also has a protective role against lipid peroxidation and prevent cellular injury (12). Besides, quercetin was reported to be protective against poisonous compounds and has ameliorating and protective role for the hematological and reproductive aspects of laboratory animals (13, 14).

Materials and Method

- Animals and Diets

Fifty adult laboratory male rats (*Rattus norvegicus*) of weights 175 – 200 grams were purchased from a local licensed laboratory medical centre and they were housed in a suitable cages in a very typical laboratory conditions and allocated randomly into five groups of ten rats each. The rats were fed and treated as:

1- Control group, fed and maintained on a standard diet (AIN-93) referenced by (15).

2- Second group, fed and maintained on a standard diet.

3- Third group, fed and maintained on a standard diet and they were orally dosed with Quercetin (20 mg) and vitamin C (500 mg) daily. The doses of quercetin and vitamin C were chosen depending upon LD50 (161mg/kg for quercetin, and 11,900 mg/kg for vitamin C) as referenced by (16, 17) respectively.

4- Fourth group, fed and maintained on a standard diet.

5- Fifth group, fed and maintained on a standard diet and they were orally dosed with Quercetin (20 mg) and vitamin C (500 mg) daily.

- Experimental Challenges

The protocol of the experiment was continued for one month during which the rats were maintained on standard diets and the treatment with quercetin and vitamin C was done as mentioned before. After that, the rats of the second and third groups where intramuscularly injected with 16×10^6 (CFU) of *Klebsiella pneumoniae*. Organs of these animals including spleen, liver, kidney, lung and thigh muscle were homogenized in sterile PBS after being removed and weighed. Viable

bacteria number in the organs was obtained by plating on specific agar; BHI agar and the expression of results was the number of CFU/g – tissue. The rats of the fourth and fifth groups were intramuscularly injected with 20×10^5 (CFU) of *Pseudomonas aeruginosa*. Organs of these animals were processed as before mentioned and viable bacteria number in these organs determined by plating on specific agar plates; cetrinide agar and the expression of results was the number of CFU/g – tissue. All plates where incubated for 24 hours at 37 C° and the scoring of CFU was done. The bacteria isolates used in this experiment where obtained from Basrah general hospital. Cetrinide agar was prepared according to the manner described by (18).

- Statistical analysis

At ($P \leq 0.05$), (t) test was used to find out the significant differences among groups by using SPSS program version 20.

Results and Discussion

It is obvious from the results shown in tables below that the use of quercetin and vitamin C was very effective against the experimental infection of rats with *Klebsiella pneumonia* and *Pseudomonas aeruginosa* bacteria where it causes a significant increase in the survival numbers and ratios of rats (table 1) and a significant decrease in the numbers of bacteria isolated from different rats organs (tables 2 and 3).

Quercetin has been reported and documented by vast numbers of researches to be a very potent against viral, fungal, and bacterial infections beside its beneficial effects on all bodily systems and immunity. One of these studies (19) who mentioned that quercetin has a wide range of antiviral, antibacterial, antioxidant properties. As anti-inflammatory agent in animals, quercetin was found to be very potent against inflammation and has a modulatory effect on the immune system beside boosting immunity as a whole (20). It was found to decrease TNF- α of adipose tissue and nitric oxide generation in obese rats (21). The mechanism of quercetin effects against bacterial infection might be related to its anti-inflammatory role where it has a very strong antioxidant potency and cause increase the secretion of cytokines (22, 23).

Vitamin C on the other hand, is well known for its drastic effects against infections such as protozoal, viral and bacterial infections (24). Infections with microbial agents in humans or animal lead to oxidative stress and

then activation of phagocytes which in turn will cause elevation in reactive oxygen species ROS production^(25, 26). These ROS are known to cause damages to the cells and it was found in many cases of infection that vitamin C contents in macrophages or leukocytes declines severely

in cases of infection^(27, 28). One can exclude that vitamin C is required as antioxidant in case of infection and it can exert its action throughout its antioxidant effects against ROS beside its boosting role to other immune system compartments^(29, 30, 31, 32).

Table (1). Role of quercetin and vitamin C on rats' survival after being challenged with *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*.

Groups	Total rats number	Number of died rats	Number of survived rats	Ratio of survived rats %
Control	10	0	10	100
Second <i>Klebsiella</i>	10	10	0	0
Third <i>Klebsiella</i> + Vit C and <i>Quercetin</i>	10	4	6	60
Fourth <i>Pseudomonas</i>	10	10	0	0
Fifth <i>Pseudomonas</i> + Vit C and <i>Quercetin</i>	10	3	7	70

Table (2). The role of Quercetin +vitamin C on the cultured *Klebsiella pneumoniae* bacterial numbers isolated from different rats organs

Groups	Organs					
	Muscle	Lung	Kidney	Liver	Spleen	Stomach
Control	C 0	C 0	C 0	C 0	C 0	C 0
Second <i>Klebsiella</i>	A 62×10^7	A 27×10^7	A 40×10^7	A 9×10^7	A 16×10^7	A 12×10^7
Third <i>Klebsiella</i> + Vit C and <i>Quercetin</i>	B 15×10^6	B 7×10^6	B 10×10^6	B 27×10^6	B 24×10^6	B 16×10^6

Table (3). The role of Quercetin +vitamin C on the cultured *Pseudomonas aeruginosa* bacterial numbers isolated from different rats organs

Groups	Organs					
	Muscle	Lung	kidney	Liver	Spleen	Stomach
Control	C 0	C 0	C 0	C 0	C 0	C 0
Fourth <i>Pseudomonas</i>	A 37×10⁷	A 25×10⁷	A 31×10 ⁷	A 8×10 ⁷	A 13×10 ⁷	A 11×10 ⁷
Fifth <i>Pseudomonas + Vit C and Quercetin</i>	B 13×10⁶	B 6×10 ⁶	B 8×10 ⁶	B 21×10 ⁶	B 21×10⁶	B 14×10⁶

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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Study The Role of Selenium in The P-Selectin and E-Cadherin Serum Levels in Women with Preeclampsia

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Abstract

Preeclampsia (PE) is characterized by endothelial dysfunction with vasoconstriction due to cell adhesion molecules or mediators released by defective placentation. Platelet selectin (P-selectin) and epithelial cadherin (E-cadherin) are the cell adhesion molecules, is elevated in many inflammatory conditions including PE.

Objective: To investigate if P-selectin and E-cadherin levels can be used as a marker for adverse outcomes in pregnancy complicated with PE.

Patients and Method: This study involved 90 pregnant women in their third trimester of pregnancy divided into 2 group:

Group A: involves 45 pregnant women with PE.

Group B: involve 45 healthy pregnant women and normal fetal growth (Control group).

Result: The results show there were a high significant increase in the mean values of P-selectin with high increase in the mean values of E-cadherin in PE group when compared to control group.

ROC curve shows sensitivity and specificity and false positive rate for predication of PE by P-selectin and E-cadherin in control and patients groups, and the maximum accuracy for the P-selectin and E-cadherin in discrimination between control and PE patients groups.

Conclusions: There is an inverse relationship between cell adhesion molecules and selenium in PE compared with normal pregnancy.

High level of serum P-selectin and E-cadherin are associated with the presence PE, which provide additional information for predicting of PE and preventing its complications and for better understanding pathogenesis of PE.

Key words: *platelet-selectin and epithelial-cadherin, with preeclampsia & with normal pregnancy.*

Introduction

Preeclampsia (PE) is a disorder of pregnancy, is a multisystem syndrome that is primarily, characterized by the onset of high blood pressure (HBP) (hypertension) and often a significant amount of protein in the urine (proteinuria). When it arises, the condition can appear any time from the twenty weeks of pregnancy ⁽¹⁾. The exact causes of PE and eclampsia - a result of a placenta that doesn't function properly, insufficient blood flow to the uterus could be associated. Genetics plays a role as well, and have many risk factor for PE is most often seen

in first-time pregnancies, in pregnant teens, and in women over 40 years old While it is defined as occurring in women have never had high blood pressure before, other risk factors include:

- A history of high blood pressure prior to pregnancy.
- A history of preeclampsia.
- Having a mother or sister who had preeclampsia.
- A history of obesity.

History of diabetes, kidney disease, lupus, or rheumatoid arthritis.

P-selectin functions as a cell adhesion molecule (CAM) on the surfaces of activated endothelial cells, which line the inner surface of blood vessels, and activated platelets. In inactivated endothelial cells, it is stored in granules called Weibel-Palade bodies. In inactivated platelets P-selectin is stored in α -granules of platelets, have been shown to correlate with the level of oxidative stress in pregnancy (2).

Other names for P-selectin include CD62P, Granule Membrane Protein 140 (GMP-140) and Platelet Activation-Dependent Granule to External Membrane Protein (PADGEM) (3).

Cadherin (named for “calcium-dependent adhesion”) are a type of cell adhesion molecule (CAM) that is important in the formation of adherence junctions to bind cells with each other (4). E- Cadherin is a class of type-1 transmembrane proteins. It is dependent on calcium (Ca^{2+}) ions to function.

Cell-to-cell adhesion mediated by E- Cadherin plays an important role in tissue differentiation, holding the tissues together as they form during embryonic development.

Role of Adhesion in Preeclampsia:

Increase expression of adhesion molecule interfere with homeostasis. For example adhesion molecules can activate platelets through their contact with exposed epithelial wall (5,6). Abnormal active platelet are involved

in the pathogenesis of several pathologies including PE.

Patients and Methods

A case control study was conducted on 90 pregnant women (aged 18-45 years old) from the obstetrics and gynecology department of Al- Immamain Al-Kadhmain Hospital and Baghdad Teaching Hospital, after taking an approval from institutional review board (I.R.B.) of the Medical Collage / Al-Nahrain university and taking a written informed consent from all women in the study.

The subject in the study were 45 pregnant women with PE patient and 45 health pregnant women with gestational age matching to the cases at sampling, which remain normotensive and deliver a healthy baby. Blood pressure for each pregnant women was measured twice in four-hour intervals while resting, at third trimester as well as protenuria detected in urine sample by a simple dip-stick test.

The blood sample were taken from each women that participate in the study and used to measure P-selectin and E-cadherin by using enzyme linked immunosorbent assay (ELISA) method.

Result

Serum Levels of Adhesive Molecules

Mean serum level of P-selectin in PE patients was 261.69 ± 101.64 ng/mL which was higher than that of controls (204.13 ± 85.68 ng/mL) with a significant difference (Figure 1).

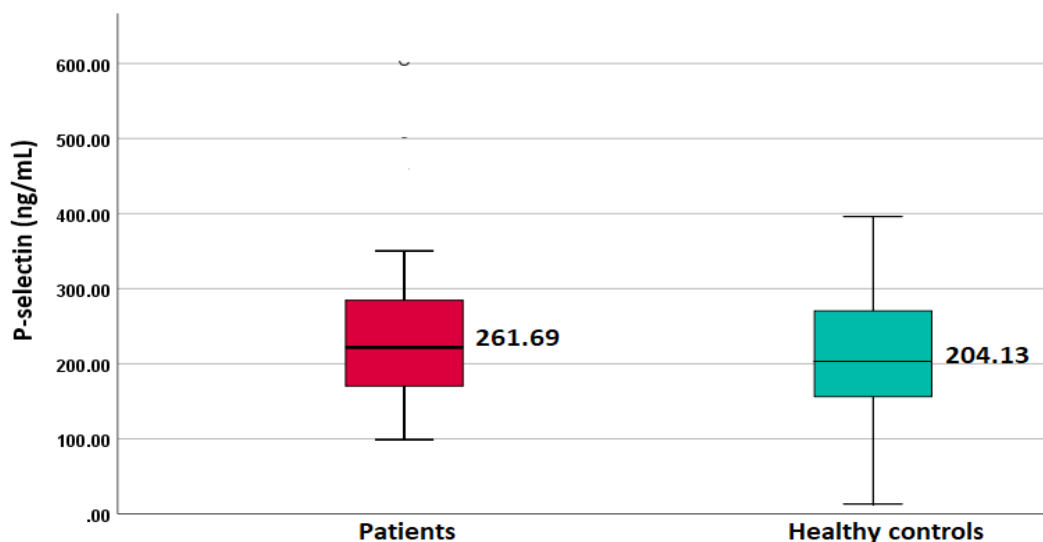


Figure 1: Mean serum level of P-selecting in PE patients and healthy controls

Similarly, mean serum level of E-cadherin in patients (69.45 ± 15.26 ng/mL) was higher than that of controls (58.6 ± 21.69 ng/mL) with a significant difference (Figure 2).

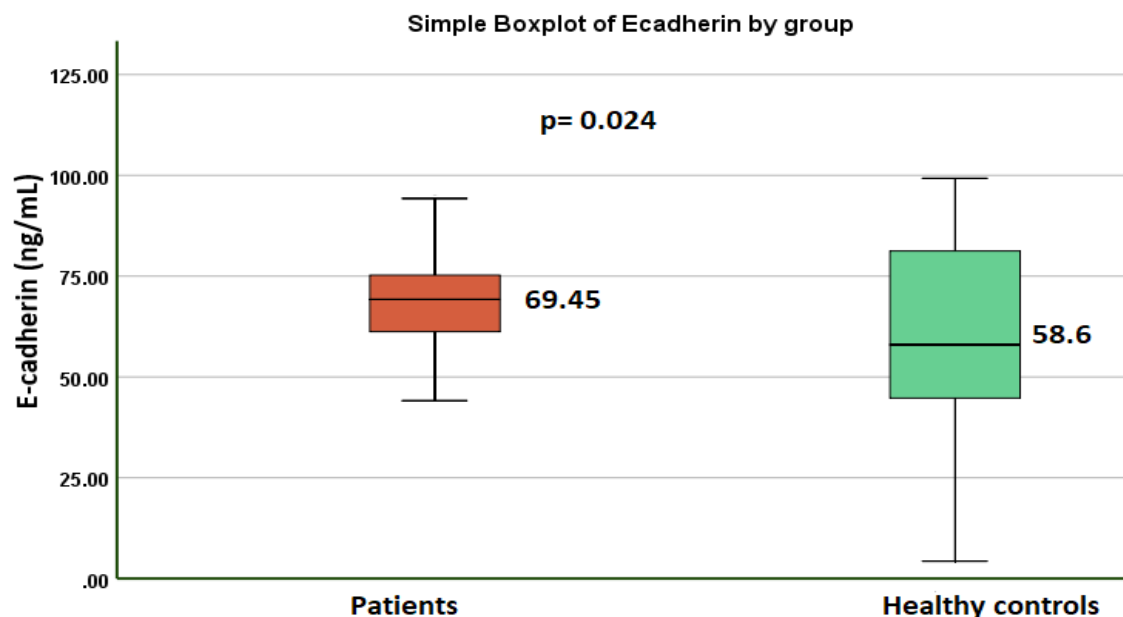


Figure 2: Mean serum level of E-cadherin in PE patients and healthy controls

Diagnostic Value of Adhesive Molecules

Receiver operating characteristic curve was used to explore the diagnostic value of adhesive molecule in the context of discrimination between PE patients and healthy controls (Figure 3).

For P-selectin, the AUC was 0.586, 95% CI= 0.469-

0.704, $p = 0.159$. The sensitivity and specificity of the test at cut off values of P-selectin= 211.0 ng/mL were 0.60 and 0.556 respectively.

For E-cadherin, the AUC was 0.617, 95% CI= 0.495-0.739, $p = 0.056$. The sensitivity and specificity of the test at cut off values of E-cadherin= 64.87 ng/mL were 0.622 for both.

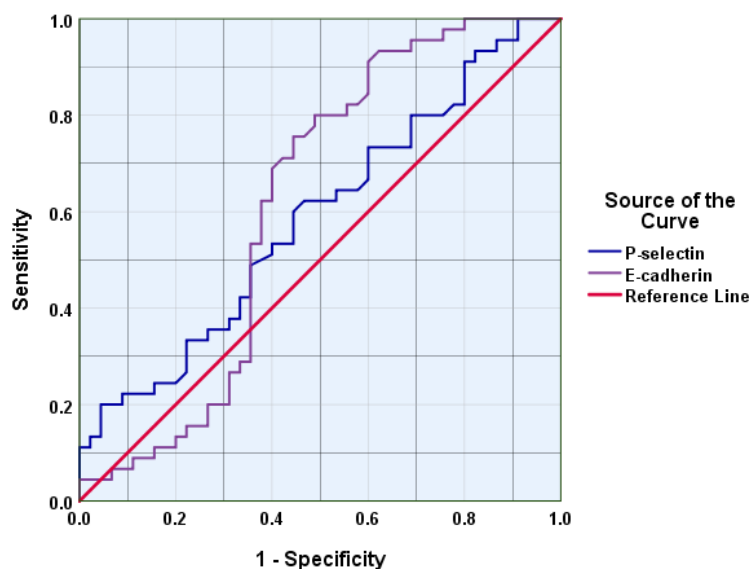


Figure 3: Receiver operating curve for P-selectin and E-cadherin in the context of discrimination between PE patients and healthy controls

The combination of the two markers did not improve the discriminative value (Figure 4). The AUC was 0.613, 95% CI= 0.496-0.729, $p= 0.056$. The sensitivity and specificity of the test at the corresponding cut off values were 0.60 and 0.51 respectively.

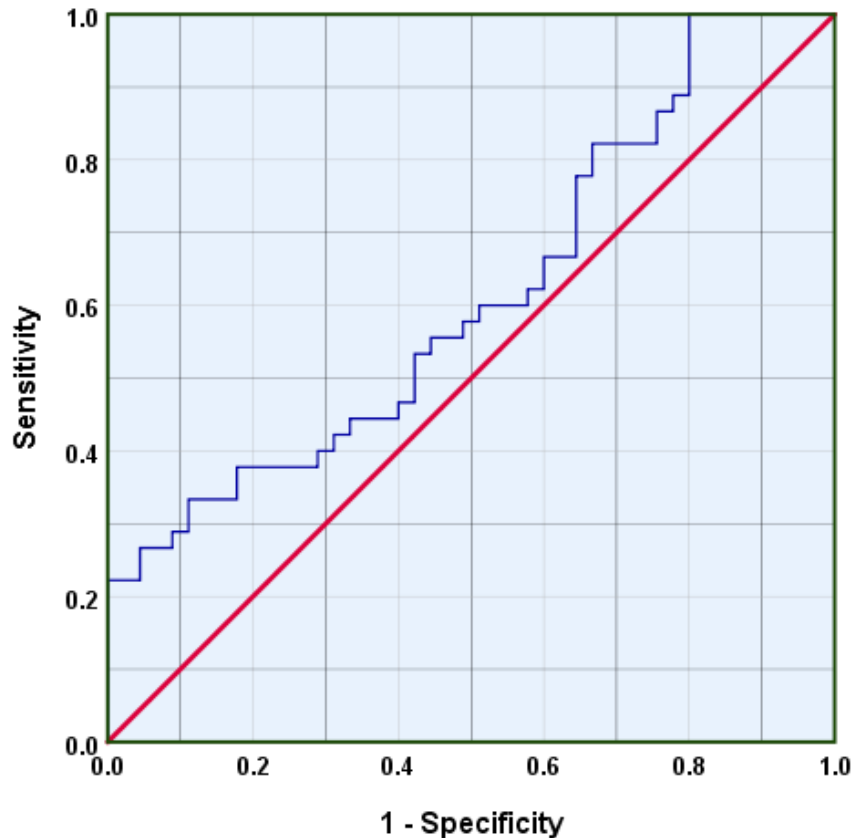


Figure 4: Receiver operating curve for a combination of P-selectin and E-cadherin in the context of discrimination between PE patients and healthy controls

Discussion

In the present study, markers were chosen to reflect inflammation, endothelial dysfunction and poor placentation which are the hallmark of PE. Previous studies which have done on the these markers in other similar clinical situations such as CVD, had shown great association of the markers with the disease processes.

Nevertheless, these clinical condition are known to share more than one physiological and vascular factors. So that this study aimed to investigate the role of current markers with PE development.

Serum Levels of Adhesive Molecules

In the current work, the mean level of P-selectin was found to be significantly higher in women with PE compared with the control group. Presented a significantly higher expression of P-selectin in PE than in apparently healthy pregnant women.

Same results of increased levels of sP-selectin in preeclamptic pregnancies were obtained by ⁽⁷⁾. The authors proposed that their findings support an inflammatory model for PE, while the endothelial cell activation might be a secondary to a primary inflammatory response. However, ⁽⁸⁾ observed significantly increased levels of both P-selectin and sP-selectin form in women with PE in comparison with normal pregnant women and came to the result that normal pregnancy is connected with increased platelet activation followed by further alteration in these parameters in pregnancies complicated by hypertension.

Also, the present findings are in accordance with the results reported by ⁽⁹⁾, who suggested that the elevated level of the P-selectin is associated with PE (Figure 1), sP-selectin acts as a marker for platelet and endothelial activation and as an initiator of the pro-coagulant state as well as playing an important role in atherosclerosis. The current results of elevated sP-selectin in PE seem

to confirm that these processes occur in preeclamptic pregnant women and the excess circulating sP-selectin aid to the pathogenesis of this pregnancy-specific disorder.

There are two sources of sP-selectin. A minor proportion of this marker is produced through alternative splicing of mRNA which removes the exon that codes for the transmembrane domain.

However, the main proportion of sP-selectin is primarily derived from proteolytic cleavage of the ectoderm part of membranous P-selectin.

Interestingly, shedding of sP-selectin requires leukocyte adhesion to activate platelets or endothelial cells through interaction of PSGL-1 on leukocyte⁽¹⁰⁾.

PE involves an endothelial cell activation to coagulation hyperactivity and inflammation, which implies the availability of PSGL-1 for activation of platelets and endothelial cells with eventual increase in sP-selectin shedding.

The circulating platelet count is reduced reflecting a decreased platelet lifespan⁽¹¹⁾. Features of platelet activation in PE include an increased expression of platelet surface P-selectin (CD62P)⁽⁶⁾. As can be observed from receiver operating characteristic curve (ROC) (Figure 3). Analyses of P-selectin demonstrated the low discriminative value of this marker to diagnose PE both in terms of sensitivity and specificity. The sensitivity was 0.60 and specificity 0.556 respectively. And the AUC was 0.586, 95% CI=0.469-0.704, P=0.159. This is because sP-selectin can be elevated in many pathologies. For example in a case-control study, including women with polycystic ovary syndrome (PCOs) and healthy control women, found that sP-selectin levels were significantly higher in PCOs women than controls.

The current study revealed a significant elevation in serum level of E-cadherin in PE compared with control. This result is in accordance with during human placental development, cytotrophoblast (CTB) differentiates and fuses with the syncytiotrophoblast cell layer (STB), allowing for growth of the syncytium and for re-epithelization of aged or damaged regions of villi. This process of trophoblast turnover is regulated to ensure normal fetal development. Localization and expression of cadherins are highly relevant to the morphology of trophoblasts at different stages of placental development. E-cadherin, a classical cell-cell adhesion molecule, is expressed

in villous CTB, but is lost when they differentiate and syncytialise, resulting in the absence of E-cadherin expression in the STB of both healthy 1 and 2 trimester placentae⁽¹²⁾. The reduction of E-cadherin expression from 1 trimester to 3 trimester is reported in normal term placenta⁽¹³⁾. A number of studies have shown that the expression of E-cadherin was increased in PE resulting in CTB proliferation⁽¹⁴⁾, although more recent studies have shown the reduced expression of E-cadherin in PE, or no changes in E-cadherin expression in TNF- α induced reduction of trophoblast invasion⁽¹⁵⁾. Elevated expression of E-cadherin raises the proliferation of CTB and inhibits their differentiation into STB in PE, which suggests the alterations of E-cadherin levels are potentially important to the pathogenesis of PE⁽¹⁶⁾. Consistent with other studies, this data showed that E-cadherin was expressed in a higher level in the preeclamptic patient women compared with normotensive pregnant women. Studies have shown the villous trophoblast undergoes increased apoptosis in preeclampsia and the increased apoptosis was observed in STB⁽¹⁷⁾.

As can be observed from receiver operating characteristic curve (ROC) (Figure 3), analyses of E-cadherin demonstrated poor diagnostic value of this marker to diagnose PE. The sensitivity and specificity was 0.622 for both.

The combination of the two markers did not improve the discriminative value (Figure 4). The AUC was 0.613, 95% CI= 0.496-0.729, p= 0.056. The sensitivity and specificity of the test at the corresponding cut off values were 0.60 and 0.51 respectively.

Conclusions

There is an inverse relationship between cell adhesion molecules and selenium in PE compared with normal pregnancy.

High level of serum P-selectin and E-cadherin are associated with the presence of PE, which provides additional information for predicting of PE and preventing its complications and for better understanding pathogenesis of PE.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they

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Histological Sections of Pancreas and Serum Biochemical Changes in Rats after *Dexamethasone* and Zinc Oxide Nanoparticles Injection

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Abstract

Zinc Oxide Nanoparticles have been prepared using a simple green synthesis method by green tea extract (*Camellia sinensis*) as a reducing and capping agent, XRD measurement of Nano powder stated that Zinc Oxide had a hexagonal wurtzite structure, UV-Vis. The maximum absorption peak was approximately 318 nm and the energy gap was nearly 3.8eV calculated using Planck's equation, blood serum sugar levels, liver function after ZnO NPs injection for rats was recorded. Forty-eight adult male rats were used and separated randomly into six groups of eight (n=8) rats in each group. Results stated that blood glucose levels, liver enzymes were increased in groups that injected by dexamethasone while considerably modified in rats administered by the first dose (100 mg/kg) of ZnO Nanoparticles while the other dose (300 mg/kg) hadn't any significant effects.

Keywords: *Dexamethasone, XRD, Zinc Oxide NPs, AST, HDL-C*

Introduction

recently, a strategic development has been frequently implemented in the context of a novel green synthesis technique that forms biocompatible nanoparticles because of the possibility of developing bio-nanomaterials with particular biological functionalities⁽¹⁾. Today, non-toxic, environmentally friendly techniques have gained more importance because of their ability to generate a wide variety of nanomaterials to cover better suite biomedical applications⁽²⁾ most of these apps are due to the fact that the Nanometer scale has considerably unique characteristics compared to the bulk. Nanoparticles have good surface bonding, The large surface-volume ratio in nanoparticles is the primary reason for a structural deformation that can influence the physical characteristics of nanoparticles⁽³⁾ In particular, the synthesis of zinc oxide nanoparticles has gained considerable interest due to the fact that it has excellent characteristics for biomedical apps, zinc⁽⁴⁾ plays a significant part in the preservation of blood sugar and activate more than three hundred of body enzymes.⁽⁵⁾, it is also known to maintain the structure of insulin and has an important roles in insulin biosynthesis, storage

and secretion⁽⁶⁾. There are several zinc transporters in pancreatic β - cells⁽⁷⁾. This report intended to investigate the ability of prepared Zinc Oxide by green synthesis to recover blood glucose, liver enzymes and lipids in rat's body after dexamethasone administration.

Materials and Method

Zinc Acetate Dehydrate ($\text{Zn}(\text{CH}_3\text{COO})_2 \cdot 2\text{H}_2\text{O}$) (0.2 M) is mixed with 70ml of Deionized Water using a magnetic stirrer, stirring 1500 rpm a few minutes. Then 20 ml of the previously prepared green tea leaf extract was obtained from the stock solution (stored in the refrigerator) and gradually added. Now the blend was stirred continuously for 2 hours at 40°C. The solution was then cooled at room temperature and centrifuged twice at 4000 rpm for 15 min after a thorough washing and then dried at 60°C for 3 hours, lastly the produced ZnO nano-powder pale white colored using for further studies.

Experimental Protocols and Grouping

(Forty-eight) Male adult Wister albino rats weighing (175-225 g) and (10-14) weeks old housed in cages

made of polypropylene under controlled conditions (25 ± 5) ° C and 12/12 hrs light / dark cycles, drinking water and diet food were provided ad libitum, animals were grown and housed at the University of Baghdad / animal house in the college of science. The experimental animals were randomly grouped into six groups, each of which consisted of eight rats ($n=8$) treated for 30 days and designed as follows: G1 the first group was served as negative control, G2 the second group was injected intraperitoneally with (0.5 mg/kg) dexamethasone sodium phosphate, G3 and G4 were injected intraperitoneally with (100 and 300) mg/kg ZnO NPs⁽⁸⁾ and (0.5 mg/kg) of dexamethasone respectively, G5 was injected with 100 mg/kg ZnO NPs and G6 injected with 300 mg/kg ZnO NPs. The Laboratory animals were fasted 24 hrs before dexamethasone injection; they were weighed and anesthetized by inhalation in a glass dome.

Biochemical assessment & Statistical Analysis

When the experiment period end; blood samples collected from animals by heart puncture, the blood centrifuged at 4000 rpm for 10 min, serum was separated for test of several biochemical parameters such as blood glucose level (BGL) measured by commercially kit (Biosystem, Germany), cholesterol (TC), High Density Lipoprotein Cholesterol (HDL-C), Triglyceride (TG) and Low Density Lipoprotein Cholesterol (LDL-C) estimated using an available kit (Linear kit, Spain), serum levels Alanine Amino transferase (ALT), Aspartate Amino transferase (AST), Alkaline Phosphate (ALP) and Total Bilirubin (TB) were assessed using commercially available kit (Reflotron kit, Germany). Results were stated as means \pm standard Errors. The

Statistical Analysis System applied one way (ANOVA) analysis of variance to verify (LSD) using statistical package of Prism software 8.1.2 (Version 8.1.2, GraphPad, San Diego, CA, USA). The Probability (P) value ≤ 0.05 has been considered to be of statistical significance. When pancreatic samples collected from animals after organs separation and fixed in 10% buffered neutral formalin solution, dehydrated in gradual ethanol (70%), cleared in xylene, and embedded in paraffin. 5 micron thick paraffin sections were prepared and then regularly stained with Hematoxylin and Eosin (H&E)⁽⁹⁾ and examined microscopically.

Results and Discussion

Structural characterization of Nano-powder was recorded by Pro Penalty CAL with Cu-K α radiation (1.5406 Å). X-ray diffraction was indicating the structure and crystalline nature of as synthesized ZnO Nanoparticles. Results show all diffraction peaks are in good agreement with the international crystallographic data table; JCPDS card No. 01-075-0576. No impurities peaks can associate to the XRD spectrum of the gotten powder, showing high purity of ZnO products and the peaks intense of the samples proof to good crystallinity. The broadening of the diffraction peaks clearly indicates the presence of Nano-size, large broadening in X-ray diffraction lines occur when particle size is less than 100 nm, The peak width at half height using the Debye-Scherrer formula⁽¹⁰⁾ gives indication for average crystallite size of green synthesized ZnO NPs, The calculated average crystallite size was 9.27 nm, result of X ray pattern agreed with⁽¹¹⁾⁽¹²⁾.

Table (1): The structural parameters of as synthesized ZnO Nanoparticles

2 θ (Deg.)	G.S (nm)	FWHM (Deg.)	dhkl Exp.(Å)	dhkl standard (Å)	(hkl)
30.81	14.7	0.539	2.877	2.902	(100)
34.32	8.4	0.941	2.593	2.613	(002)
35.3	9	0.883	2.523	2.537	(101)
46.7	5.33	1.497	1.943	1.941	(102)
57.97	5.54	1.470	1.592	1.595	(111)
62.15	5.25	1.516	1.492	1.493	(013)
66.93	10.3	0.773	1.396	1.398	(201)
76.5	15.7	0.510	1.243	1.268	(202)

The optical behavior recorded by VARIAN spectrophotometer (Cary 5000 Scan), to explain the optical properties and energy gap value of ZnO NPs; UV-Vis absorption spectrum has been studied. Fig. (1) Shows the exciton maximum absorption is about 318 nm. Actually, energy absorbed in UV or visible region causes a change in the electronic excitation of the molecule, and hence results in corresponding change in its ability to absorb light in the UV-visible region of the electromagnetic radiation. The optical energy band gap for ZnO NPs was 3.8 eV has been calculated using Planck's relationship⁽¹³⁾.

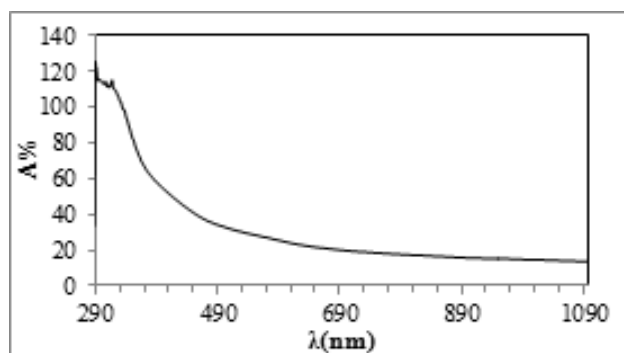


Figure (1): Absorption Spectrum of ZnO nanoparticles

Table (2) shows blood glucose of the study groups, mean blood glucose level (BGL) of G2 after 30 day administration of dexamethasone showed a significant

increasing compared with control group, the reasons behind increasing glucose is generated oxidative stress by sugar causes the generation of free radicals that attack and damage beta cells, thus inhibiting the formation and secretion of insulin, and then stops glucose metabolism and glycogen decomposition, Oxidative stress is involved in creation of ROS that damage cellular membranes, proteins and nucleic acids, the auto oxidation of glucose that produces hydrogen peroxide (H_2O_2), a strong ROS⁽¹⁴⁾, these results similar to previous study⁽¹⁵⁾ that reported the dexamethasone cause tissue damage in pancreas.

Treatment with 100 mg/kg of ZnO NPs were responsible of significant reduction to BGL ($P \leq 0.05$) may be due to that Zinc has been elucidated to be a potent metal that Improves glucose utilization and metabolism through its potent influence on enhancement of hepatic glycogenesis through actions on the insulin signalling pathway⁽¹⁶⁾, interestingly, on the basis of Umrani and Paknikar⁽¹⁷⁾; ZnO did not possess the risk of hypoglycemia in living organisms so it can act as an insulin secretion, more researches have the same results revealed that ZnO NPs could increase serum insulin level in diabetic animals⁽¹⁸⁾.

Table (2): Changes of Serum biochemical parameters in treated rats with CeO₂ Nanoparticles after 30 days, Each value represents the mean± standard error of (n=8), The values were found to be statistically significant at $P \leq 0.05$, (* $P < 0.01$, ** $P < 0.001$, *** $P < 0.0008$, **** $P < 0.0001$)

Groups Parameters	Means± SE					
	G1	G2	G3	G4	G5	G6
BGL (mg/dL)	113.2±6.4	395.2±29.7	130.2±18.9**	236.7±5.1*	110.25±0.8	121.25±6.4
ALT(IU/L)	35.7±1.6	66.2±4.7	33.7±1.6*	46.5±0.6	41.2±0.6	43.7±1.6*
AST(IU/L)	27.2±4.4	48.2±3.5	34.5±2.3*	58±3	31±1.6	38.2±1.2
ALP(IU/L)	151±17.8	383.2±30.7	124±7.5**	317.5±8.5	159.5±12.7	238.2±20.5*
TB(mg/dL)	0.33±0.01	1.42±0.08	0.54±0.02**	1.27±0.04	0.45±0.06	0.62±0.1
TC(mg/dL)	178.5±12.5	255±5.4	139.7±13.8**	232.7±5.9*	164±4.2	173.2±5.5
TG(mg/dL)	152.2±10	231.7±14.8	170.5±2.2*	203.7±3.8	157±1.9	165.7±2.9
HDL-C(mg/dL)	45±1.6	26±3	46.2±2.3*	29±1.4	40.2±2.2	35±1.7
LDL-C(mg/dL)	91.2±8.1	172±13.1	115.2±3.9*	163.5±5.1	101.7±2.4	113.7±2.4

ALT and AST are very sensitive enzymes and have been closely connected with hepatic damage these levels enzymes will rise when liver is in dysfunction^{(19) (20)}, Maiti et al.⁽²¹⁾ have suggested that increases in the actions of ALT, AST, and ALP in the serum of diabetic rats as a consequence of hepatic damage, ALT and AST levels increased is associated with insulin deficiency has been interrelated to increased gluconeogenesis during hyperglycemia⁽²²⁾.

The results showed there was a significant increase in liver functions parameters such as ALT, AST and ALP in experimental animals compared with negative control group (**G1**) table (2), increases of liver functions parameters levels possibly due to hepatic damage and increase synthesis of these enzymes in the liver⁽²³⁾, and a significant decrease ($P \leq 0.05$) with liver enzymes when animals treated with (100 mg/kg) of ZnO NPs while there was no statistically significant effect of 300 mg/kg dose for infected rats respect to **G2**. Increases of Bilirubin levels may be attributed to the changes in cell membrane permeability with change of effective stress of the membrane under the oxidative stress⁽²⁴⁾, ZnO nanoparticles have reduced Bilirubin levels in **G3**; **G5** and **G6** were nearly the normal ranges.

G2 had a significant increase in cholesterol; this increasing attributed to high exposure of free radicals which stimulate the rate limiting enzyme hydroxyl-methyl glutaryl which is responsible for liver synthesis⁽²⁵⁾. When these animals treated with 100 mg/kg of ZnO NPs, a significant recovery in cholesterol levels occurred. Higher levels of Triglycerides (TG), LDL-C and reduction in HDL-C levels in **G2** is possibly due to a direct consequences of conversion white adipocytes to

brown adipocytes⁽²⁶⁾, or may be attributed to decrease the activity of lipoprotein lipase which is responsible for TG removal. However, triglyceride and LDL-C levels ($P \leq 0.05$) decreased was evident. With the exception of raises of serum HDL level.

Histological section in (Fig. 2a) shows pancreatic lobules containing acini (*), islets of Langerhans (***) and unstained connective tissue septa (***) for control group. Fig. (2b and c) showed damage and necrosis of endocrine cells of islet (*), Langerhans with shrinkage of islet (**), degenerated acini cells and islet of Langerhans (***) and presented different alterations of rat's pancreas and many histological changes were detected in pancreas section of (**G2**) that administrated by dexamethasone, such as necrosis and damage of endocrine cells of islet Langerhans with shrinkage of islets, Dexamethasone induced necrosis is mediated by reactive oxygen species mediated lipid peroxidation which causes bursting of plasma membrane of the cell and disturbance of osmotic balance this osmotic alteration ultimately leads the cell towards necrosis. The histological sections showed several modified in rats pancreas of rats in groups that treated with 50 mg/kg of ZnO Nanoparticles (**G3**), whereas group that treated with (100 mg/kg) (**G4**) had no clear changes after dexamethasone and nanoparticles injection, in fig. (3a) the section shows animal from **G3** had a normal histological structure of islets of Langerhans of pancreas which consist of α and β cells, in between capillaries blood vessels, while fig. (3b) section shows no effects of Nanoparticles on pancreatic cells, abundant necrosis, degenerated acini and damage of endocrine cells, **G5** and **G6** in fig. (3c and d) appears look like normal pancreatic structure.

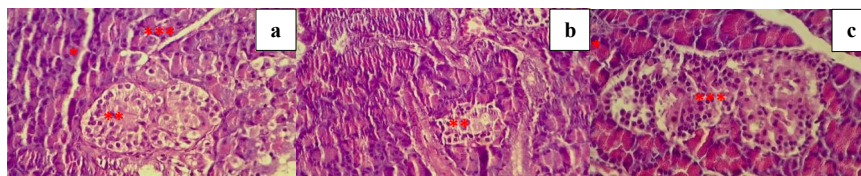


Figure (2): Cross sections of pancreas (a) Control group G1, (b and c) G2 X400 (H&E)

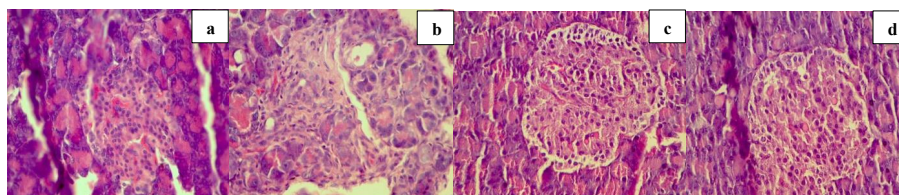


Figure (3): Cross section of pancreas (a) G3 (b) G4 (c) G5 (d) G6 X400 (H&E).

Conclusions

Biocompatible nanoparticle synthesis was produced by using green tea extract (*Camellia Sinensis*) method for the preparation of Zinc Oxide nanoparticles. Successful formation of nanoparticles by examining its structural and optical properties was investigated. Results indicated that blood glucose concentrations, liver enzymes and lipids were enhanced in dexamethasone-injected groups, while significantly altered in rats administered 100 mg / kg dose of ZnO NPs and the other dose (300 mg / kg) did not significantly improve BGL, liver enzymes and lipids.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Study the Role of Trichomoniasis in In Vitro Fertilization (IVF) Failure

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Abstract

Trichomoniasis is a sexual transmitted disease that affects human fertility. In women, trichomoniasis has been related to infertility due to pelvic inflammatory disease that compromises tubal patency, while in men, trichomoniasis may contributed to infertility by deficit of sperm cell quality and function due to physical damage. In this article, asymptomatic fifty couples with unexplained infertility, undergoing In Vitro Fertilization (IVF) were examined for *Trichomonas vaginalis* (T.V.) infection. In 70% of couples, embryo implantation failed and pregnancy was not achieved, probably as a consequence of trichomoniasis. The result indicates that *T. vaginalis* pathogenicity, adverse reproductive health outcomes, in time diagnosis, and treatment may improve implantation rate in patients with unexplained infertility undergoing Assisted reproductive technology (ART).

Key word : *Trichomonas vaginalis* , (IVF) Failure, infertility; sexual transmitted disease

Introduction

Trichomonas vaginalis is a globally occurring anaerobic/ microaerophilic protist parasite which colonizes the epithelium of the human urogenital tract⁽¹⁾. Aside from human papillomavirus, trichomoniasis is the most common sexually transmitted infection worldwide, based on estimates of the World Health Organization (WHO) from 2016⁽²⁾, *T. vaginalis* infection , affect approximately 156 million people every year. Medical opinion has traditionally held that it plays little role in health complications in women, and it is rarely seen in men, the Centers for Disease Control and Prevention (CDC), reports that only 30 percent of people with trichomoniasis report any symptoms at all⁽³⁾. However, evidence has recently accumulated implicating *T. vaginalis* as a contributor to a variety of adverse outcomes among both sexes. Among both women and men, the association of *T vaginalis* with human immunodeficiency acquisition and transmission has been shown in multiple studies^(4,5). Among women, trichomoniasis may play a

role in development of cervical neoplasia, postoperative infections, and adverse pregnancy outcomes and as a factor in atypical pelvic inflammatory disease and infertility^(6,7). Among men, trichomoniasis has emerged as a cause of nongonococcal urethritis and contributes to male factor infertility⁽⁸⁾. Published reports clearly show that the rate of trichomonas infections among infertile couples is higher than that among fertile ones⁽⁹⁾.

The interaction of vaginal pathogens with epithelium and mucosa of the reproductive tract affects the immunological harmony needed for the success of embryo implantation. Nowadays, *T. vaginalis* is a latent pathogen in the reproductive tract, in this way is responsible of the adverse reproductive health outcomes in humans. Trichomoniasis proves the way for several bacterial intruders of the inflammation processes, thereby increasing the risk of failure in reproductive capacity and increasing the risk by 1.5-3 times of HIV and VPH acquisition^(10,11). *T. vaginalis* evades host immunity by the presence of adhesion proteins, cysteine proteases, and lipophosphoglycan molecules, all of which increase the pathogenicity of this intruder. The parasite adheres to the vaginal and cervical epithelial cells and triggers an immunosuppressive response from monocytes, macrophages, and dendritic cells. Also, *T. vaginalis* carries viruses and other parasites, such as mycoplasma

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and gardenella, causing chronic mucosal damage and an inflammatory reaction which gives rise to severe consequences in reproductive outcomes⁽¹²⁻¹⁵⁾. Goodman *et al.*⁽¹⁵⁾ reported the presence of a Totiviridae viral family, which is a virus with a doubled stranded RNA that concurrently, is infecting the *T. vaginalis* parasite⁽¹⁵⁻¹⁷⁾. Infection of *T. vaginalis* by such a virus increases severely the immunological genesis of trichomona virulent factors by changes in its genome organization, protein coding, and replication signals. Trichomona virus increases the recurrence of the parasite infection and resistance to the metronidazole treatment^(15,18,19-21).

Materials and Method

Ethics Statement: All human participants were enrolled in conformity with informed consent, privacy and confidentiality of patients who were sampled and analyzed anonymously during study (No. 53.2017).

Sampling:

From August 2017 through to August 2019, a prospective and case-control study at Dr. Khawer center for infertility and In vitro fertilization (IVF) in Erbil province of Kurdistan region of Iraq, were conducted. For research purpose only, fifty women under the age of 35 years, had normal body index, and nonsmokers and their spouses (normal seminal fluid analysis according to the world health organization parameters (WHO) at 2010),⁽²²⁾ with unexplained infertility, were enrolled in this study. High vaginal swab and semen sample had been collected from the participate couples.

DNA extraction and PCR:

The genomic DNA was extracted by the extraction kit gSYNCTM (Geneaid England) directly from high vaginal swab, following the manufacturer's instructions.

PCR steps

The primer set targeting beta tubulin gene 9/2 which is a conserved region found in all of *T. vaginalis* (gene bank accession No. L05470) were used to amplify a 112 bp piece of the gene, the sequence of the primers.

Forward primer sequences (5'-3'): CAT TGA TAA CGA AGC TCT TTA CGA T

Reverse primer sequences (5'-3'): GCA TGT TGT GCC GGA CAT AAC CAT

PCR protocol:

The PCR master mixture prepared at final volume of 20 µl in 0.2 mL PCR tubes. Component and their volume are explained in Table (1).

Table (1): the PCR construct master mixture for amplification of (BTUB) gene:

Reagents	Volume for 1X
Master mix(Prime taq Primemix)	10.0 µl
Forward primer	1.0 µl
Reverse primer	1.0 µl
Nuclease free water	4.0 µl
DNA	4.0 µl
Total	20 µl

The PCR amplifications were performed on a program according to the cycle

The construct reaction conditions for (BTUB) as shown in table (2):

Table (2): the construct reaction conditions for (BTUB):

Stage	Temperature	Time	Cycles
Initial Denaturation	95	5 minutes	1 cycle
Subsequent denaturation	95	30 second	10 cycles
Annealing	(64-55)	30 second	
Extension	72	1.0 minute	40 cycles
Subsequent denaturation	95	30 second	
Annealing	55	30 second	
Extension	72	1.0 minute	1 cycle
Final Extension	72	10 minutes	
	4	To time end	

A 3 µl volume of each reaction was subjected to electrophoresis on 3.0 % agarose gel in Tris-acetate-EDTA buffer pH 8.5 (45 min at 10 V/cm) and staining

with safe dye. The DNA bands were visualized under UV light (transilluminator). The size of the amplified products was assessed by comparison with a commercial weight marker, Smart Ladder (50 bp) GeneDix|Korea and photographed by digital camera.

PCR products sequencing:

To reconfirm the PCR results, 10 amplified PCR products were directly sequenced by targeting Beta tubulin gene in both directions using, the Big Dye Terminator method. Sequencing was performed bi-

directionally using the same primers used in PCR amplification of the beta tubulin genes (Macrogen /South Korea). The obtained sequences were aligned (by using Bio edit software) with normal sequence from GenBank.

Results and Discussion

Unfortunately, all the examined women for trichomoniasis were positive by detection of BTUB gene and 40% of their spouses also. Only 30% of these women successfully achieve pregnancy, as shown in table 3.

Table (3): the percentage of trichomoniasis in males and females and the successful percentage of IVF.

Gender	T.V. infection percentage	IVF percentage	IVF success percentage	IVF failure percentage
Female	100%	100%	30%	70%
Male	40%			

Although, couples that enrolled in this study were chosen very carefully, to overcome the IVF failure causes and to insure getting good eggs quality (eggs without chromosomal changes) and quantity, not defective embryo (that can implanted successfully in the uterus), yet it has long been regarded as a sexually transmitted infection of minor importance, trichomoniasis is not routinely screened in asymptomatic patients and the infection can persist for 3-12 months in the genital tract. (23-26). Patients with trichomomiasis are asymptomatic in 70-100% of male cases *versus* 35-85% of female cases (23), however, the asymptomatic women may also experience, at least part of pathological signs, could be due to the genetic diversity of the parasite strains to express virulence factors, which increase cytoadherence, cytolysis and cell detachment (27).

Additionally, previous studies have reported that trichomoniasis has high rates of reinfection due to resistance of the parasite to metronidazole treatment (18, 26) making this microorganism a serious reproductive tract pathogen.

The *T. vaginalis* protozoan attaches to vaginal epithelial cells through its barbed tail, membrane expression of surface protein p270, secretion of proteases and a cell-detaching factor, leading to an intense host inflammatory response, inducing local

cytotoxic effects, genital tract damage, and reproductive effects (28,29). Because, trichomonas has been been isolated from fallopian tubes, peritoneal fluid, and the pouch Douglas, scientists suggesting that motile trichomonas may be able to invade the whole genital tract (30,31). There are several studies that conclude that *T. vaginalis* causes urogenital damage to different types of cells and tissues, such as connective and muscular tissues, due to an excessive cytotoxic local effect suggesting high risk of reproductive failure (31-37). Trichomonas bind to the cells inducing membrane retraction, cell blebbing, and apoptosis. These changes of cell architecture can be evidenced under microscopy and characterized by condensed chromatin and intense cytoplasm vacuolization (37). In this study, the female partners did not report any infectious symptom and, therefore, they were not tested for *T. vaginalis*, but they might have been affected with latent trichomoniasis. They are an examples of asymptomatic patient who obtained a negative outcome of implantation failure after ART. More than 20% of women with trichomoniasis have a chronic inflammatory process in the reproductive tract and that may explain the embryo implantation failure after ART procedure. Consequently, the clinical implication of embryo implantation failure depends on both the quality of the embryo and the receptivity of endometrium mainly marked by the correct and exact immune environment needed for a successful pregnancy.

On the other hand, men infected with *T. vaginalis* display abnormal motility of the spermatozoa and high semen agglutination. A relevant tropism from *T. vaginalis* microorganism to the head or flagella of the human spermatozoa has been reported. The adhesion of *T. vaginalis* and sperm affects sperm motility followed by phagocytosis, lysis, and digestion of sperm cell^(38, 39). In 2008, Benchimol *et al.*

⁽⁴⁰⁾ report that, after one hour of interaction between *T. vaginalis* and sperm cells in an *in-vitro* environment, 75% of the sperm cells were immotile or dead. Additionally, cyto-adhesion and phagocytic activity of trichomonas to ingest and digest spermatozoa in an *in-vitro* environment suggest a similar behavior in an *in-vivo* environment as a cause for decreasing numbers of motile sperm directly affecting reproductive success. Latent trichomoniasis infection could be the cause of the unexplained infertility in men, since sperm damage evidenced by severe asthenozoospermia.

This search showed that, Couples with unexplained infertility must be widely screened and tested for sexually transmitted pathogens to ensure adequate conditions of the female reproductive tract needed to achieve pregnancy. Further studies are required to accurately fill the gap of knowledge between trichomoniasis, unexplained infertility, and implantation failure.

In conclusion: The result indicates that *T. vaginalis* pathogenicity, adverse reproductive health outcomes, in time diagnosis, and treatment may improve implantation rate in patients with unexplained infertility undergoing Assisted reproductive technology (ART).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Unexpected Adverse Medical & Surgical Health Conditions in Neonates after Elective Cesarean Sections within the Context of the Influence of Local Socio-demographic Factors in Babylon

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Abstract

Background: Caesarean section was first introduced to reduce the risks of normal delivery, and is recommended only when the lives of the mother and fetus are compromised, as it is associated with certain risks. However, some women's perceptions may be influenced by local culture. According to international statistics, the rate of C-section is increasing globally, and in Iraq it is 2-3 times higher than other nations. More than 1/3 of women in Babylon choose C-section voluntarily, believing it is safer, healthier, and less painful.

Aim of the Study: Identify the unexpected medical and surgical conditions of newborns by elective cesarean delivery in Al-Hillah city, and assess the association between the actual gestational age at birth and decision by which elective caesarean sections were done as influenced by local socio-demographic factors and perceptions; that resulted in those conditions.

Methodology: This study is a cross sectional study conducted in Al-Hilla General Teaching Hospital from the beginning of March 2018 until the end on August 2018, and included a total of 150 neonates born via elective cesarean section who had unexpected medical and surgical conditions.

Results: Mean maternal age was (26.27±9.56) year ranging from (16-43). Seventy percent of them had timing of < 39 weeks of gestation, and 36.7% had actual gestational age at birth of < 37 weeks. Almost half of them chose C-section for being safe. Respiratory compromise was the commonest medical complication among mothers. There was significant relationship between decision basis and actual gestational age at birth, as well as between maternal age and medical and surgical complications (P-value<0.05).

Conclusion: Neonates born after elective cesarean delivery in Al-Hillah city have significantly higher rates of respiratory morbidity and longer length of hospital stay, with increased risk of certain medical and surgical complications. The unexpected medical complications are inversely related to gestational age at which elective cesarean section is timed.

Keywords: cesarean section; medical complications; surgical complications.

Introduction

Child delivery in Babylon is associated with a multitude of physical, emotional, social, physiological, ethnocultural, and psychological dimensions. Cesarean

section rates are increasing in Babylon Province. Given the steady rise of C-sections carried out, the unexpected adverse health outcomes in neonates born via this mode of delivery it seems necessary to investigate and forge out sufficient information about this area of obstetric practice and the factors that attract women's decision of choosing this mode of delivery given that few scholarly articles in Iraq are available currently[1].

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In an ethnographic based study carried out by Latifnejad-Roudsari et al. in 2014, non medical factors including dread of mesmerizing normal vaginal delivery related pain, local Iraqi social attitudes and values, and social network were blamed as the reasons affecting the choice of opting for elective cesarean delivery and act partly for a proportion of the observed increase [2].

Caesarean sections are either planned electively or emergent. Planned sections are done before delivery commences, as compared to emergency sections, which are undertaken before or after labour has commenced [3]. The reasonable gestational age for scheduled sections has become a matter of heated debate among professionals dealing with maternal and child health care [4].

Over nearly a half century, maternal and child health care professionals have defined “term pregnancy” based on the assumption that fetal maturity is completed at the end of 37th week [5]. However, it recently became clear that neonatal respiratory complications are reduced when increasing the gestational age to 39 weeks. There is evidence that babies born by planned C-section at 37 weeks have more occurrences of certain complications than those at 39 weeks [6]. Therefore, experts recommend that elective C-section be conducted from 39 weeks onwards to achieve fetal maturity [7].

Although pregnancy is a physiological process, its end is a painful experience for mothers and associated with fear, dread and anxiety [8]. Local culture in Babylon province has a major impact on women’s beliefs and attitudes towards labor pain, coping mechanisms, and observed behaviors. This attitude can influence women’s decisions about her mode of delivery [9].

Safe delivery is the target of every medical team dealing with childbirth. C-section was introduced primarily to reduce the risks maternal child complications. Unfortunately there is a false assumption nowadays that scheduled C-section provides a safe and healthier means of escaping vaginal delivery pain. That is why it is estimated that more than half of women voluntarily choose C-section as the preferred mode of delivering their babies [10].

C-section rate is an important health insurance index. According to WHO, C-section rate was 15% in 1985, significantly increasing in 2009 worldwide [11]. In

North America notably the United States of America, C-section accounted for 26.1% of all deliveries in 2002. In Europe, this rate was one quarter of births in some EU states. In addition, in Latin America this rate is also quite high reaching up to 40% [12].

According to regional health records and statistics, the prevalence of C-section in Iraq is up to three times higher than the international rate [13]. Although scheduled operations should be decided when the health of the mother or baby are compromised; this mode of delivery has become a way of avoiding distress of labor pain, due to a common notion that its less painful, safer, and healthier than vaginal delivery [14].

Aim of the Study

Identify the unexpected medical and surgical conditions of newborns by elective cesarean delivery in Al-Hillah city, and assess the association between the actual gestational age at birth and decision by which elective caesarean sections were done as influenced by local sociodemographic factors and perceptions; that resulted in those conditions.

Patients and Methods

This is a cross-sectional study conducted in Al-Hilla General Teaching Hospital from the beginning of March 2018 until the end on August 2018, and included a total of 150 neonates born via elective cesarean section who had unexpected medical and surgical conditions following the procedure, who were born at various gestational ages. Excluded cases were those who did not develop unexpected outcomes, as well as those born via emergency C-section or normal vaginal delivery.

Results

Timing of caesarean section was less than 39 weeks in 70.0%, while it was equal or more than 39 weeks in the remaining 30.0% (Figure 1).

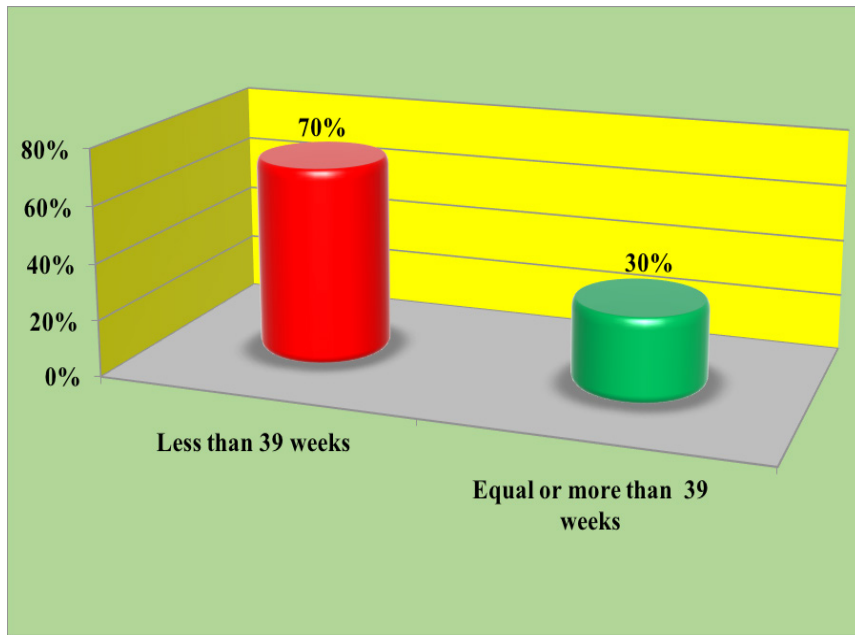


Figure 1: Distribution of the timing of elective caesarean section

Figure 2 shows the primary basis for decision to time elective caesarean section, which is clinical in 26.75% and by ultrasound in 73.3%.

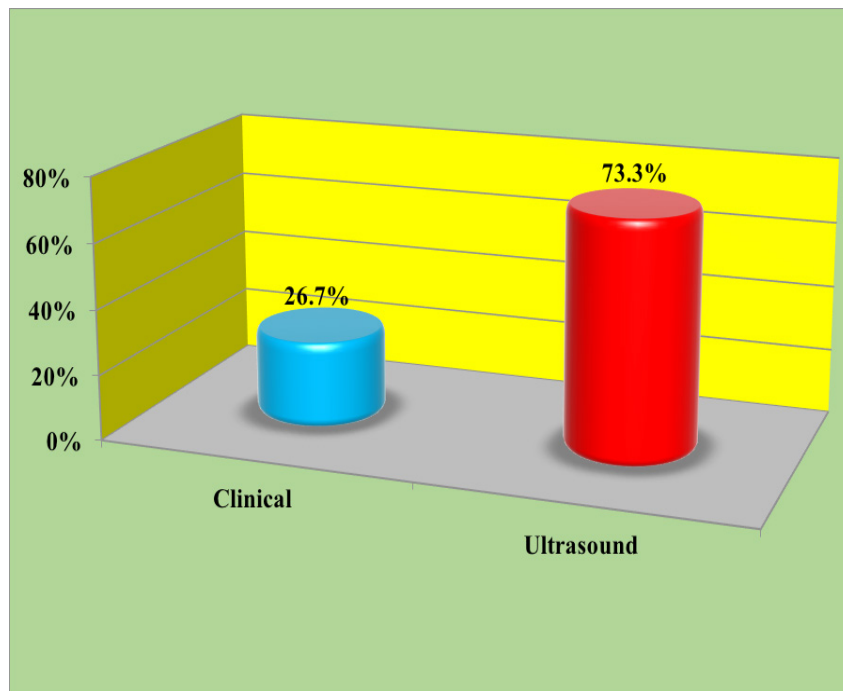


Figure 2: The primary basis for decision to time elective caesarean section

Figure 3 represents the reasons for opting for elective C section cited by women.

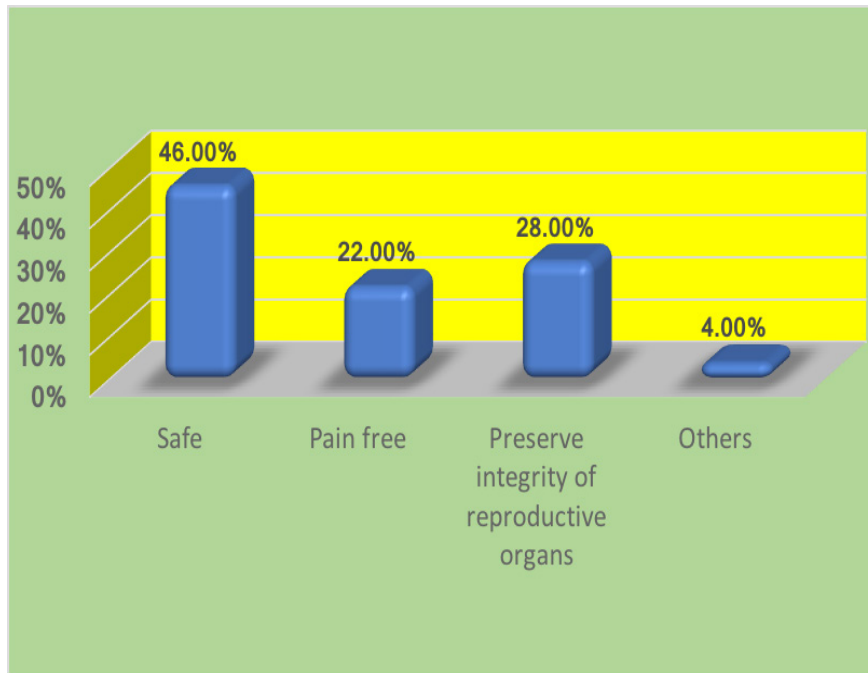


Figure 3: Reasons for opting for elective C-section cited by women

Table 1 shows that the higher percentage of unexpected medical complication of pregnant women who underwent elective caesarean section was respiratory compromised which represented 23.3%, followed by nosocomial infection and neonatal sepsis, prematurity, congenital heart disease which represented 16.7%, 14.7%, and 12.7% respectively.

Table 1: Distribution of unexpected medical complication of pregnant women who underwent elective caesarean section.

Medical complication	Number	Percentage(%)
Respiratory compromised	35	23.3%
Prematurity	22	14.7%
Postmaturity	5	3.3%
Birth asphyxia	10	6.7%
Nosocomial infection & neonatal sepsis	25	16.7%
Reluctant to feed, artificial feeding & GERD	9	6.0%
Seizure and electrolyte disturbance	15	10.0%
Hypothermia and hypoglycemia	5	3.3%
Congenital heart disease & other anomalies	19	12.7%
Stillbirth	5	3.3%
Total	150	100.0%

Table 2 shows that the higher percentage of surgical complication was injury followed by intestinal obstruction, pneumothorax and trachea esophageal fistula in a percentage of 40.0%, 30.0%, 20.0% and 10.0% respectively.

Table 2: Distribution of unexpected surgical complication of pregnant women who underwent elective caesarean section.

Surgical complication	Number	Percentage(%)
Pneumothorax	10	20.0%%
Intestinal obstruction	15	30.0%
Tracheo esophageal fistula	5	10.0%
Others (injury)	20	40.0%
Total	50	100.0%

Table 3 shows that chi-square test was conducted to find an association between variables (decision by which caesarean section was conducted and actual gestational age at birth) and timing of caesarean section (less than 39 weeks and equal or more than 39 weeks).

Table 3: Association between variables and timing of caesarean section

Variables	Timing of caesarean section		Total	X2	P-value
	<39 weeks	≥39 weeks			
Decision					
Clinically	20(19.0%)	20(44.4%)	40(26.7%)	10.39	0.001*
Ultrasound	85(81.0%)	25(55.6%)	110(73.3%)		
Total	105(100.0%)	45(100.0%)	150(100.0%)		
Actual GA at birth(week)					
< 37	55(52.4%)	0(0.0%)	55(36.7%)	44.99	<0.001*
37 – 42	40(38.1%)	25(55.6%)	65(43.3%)		
≥ 42	10(9.5%)	20(44.4%)	30(20.0%)		
Total	105(100.0%)	45(100.0%)	150(100.0%)		

*P-value≤0.05 was significant

Discussion

Depending on the results of this cross sectional study, vaginal birth should be highly encouraged to avoid unexpected negative maternal child health outcomes . The results are highlighted by the findings of Knoblauch H.^[15]. In similar international studies, participants assumed that vaginal delivery was necessary for baby's lungs functional maturation, propping up of mother-child emotional attachment, reduction of unnecessary drug usage and other interventions. Overall, they assumed that vaginal delivery was less risky than C-section as it eliminates maternal child adverse outcomes^[16].

The highest percentage of unexpected medical complications of pregnant women who underwent elective C-section was respiratory compromise in 23.3%, followed by nosocomial infection and neonatal sepsis in 16.7%, prematurity in 14.7%, and congenital heart disease in 12.7%. This study is in line with international studies that indicate lung complications are the commonest cause of neonatal morbidity following elective C-sections^[17].

These are in part attributed to the absence of hormonal and physiological cascade of changes associated with birth which are vital for lung function

in newborns, which do partially occur in neonates delivered as preterm^[18]. Term neonatal respiratory distress syndrome is also associated with higher need for oxygen and assisted pulmonary ventilation, lengthy hospital stays and higher mortality than other causes of respiratory morbidity in term counterparts^[19].

Infants delivered by planned C-sections in Babylon have an increased risk of adverse respiratory morbidity. The relative risk increased with decreasing gestational age. Nearly one quarter (23.3%) of unexpected neonatal medical conditions following elective C-sections were neonatal respiratory compromise that required SCBU or RCU admission, including (respiratory distress syndrome, transient tachypnea of newborn and assisted ventilation in respiratory care units). These complications are similar to international studies and surpassed other medical conditions.

As shown by this current research paper elective C-section can elicit some unexpected negative outcomes in neonates. The findings are in agreement with those of Fenwick and associates, who concluded maternal and fetal health, mother-child bonding and attachment, and transition to motherhood as the main positive benefits of vaginal delivery^[20]. An outstanding issue pointed out by those with scheduled cesarean experience was mothers' "paralysis" literally and helplessness to care for the child with unexpected negative outcomes and meet the maternal role; the results were in harmony with those of Cranley and colleagues.^[21]

Thus results of the present study demonstrate that vaginal delivery remains and should remain a symbol of well being and health as it is a defining point in life. Since childbirth pain is usually ends with positive outcomes, this distinguishes it from other types of painful experiences. The study of Manthata also explicitly emphasized this fact^[22]. Selecting C-section electively in Babylon according to this paper was mainly out of fear of labor pain. The study of Poikkeus likewise concluded that women's preference for elective C-section is due to their unfound anxiety of pain during vaginal delivery and unrealistic thoughts about their inability to withstand vaginal birth^[23].

Almost all participants had positive attitude towards scheduled C-section despite its adverse outcomes. They also attributed many advantages to it. The most important conceptions were that it is harmless, painless and maintain beauty of reproductive organs, with

no negative impact on intimacy and sex life^[24]. Gungor and associates, in a study in 2008, also documented similar social beliefs. They also found that the frequency and mode of delivery are greatly influenced by cultural beliefs^[25].

Conclusions

Neonates born after elective cesarean delivery in Al-Hillah city have significantly higher rates of respiratory morbidity and longer length of hospital stay, with increased risk of certain medical and surgical complications. The unexpected medical complications are inversely related to gestational age at which elective cesarean section is timed. The recommended gestational age at which elective cesarean section should be timed is at 39 weeks.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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Isolation of MRSA from Drinking water Supplies in Al-Anbar Province, Iraq

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Abstract

This study was aimed to isolate MRSA from water supplies from different places in alanbar province, fifty water samples were cultured on nutrient, macConkey and blood agars then subcultured on MSA and Staph 110, then gram stain and biochemical test done to confirm this bacteria. Then antibiotic susceptibility test were done on *S. aureus* by using different antibiotics including Methicillin, erythromycin, Doxycycline, Sulfa-trimethoprim, penicillin, chloramphenicol, ciprofloxacin.

The results showed that 12 (24%) samples were diagnose as *S. aureus*, these were showed complete resistance to methicillin, erythromycin, Doxycycline and showed different percent for resistance to other antimicrobials that used.

In conclusion, the MRSA were isolated from drinking water in significant percentage and this strain of bacteria were showed higher resistance to antibiotics.

Key words: MRSA, drinking water, Antibiotic.

Introduction

The WHO reported that MRSA was an important pathogenic bacteria causing high infections that was initially detected in 1961 & became a main threats to the public health (1).

In a study of Chen et al. (2), they reported that above two million of MRSA infection cases around the different countries in the world producing human death. As described in the UK, above five thousands deaths each year were showed to be linked with MRSA, although in Netherlands, MRSA has been found to be causes for in excess of twenty percent of all infections for MRSA (3). In Europe, it has been reported that MRSA was responsible for above 170,000 infections each year, consistent to forty four percent from all infections linked to the health care (4).

Staphylococcus aureus is an environmentally widespread but it is found chiefly on the skin as well as mucous membranes of human and animals. *Staphylococci* are sometimes identified in the GIT and has been discovered in a sewage. *S. aureus* can become free by human direct contact with the water environments for example the pools for swimming as well as fun waters. It has been also identified in a drinking water supplies (5), there is an indication of spread through the drinking of such water. While *Staph. Spp.* are somewhat resist to residuals chlorine than the *E. coli*, their occurrence in water is restricted by conventional therapy as well as disinfection procedures (6).

This study aimed to isolate MRSA from human water supplies and detection of resistance to different antimicrobials by using antimicrobials sensitivity test.

Materials and Method

A Fifty drinking water specimens were taken from a different places found in Al-anbar province (Fallujah, Heet, Ramadi, Ana, Rawa, Al-qaim, Saqlawya, Garma), these were cultured on primary media (nutrient, macConkey, blood agars), then were subcultured on other media such as mannitol salt agar and Staph 110, then gram stain as well as biochemical tests were done including catalase, oxidase as well as coagulase (7).

The antibiotics sensitivity test were done according to Bauer et al. (8) by using different antibiotics including Methicillin, erythromycin, Doxycycline, Sulfa-trimethoprim, penicillin, chloramphenicol, ciprofloxacin.

Results and Discussion

The current results were showed detection of 12 isolates of MRSA from water specimens (Table 1, Fig. 1&2).

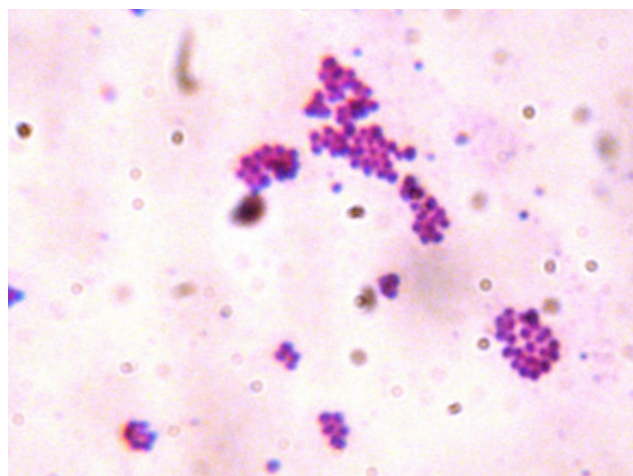
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Table 1- Number and percentages of MRSA from different location

Location	Number of MRSA	Percentage (%)
Fallujah	1	8.33
Ramadi	2	16.66
Heet	1	8.33
Ana	1	8.33
Rawa	0	0
Al-qaim	1	8.33
Saqlawya	4	33.33
Garma	2	16.66
Total	12	24%

**Figure -1- S. aureus on MSA (left)****Figure -2- Gram positive cocci**

The WHO reported that above 80% of all illness as well as the diseases on the world is made by insufficient hygiene, contaminated water or unreachability of water & at least five million deaths occur in each year which attributed to the water-borne illnesses (9). These results were in agreement with results of (10) who isolated *S. aureus* from the water provisions. Also, these similar to results of another study in Ghana that showed *S. aureus* was detected from about 64% of the specimens, with about 34.38% from well water supplies, 32.81% from hole supply & 31.25% from the tap water (11).

A study of Salim et al. (12) in Iraq found that *Staphylococcus aureus* were isolated from bottled drinking water during storage for one year at 18°C. Also, in Nigeria (13) isolated *S. aureus* from a drinking water. Moreover the bacteria that resist antibiotic were upper in the tap water than in treated water (14). Additional studies have also recognized *S. aureus* that are MDR in seaside societies in their tap water as well as fresh water (15).

The results were disagree with a results of Hillo (16) who reported that *S. aureus* not detected in drinking water in Albasrah city.

The present results of antimicrobial sensitivity test for presumptive *S. aureus* (12 isolates) showed complete resistance to methicillin, erythromycin, Doxycycline and showed different percent for resistance to other antimicrobials that used (Table 2, Figure 3).

Table 2 Antimicrobial susceptibility test for S. aureus

Antimicrobials	Resistance (%)	Sensitive (%)
Methicillin	12 (100)	0
erythromycin	12 (100)	0
Doxycycline	12 (100)	0
Sulfa-trimethoprim	5 (41.7)	7 (58.3)
penicillin	10 (83.3)	2 (16.7)
chloroamphenicol	3 (25)	9 (75)
ciprofloxacin	4 (33.3)	8 (66.7)

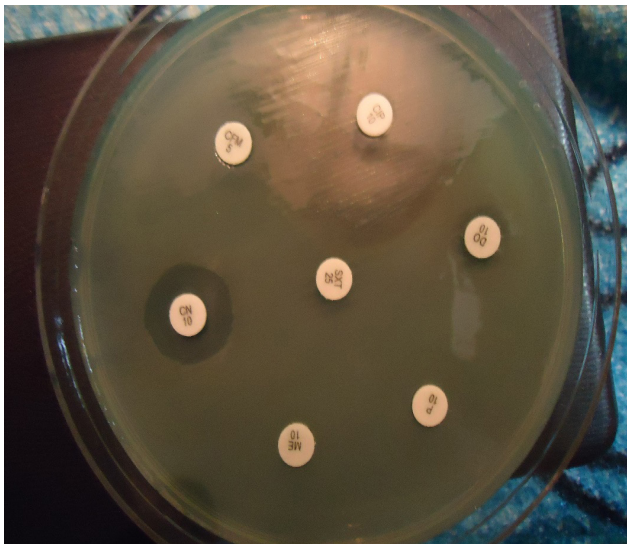


Figure 3- showing MRSA on Muller hinton agar

The current results were in agreement with results of many studies, Younis et al. (17) reported that 96.6% of *S. aureus* isolates were resistant to penicillin. Shi et al. (18) reported that 87.6% of isolates were resistant to penicillin. Abera et al. (19) recorded that 94.4% of isolates were resistant to the penicillin. Vanderhaeghen et al. (20) reported that all isolates (118 *S. aureus* isolates) in their study were resistant to tetracycline. Tiao (21) found that none of the 20 *S. aureus* isolates tested in her study carried the *mecA* gene and one showed methicillin resistance phenotypically. Turutoglu et al. (22) stated that out of 18 *S. aureus* isolates, 15 were typically resistant to the methicillin but didn't carry the *mecA* gene.

Also, these strains presented greater amounts of resistance to the family of macrolides especially erythromycin as reported by (23).

The incidence of genes that are responsible for antibiotic resistance in drinking water is of special concern because of the amount of persons as well as animals who are possibly affected by consuming contaminated water that contains bacteria which are antibiotic resistant and can transmit antibiotic resistance to the usual bacterial flora in the bowels of humans as well as animals.

The presence of resistance for most antibiotics that are used may be due to random usage of antibiotics and usage of drugs by incomplete course, these may lead to what is called multi drug resistance bacteria.

It has been concluded that MRSA isolated from water suppliers in a significant number and this has been resistant to multiple antibiotics.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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The Predictive Value of Red Cell Distribution (RDW) in Patients with Type 1 and Type 2 Diabetes Mellitus

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Abstract

Background: Epidemiologically speaking the diabetes mellitus is one of the common leading causes of mortality and morbidity worldwide. Prognosis of the disease is variable and depends on the development of macrovascular and microvascular complications. Researchers are nowadays spending plenty of time trying to identify prognostic factors in order to make treatment approach be tailored according to the predictive value of such prognostic factors. One of these newly introduced factors is red cell distribution width (RDW).

Aim of the study: The current study was aiming at shedding light of the possible prognostic role of RDW in patients with type 1 and 2 diabetes mellitus.

Patients and methods: The present case control study was carried out at diabetes center in Al-Diwaniyah Teaching Hospital, Al-Diwaniyah Province, Iraq. The study started on January 2019 and ended on August 2019. The study included 30 patients with established diagnosis of type 2 diabetes mellitus, 30 patients with type 1 diabetes mellitus and 30 apparently healthy control subjects. Diabetic patients were selected randomly from the pool of patients already registered in that center.

Results: We grouped diabetic patients into two groups according to HbA1c level, $\leq 7\%$ and $> 7\%$ and contrasted hematological levels between those new groups. The results showed no significant difference in mean hematological values between the two groups in diabetic type 1 and type 2 patients ($P > 0.05$).

Conclusion: There was no significant role for RDW in predicting poor glycemic control of patients with type 1 or type 2 diabetes mellitus.

Key words: RDW, diabetes mellitus type 1 and 2

Introduction

Diabetes mellitus is represented by a heterogenous group of metabolic disorders sharing in common the criterion of chronically elevated blood sugar level ^(1, 2). The disease is heterogenous because of variation in the etiology associated with raised blood sugar. The most common form is type 2 diabetes mellitus in which the etiology is shared by resistant to insulin action and some degree of defective insulin secretion;

even though, early in the disease there may transient period of hyperinsulinemia ⁽³⁾. Type 2 diabetes was previously called non insulin dependent diabetes mellitus and adult onset disease; however, and because of insulin requirement to control the blood sugar level in significant proportion of patients late in the disease, in addition to the identification of children with type 2 diabetes mellitus, the preferred name nowadays becomes the “type 2 diabetes mellitus” ⁽³⁾.

Type 1 diabetes mellitus, on the other hand, is often recognized in patients younger than 40 and is principally caused by profound insulin deficiency ⁽⁴⁾. From etiologic perspective, the disease is autoimmune in approximately 70-90 % of cases and the rest of cases are

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labeled idiopathic as no cause can identified ⁽⁵⁾. Other forms of diabetes mellitus included gestational diabetes, endocrine abnormality, drug induced and exocrine disease of the pancreas such as pancreatic tumors and resection ⁽⁶⁾.

Epidemiologically speaking the disease is one of the common leading causes of mortality and morbidity worldwide ^(7, 8). Prognosis of the disease is variable and depends on the development of macrovascular and microvascular complications ⁽⁹⁾. Researchers are nowadays spending plenty of time trying to identify prognostic factors in order to make treatment approach be tailored according to the predictive value of such prognostic factors ⁽¹⁰⁾. One of these newly introduced factors is red cell distribution width (RDW) ⁽¹¹⁾. Red cell distribution width (RDW) is a quantitative hematological parameter which can indicate the degree of variation in size of RBC (anisocytosis); initially was considered in the differentiation of cause of anemia ⁽¹²⁾.

The data obtained from published articles dealing with the predictive role of RDW in diabetes mellitus are conflicting and no clear consensus can be inferred from these data. Besides, data from Iraqi literatures dealing with this subject are extremely rare; therefore, we were encouraged to plan and conduct the current study aiming at shedding light of the possible prognostic role of RDW in patients with type 1 and 2 diabetes mellitus.

Patients and Methods

The present case control study was carried out at diabetes center in Al-Diwaniyah Teaching Hospital, Al-Diwaniyah Province, Iraq. The study started on January 2019 and ended on August 2019. The study included 30 patients with established diagnosis of type 2 diabetes mellitus, 30 patients with type 1 diabetes mellitus and 30 apparently healthy control subjects. Diabetic patients were selected randomly from the pool of patients already registered in that center.

Variables included in the questionnaire form included: duration of illness, age, body mass index, systolic and diastolic blood pressures, a number of hematological parameters, namely (MCV, RDW, WBC and platelet count), serum lipid profile (triglyceride, HDL and LDL) and glycated hemoglobin (HbA1c %). Patients were considered type 2 diabetes bases one positive protein c results.

The study was approved by institutional ethical approval committee and verbal consent was obtained from all participants.

Data were then transformed into an SPSS (version 23) spread sheet for statistical analysis. Quantitative data were expressed as mean and standard deviation. Independent samples t-test was used to compare mean values between two groups, whereas, one way ANOVA was used to compare mean values among more than two groups. The level of significance was considered at $P \leq 0.05$.

Results

The current study included 30 patients with diabetes mellitus type 1, 30 patients with type 2 diabetes mellitus and 30 control subjects. The characteristics of subjects enrolled in the current study are shown in table 1. There was no significant difference in mean duration of diabetes mellitus between type 1 and type 2 DM patients ($P > 0.05$); however, patients with type 1 DM were significantly younger than type 2 DM patients ($P < 0.05$). There was also, no significant difference in mean BMI among study groups ($P > 0.05$).

In addition, there was no significant difference in mean systolic blood pressure (SBP) and diastolic blood pressure (DBP) among groups ($P > 0.05$). WBC count was significantly higher in diabetic patients in comparison with control group ($P < 0.05$); however, the count was comparable in both diabetic groups ($P > 0.05$). Besides, there was no significant difference in other hematological parameters and serum lipid profile among study groups ($P > 0.05$), as shown in table 1. We grouped diabetic patients into two groups according to HbA1c level, $\leq 7\%$ and $> 7\%$ and contrasted hematological levels between those new groups. The results showed no significant difference in mean hematological values between the two groups in diabetic type 1 and type 2 patients, as shown in table 2 and 3.

Table 1: Characteristics of patients with diabetes and control subjects

Characteristic	Control n = 30	DM type 1 Protein C -ve n = 30	Type Protein C +ve n = 30	P value
Duration of illness (years)	-----	7.23±6.91	7.1±6.82	> 0.05 ¥
Age (years)	55.42 ±11.7	35.64±10.81	57.84±10.7	<0.01 †**
BMI (kg/m ²)	31.53±3.54	31.50±4.73	32.50±4.13±	> 0.05 †
SBP (mmHg)	127.60±6.1	129.55±16.7	130.41±15.6	> 0.05 †
DBP (mmHg)	79.1 ±6.51	73.75±7.11	74.55±5.15	> 0.05 †
MCV (fl)	83.51±7.5	81.80±7.00	81.12±7.6	> 0.05 †
RDW	12.98±1.96	13.61±1.2	13.57±1.5	> 0.05 †
WBC X10 ⁶ /L	5.98±2.1	6.8±1.99	7.1±2.20	<0.05 *
Platelet count X10 ⁶ /L	257.76±55.54	254.81±77	255.72±74	> 0.05 †
TG (mg/dl)	1.72±0.81	1.70±0.1	1.68±0.7	> 0.05 †
HDL (mg/dl)	1.2±0.37	1.1±0.08	1.09±0.2	> 0.05 †
LDL (mg/dl)	2.92±0.85	2.71±0.6	2.60±0.80	> 0.05 †

BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; MCV: mean corpuscular volume; RDW: red cell distribution width; WBC: white blood cell count; TG: triglyceride; HDL: high density lipoprotein; LDL: low density lipoprotein; ¥: independent samples t-test; †: one way ANOVA; *: significant at P ≤ 0.05; **: highly significant at P ≤ 0.01

Table 2: Hematological characteristics of patients with type 1 diabetes mellitus according to HbA1c level

Hematological characteristic	Hb A1C ≤7%	Hb A1C >7%	P value
MCV (fl)	81.94±7.1	80.23±7.2	> 0.05 ¥
RDW	13.94±1.1	14.22±1.09	> 0.05 ¥
WBC X10 ⁶ /L	255.83±61.1	259.56±65.1	> 0.05 ¥
Platelet count X10 ⁶ /L	6.55±1.9	7.17±2.5	> 0.05 ¥

MCV: mean corpuscular volume; RDW: red cell distribution width; WBC: white blood cell count; ¥: independent samples t-test

Table 3: Hematological characteristics of patients with type 2 diabetes mellitus according to HbA1c level

Hematological characteristic	Hb A1C \leq 7%	Hb A1C $>$ 7%	P value
MCV (fl)	82.94 \pm 7.1	80.93 \pm 7.2	$>$ 0.05 ¥
RDW	13.84 \pm 1.08	14.42 \pm 1.2	$>$ 0.05 ¥
WBC X106/L	253.83 \pm 62.1	257.56 \pm 65.1	$>$ 0.05 ¥
Platelet count X106/L	6.67 \pm 1.9	7.19 \pm 2.2	$>$ 0.05 ¥

MCV: mean corpuscular volume; RDW: red cell distribution width; WBC: white blood cell count; ¥: independent samples t-test

Discussion

Diabetes mellitus is a heterogenous disorder with wide spectrum of outcomes and complications that vary from to patient. These outcomes are determined by macrovascular and microvascular complications. Microvascular complications include nephropathy, retinopathy and neuropathy; whereas macrovascular complications included ischemic heart disease and cerebrovascular accidents. The development of these complications can be delayed and their effects can be minimized if patients were able to control their blood sugar strictly. For that reason, the quality of life of patients with type 1 and type 2 diabetes mellitus can be improved if treatment is directed toward strict glycemic control. Indeed, glycemic control can be determined by measuring HbA1c every 90 days in average. Recent studies have shown that the red cell distribution width (RDW) can be used as a prognostic factor since it has a correlation to HbA1c and diabetic complications and can be used as a predictive marker for diabetic control (11, 13); however, some authors have denied such role for RDW in diabetes mellitus (14, 15).

The evidence connecting red cell distribution width (RDW) with an increasing risk of mortality has been grown since the early report of its predictive value in patients with heart failure. It has also been described to independently anticipate cardiovascular and overall mortality in various high-risk populations and in the general population (16, 17). Besides, it has been shown to be a significant predictor of mortality in number situations such as malignancies, obesity and renal disorders (18). For that reason, some authors suggested that linking RDW to diabetes prognosis is justified (11).

In the current study it was shown that RDW is not sufficiently affected by type of diabetes or even by degree of glycemic control indicated by HbA1c. These results are in agreement with a number of authors (14, 15) and disagree with other authors (13, 11), thus we believe that it is very early to judge the role of RDW in diabetic prognosis and that a lot of research work is needed in order to reach clear consensus about such role.

In one study, it was found that Red cell distribution width (RDW) was significantly higher in diabetic patients than in control subjects ($P=0.008$). It was also higher in patients with uncontrolled glycemia (HbA_{1c} $>$ 7%) than those with good control (HbA_{1c} \leq 7%; $P=0.035$) (11).

Actually, these findings are not consistent with the present study findings; however, the author of the later study agreed with us that other hematological characteristics were not affected by diabetes or its degree of glycemic control.

It is worth to mention that WBC was significantly higher in both diabetic groups when compared to non diabetic group. This finding is similar to the findings of several other authors (19-21); however, it contradicts other authors (11). Several explanations have been suggested to explain the high WBC in association with diabetes such as increased insulin resistance, development of complications and high rate of infections (19-21).

In conclusion, there was no significant role for RDW in predicting poor glycemic control of patients with type 1 or type 2 diabetes mellitus.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Histopathological Changes Associated with Cutaneous Leishmaniasis in Patients with Baghdad Boil/South of Iraq

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Abstract

Cutaneous leishmaniasis is an endemic disease in Iraq and it is become epidemic in Nassirriyah city recently/ South of Iraq.

The following histopathological study were achieved in microbiology dept. at college of Medicine in University of Thi-Qar, targeting Nassirriyah city in south of Iraq where Baghdad boil is highly distributed during a period of time at end of April 2016. several of tissue (skin) biopsies were obtained by dermatologist under sterilizing condition and at Al-Hussain teaching hospital where the patients have entered for treatment . the result explain the following changing :

- marked epidermal hyperplasia with hyperkeratosis .
- two small granulomas of macrophages some with vaculation in the dermis .
- sever dermal hyperplasia and folliculitis also hyperkeratosis and scab formation.
- marked hyperplasia of epidermis , hyperkeratosis and scab formation .

Key words : *coetaneous leishmaniasis , Baghdad boil , histopathology*

Introduction

The parasitic disease of Leishmaniasis caused by haemoflagellate *Leishmania tropica* . It is widespread and may cause serious health problems in communities throughout the Mediterranean regions and the Middle East, including Iraq [1-3]. There are an estimated 12 million cases worldwide, and there are about 1.5 million new cases of cutaneous leishmaniasis each year, of which over 90% occur in Afghanistan, Algeria, Iran, Iraq, Saudi Arabia, Syria, Brazil and Peru [4]. Old World disease primarily is caused by *Leishmania tropica minor* in urban areas and *Leishmania tropica major* in dry desert areas [3].

In Iraq, two species are present: *L. tropica*, the agent of anthroponotic cutaneous leishmaniasis (ACL), and

L. major, the agent of zoonotic cutaneous leishmaniasis (ZCL). Both ACL and ZCL were reported as causative agents of leishmaniasis in Iraq, but ACL is found mainly in suburban areas [5]. The disease is epidemiologically unstable, with large and unpredictable fluctuations in the number of cases. The total incidence rate of cutaneous leishmaniasis in Iraq varies from 2.3 / 100000 to 45.5 / 100000 [5]. Cutaneous leishmaniasis is characterized by one or more cutaneous lesions on areas where sandflies have fed. Persons who have cutaneous leishmaniasis have one or more sores on their skin. The sores can change in size and appearance over time. They often end up looking somewhat like a volcano, with a raised edge and central crater. A scab covers some sores. The sores can be painless or painful. Some people have swollen glands near the sores (for example, in the armpit if the sores are on the arm or hand).[6]

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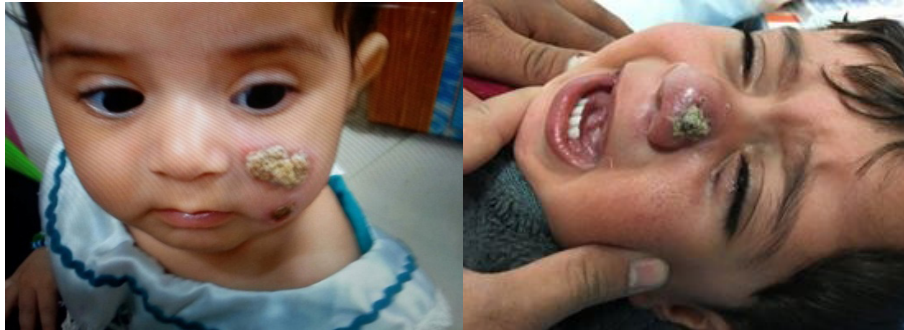
Mobile: (07802521845)

Email: amalkhudair111@yahoo.com

Materials and Method

- **Skin biopsy** : Biopsies were taken from patients by the dermatologist and placed in 10% of formalin to prepare it for tissue processing .⁽⁹⁾

- **Histology** : Tissues biopsy were processed according to ⁽⁹⁾, briefly the tissue from the skin collected and placed in 10% formalin for histopathological studies and dehydrated by several dilutions of ethanol alcohol dealcoholization with xylol, then embedded with paraffin wax blocked (3-5) mm thickness sections were obtained by microtome. The sections were put on glass slides deparaffinised with xylol, rehydrated by alcohol and stained by hematoxyline and eosin.



Fig(1) : explain the presence of Baghdad boil or cutaneous leishmaniasis

Results

The following histopathological changing has associated with Baghdad boil , the clinical infection with cutaneous leishmaniasis caused by the protozoan *Leishmania tropica* , as illustrated in the following figures;

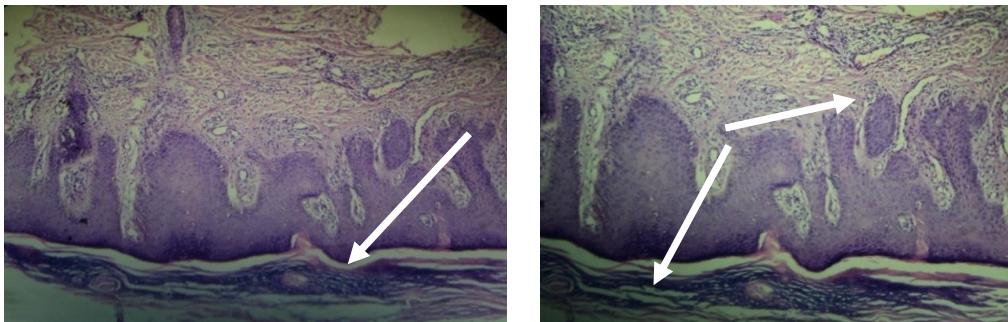
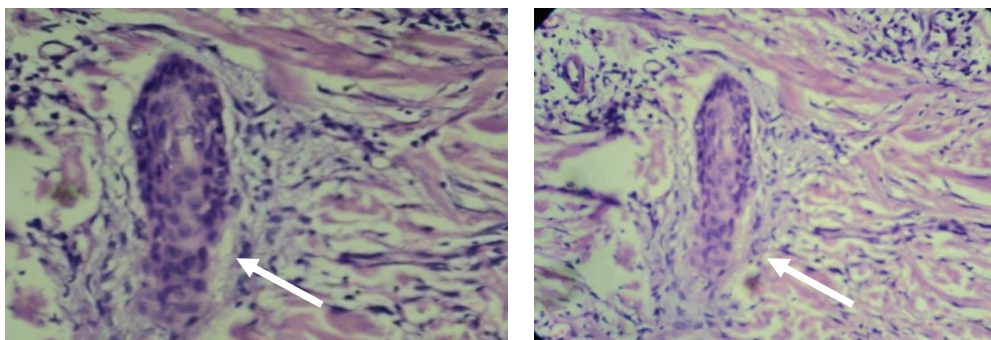


Fig (2) : marked epidermal hyperplasia with hyperkeratosis (10X)



Fig(3): small granuloma in the dermis consist of macrophages and fibroblast at the periphery (40X)

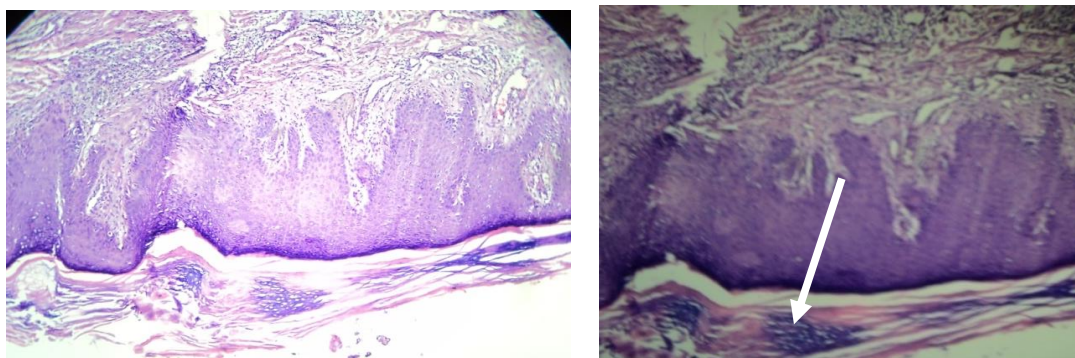


Fig (4) marked hyperplasia of epidermis , hyperkeratosis and scab formation (10X)

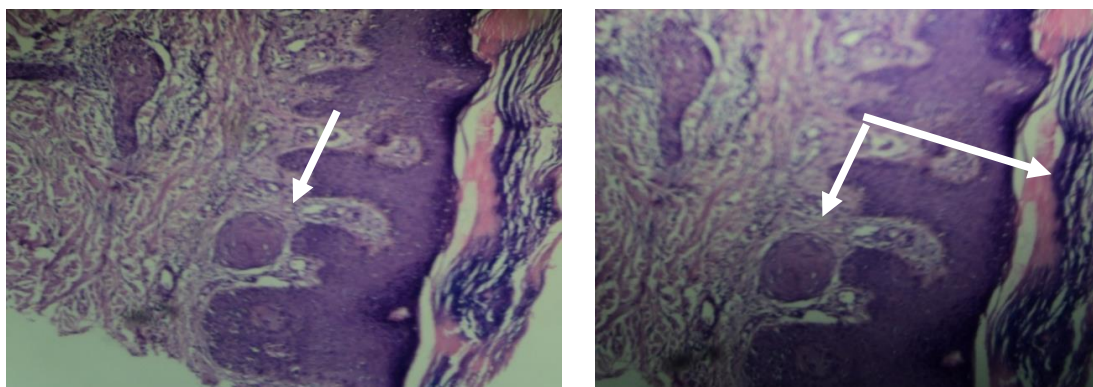


Fig (5) : marked hyperplasia of epidermis , hyperkeratosis and scab formation , keratin nest in the dermis (10X)

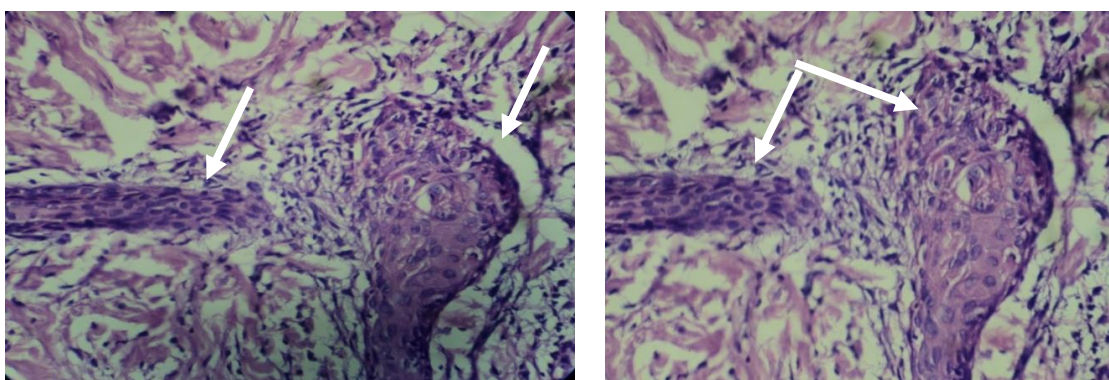


Fig (6): two small granulomas of macrophages some with vacuolation in the dermis (40X)

Discussion

The skin covers the human body and is constantly exposed to the environment. As a barrier against infection, the skin not only forms a physical hindrance but also serves as a very important immunological organ.

cutaneous leishmaniasis appears in variable patterns clinico-pathologically, and sometimes a simple erythemic lesion, shows (LD) bodies and in few cases has been diagnosed clinically malignant and remained untreated for years. The CL clinically presents according

to the stage of infection and the clinical type of disease basically an ulcer appearing at the site which heals slowly, takes months to years depends upon the host immunity.

Cutaneous leishmaniasis, a wide clinical and histological spectrum. The histological picture in CL differs according to the stage of infection and the clinical type and host immunity. There is evolution of the lesion as it progresses from a papule and nodule into a soft boggy, crusted plaque or nodule⁽¹²⁾. The lesion breaks up after 3-4 months into a well circumscribed ulcer, which heals slowly over a period of 3 to 12 months. The histological spectrum in CL has wide range with a great variation in morphology. The appearances may range from predominance of leishmanial granuloma with macrophages showing epithelioid. Granuloma formation results from macrophages activation into epithelioid cells, considering clinicopathological relationship⁽¹¹⁾. The histological picture in CL differs according to the stage of infection and the clinical type. A consistent finding is a moderate to heavy dermal infiltrate of lymphocytes, plasma cells, and macrophages. In approximately 80% of cases, epithelioid cell granulomas with giant cells and a rim of lymphocytes are present. It is important to search for amastigotes, which are diagnostic^(13,14). Histopathological changing of skin during cutaneous leishmaniasis explain the granulomatous reaction in the site of infection together with presence of amastigote stage or LD bodies in the lesion based on the current study. The essential feature of CL pathology is the colonization by amastigotes of cells of the mononuclear phagocytic system and the resulting granulomatous inflammatory response. A granuloma is defined as a compact collection of mature mononuclear phagocytes, not necessarily accompanied by accessory features such as necrosis. Conceptually granuloma evolves in three stages: 1) the development of an infiltrate of young mononuclear phagocytes; 2) the maturation and aggregation of these cells into an unorganized granuloma; and 3) the potential maturation of these cells into an epithelioid or organized granuloma⁽⁷⁻¹⁰⁾

Cutaneous Leishmaniasis presents a spectrum of manifestations both clinically and histologically. Lesions can present as nodule, plaque or ulcer mostly present on exposed sites^(8,9). Histopathological findings in acute CL include dermal infiltrate predominantly consisting of macrophages containing large number of leishmania organism called LD bodies^(5,6) In addition plasma cells and dense mixed inflammatory cell infiltrate are also

present in dermis. The morphology of LD bodies in histopathological sections were rounded with a nucleus and kinetoplast, in some sections spindle shape form similar to smear morphology were detected^(7, 8).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Serum Anti-Mullerian Hormone Concentration and Function of The Pituitary-Gonadal Axis in Iraqi Patients with Chronic Kidney Disease

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Abstract

Infertility among patients with chronic kidney disease (CKD) has been extensively investigated. However, reproductive function in these patients is less well-characterized. The present study was aimed to examine the associations among chronic kidney disease (CKD) and fertility status by evaluation levels of: Luteinizing hormone (LH) and Follicle-stimulating hormone (FSH). Estrogen (E2) and Progesterone (P4) for females and Testosterone for males along with Anti-Mullerian Hormone (AMH) in CKD patients. The study has been registered at Nephrology and Transplant Center in Medical City of Baghdad- Iraq from April 2018 to July 2018. The study included 50 patients who are diagnosed to have CKD stage-5, their ages ranged between 20-50 years (25 males and 25 females) and 20 matched apparently healthy as control, their ages ranged between 20-48 years (10 males and 10 females). This study showed a highly significant ($P<0.01$) increase in LH, FSH levels in CKD patients compared to the control group. Highly significant ($P<0.01$) decrease in E2 level in CKD females patients compared to the control group, while there was non-significant ($P>0.05$) decrease in P4 level in CKD females patients compared to the control group. In parallel, there is significant ($P<0.05$) decrease in Testosterone level in CKD males patients compared to the control group. On the other hand, the study showed non-significant ($p>0.05$) increase in AMH level in CKD patients compared to the control group.

Keywords: CKD, AMH, LH, FSH, E2, P4, Testosterone.

Introduction

The genesis of sexual dysfunction in patients with chronic kidney disease (CKD) is multifactorial [1]. Hormonal dysfunction in CKD is clinically accompanied by sexual dysfunction that influences the life quality of these patients, in advanced stages of CKD, these sexual dysfunctions can be more evident, several changes in hormone levels have been demonstrated, these changes can be because of decreased renal excretion and disturbance of the endocrine system because of uremic effects [2]. Disturbances in the hypothalamic-pituitary-gonadal axis, resulting in alterations in signal-feedback mechanisms and hormone production, are seen already in patients with moderate reduction in the glomerular filtration rate and often become more obvious as kidney failure progresses [2,3]. Earlier studies have shown elevated levels gonadotropins, luteinizing hormone (LH) and

follicle-stimulating hormone (FSH) [4]. Decreased levels of free and total testosterone have also been reported in patients with CKD [5,6]. In those patients, level LH and FSH rise up [7]. In uremic patients, GnRH releasing from the hypothalamus and GnRH- LH signal are impaired. In these patients, bioactivity of LH changes and then a series of function inhibitors of LH are made [8].

Anti-Müllerian hormone (AMH) is a glycoprotein with a fundamental role in male sex differentiation [9]. As such, AMH is now recognized as the best available biomarker of both the functional and true ovarian reserve [10]. In male serum AMH is correlated with spermatogenesis, the Sertoli cells secrete AMH, and it is a specific marker of Sertoli cell function [11]. CKD and its consequences affect the production of AMH, resulting in change in AMH levels, this may indicate impaired function of Sertoli cells [12]. In women with CKD the aforementioned fertility disturbances may be

caused by the damage of the ovaries by uremia, this may reflect an intrinsic dysregulation of the granulosa cells leading to higher AMH production or alternatively AMH accumulation in CKD patients requiring dialysis [13,14].

Material and methods

The study has been registered at Nephrology and Transplant Center in Medical City of Baghdad- Iraq from April 2018 to July 2018. This study included two groups, patients and control group. The study included 50 patients are diagnosed to have CKD stage 5, their ages ranged between 20-50 years (25 males and 25 females) and 20 control their ages ranged between 20-48 years (10 males and 10 females). Blood samples

were collected from all groups for estimation of (LH, FSH, E2, P4, Testosterone), All those biomarkers were estimated in serum of all subjects by using an automated quantitative COBAS e 411 test (from Roche, Germany). Serum AMH was measured by ELISA using a kit supplied by Beckman Coulter- Germany.

Results

In this study the level of LH (7.10 ± 0.57) was highly significant increased ($P < 0.01$) in comparison with control (3.62 ± 0.45). Also, the level of FSH showed high significant increase ($P < 0.01$) in patients group (8.01 ± 0.50) when compared with control group (4.79 ± 0.55), Table (1).

Table 1: Comparison between patients and control in level of LH, and FSH.

Group	Mean \pm SE	
	LH mIU/ml	FSH mIU/ml
Patients	7.10 ± 0.57	8.01 ± 0.50
Control	3.62 ± 0.45	4.79 ± 0.55
T-Test	1.897 **	1.732 **
P-value	0.0005	0.0004
** (P<0.01): Highly Significant		

On the other hand the mean of serum E2 and P4 levels in the females of study groups are summarized in Table (2). E2 level (7.89 ± 1.17) in patients group observed highly significant decrease ($P < 0.01$) in comparison with control group (20.80 ± 5.04), while P4 levels showed non-significant decrease (0.407 ± 0.06) in patients compared to control group (0.408 ± 0.10).

Table 2: Compare between patients and control (Female) in E2 and P4.

Group	Mean \pm SE	
	E2 Pg/ml	P4 ng/ml
Patients	7.89 ± 1.17	0.407 ± 0.06
Control	20.80 ± 5.04	0.408 ± 0.10
T-Test	7.318 **	0.249 NS
P-value	0.0008	0.997
** (P<0.01): Highly Significant ; NS: Non-Significant.		

The present study displayed, significant decrease ($P < 0.05$) in Testosterone level in male patients with CKD (1.57 ± 0.25) in comparison with healthy control group (2.73 ± 0.58).as shown in Table (3).

Table 3: Compare between patients and control (Male) in level of Testosterone.

Group	Mean ± SE of Testosterone ng/ml
Patients	1.57 ± 0.25
Control	2.73 ± 0.58
T-Test	1.097 *
P-value	0.0387
* (P<0.05): Significant	

On the other hand, in this study as shown in Table (4), level of serum AMH found to be slightly elevated but not significant in patients with CKD in comparison to control group. AMH levels in both groups (9.03 ± 1.58), (7.76 ± 1.75) respectively showed non-significant difference ($p > 0.05$).

Table 4: Compare between patients and control in level of AMH.

Group	Mean ± SE of AMH ng/ml
Patients	9.03 ± 1.58
Control	7.76 ± 1.75
T-Test	5.490 NS
P-value	0.645
NS: Non-Significant.	

Statistically, the finding in Table (5) indicate a correlation coefficient between AMH hormone and other parameter in this study. As showed there is a highly significant ($P < 0.01$) positive correlation between AMH with Testosterone, non-significant ($p > 0.05$) positive correlation between AMH and FSH, E2. On the other hands there is non-significant ($p > 0.05$) negative correlation between AMH with LH and P4.

Table 5: Correlation coefficient between AMH and other parameters.

Parameters	Correlation coefficient (r) and Level of significant
	AMH
LH	-0.15 NS
FSH	0.09 NS
E2	0.001 NS
P4	-0.16 NS
Testosterone	0.22**
* (P<0.05), ** (P<0.01), NS: Non-significant.	

Discussion

End stage renal disease (ESRD), has a strong influence on the hypothalamic-pituitary-gonadal axis resulting in hormonal disturbances and deterioration in gonads function. [2,15]. The results of this study on elevated levels of LH and FSH in CKD patients are consistent with previous study reported by Anatharamaa and Schmidt [16], who found that changes in pulsatile release of GnRH and LH reduce feedback inhibition of LH production (because of low levels of testosterone) contribute to high levels of LH, FSH secretion in CKD patients. With CKD there was a significant increase in LH and FSH and development of pattern of hyper gonadotropic hypogonadism, which indicates that uremic metabolite tend to increase CKD effect on testes and ovaries more than hypothalamic or pituitary function [17].

The results of this study agree with those that have been found with previous studies [7,8,15], who showed that low concentration of E2 has been seen in uremic patients, nevertheless it has insufficient concentration in the puberty, while in the second half of menstrual cycle serum P4 concentrations are decreased due to the defective follicle luteinization. In this study P4 levels are slightly decreased with no significance compared to the control group, previous reports go in agreement with the results of this study which reported that mean P4 levels in patients were not significantly different from those of control subjects [18,19].

In this study, the results of testosterone in male patients indicated significant decrease ($P < 0.05$) in CKD patients, and this result was also approved by several previous studies as testosterone which is normally reduced in CKD patients and when LH level is arise in response to low levels of testosterone, so that the hypothalamic pituitary axis in CKD is reset in such a way that it is more sensitive to the negative feedback inhibition of testosterone [16,17,20,21]. Rathi and Ramachandren. [22], showed that low testosterone is due to decreased production, increased metabolic and dialytic clearance, alteration in testosterone binding capacity.

The data of this study suggest that patients with CKD stage-5 have elevated but not significant AMH compared with control and this results go in agreement with those that have been found with Stoumpos *et al.* [14], who showed that CKD patients were found to have non-significant increase in AMH concentrations compared with control. Also, the results of this study was compatible with data reported by Sikora-Grabkaa *et al.* [13], who found that serum AMH concentration was higher in haemodialysed women with CKD and had menstrual cycle abnormalities in comparison to those with regular menstrual cycles, and suggested that serum AMH clearance is reduced in CKD patients and AMH similar to other protein hormones probably accumulates in those patients [14]. On the other hand, AMH is of similar size to other molecules perceived to be uremic 'toxins' [1].

This study disagrees with those that have been found with Eckersten *et al.* [1], who they reported that male patients with CKD have lower serum AMH levels versus controls and this was an unexpected finding, the author explained that this finding of low AMH levels indicate a dysfunction of both Sertoli cells and Leydig cells in men with CKD. The results of this study also in disagreement with Eckersten *et al.* [23], who showed that plasma AMH levels were lower in CKD stages 1–4 by 30% and by 70% in CKD stage 5 compared with controls, the author said that this reduction in AMH is unclear, but can be linked to altered Sertoli cell function. The cause of decreased plasma AMH levels is unknown, but it speculate on effects of inflammation, uremic toxicity, or other causes. The results of this study support that the molecular weight of AMH (140 kDa) indicates that it is not eliminated by glomerular filtration or dialysis, if this is the case, an increase in plasma AMH levels would be expected with advancing CKD stages [1,14,24].

Results of this study showed that LH has negative correlation with serum AMH in men and women with CKD, this finding disagree with another finding [25], who found no relationship between AMH and LH. Another study also showed no significant correlation between AMH and LH [26]. Results of current study showed positive no significant correlation between AMH and FSH and this result was in agreement with other study which reported that AMH positive correlated with FSH [27]. Fiza *et al.* [28], showed a negative relationship between the levels of AMH and FSH and this results disagreement with the results of this study.

Thus, the higher levels of AMH are associated with lower level of the FSH and support this result by another study which reported that the excess of AMH is involved in diminishing FSH induced aromatize activity and this results disagreement with this study [9,29,30]. High AMH levels are probably related to the follicular arrest during the selection process of the dominant follicle, through a negative interaction between AMH and FSH [31].

In this study E2 showed non-significant positive correlation with AMH and this result was in agreement with other study which reported that AMH was negative correlated to LH and positive correlated with FSH and E2 [27].

Conclusions

This study confirms the noxious role of CKD in hormonal disruption and infertility among patients with CKD.

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Infection Control Measures for Nurses Staff Concerning with Hepatitis B and C at Hemodialysis Unit in Hilla Hospitals

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Abstract

Hepatitis an infection in the liver is very contagious and is caused by the hepatitis virus. Objectives: The study aims to evaluate nurses performance concerning infection control practices, and to determine the relationship between nurses performance and their demographic characteristics. As well as, to determine the relationship between nurses performance and patients clinical data. A quantitative descriptive design was conducted in Hilla City Hospital for the period of from September 2018 to March 2019. A checklist was used as a means of data collection from those who works at Hemodialysis unit. Non probability sampling (purposive) has been performed on (30) nurses and (30) patients in dialysis unit. direct observation as mean of data collection. Nurses were observed three times while they are working in the dialysis unit. The data were analyzed through the application of descriptive and inferential data analysis. The study results reveals that (80%) sometime applied hand washing, (76.7%) were sometime apply uniform, and (66.7%) were always apply gloves, (53.3%) never wearing gown, and (86.7%) never wearing mask. A majority of (63.3%) of nurses were partially performed infection control measures. There is insignificant association with nurses demographic characteristics at $p\text{-value} > 0.05$.

Keywords: Infection, Control, Nurses, Hepatitis.

Introduction

One of the most challenges is health care-associated infections, or infections acquired in health-care settings are the most frequent adverse event in health-care delivery worldwide. Hundreds of millions of patients are affected by health care-associated infections worldwide each year, leading to significant mortality and financial losses for health systems¹. The World Health Organization (WHO) estimates an average of 9 million individuals are affected by nosocomial infections and approximately 1million patients die each

year because of these diseases². Patient safety is one of the most important aspects in evaluating the quality of healthcare. However, healthcare associated infection is a major cause of morbidity and mortality in the critical care units. It is imperative for health care administrators to ensure implementation of the infection control program in healthcare facilities³. Control measures is a set of specific practices and procedures performed under carefully controlled conditions with the goal of minimizing contamination by pathogens⁴. It is well known that patients undergoing dialysis treatment, and in particular hemodialysis (HD), are at increased risk for contracting viral infections. This is due to their underlying impaired cellular immunity, which increases their susceptibility to infection. In addition, the process of HD requires blood exposure to infectious materials through the extracorporeal circulation for a prolonged period. Moreover, HD patients may require blood

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transfusion, frequent hospitalizations and surgery, which increase opportunities for nosocomial infection exposure⁵. After the identification of HCV in 1989 and HEV in 1990, there were still unexplained cases of post transfusion and “community-acquired” hepatitis, implying that cryptogenic hepatitis and cirrhosis may be related to viruses other than hepatitis A, B, C, D or E. By the mid-1990s, between 3% and 4% of anti-HCV-negative patients on chronic HD had elevated serum aminotransferase levels with no apparent etiology^{6,7}.

Methodology

Study Design:

A quantitative descriptive design was conducted to evaluate nurses performance concerning infection control practices, and to determine the relationship between nurses performance and their demographic characteristics. As well as, to determine the relationship between nurses performance and patients clinical data in has been carried out in Hilla City Hospital.

Instrument Construction:

The checklist (observation tool) include three part. They are: Nurses demographic data, patients clinical data, and observation tool. The last part consists from 55 items divided (8) section; includes: hand washing, uniform, gloves, gown, mask, instruments and equipment, intra venous iv fluids and medication, medical waste management and sharp disposal.

Participants Sample:

Non probability sampling (purposive) has been performed on (30) nurses who work in dialysis unit and (30) patients.

Data Collection:

The researcher has gathered the objective’s responses through an application of direct observation as mean of data collection. Nurses were observed while they are working in the dialysis unit . The researcher observed each nurse three observations and among each observation (10) days’ time period. Three correct practices out of 3 episodes were rated as always , 2-1 correct practice out of 3 episodes were rated as sometimes, and no correct practice out of 3 episodes was rated as never.

Data Analysis: Through the used descriptive

statistical (SPSS) version XX analysis approach that includes, frequencies, percentages, mean of scores, standard divagation and graphical presentation of data; and inferential statistical data analysis approach that include Chi-squared test.

Results and Discussion

In light of frequencies and percent, results depicts that the nurses were female within age groups (19-29) years old and single state residences in urban areas. Concerning education, (53.3%) were bachelor in nursing graduated, works for (1-3) years in nursing field and in Hemodialysis unit without training in-outside of country. This results come because most of them are new appointments at the same time that unity needs effort. These results agree with study deals with case control educational program on nurses knowledge find that the majority of nurses at 20-29 years⁸. Also, study conducted in Baghdad City has been evaluate the nurses’ practice concerning infection control. Finds that the high percent of nurses have 1-5 years of experiences in nursing⁹. Finding reveals that 96.7% of patients with hepatitis C is for duration (1-2) years diagnosed after dialysis for a two dialysis times per week . In light of these results, a study has been assessed the “Hepatitis B and C infection in hemodialysis patients in Libya, the results indicated that the patients on maintenance HD in Libya have a high incidence and prevalence of HCV infection and lower rates of HBV infection¹⁰. Also, in another study (Yousifetal., 2018), the result indicated that the prevalence of HBV, HCV, and coinfection in the studied subjects was 1.8%, 9.2%, and 0.2%, respectively¹¹. The results reveals that the majority of nurses measures regarding hand washing and uniform were sometime apply. In contrast a study conducted in Turkey , they found that the majority of nurses have a partially level of practices concerning quality of hand washing¹². Also in another study in Al-Najaf AL-Ashraff City Hospitals, their findings indicate that 72.5% of study sample are not applying the practices of hand washing¹³. While another study in Palestine, show that the high percentage of nurses are wearing the special uniform¹⁴.

Concerning with personal protective equipment, the results reveals that the majority of nurses were always apply gloves, and never apply gown, and mask. In another study done by (Cason and others, 2007), which reported that 75% of nurses are wearing gloves. The researcher believes that the present result related to not available of sterile gloves, but they can be used clean

gloves during the nursing intervention ¹⁵. These results supported by (Chan et al., 2008), show that the nurses have negative attitudes and practices toward standard precaution. These results may be to not the availability of sterile gown in the hospital ¹⁶. In another study done by (Nichol et al., 2013), their study showed that the 56% nurses reported adherence to recommended use facial mask ¹⁷.

Concerning with nurses measures deals with instruments and equipment the results depicts that the majority of nurses measures regarding instruments and equipment were sometime apply. In another study done by (Kandeel et al., 2012), which revealed that high percent of nurses were used a sterile technique in preparing the instrument in critical care units ¹⁸.

Concerning with nurses measures deals with dialysis Catheters and port catheter systems, intravenous fluids and medication and medical waste management and sharp disposal, the results show that the majority of nurses were always applied. The present results disagree with (Alkubati et al., 2015), they founded that the majority of nurses had poor compliance with the standard strategies for prevention PVC infection ¹⁹. In addition the results agree with (Dolan et al., 2010), they confirmed in their study that an infusion, safe injection, and medication vial practices in health care needed to adhere sterilization technique during the administration of intravenous fluids and medication for the patient ²⁰. The present result also disagrees with (Ferreira et al., 2010), they founded in their study that a healthcare worker was inadequate practice and knowledge related to the correct separation of wastes and sharps disposal ²¹. Findings of present study demonstrated that there demographic characteristics of nurses have been not affected their control measures at *p-value* >0.05. The present finding agree with study done by (Bakey, 2012), which indicated that there was no significant relationship at *p-value* (0.464) level between nurses' practice and their age, level of education, years of experience in

hemodialysis unit ²². Also the present finding disagree with study done in Korea, they found that there were significant relationship between nursing practice concerning infection control and age and significant between the type of units and nurses practices ²³. Results demonstrated that there were non-significant association between nurses control measures and patients their clinical data at *p-value* >0.05. The result disagree with study of (Alashek, 2012), which indicated that their is a significant relationship between duration of hemodialysis and prevalence of HCV, and longer dialysis times increase the probability of hepatitis C in Libya ¹⁰. Also in another study done by (Sarhan et al., 2015), the result show that the prevalence of HCV antibody (HCV Ab) at the start of dialysis was 45.2%, and the prevalence of HCV Ab by the time of data collection was 51%; the incidence rate of seroconversion was 10.7% after a mean duration of dialysis of 3.35±2.048 years ²⁴.

Table (1): Distribution of Patients by their Clinical Data about Hepatitis

Demographic data	Rating	No	Percent
Type of hepatitis disease	C	29	96.7
	B	1	3.3
Duration of disease	<1 years	1	3.3
	1-2 years	26	86.7
	>3years	3	10.0
When the disease was diagnosed	Before dialysis	3	10.0
	After dialysis	27	90.0
Number of dialysis times per week	One	4	13.3
	Two	17	56.7
	Three	9	30.0

Table (2): Infection Control Measurement Concerning Hepatitis B and C in Hemodialysis Unit

	Rating	No	%	M.S.	S.d.	Evaluation
Hand Washing Domain	Never	6	20.0	1.80	0.40	Sometime
	Sometime	24	80.0			
	Always	0	0.0			
Uniform Domain	Never	4	13.3	1.96	0.49	Sometime
	Sometime	23	76.7			
	Always	3	10.0			
Gloves Domain	Never	0	0.0	2.67	0.47	Always
	Sometime	10	33.3			
	Always	20	66.7			
Gown Domain	Never	16	53.3	1.56	0.67	Never
	Sometime	11	36.7			
	Always	3	10.0			
Mask Domain	Never	26	86.7	1.17	0.39	Never
	Sometime	3	10.0			
	Always	1	3.3			
Instruments and Equipment Domain	Never	1	3.3	2.03	0.32	Sometime
	Sometime	27	90.0			
	Always	2	6.7			
Catheters and port catheter systems	Never	0	0.0	2.73	0.45	Always
	Sometime	8	26.7			
	Always	22	73.3			
IV fluids and medication Domain	Never	7	23.3	2.40	0.85	Always
	Sometime	4	13.3			
	Always	19	63.3			
Medical waste management and sharp disposal	Never	2	6.7	2.70	0.59	Always
	Sometime	5	16.7			
	Always	23	76.7			

Table (3): Overall Infection Control Measurement Concerning Hepatitis B and C in Hemodialysis Unit at Hilla Hospitals

	Rating	No	%	M.S.	S.d.	Evaluation
Overall Measures	Never	1	3.3	2.30	0.53	Sometime
	Sometime	19	63.3			
	Always	10	33.3			
	Total	30	100			

Table (4): Statistical Relationship between Nurses Infection Control Measurement and Patients Clinical data about hepatitis.

Demographic data	Rating	Nurses Measures			Total	d. f	
		Never	Sometime	Always			
Type of hepatitis disease	B	1	19	9	29	2	obs.=2.069 crit.=5.991 P-value= 0.355→NS
	C	0	0	1	1		
	Total	1	19	10	30		
Duration of disease	<1 years	0	1	0	1	4	obs.=2.672 crit.=9.488 P-value= 0.614 →NS
	1-2 years	1	15	10	26		
	>3years	0	3	0	3		
	Total	1	19	10	30		
When the disease was diagnosed	Before dialysis	0	1	2	3	2	obs.=1.696 crit.=5.991 P-value=0.428 →NS
	After dialysis	1	18	8	27		
	Total	1	19	10	30		
Number of dialysis times per week	One	0	3	1	4	4	obs.=1.024 crit.=9.488 P-value=0.906→NS
	Two	1	10	6	17		
	Three	0	6	3	9		
	Total	1	19	10	30		

Conclusions

Most of nurses new appointments young adults nurses partially performed infection control measures in the dialysis unit not affected by their demographic data, and not influence the results of patients. An intensive training courses and provide possibilities for personal protection with activate principle of reward and punishment.

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Gingival and Salivary Changes in Correlation with Multiple Sclerosis

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Abstract

Multiple sclerosis: chronic degenerative autoimmune disease of the central nervous system marked by patchy destruction of the myelin sheath that surrounds the nerve fibers. The gingival or oral changes that associated with multiple sclerosis might be related to disease itself or as sequel of medications that used for treatment. Aims;-to determine the gingival index and assess the SIgA, SFR and PH in MS patients in compare to control group as well as analyses theses parameters according to age group, gender and type of MS. 36 patients with proven diagnosis of MS were selected randomly between 1st Nov.2016-1st nov.2017 from MS center. Medical city .Baghdad. Iraq. Oral examination was done to measure the gingival index as well as saliva was taken to assess the salivary IgA level, salivary flow rate and PH of saliva, in addition 20 subjects who are free of MS or any others autoimmune disease were selected as control group. The GI of patients group was significantly higher than control group(3.4 ,1.4) respectively while the SIgA ,SFR and PH of saliva was significantly lower with patients group in compare to control group(510,0.56,6.6 for patients group) 941.8,1.7,7.1 for control group

Key word: Multiple sclerosis, salivary immunoglobulin A, gingival index, saliva flow rate

Introduction

Multiple sclerosis (MS) is a progressive, neurodegenerative disorder of the myelin sheath, in which plaques created on the central nervous system (CNS) alter nerve function. ⁽¹⁾ Although the exact cause of MS is unknown, a combination of genetic susceptibility, environmental factors, immune system response and systemic inflammation is suspected. Progression of MS and new plaque formations cause CNS changes in motor, sensory and cognitive functions, leading each individual to experience symptoms that vary in degree and severity.⁽²⁾ The prevalence of MS varies considerably, from high levels in North America and Europe (>100/100,000 inhabitants) to low rates in Eastern Asia and sub-Saharan Africa (2/100,000 population). Concerning mortality, in a large French cohort of 27,603 patients, there was no difference between MS patients and controls in the first 20 years of the disease, although life expectancy was reduced by 6–7 years in MS patients. MS starts attacks people from age 20–50 years old and the records investigated that females' attacks double than males' attacks ⁽³⁾ There are 4 types of MS. They're named according to the way the

disease acts on the body over time. Multiple sclerosis (MS) is a chronic autoimmune disease of the central nervous system (CNS), usually characterized by a relapsing-remitting (RR) course, or by disability accrual over an extreme variability of time. At diagnosis, about 75% of persons with MS suffer from RRMS, while about 25% of such persons will convert to secondary progressive MS (SPMS) within two to three decades from the onset. About 10% of patients with MS manifest primary progressive MS (PPMS) at diagnosis, and they show gradual worsening of neurological disability from symptom onset ⁽⁴⁾. With the term progressive MS (PMS), we usually refer to the combined population of secondary progressive MS (SPMS) and primary progressive MS (PPMS) that still remains a distinct phenotype in the 2013 revision of clinical course in MS ⁽⁵⁾

THE 4 TYPES OF MS

Relapsing-Remitting MS (RRMS). This is the most common form of multiple sclerosis. About 85% of people with MS are initially diagnosed with RRMS. People with RRMS have temporary periods called relapses, flare-ups or exacerbations, when new symptoms appear ⁽⁶⁾

□ Secondary-Progressive MS (SPMS). In SPMS, symptoms worsen more steadily over time, with or without the occurrence of relapses and remissions. Most people who are diagnosed with RRMS will transition to SPMS at some point ⁽⁷⁾

□ Primary-Progressive MS (PPMS). This type of MS is not very common, occurring in about 10% of people with MS. PPMS is characterized by slowly worsening symptoms from the beginning, with no relapses or remissions²

□ Progressive-Relapsing MS (PRMS). A rare form of MS (5%), PRMS is characterized by a steadily worsening disease state from the beginning, with acute relapses but no remissions, with or without recovery^{2 (6)}

The hypothesis states that the pathophysiology of MS is related to myelin antigen-specific CD4+ T cells which become activated. The exact trigger for the activation of the T cells is still unknown. One theory suggests that T cells might become activated by cross-reacting with a particular antigen, such as a microbial agent, known as “molecular mimicry”. This theory explains why some viruses have been studied as a possible trigger for the disease. These cells then cross the blood-brain barrier, recognize myelin basic protein, attack the neuronal myelin sheaths, and trigger the onset of muscular symptoms and can lead to cognitive decline. These areas of axonal damage are known as lesions. The actual mediator of myelin and axonal destruction has not been established, but it may reflect a combination of macrophages, antibodies, cytokines, and reactive oxygen intermediates.⁽⁸⁾ To our knowledge this is the first study in our country studying the changes in salivary IgA, SFR, PH of saliva in MS patients in compare to control health group as well as assessment the changes according to type of MS.

Subjects and methods

Between 1st Nov.2016-1st Nov.2017 and after approval was obtained from concerned authouritis,36 patients with proven diagnosis of MS who are attending the MS center of medical city. Baghdad.Iraq were selected randomly and oral examination was doing to measure the Gingival Index as well as saliva was taken to assess the salivary IgA level, Salivary Flow Rate and PH of saliva, in addition 20 subjects who are free of MS or any others autoimmune disease were selected as control group.

Saliva sample:

Un stimulated whole saliva (2 ml) were collected from patient group and control by expectoration into sterilized vials then saliva sample were centrifuged at 12000 rpm for 10 minutes and the supernatants were stored at -20°C until use .

Estimation of SIgA by ELISA procedure of the test: -

1- Standard was constituted to 1000 pg/ ml with standard dilution buffer. a serial diluents of the standard were prepared from original standard.

2- One hundred ml of standard or sample was added per well, then 100 ml of diluent were added for each well. The plate was incubated for 4 hours.

3- The contents of well were discarded and washed by washing solution.

4- Two hundred ml of conjugate reconstituted was added into each well and incubated at 25 C° and then washed three times.

5- Two hundred ml of substrate was added into each well, followed by incubation for 15 minutes at 25 C° with continuous shaking in the dark.

6- Fifty ml of stopping solution H₂SO₄ was added into each well and mixed gently.

7- Absorbance was measured by spectrophotometer at 450 nm within two hours.

The flow rate of saliva (SFR) ml/min was estimated by dividing the total collected saliva volume (ml) by collecting time (min) that was measured by sample collection:

$$\text{SFR ml/min} = \frac{\text{saliva sample volume (ml)}}{\text{collection time (min)}}$$

Salivary pH was measured with a digital pH-meter (Hanna Instruments, USA) 30 to 60 minutes after saliva samples were collected, and pH was considered as a quantative variable. The BMI for a person is defined as their body mass divided by the square of their height with the value universally being given in units of Kg/m².

Statistical Design

SPSS version 23 was used for data entry and analysis, mean and standard deviation was used to represent the continuous data. ANOVA and student t test were used

to confirm significance. P-value \leq 0.05 was considered significant.

Results and Discussion

The findings indicated that the mean age of patients group was 37.2 \pm 4.3, 47.2% belong to age group of 20-

40 years, 75% was females and 72.2% of RRD type. With regards to control group; the results revealed that the mean age was 38.7 \pm 6.8 years, 45.5% was fall to age group of 20-40 years and 63.6% was females as seen in table.1.

Table.1. descriptive characteristics of studied groups

	Groups				
	Patients(n=36) Mean age=37.2 \pm 4.3years		Control(n=22) Mean age=38.7 \pm 6.8 years		
	No.	%	No.	%	
Age groups	<20	8	22.2%	6	27.3%
	20-40	17	47.2%	10	45.5%
	>40	11	30.6%	6	27.3%
Gender	Female	27	75.0%	14	63.6%
	Male	9	25.0%	8	36.4%
Type	RRD	26	72.2	-	-
	SPD	3	8.3	-	-
	PPD	4	11.1	-	-
	PRD	3	8.3	-	-

The results demonstrated that the mean value of GI, SIgA, SFR and PH of patients group were significantly higher than that of control group (p \leq 0.05 for all) as displaced in table.2.

Table.2. Mean of GI, SIgA, SFR and PH of patients and control group.

	Groups				
	Patients group		Control group		
	Mean	Std. Deviation	Mean	Std. Deviation	p-value
GI	3.4	0.6	1.4	0.5	0.01
SIgA	510.8	59.7	941.8	63.8	0.01
SFR	0.56	0.1	1.7	0.2	0.01
PH	6.6	0.2	7.1	0.1	0.01

Our data showed that the mean value of GI was significantly increased with aging while the mean value of SIgA, SFR and PH were decreased as the patient get elderly but the significant difference was reported with SIgA and SFR only as illustrated in table.3.

Table.3. Mean of GI, SIgA, SFR and PH of patients according to age groups

		N	Mean	Std. Deviation	p-value
GI	<20	8	2.8	0.3	0.01
	20-40	17	3.1	0.2	
	>40	11	3.4	0.12	
SIgA	<20	8	561.0	58.8	0.02
	20-40	17	512.0	62.3	
	>40	11	415.3	66.1	
SFR	<20	8	0.6	0.05	0.03
	20-40	17	0.4	0.1	
	>40	11	0.3	0.08	
PH	<20	8	6.5	0.05	0.09
	20-40	17	6.4	0.23	
	>40	11	6.1	0.18	

The results showed there was no significant difference ($p \geq 0.05$ for all) regarding the mean value of GI, SIgA, SFR and PH when compared according to the type of multiple sclerosis, however the patients who had remission relapsing type showed higher value for all these studied parameters but the difference did not reach the significant level as displaced in table 4.

Table.4. mean of GI, SIgA, SFR and PH of patients according to MS types

		N	Mean	Std. Deviation	p-value
GI	RRD	26	3.6	0.5	0.06
	SPD	3	3.4	0.3	
	PPD	4	3.5	0.7	
	PRD	3	3.4	0.4	
SIgA	RRD	26	517.4	67.3	0.06
	SPD	3	482.0	69.2	
	PPD	4	502.8	66.4	
	PRD	3	506.7	61.8	
SFR	RRD	26	0.6	0.08	0.07
	SPD	3	0.4	0.05	
	PPD	4	0.5	0.08	
	PRD	3	0.5	0.15	
PH	RRD	26	6.7	0.18	0.09
	SPD	3	6.4	0.25	
	PPD	4	6.4	0.08	
	PRD	3	6.6	0.2	

Cont... Table (4): Association between (IgG) and (IgM) anti -*T.gondii* seropositivity and risk factors

The result of current study demonstrated that the mean value of GI, SIgA, SFR and PH of MS patients were higher with females in compare to male patients but the difference not significant statistically ($p \geq 0.05$ for all) as showed in table 5.

Table.5. mean of GI, SIgA, SFR and PH of patients according to their gender.

	gender				p-value
	Female(N=27)		Male(N.=9)		
	Mean	Std. Deviation	Mean	Std. Deviation	
GI	3.6	0.4	3.4	0.3	0.06
SIgA	562.4	78.8	554.3	81.03	0.07
SFR	0.6	0.1	0.5	0.09	0.7
PH	6.5	0.2	6.6	0.15	0.09

The results showed there was significant direct correlation between duration of disease in years and gingival index while negative correlation was reported between each of SIgA, SFR and PH and duration of disease as displaced in table.6.

Table.6. correlation of age,

		GI	SIgA	SFR	PH
Duration	Pearson Correlation	0.8**	-0.9**	-0.9**	-0.3
	p-value	0.001	0.001	0.001	0.1

Multiple sclerosis (MS) is a chronic inflammatory demyelinating disorder of the central nervous system affecting white and possibly grey matter. MS characterized by multiple focal demyelinating lesions affecting the white matter, which is not infrequently associated with cortical demyelination. The finding of this study indicated that the mean age of patient group was 37.4 ± 6.3 SD (ranged from 20-40) year while the control group was 36.3 ± 4.8 SD years old. The studies showed that the age at MS onset follows a similar pattern across different regions, with incidence low in childhood, rapidly increasing after adolescence, reaching a peak between 25 and 35 years, and then slowly declining⁽¹¹⁾; this opinion support our work in the term of spread of the MS in this age group. With regard to gender distribution, our data indicated that female was 75% of patient group and 63.6% of control group,

this result in consistent with finding of other studies that revealed the women are affected more commonly than men, with the female-to-male ratio varying between 1.5:1 and 2.5:1, with a trend toward higher values in the most recent studies^(17,18). Recent research though anyone can be affected, but MS most frequently occurs in white women ages 20 to 45.^(1,2) According to some authors the lifetime risk of developing MS in high-risk populations is approximately 1 in 200 for women which coincide our study, others supposed MS 3 times more common in females than in males. Although controversy surrounding sex factor. several investigators indicated that females had a relatively favorable course⁽¹⁹⁾. For salivary IgA changes that associated with MS, a studies reported that chronic stress mostly reported with MS patients result in an increased levels of salivary cortisol and decreased level of salivary IgA.⁽²⁰⁾ This study revealed effect of

MS on saliva immunoglobulin A comparing with saliva of healthy individuals (control) group which show decreased salivary IgA levels as well as the (SFR) with duration. Increased autoimmunity with age may result from increased numbers of auto aggressive T-cells or reduced immune regulation. Autoimmune diseases with interleukin-17 as an important messenger cytokine may also be relevant in periodontitis⁽²⁷⁾, T cells protect from autoimmune inflammation despite reduced STAT3 activation and decreased constraint of IL-17 producing T cells. This may be an appropriate explanation for this outcome in this study. However, many other studies correspond our result it is observed Individuals with MS are at increased risk for dental caries, gingivitis and periodontitis due to the physical effects of MS, as well as these patients' reduced immune response^(2,10)

Conclusion

The gingival index increased but the S.IgA, SFR, and s.PH in MS patients but we could not prove these changes due to the disease itself where they might be induced by used medications that used for MS treatment

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Dentistry/Al-Mustansiriyah University and all experiments were carried out in accordance with approved guidelines.

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Impact of Caring Child with Diabetes Mellitus Type1 upon Mothers at Specialized Center for Endocrinology and Diabetes in Baghdad City

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Abstract

The purposes of the study to assess the impact of caring children with Diabetes Mellitus Type 1 upon mothers. A descriptive study was conducted at Specialized Center for Endocrinology and Diabetes in Baghdad City. To achieve the objectives of the study, a (Convenience) samples of (50) mothers who have children with Diabetes Mellitus Type 1. Data were collected by an application of direct interview as a means of data collection. The results indicated that mothers of diabetic children are experiencing a moderate level of burden regarding care of their children (86.5%), in which they are experiencing a moderate psychological and social burden (61.5% and 51.9%), while they show moderate to high financial burden of care for their children (40%). The study concluded that child with Diabetes Mellitus Type I are experiencing a moderate impact on their mothers .

Key Words: *Burden, Caring, Diabetes Mellitus Type1, Mothers*

Introduction

Type 1 diabetes mellitus one of the most common chronic diseases of childhood, can be diagnosed at any age; peaks in onset occur between 5 years and 7 years of age and at or near puberty. T1DM accounts for ~10% of all diabetes cases, and the incidence rate of childhood T1DM has risen worldwide by ~2.8%–4.0% each year in all age groups in the last several decades. T1DM is most common in Europe (129,000) and North America (108,700) and far less common in People's Republic of China, India, and Africa. ^{1,2} Iraq is one of the 19 countries and territories of the IDF MENA region. 415 million people have diabetes in the world and more than 35.4 million people in the MENA Region; by 2040 this will rise to 72.1 million. There were 1.2 million cases of diabetes in Iraq in 2015 ¹ Type 1 diabetes mellitus is a challenge for children, adolescents and their parents as they need special support to keep it under control. After the diagnosis of T1D, the lifestyle of all family members' changes and this interferes in their quality of life ³. Mothers were considers the

primary caregivers in most families, and many had to rearrange work schedules or leave work in order to care for their child full-time. Parenting roles also changed dramatically ^{4,5}. Mothers are ultimately responsible for daily management of T1DM, which has a significant impact on family life. Daily management of T1DM is time-consuming and requires a change to many well-established family routines. Although technological advances have greatly enhanced the ability of parents to monitor and manage T1DM in youth, the responsibility of T1DM management can contribute to parental stress, distress, and diminished quality of life. Understanding the experience of parenting a child with T1DM can provide insight into the challenges and needs of parents ^{6,7}. Type 1 diabetes mellitus is early age of onset, and a major burden of care on to the family members, especially parents. Parents with psychological morbidity had more dysfunction in social, personal and cognitive domains and also had significantly poorer quality of life in the physical health, psychological health and general well being domains ⁸. The diagnosis and treatment of a chronic illness or disability, such as type 1 diabetes, in a child leads to family upheaval and reorganization ⁹. The effects of this stress on parents not only may adversely affect parents' mental health but also could affect the health of the child with diabetes. According to family

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systems theory, what happens to a target member of the family affects other family members and their response in turn affects the target family member (10). Moore et al; (2013) and Simsek et al., (2013) reported that 20% to 30% of parents report clinically significant distress, which has been defined as stress (life stress or parenting stress) and symptoms of anxiety, depression, and/or posttraumatic stress.6–8 Parental psychological distress at the time of diagnosis has been found to predict later parental distress(3,11). Parents and particularly mothers of children with T1DM are at increased risk for depression, which was associated with negative effects on parenting, the child's quality of life, and the child's psychosocial adjustment (12).

Methodology

A descriptive study was conducted at Specialized Center for Endocrinology and Diabetes in Baghdad City. To achieve the objectives of the study, a (Convenience) samples of (50) mothers who have children with Diabetes Mellitus Type 1. In order to assess burden of caring children with Diabetes Mellitus Type 1 upon mothers,

a constructed questionnaire was design and means of an interview technique with the mothers was constructed to measure the variables underlying study. Questionnaire based on comprehensive review of relevant literature and previous studies was also used. These instruments consist of two parts Part one concerned with personal information includes, the demographic data of the mothers, child and child's illness. Part two contained of (25) items concerning burden (psychological, social and economical) of caring children with Diabetes Mellitus Type 1 upon mothers. The questionnaire was answered by one of these answers (always, sometime and never). Constant validity determined for questionnaire through the use of panel experts who are faculty members from College of Nursing. The experts were asked to review the questionnaire for content with clarity. Such changes were employed according to their suggestions and valuable comments. The data collected with constructed questionnaire through an application of direct interview as mean of data collection. Appropriate statistical approach was used

Results and Discussion

Table 1: Demographic Characteristics for Mothers

No.	Characteristics		F	%
1	Age Group:	20 – 29 years	13	25
		30 – 39 years	26	50
		40 – 49 years	12	23.1
		50 ≤ years	1	1.9
		Total	52	100
2	Educational Level:	Doesn't read & write	1	1.9
		Read & write	0	0
		Primary school	19	36.5
		Intermediate school	19	36.5
		Secondary school	5	9.6
		Institute/College	8	15.4

Cont.... Table 1: Demographic Characteristics for Mothers

		Total	52	100
3	Marital status:	Married	49	94.2
		Divorced	1	1.9
		Widowed	2	3.8
		Total	52	100
4	family members:	1 – 5	34	65.4
		6 – 10	17	32.7
		11 ≤	1	1.9
		Total	52	100
5	Monthly income:	> 300,000 IqD	19	36.5
		300,000 – 600,000 IqD	21	40.4
		600,000 – 900,000 IqD	9	17.3
		900,000 IqD <	3	5.8
		Total	52	100
6	Occupation:	Housewife	48	92.3
		Governmental employed	3	5.8
		Self-employed	1	1.9
		Total	52	100

The analysis of table (1) shows that half of the mothers are with age group ranged 30 -39 years old (50%), who were graduated from primary and intermediate school (36.5%). The marital status is normal for most of mothers in which 94.2% of them are married. The number of family members reveals that more than half

mothers are living in family composed of 1-5 members (65.4%). Regarding monthly income, 40.4% of mothers are having monthly income of 300,000-600,000 Iraqi dinars per month. The occupational status shows that most of mothers are housewife (92.3%).

Table 2: Demographic Characteristics of Children with Diabetes Mellitus

No.	Characteristics		F	%
1	Age:	> 2 years	1	1.9
		2 – 5 years	14	26.9
		6 – 12 years	26	50
		13 – 18 years	11	21.2
		Total	52	100
2	Gender:	Male	30	57.7
		Female	22	42.3
		Total	52	100
3	Birth order:	First	14	26.9
		Second	9	17.3
		Third	14	26.9
		Fourth/+	15	28.8
		Total	52	100
4	Age at diagnosis:	> 2 years	5	9.6
		2 – 5 years	22	42.3
		6 – 12 years	24	46.2
		13 – 18 years	1	1.9
		Total	52	100

This table presents the characteristics of children with diabetes mellitus; the table shows that 26.9% of them are male toddler, preschool children with age group 2-5 years old (57.7%). 28.8% of them are fourth born in the family. More than third of children are diagnosed at school age of 6-12 years (46.2%) and 42.3% of them are diagnosed at preschool age.

Table 3: Total impact of Care of Children with Diabetes Mellitus on Mothers (N=52)

Burden	Levels	F	%	M.S	SD
	Low	23	1.9		
Psychological	Moderate	32	61.5	2.35	0.520
	High	19	36.5		
	Low	23	44.2		
Social	Moderate	27	51.9	1.60	0.569
	High	2	3.8		
	Low	10	19.2		
Financial	Moderate	21	40	2.21	0.750
	High	21	40		
	Low	2	3.8		
Total	Moderate	45	86.5	2.06	0.366
	High	5	9.6		

The findings in this table indicate that mothers of diabetic children are experiencing a moderate level of burden regarding care of their children (86.5%), in which they are experiencing a moderate psychological

and social burden (61.5% and 51.9%), while they show moderate to high financial burden of care for their children (40%).

Table 4: The Relationship between Mothers’ Burdens of Care with Their Children’ Characteristics (N= 52)

	Burden	Chi-square	d.f	P-Value	Significance
Characteristics				≤ 0.05	
Age		4.691	6	0.584	N.S
Gender		0.788	2	0.674	N.S
Birth order		6.810	6	0.339	N.S
Age at diagnosis:		10.668	6	0.099	N.S

d.f: degree of freedom, P: Probability, N.S: Not significant

This table reveals that there is no significant relationship between mothers’ burden of care and characteristics of their children with diabetes mellitus at p-value ≤ 0.05.

Table 5: The Relationship between Mothers’ Burden of Care with Their Demographic Characteristics (N= 52)

	Burden	Chi-square	d.f	P-Value	Significance
Characteristics				≤ 0.05	
Age group		4.874	6	0.560	N.S
Educational level		13.608	8	0.093	N.S
Marital status		0.495	4	0.974	N.S
Family members		12.796	4	0.012	S
Monthly income		4.287	6	0.638	N.S
Occupation		0.674	4	0.954	N.S

d.f: degree of freedom, P: Probability, N.S: Not significant, S: Significant

This table indicates that there is no significant relationship between mothers' burden of care with their demographic characteristics, except number of family members that shows significant at $p\text{-value} \leq 0.05$.

The finding of this study found that half of the mothers are with age grouping ranged 30 -39 years old (50%), who were graduated from primary and intermediate school (36.5%). The marital status is normal for most of mothers in which 94.2% of them are married. The number of family members reveals that more than half mothers are living in family composed of 1-5 members (65.4%). Regarding monthly income, 40.4% of mothers are having monthly income of 300,000-600,000 Iraqi dinars per month. The occupational status shows that most of mothers are housewife (92.3%). characteristics of children with diabetes mellitus described in table that 26.9% of them are male toddler, preschool children with age group 2-5 years old (57.7%). 28.8% of them are fourth born in the family. More than third of children are diagnosed at school age of 6-12 years (46.2%) and 42.3% of them are diagnosed at preschool age. The study found that table (2) demonstrates the findings indicate that mothers of diabetic children are experiencing a moderate level of burden regarding care of their children (86.5%), in which they are experiencing a moderate psychological and social burden (61.5% and 51.9%), while they show moderate to high financial burden of care for their children (40%). Helgeson (2012) agree with this study said that found that caring for a child with diabetes had implications for both parent mental health and the health of the child with diabetes, he found that both were associated with increased parent depressive symptoms and decreased parent life satisfaction ⁽¹³⁾. Whittemore (2012) reported that prevalence of parental psychological impact ranged from 10% to 74%, with an average of 33.5% of parents reporting distress at diagnosis and 19% of parents reporting distress 1 to 4 years after diagnosis ⁽⁶⁾. The result of this study contrast with study done by Bhadada (2011) indicates that nearly two-third of parents (64%) had psychological morbidity. Parents with psychological morbidity had more dysfunction in social, personal and cognitive domains and also had significantly poorer quality of life in the physical health ⁽⁸⁾. Another study focused on Economic burden done by (Shorer et al., 2011; Zysberg and Lang ,2015), concluded that families with lowest incomes bear the highest relative financial burden of diabetes ^(14,15). Study done by Abolhassani, (2013) indicated that findings of this study provide an insight about effects

of diabetes on the parents' life. Participants' reactions for their children were denial, shock, presentiment and concern, anger, anxiety, and impatience, and crying ⁽¹⁶⁾. Hanif and Felimban (1998) concluded in their study that Psychological symptoms shown by mothers such as nervousness, irritability, insomnia, fatigue, poor concentration, fear and indecision, were significantly higher in mothers of diabetic children ⁽¹⁷⁾.

Conclusion

Mothers of children with Type 1 Diabetes Mellitus experience considerable many burden related to the caring of diabetes. Although many mothers find ways to effectively manage this burden, such as developing routines and finding sources of support, others experience clinically significant levels of psychological distress, including symptoms of depression, anxiety, and posttraumatic stress. These symptoms have been shown to have negative effects on parenting, child quality of life. A better understanding of the experience of parenting a child with T1DM may help providers to identify parents at highest risk.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing /University of Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Measures Self-Esteem among Undergraduate Nursing Students

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Abstract

A large body of research has highlighted self-esteem and self-concept for their importance and relatedness to various aspects of students' academic and personal life. Self-esteem is significantly associated with the positive psychological outcomes of both individual and society, including, but not limited to psychological adjustment, positive emotion, and academic performance. A descriptive-correlational study was done through the period of November 10th, 2017 to February, 11th, 2019. The study also aims to assessing levels of self-esteem in the study sample, and to determine the relationship between self-esteem and the following variables: age, gender, academic year, residency place, father job, mother job, family's monthly income, and interest of attending the nursing college. A non-probability, convenience, sampling of (600) undergraduate nursing students were selected from four nursing colleges located in Middle Ephorates region. A two parts questionnaire was used to fulfil the study objectives. The first part includes student's sociodemographic information. The second part is the Rosenberg self-esteem scale to measure levels of self-esteem. The finding indicates that in majority of nursing students had a self-esteem levels range between average (52.2%) to high level (44.8%).

Keywords: *self-esteem, nursing students*

Introduction

Nursing is a humanitarian profession that cares about caring for people, families and communities, so that they can be fully healthy, preserved or restored to good health in the best possible way ¹. As for nurses, they can be distinguished from each other through their theoretical and scientific training ². Nursing also includes independent care and cooperative care for individuals of all ages, families, groups and communities, whether healthy, sick or ill, and in all circumstances. Nursing includes health promotion, disease prevention, patient and disability care, and pre-death care. Promoting a safe environment, scientific research, participation in shaping health policies, management of disease and patient systems, and health and nursing education are key nursing roles ³. The concept self-esteem is multi-dimensional and is present in varying degrees among

people, and is considered important within the concept of self, which reflects the sense of human value and efficiency. When the attitudes of people are positive towards themselves, they are highly appreciated, and conversely, when people have negative attitudes towards themselves, with a low self-esteem, the contrary happens ⁴. Self-esteem is thus the overall assessment of the value of the individual as seen by himself/herself ⁵. Rosenberg (1965) defined self-esteem as a set of positive or negative attitudes towards the self; self-esteem is a prominent psychological trait that concerns a person's image of self-esteem and self-confidence in the overall aspects of human activity in general. Many studies and research in different countries have linked the level of self-esteem with psychological well-being. This influence can be explained by the extent to which one has control over the management of things, the resources available to him/her and how effectively life's problems are dealt with and solved. Moreover, there seems to be a significant effect of the strength of personality and high self-esteem on the rate of stress and regardless of the conditions experienced by the individual. High self-esteem is an essential aspect of human well-being, happiness and adaptation ⁶. Individuals with low self-esteem perceive

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life in a dark and negative way. These negative views felt by a person can lead him/her to believe that life is worthless (Crocker, 2006). This feeling may lead one to despair, inability and lack of motivation to exert more, because one sees one’s experiences as meaningless. Low self-esteem leads to the feeling that others are better than us, which is a feeling of lack of will, firmness and trust that leads us to make room for others to benefit us.

Materials and Method

descriptive-correlational analytic study. This design was carried out in order to attain the purposes of the study by using an assessment technique on undergraduate nursing students. The chosen period for measuring self-esteem among undergraduate nursing students was from 10th June, 2018 to 11th February, 2019. A study was conducted at Middle-Euphrates Region in Iraq, which is a group of four Iraqi provinces Babylon, Al-Kufa, Kerbala, and Al-Qadisiyah Province; each province has one nursing college. The subjects of current study were selected from all the nursing colleges of the Middle-Euphrates Region. Target population: A convenient sample of 600 consenting nursing students was chosen out of a total of (1600) nursing students in the four nursing colleges in the Middle Euphrates Region. The selected study sample was used to reflect the general

characteristics of target population and to improve a generalizability of study results.

Results and Discussion

Table (1) Chi-square analysis was run to determine the association between the nursing collegians self-esteem and their demographic data. The study results indicate that there is a significant association between the nursing collegians self-esteem and their academic year at p-value less than 0.05. While there is a non-significant association with the other demographic data at p-value more than 0.05. Table (2) As it is seen in Table 2, there were the students (44.8% of the sample) with high self-esteem level, while there were students (52.2 % of the sample) with Average self-esteem level, and the students (3.0% of the sample) was with poor self-esteem. T6able (3) The analysis of variance was used to find group mean difference between academic years in response to students’ self-esteem. Previous table shows that there is a significant difference in nursing students’ self-esteem according to their academic year. Based on the statistical mean, the study results indicate that the students in fourth academic year perceive a more self-esteem compared with those in other academic years with a mean score equal to 2.5.

Table (1) Relationship between the Nursing Students’ Self-Esteem and their Demographic Data `

Demographic Data	Rating and Intervals	Self-Esteem Levels			Sig.
		Poor	Average	High	
Gender	Male	6	77	54	X2 (2.84) D.F. (2) P-Value (0.24) NS
	Female	12	236	215	
Total		18	313	269	
Age / Years	18-20	10	134	143	X2 (6.881) D.F. (4) P-Value (0.14) NS
	21-23	7	164	114	
	24-26	1	15	12	
Total		18	313	269	
Academic Year	First Year	5	57	56	X2 (13.921) D.F. (6) P-Value (0.031) S
	Second Year	8	136	115	
	Third Year	3	82	44	
	Four Year	2	38	54	
Total		18	313	269	
Residence	Rural	5	63	41	X2 (3.476) D.F. (2) P-Value (0.17) NS
	Urban	13	250	228	
Total		18	313	269	

Cont.... Table (1) Relationship between the Nursing Students' Self-Esteem and their Demographic Data `

Father's Job	Unemployed	1	10	15	X2 (3.309) D.F. (6) P-Value (0.76) NS
	Earners	7	121	90	
	Employee	7	127	114	
	Retired	3	55	50	
Total		18	313	269	
Mother's Job	Housewife	16	271	232	X2 (4.284) D.F. (6) P-Value (0.63) NS
	Earners	0	5	5	
	Employee	2	36	27	
	Retired	0	1	5	
Total		18	313	269	
Marital Status	Single	16	278	236	X2 (1.751) D.F. (6) P-Value (0.94) NS
	Married	1	25	26	
	Divorced	1	8	6	
	Widowed	0	2	1	
Total		18	313	269	
Family Monthly Income	Plus	1	37	25	X2 (10.54) D.F. (6) P-Value (0.10) NS
	Barely Enough	13	133	112	
	Enough	3	121	120	
	Don't Enough	1	22	12	
Total		18	313	269	
The study at the College of Nursing was my desire	No	8	144	129	X2 (0.26) D.F. (2) P-Value (0.87)
	Yes	10	169	140	
Total		18	313	269	NS

Table (2) Overall Assessment of the Nursing Students' Self-Esteem

Self-esteem levels	Frequency	Percentage	Prevalence rate of poor self-esteem
Poor	18	3.0	3.0%
Average	313	52.2	
High	269	44.8	
Total	600	100.0	

Table (3) Mean Difference (ANOVA) in Nursing Students' Self-Esteem According to their Academic Year

Academic year	N	Mean	Std. Deviation	F	Sig.
First years	118	2.4322	.57704	3.377	0.018
Second years	259	2.4131	.55264		
Third years	129	2.3178	.51515		
Four years	94	2.5532	.54115		
Total	600	2.4183	.55121		

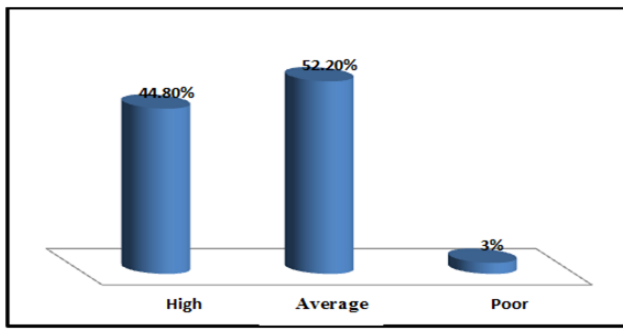


Figure (1) Overall Assessment of the Nursing Students' Self-Esteem

With the aim of assessing the level of self-esteem, the study evaluated the level of self-esteem among the study sample. The findings from the present study indicate that most of the students, amounting to 52.2 percent, had an average score of self-esteem. Also, 44.8 percent of the employees had a high level of self-esteem reflecting that low self-esteem level was not a major issue among the sample population investigated. Several authors have proved that when individuals have portrayed that persons high level of self-esteem are not susceptible to life stressors when compared to persons with low self-esteem. The focus by research in differentiating between participants with varying levels of self-esteem is focused on such aspects as their approaches towards perceiving a wide range of objects, their distinctive self-image, and an understanding of the personal strengths and weaknesses. Through these traits, the persons with high self-esteem levels are more likely to portray high acceptance to the different events they face thus minimizing the likelihood that they will be adversely affected by the nature of these effects. On the other hand, learners with low levels of self-esteem tend to be characterized by the feeling and perceptions of powerlessness, helplessness, and even ineptness. When faced by different tasks and challenges in their personal lives, the group with low self-esteem is highly susceptible to stress where they can perceive a normal challenge to be insuperable. The findings from the present study align from the findings from a study by Fahren & Khan (2015) that identified that individuals with lower levels as compared to the average level of self-esteem portrayed lack of confidence and self-assurance. The study by Fahren & Khan (2015) emphasized that the lack of assertiveness is negative for these individuals, especially if they are nursing students. Such negativity is linked to contributing to the students accepting tasks that are beyond their capabilities. Due to the lack of the necessary skills and competencies required to complete these tasks, the students are more likely to demonstrate increased stress levels. Several aspects can be linked

with the behavior of individuals with lower levels of self-esteem. These factors include challenges with alcohol usage, poor time management, study behavior and even reflecting self-defeating practices. Another research by Georgios et al. (2017) pointed out that self-esteem levels tend to decline when individuals are at the adolescent stage. Such a decline in self-esteem is linked with the growth in the cognitive ability of these individuals which makes them increasingly sensitive to social issues. The lowered self-esteem is also attributed to the widening gap between the real identity and the ideal selves. The gap between the two identities has been identified to be wider among the adolescent girls compared to the boys. These findings have also been contradicted by other studies that identify the female adolescents and having a more positive perception of themselves compared to the male adolescents and also those that identify no difference between the self-esteem levels across different genders.

Conclusion

Conclusions, despite that most of the students have good levels of self-esteem is still critical issue that needs close attention to minimize the expected impact on student's academic performance, because of the fact that self-esteem significantly in this study. There are gender differences in respect to self-esteem. In which that male had higher level of self-esteem than female students. Recommendations, it is important to raise awareness of faculty members about the alarming level of stress among students to help them find new ways of supporting their students. Teach and encourage students to use more effective stress management strategies to minimize the risk of academic stress. Maintain student's self-esteem to improve their academic wellness. Further, research is needed to target academic-related aspects (learning environments, teaching style, course workload, and tests) and their effect on the students' academic stress.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, University of Kerbala, Kerbala City, Iraq and all experiments were carried out in accordance with approved guidelines.

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Patterns of Haemoglobinopathies Diagnosed by High Performance Liquid Chromatography in Karbala Population and Correlations between Different Hematological Parameters

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Abstract

Aim: To know the patterns of hemoglobinopathies and their prevalence in Kerbala society by using high performance liquid chromatography and to conclude if there is any correlations between different hematological parameters in Hemoglobinopathic patients. A total of 70 cases studied from 16th of February 2018 to 20th of June 2018 for hemoglobin variant analysis at the teaching laboratories of Al- Husseini Teaching hospital which were studied for patterns of hemoglobinopathies. When the samples were received, Complete Blood Counts including: Hemoglobin concentration, Total White blood cells count (WBC), Mean Cell Volume (MCV), Mean Cell Haemoglobin (MCH), Mean Cell Hemoglobin Concentration (MCHC), Serum ferritin, Total Iron Binding Capacity (TIBC), Hemoglobin H (HbH) preparation were done. Out of total 70 patients screened for patterns of hemoglobinopathies the result of the study revealed that 48 Patients which represent (68.57 %) of total patients had B-thalassemia trait which form the predominant percentage of patients with haemoglobinopathy, 11.85% of patients had sickle cell trait, 5.71% of them had B-Thalassemia Major, 4.29% had Hb S/B+Thalassemia Trait, 2.86% had HbS/Alpha thalassemia trait, 1.43% of them had Hb S homozygosity, 1.43% Alpha thalassemia trait, 1.43% had D-Los Anglos, 1.43% had HbS/B+ Thalassemia trait and 1.43% had HbC/B-Thalassemia trait.

Key Words: Hemoglobinopathies, Hb electrophoresis, Hemoglobin Variants, retention time, hemoglobin A2.

Introduction

Haemoglobinopathies are groups of inherited disorders which result either by an abnormal structure of hemoglobin as in sickle cell anemia or by decreased formation of one or more globin chains as in thalassemia¹ There is worldwide increment of the prevalence of inherited hemoglobinopathies such as thalassemia and sickle-cell disorders due to people's migration^{2,3}. Hemoglobin abnormalities are present as carrier states in About 5% of the world's population.⁴ The normal

structure of hemoglobin in healthy individual consisted of tetramers of 4 globin chains of polypeptide, every one of them connected to haem protein. The predominant hemoglobin in normal adults is HbA (forming about 97%) and it has 2 α and 2 β chains. A remaining part of hemoglobin consists of approximately 2-3% HbA₂ which has two α and two δ chains, and a few portion of hemoglobin of fewer than 1% represents HbF, which has two α and two γ chains. In the neonatal period, the major haemoglobin is HbF (approximately 80-90%), with a variable amount of HbA (approximately 10-20%). The switch from γ chain synthesis (which is the predominant form of hemoglobin in the fetus and neonate) to β chain synthesis (which predominates in children and adults), together with the production of δ chains, is usually finished by about one year from time of baby delivery. So, at that period of life, the infant

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get full maturation of HbA₂ and Hb F levels.⁵ HPLC is used for identification, and estimation of both normal and many abnormal Hb categories.⁶ HPLC provides the clear benefits and priorities in comparison to traditional Hb electrophoresis because of its ability to detect and estimate the quantities of different types of disrupted Hbs in very accurate and perfect manner.⁷ It has been proved that HPLC is very rapid, sensitive, specific, and reproducible replacing technique to conventional Hb electrophoresis.⁽⁸⁾ It's important to mention that every disordered haemoglobin (variant of hemoglobin) can be represented in HPLC in specific area and had specific imprecision of retention time that can differentiate it from other types of hemoglobin's. Retention time is the time that extended from the moment of the person's sample injection to the appearance of the summit (apex) of a haemoglobin high point (peak). The established values at which the well-known disrupted hemoglobin's (variants) were noticed to be eluted and separated by applying the "Variant Beta-thalassemia's short scheme or program are termed as "Windows". During printing the chromatogram's paragraph, there is existence of the following components: all portions of the separated disordered haemoglobin (variants), retention times, the reasons of hemoglobin's peaks and the levels (%) of various haemoglobin elements. If hemoglobin peaked area was separated at an imprecision of retention time that is not pre-identified, it will be named as an "unknown" area.⁽⁹⁾ Several structural Hemoglobin disorders and the rarest hemoglobinopathies that can't be identified and diagnosed by Hb electrophoresis, they were detected by HPLC which is preferred in such cases and gave very accurate results as it's the ideal, sensitive and gold standard technique.⁽¹⁰⁾ Beside HPLC, there are numerous hematological tests and tools could be used in the assessment and diagnosis of many hemoglobin abnormalities, as example for these tests: sickling test, alkaline and acid electrophoresis, isoelectric focusing (IEF), capillary electrophoresis and DNA testing /protein testing and analysis. On the other hand, it is mandatory to correlate the results of all above mentioned tests when applied with the peripheral blood smears findings of the patients as there is pathognomonic picture of blood film for many hemoglobin abnormalities and disorders.⁽¹¹⁾

Methodology

This Descriptive Cross Sectional study analyzed 70 blood samples received from February 2018 to June 2018 in Teaching Laboratories In Al-Hussaini teaching hospital in Kerbala governorate / Iraq. Patients with

the following eligibility criteria included in the current study: anemia with Hb level extending from 9 to 11.2 g/dl, generalized weakness, patients from both genders with age limits from 17 to 30 years old with suspected haemoglobinopathy depending on the bases of clinical and family history and the results of blood film for those patients which show accordingly: hypochromic microcytic red cells, anisopoikilocytosis, target cells, sickle cells in sickle cell disease confirmed by sickling test were included for study on High Performance Liquid Chromatography (HPLC). Beside above mentioned Criteria, Patients with a recent blood transfusion and inadequate sample did not included in the current study. About Five milliliters of patient's blood was collected in dipotassium ethylenediaminetetraacetic acid vacutainers and was run in Sysmex autoanalyzer for hemogram and red cell indices; The initial laboratory tests done for the patients were: Complete Blood Picture CBP (RBC count, Hb level, Packed Cells Volume (PCV), Mean Cells Volume (MCV), Mean Cells Hematocrit (MCH), Mean Cells Hematocrit Concentration (MCHC), Total and differential white blood cells counts and Platelets Count in which the normal RBC count is $4.06-5.30 \times 10^6/\mu\text{l}$ and normal Hb level is $12.0-16.0 \text{ g/dl}$. The manual blood film was performed using the method of Leishman stain⁽¹²⁾. The samples were run on High Performance Liquid Chromatography instrument HPLC manufactured by Bio-Rad Laboratories. Based on retention time and proportion of Hb variants, different hemoglobinopathies were diagnosed and their prevalence was analyzed. The assigned windows of Manufacturer for Bio-Rad variant HPLC system was shown in Table 1. The presence of Hb H was proved by the usage of brilliant crystal blue staining for the visualization of Hb H inclusions by the light microscope. Another parameters tested in present study are: Serum Iron, Serum ferritin, Total Iron Binding Capacity (TIBC) which were evaluated for all patients in this study.

Results and Discussion

This descriptive cross sectional study was attempted to see the difference in the prevalence of various hemoglobinopathies in Kerbala Governorate in Iraq Country and to conclude if there is any significant correlations between different hematological parameters. Different types of Hemoglobinopathies including thalassemia's and other groups of hemoglobin disorders are distributed worldwide and are known to be autosomal recessive in inheritance with defects in Hemoglobin synthesis.⁽¹⁴⁾ Thalassemia is a haemoglobinopathy

that result from defect in the quantity and amount of hemoglobin formed in which there is reduction in the level of hemoglobin synthesized resulting in a form of anemia .with RBCs have reduction in their size and their hemoglobinization (hypochromic microcytic) RBCs. There are many forms of thalassemia which are classified according to which type of globin chain are mutated and depleted for example there is α and β thalassemia due to depletion of α and β chains synthesis. Also there is further clinical sub classifications of thalassemia's in to thalassemia major and minor(homozygous and heterozygous) respectively which is based on number of genes affected , either one gene mutated or two genes affected in respective manner. Thus the patients presented in different clinical manifestation. The patients who are of homozygous in type are so ill in which only very limited number of them can still alive to the adulthood period of life and this fatality is due to the severity of anemia and due to cardiopulmonary deteriorations. Regarding thalassemia of heterozygous gene defect, also categorized as thalassemia trait and the clinical finding in such type is solely very mild anemia with hemoglobin concentration not getting below 9g/dL.⁽¹⁵⁾ The current research conclude that the predominant number of Hemoglobinopathic cases were of Beta thalassemia trait (68.57%) and were common in the age limit of 20-30 years and this is in consistent with Buch et al study . The high incidence of thalassemia trait require antenatal screening tests and screening of marriageable age groups. This will help in the limitation and prevention of thalassemia major in the offspring's. This may be the cause for detecting less number of cases of thalassemia major in our study group. We think that antenatal screening or screening of higher secondary school children to detect hemoglobinopathies, counseling of the individuals with hemoglobinopathies will definitely help in drastically reducing the incidence of the thalassemia major and sickle cell disease. This study found that the incidence of B-Thalassemia

Major was (5.71%), Similar research done by Patel et al in Gujarat had reported the incidence of thalassemia major (5.63%).⁽¹⁶⁾ The Current study concludes that the incidence of remaining Hemoglobinopathies was as Follows: Sickle/B+-Thalassemia trait(2.86%), sickle cell trait (10%), Hemoglobin S homozygosity (1.43%), Hemoglobin S/alpha thalassemia trait(2.86%), Hemoglobin C/B-Thalassemia(1.43%), Hemoglobin D-Los Anglos (1.43%). There was no gender difference in the different hematological parameters in the sample and this agreed with *Bhokare SB et al*⁽¹⁶⁾ The present study shows that there were significant differences regarding some hematological parameters between the patients of different hemoglobinopathies including: Hemoglobin A, Hemoglobin F and White Blood Cell Count and this agreed with Patel et al. ⁽⁸⁾ Also there were significant differences between Thalassemia trait patients and Those with Thalassemia Major regarding HbA, HbA2, HbF, Hemoglobin Level, Mean Cell Hemoglobin Concentration (MCHC), Hb H preparation and Serum Iron and this is in consistent with Colah et al.⁽¹⁷⁾ And Patel et al⁽⁸⁾ HPLC also helped us in detecting various heterozygous states. Though these abnormal variants have less clinical significance but they can produce severe disease when coexisted with other variants. This once again highlights the significance of mass screening of the population. Although these states can be detected by both HPLC and gel electrophoresis, while there is further advantage of using HPLC further sub-classifying these syndromes based on detection and estimation the amount of various Hemoglobin's depending on their retention time. Regarding Hb D Los Anglos it had identical electrophoretic finding and existence at alkaline pH, on the other hand the average of its retention time in chromatography is creative and had variable results in predictable manner. This differentiation is in fact quite significant especially in a double heterozygous state with Hb S, as Hb SD ^{18, 19}

Table 1: Manufacturer assigned windows for Bio-Rad variant high-performance liquid chromatography system⁽¹³⁾

Hematological Parameters	Gender	Mean	Standard-Deviation	Significance (P value)
HemoglobinA(HbA)	Male	82.868	22.347	0.141
	Female	73.390	30.023	
HemoglobinA2(HbA2)	Male	6.265	10.350	0.315
	Female	4.358	1.774	

Cont... Table 1: Manufacturer assigned windows for Bio-Rad variant high-performance liquid chromatography system⁽¹³⁾

HemoglobinF (HbF)	Male	3.619	6.406	0.263
	Female	6.461	13.735	
HemoglobinS(HbS)	Male	42.614	23.200	0.472
	Female	52.313	26.946	
HemoglobinC(HbC)	Male	64.657	24.654	0.255
	Female	73.700	34.543	
Retic Count	Male	3.322	1.980	0.745
	Female	3.955	2.617	
HemoglobinConcentration(Hb)	Male	9.422	1.482	0.831
	Female	9.542	1.608	
Hematocrit (HCT)	Male	28.919	4.175	0.615
	Female	29.145	4.647	
Mean Cell Volume(MCV)	Male	63.738	8.186	0.198
	Female	64.794	9.286	
Mean Cell Hemoglobin(MCH)	Male	20.908	3.452	0.781
	Female	22.031	3.720	
	Female	73.672	36.566	

Table 2: The mean level of different haematological parameters of hemoglobinopathy patients and its relation to gender in Al Hussieni Teaching hospital in Kerbala in Iraq in 2018 (n=70)

Hb Type		Summation of Squares	Means of Squares	P value
HbA	Between Groups	40636.56	3386.38	<0.001
	Within Groups	5898.831	107.251	
	Total	46535.39		
HbA2	Between Groups	207.63	17.302	0.994
	Within Groups	3804.839	69.179	
	Total	4012.47		
HbF	Between Groups	4295.342	330.411	<0.001
	Within Groups	3360.108	60.002	
	Total	7655.45		
HbS	Between Groups	6579.804	822.476	0.155
	Within Groups	2083.393	347.232	
	Total	8663.197		
Hb. H. Preparation	Between Groups	2.871	0.221	.08888
	Within Groups	0	0	
	Total	2.871		
Retic. Count	Between Groups	299.899	23.069	<0.001
	Within Groups	67.333	1.202	
	Total	367.232		
Hb level	Between Groups	42.571	3.275	0.134
	Within Groups	119.486	2.134	
	Total	162.058		

Table 3. The Differences within and between groups of Different Hematological Parameters and their significance among Patients of different patterns of Hemoglobinopathies.

	Hemoglobinopathies Types	frequency
1	B-Thalassemia Trait	68.57%
2	sickle cell trait	11.85%
3	B-Thalassemia Major	5.71%
4	Sickle/B+-Thalassemia trait	4.29%
5	Hemoglobin S/alpha thalassemia trait	2.86%
6	Hemoglobin S homozygosity	1.43%
7	Hemoglobin C/B-Thalassemia	1.43%
8	Hemoglobin D-Los Anglos	1.43%
9	alpha thalassemia trait	1.43%

Table 4. The distribution of different types of Hemoglobinopathies in patients in Al Hussieni Teaching hospital in Kerbala in Iraq in 2018 (n=70)

Hematological Parameters	Disease	Mean	Std. Deviation	Significance
HbA	B Thal trait	92.534	3.441	<0.001
	B-Thal Major	52.125	12.809	
HbA2	B Thal trait	6.440	9.084	<0.001
	B-Thal Major	5.125	1.315	
HbF	B Thal trait	2.373	3.239	0.002
	B-Thal Major	35.200	25.130	
Retic. Count	B Thal trait	2.450	0.858	0.377
	B-Thal Major	8.200	1.166	
Hb level	B Thal trait	9.581	1.499	0.002
	B-Thal Major	7.200	0.963	
Hb H preperaion	B Thal trait	29.394	4.351	0.0022
	B-Thal Major	22.275	2.680	
MCV	B Thal trait	62.235	7.162	0.004
	B-Thal Major	59.000	2.582	
MCH	B Thal trait	20.533	2.728	0.06
	B-Thal Major	19.500	3.109	

Table 4. The distribution of different types of Hemoglobinopathies in patients in Al Hussieni Teaching hospital in Kerbala in Iraq in 2018 (n=70)

MCHC	B Thal trait	26.863	3.123	0.001
	B-Thal Major	24.500	3.416	
WBC	B Thal trait	8.923	3.405	0.74
	B-Thal Major	6.900	2.255	

Conclusion

The current study conclude that B-Thalassemia Trait represent the higher frequency or incidence of hemoglobinopathies among Al-Hussaini teaching Hospital Patients followed by Sickle cell/B+Thalassemia trait disease. There is no gender difference in relation to different hematological parameters among Hemoglobinopathic patients. There in significant differences regarding some hematological parameters among Hemoglobinopathic patients including: HbA, HbF, MCV, MCH, MCHC. There is significant differences between some hematological parameters between Patients of Thalassemia Major and those of Thalassemia Trait including: HbA, HbA₂, HbF, HbH preparation, MCV, Hb Level, MCHC and Serum Iron. We conclude, HPLC is an ideal method for routine diagnosis of hemoglobinopathies.

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Risk Factors of Acute Otitis Media among Infants Children in Kerbala Pediatric Teaching Hospital: A Case-Control Study

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Abstract

Objective of the study: To explore the most prevalent risk factors those are associated with AOM among infant children. A case-control study design was carried out in the outpatient clinic at Kerbala pediatric teaching hospital, from the period from January 2017 to February 2019. A purposive sampling method of 100 infants was included in this study, 50 of them were infected with AOM and the others are not. A data were collected directly from infant's parent by the researchers through the interviewing technique, then the collected data were analyzed by using the program of IBM Statistical Package of Social Sciences (SPSS) Version 24. The results of this study revealed that about 40%, 64% and 40% of infected infants were 7-9 months of age, females and urban residency respectively. The study showed a significant association between AOM and nasal obstruction at p-value 0.02, child's position during feeding at p-value 0.00, mother's position in case of bottle feeding at p-value 0.00, and using bottle feeding at night (for breast feeding infants) at p-value 0.002. Infants exposed to cigarette smoking, and that's were using pacifiers when sleeping also identified a significant risk factors for AOM at p-value 0.00, and 0.00 respectively.

Key Words: Risk Factors, Acute Otitis Media, Infants.

Introduction

Otitis media are well identifying as an infection and/or inflammation of the middle ear ¹, it is the second most common childhood disease after upper respiratory tract infection ² AOM is the most frequently recognized ear infection ³, and it is one of the most widespread communicable diseases of childhood that is most frequently occurs between 3 months to 3 years of age. In the United States of America (USA), 80-90% of AOM occur in children less than six years, the main incidence is between 6 months to 24 months of age ⁴. Newborns and infants are more likely to infect with AOM because of the immature immune system ⁶ reported that the AOM is a disease of infancy; it can affect more than 33% of children less than one year of age. Ginkel et al., (2017) mentioned that about 25-36% of children less than one year have experienced at least one event of AOM and approximately 20% of the infants developed more than one event of AOM. It is an estimated that about 709 million new AOM cases annually worldwide, with greater than half in children less than five years of age ⁸. A recurrent and prolonged episode of AOM may lead

to many health problems such as hearing impairment, delayed speaking development, and delayed language and educational development ⁹. In the United States of America, the annual cost of AOM is approximately 5 billion dollars ¹⁰. Several influences have been identified to be accompanied with the development of AOM, some of these influences are unanimously recognized such as environmental tobacco smoke exposure and adenoids hypertrophy; other influences are more controversial such as gender or poor economic status ¹¹ stated that's the possible risk factors that are associated with otitis media are family history of otitis media, recurrent upper respiratory infections, younger age, and second hand smoking. ¹² reported other risk factors for ear infections involve low birth weight, younger motherly age, inadequate housing conditions, lack of access to health care, and mothers who smoke during pregnancy. Numerous studies have been documented that the pacifier use for some babies was determined as an additional risk factor for developing otitis media. Other risk factors that are associated with recurrent otitis media among infants are includes orofacial anomalies such as cleft palate, overcrowding, lack of breast feeding or shorter duration

of breastfeeding, and prolonged bottle-feeding while lying. Supine-feeding positions, immune deficiencies, and gastro-esophageal reflux are also identified as a risk factors of AOM. Identifying of otitis media risk factors can contribute to improving management and effective prevention plan. Pawathil, and Rajamma (2016) mentioned that are by recognizing the risk factors if AOM, the clinician can notify parents about preventive measures to avoid these factors. Ginkel et al., (2017) reported that the documented of preventable risk factors is a significant effort in the prevention of AOM. In this study, we aim to determine the impact of several risk factors that are associated with AOM among children less than 12 months of age in order to improve preventive methods of this disease.

Methodology

A case-control study design was carried out in the outpatient clinic at Kerbala pediatric teaching hospital, in the period from January 5th 2017 to February 1st 2019, in order to investigate the most prevalent risk factors that are associated with AOM among children less than one year of age. A purposive sampling method of 100 infants was included in this study, 50 of them were infected with AOM and the others are not. A verbal informed consent was obtained from the infant's parent to be enrolled in this study. A questionnaire form was prepared by the researchers in order to collect all the relevant data associated with the study sample. The questionnaire form contains of (11) items that are (Age, gender, residency, type of feeding, nasal obstruction condition, child position during feeding, mother's position during feeding, upper respiratory tract infection, using bottle feeding at night, exposed to second hand smoke, and using the pacifiers when sleeping). Data were collected directly from infant's parents by the researchers through the interviewing technique. Finally the collected data were analyzed by using the program of IBM Statistical Package of Social Sciences (SPSS) Version 24, both descriptive statistical analysis procedures (frequency, percentage) and inferential statistical analysis were used in order to analyze and assess the results of the study, a p value <0.05 was considered statistically significant.

Results and Discussion

As shown in table (1), there are a statistically significant association between female gender with AOM, and no significant association with the other listed factors. Analysis of the risk factors associated with

AOM among infants as shown in table (3), indicates that the nasal obstruction, infant's position during feeding, mother's position in case of bottle-feeding, using bottle-feeding at night, second hand smoke, and using of pacifiers when sleeping were found to be a significant risk factor associated with AOM among infants. A total of (50) infants who are infected with AOM, and (50) non-infected infant were involved in this study to investigate the most prevalent risk factors that are associated with AOM. Data that listed in table (1 and 2) show that are many risk factors are contributing to the occurring of AOM in the examined group of infants. The results in table (1) revealed a significant association between female gender and AOM (at P value 0.005), this result was disagreement to the findings of the study which was done by Abed Alsalama, et al, (2018) revealed that the male gender were determined a significant risk factor for the occurrence of AOM. Another study, which was done by Sangeetha, et al., (2014) revealed that the boys infant were found to have a higher incidence of AOM than girls. Concerning to the association between nasal obstruction and AOM among the study subjects, the results in table (2) exposed a significant association between AOM and nasal obstruction (at p value of 0.02), this result was corresponding with the findings of a meta-analysis study which was done by Ilechukwu, et al., (2017) that identified the upper respiratory tract infection as an important risk factor for the occurrence of AOM. Regina, et al, (2017) reported that the AOM is mostly occurring secondary to viral upper respiratory tract infection and subsequent microbial colonization of the nasopharynx and the middle ear. Supine position of infants during feeding as shown in figure (2) also determined as a main factor contributing to AOM because this position lead to leakage of milk into the ear canal and therefore increase the chance for developing AOM, the result in table (2) show that are about 66% of infant infected with AOM were putting in supine position by their mothers during feeding, this finding was corresponding with the study of Regina, et al, (2017) emphasized that the use of supine position during feeding was significantly increases the risk of AOM in infant. Another studies that were done by Sangeetha, et al., (2014), Swamy, et al, (2017), and Abed Alsalama, et al, (2018) revealed that there is a significant association existed between supine feeding position and AOM in infants. Furthermore, the findings of the study of Regina, et al, (2017) illustrated that the using of supine or near so position by mothers for feeding their babies facilitates the reflux of milk into middle ear, with carriage of respiratory flora into

the middle ear space, thereby leading to otitis media. Pawathil, and Rajamma (2016) indicate that the supine feeding position was identified to be highly significant risk factor for otitis media in infancy. Bottle feeding as shown in figure (1) and the mother’s position in case of bottle-feeding are considered as an important factor that are associated with AOM, the findings in table (2) show that about 68.5% of mothers are always away from their infants when using bottle-feeding. Many studies have been evaluated breast-feeding role in the prevention of AOM and showed that the breast milk protects against AOM. Some studies also have been exposed that the wrong position of feeding can increased AOM among children (Regina, et al, 2017). Abrahams and Labbok (2011) highlight that the breast milk feeding, unlike bottle feeding formula, because human milk is a containing antimicrobial, and anti-inflammatory substances, therefore infants with bottle feeding show a relative immunodeficiency compared with those receiving breast feeding, placing them at significantly greater risk of infections. In a case-control study that was done by Pawathil, and Rajamma (2016), confirmed that are a significant association between bottle-feeding and the occurrence of AOM.

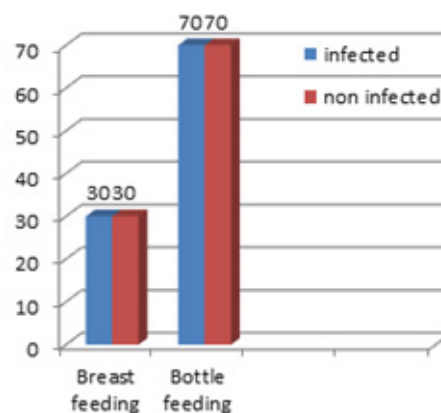


Figure1: Association of AOM with type of feeding

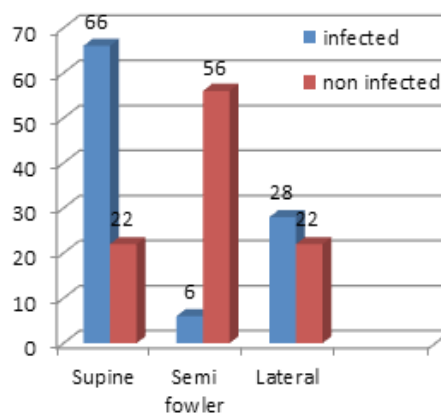


Figure 2: Association AOM with infant's position during feeding

Table (1): Demographic characteristics for infant infected and non-infected with AOM.

No.	Demographic characteristics	Frequency (F) Categories	Case N=50		Control N=50		p. value	Significant level
			Percent (%)	Frequency (F)	Percent (%)	Frequency (F)		
1.	Age	1-3 months	5	10	5	10	0.5	N.S
		4-6 months	11	22	14	28		
		7-9 months	20	40	13	26		
		10-12 months	14	28	18	36		
		Total	50	100	50	100		
2.	Gender	Female	32	64	18	36	0.005	S
		Male	18	36	32	64		
		Total	50	100	50	100		
3.	Residency	Urban	30	60	24	48	0.2	N.S
		Rural	20	40	26	52		
		Total	50	100	50	100		

NS: Non-Significant (P value >0.05); S: Significant (P value < 0.05).

Table (2): Statistical result of the risk factors for infants infected and non-infected with AOM.

No.	Risk Factors	Frequency Categories (F)	Case N=50		Control N=50		p. value	Significant level
	Items		Percent (%)	Frequency (F)	Percent (%)	Frequency (F)			Percent (%)
1.	Type of feeding	Bottle feeding	35	70	35	70	1.0	N.S
		Breast feeding	15	30	15	30		
		Total	50	100	50	100		
2.	Nasal obstruction	Yes	37	74	26	52	0.02	S
		No	13	26	24	48		
		Total	50	100	50	100		
3.	Child's position during feeding	Supine	33	66	11	22	0.00	S
		Semi fowler's	3	6	28	56		
		Lateral	14	28	11	22		
		Total	50	100	50	100		
4.	Mother's position in case of bottle feeding	Away from infant	24	68.5	8	23	0.00	S
		Near of infant	11	31.5	27	77		
		Total	35	100	35	100		
5.	Upper respiratory infection	Yes	22	44	29	58	0.1	N.S
		No	28	56	21	42		
		Total	50	100	50	100		
6.	Using bottle feeding at night (for breast feeding infants)	Yes	12	80	4	26.7	0.002	S
		No	3	20	11	73.3		
		Total	15	100	15	100		
7.	Children exposed to passive smoking	Yes	42	84	22	44	0.00	S
		No	8	16	28	56		
		Total	50	100	50	100		

Furthermore, data in table (2) have been recognized that the using of bottle-feeding at night for breast feeding infants are also contributing to development of AOM in 80 % of infant, and determine statistically significant (at P value 0.002), this finding was corresponding with the results of the study of Sangeetha, et al., (2014) who stated a higher prevalence of otitis media were associated with bottle-feeding than with breast feeding. A study of Abrahams and Labbok (2011) emphasized that the

introduction of infant bottle-feeding formula in the first 6 months of life is associated with increased risk of otitis media when compared with 6 months of exclusive breast-feeding. In a meta-analysis study which was done by Bowatte, et al., (2015) provided an evidence that the breast-feeding protects against AOM until two years of age.

Concerning the children exposed to passive smoking, the finding of the study indicates a statistically significant association (at P Value 0.00) for the development of AOM in 84% of infants who have exposed to second hand smoke, this was consistent with the findings of a meta-analysis study that identified reliable passive smoke are important risk factor for the occurrence of otitis media. The results in table (2) also demonstrate that are the using of pacifiers for infants was determine a significant risk factor for 82% of infants (at P value 0.00), its believes that the saliva may be leakage into the ear canal of infants due to the pacifiers use, that's leads to increase the chances for developing AOM. The results of the present study confirms the findings of previous studies regarding the association between pacifier use and otitis media, and largely agrees with other findings of the previous studies regarding otitis media occurrence and its risk factors.

Conclusion

Many risk factors that are associated with AOM, these include nasal obstruction, infant's and mother's position, using bottle-feeding formula, exposure to cigarette smoking, and using pacifiers when sleeping.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing/ Kerbala University and all experiments were carried out in accordance with approved guidelines.

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The impact of L-carnitine Supplement on Semen Variables and the Levels of Sexual Hormones (Serum LH, FSH, Testosterone, and Inhibin) in Males with Infertility

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Abstract

Background: It had been estimated that tenth of partners had infertility, and in approximately half of these cases, the imperfection can be ascribed to male related causes. Fecundity in men necessitate regular functioning hypothalamus, pituitary gland, and testes axis. aberrant spermatogenesis is habitually incorporated to permuted serum gonadotropins and testosterone. L-carnitine is an supreme antioxidant existing in a lofty concentration in epididymal excretions. It affords liveliness for sperms to earn their dynamism in the epididymis.

Aim: The study proposed to explore the effect of L-carnitine supplement on semen parameters, and sex hormones milieu in patients with primary or secondary infertility.

Patients and Methods: A clinical trial conducted on a 58 patients (mean age \pm SD: 30.6 ± 6.07) treated with 2gm of L carnitine, which prescribed orally at a daily dose of 2gm a day in divided doses for 3 months. Before, and after the end of the L-carnitine treatment, semen analysis and serum levels of LH, FSH, Testosterone, and inhibin were performed.

Results: The mean values of sperm count, total motility and normal morphology of and oligo-asthenoteratospermic were found notably changed ($p < 0.05$) with 3 months carnitine supplement. The outcome of this trial exhibited that L-carnitine supplement can improve sperm concentration, and count, as well active motility. Additionally it has been noticed that the serum gonadotropin (FSH and LH) levels were noteworthy declined, while serum testosterone and inhibin levels were upraised in infertile males when compared with the levels before, the 3 months course of L-carnitine treatment.

Keywords: L.Carnitine, semen variables, sex hormones, OAT.

Introduction

Infertility is a failure to procure conceiving over a year of orderly unguarded coitus. It affects nearly 15% of sexually active partners; however, male factor accords to up to 40% of instances⁽¹⁾. The male aspects of aberration marked by decrease sperm tally and/

or sperm motility and/or raised anomalous sperm morphology. These changes are altogether named oligo-asthenoteratozoospermia (OAT) and they are regarded noteworthy only if discovered in 2 sequential perusals of semen samples collected apart within one to four weeks. This accordant with the WHO guidelines (2010)⁽²⁾. Around 30% of sufferer have idiopathic (iOAT), which may be linked to aging or to non-inflammatory, or functional changes in epididymis or due to some viral or chlamydial infections⁽³⁻⁴⁾.

Semen analysis prevails the most trustworthy laboratory workup for the assessment of non-fertile male.⁵ The remarkable elements that takes primacy in in-vivo and in-vitro fertilization are sperm total number

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and the percent of motile and morphologically normal sperms.⁶⁻⁷ furthermore, experiences suggested that computer-assisted semen analysis (CASA) exactly and trustably evaluate kinematics of the sperms, which sequentially, highly related to the fertility rate in-vitro and in-vivo time to conceive.⁸⁻⁹

The therapy of male infertility particularly iOAT can be burdensome. Many medicines, dietary supplementations and antioxidants are tried but a verifying evidence reinforcing their efficacy is not yet proved⁽¹⁰⁾.

L. carnitine (LC) is a water-soluble, and a vitamin-like structured molecule. Three quarters of the body requirements of LC is of dietary source and only 25% is endogenously synthesized from lysine and methionine the two essential amino acids, and they are hoarded in striated muscles, cardiac muscles, brain tissues, and testicles.⁽¹¹⁾ The lofty level of LC is detected in epididymal excretions and sperm, with a level of about 2000 folds higher than that of the plasma giving a clue about its pivotal task in energy metabolism and sperm maturation.¹² Furthermore, LC convey the long-chain fatty acids from the cytosol into mitochondria and promote β -oxidation of long-chain fatty acids so it plays vital role in energy production.^{13,14} LC have an essential duty as it act as an outsized non-enzymatic antioxidant and helps in cell, mitochondrial membrane, and DNA protection against structural disfigurement induced by oxygen free radicals. Many experiments have been conducted to assess the antioxidant role of carnitine, their results demonstrate upswing of antioxidant enzyme activities, and the curtailment of oxidative stress in diverse cells.¹⁵

The balanced endocrine interplay of hypothalamus, pituitary and the testis, determine the flourishing and utter development of male gametes. Hypothalamus excreted gonadotropin releasing hormone (Gnrh) evoke the libration of gonadotrophins i.e follicle stimulating hormone(FSH) and lutenizing hormone(LH) from the pituitary gland⁽¹⁶⁾. FSH ties up with the sertoli cells receptors, and triggers spermatozoa production. LH triggers the excretion of testosterone in Lydgc cells, which seriatimly exploit on the Sertoli and peritubular cells of the seminiferous tubules and trigger spermatozoa production⁽¹⁷⁾. The failed secretion of FSH and LH by the hypophyseal stalk will result in turmoil of testicular function causing infertility. Testosterone, estradiol as well as inhibin orchestrate the excretion of

gonadotropins⁽¹⁸⁾. The upraised FSH level in men with azoospermia or severe oligospermia (less than 5million sperm/ml) stipulate seminiferous tubules damage⁽¹⁹⁾. Moreover if inhibin, testosterone, dihydrotestosterone and estradiol secretion is changed, this will disorganize the negative feedback mechanism which lead to disturbance of the levels of FSH⁽²⁰⁾. Customarily, the amount of FSH correspond to the production of sperms, when spermatogonia are non-existent or strikingly reduced, FSH level will be skywarded ; when the quantity of spermatogonia within normal limits, but their maturation is arrested at a specific stage (spermatocyte or spermatid), FSH values are in the ordinary range.⁽²¹⁾

The study proposed to explore the effect of L-carnitine supplement on semen parameters, and sex hormones milieu (serum LH, FSH, Testosterone, and Inhibin levels) in patients with primary or secondary infertility.

Patients and Method

A clinical trial conducted between November 2016 to the end of December 2018, a total number of 82 infertile male patients (aged 18-47 years) referred to the infertility clinic in Salahaldeen General Hospital, after the exclusion of 15 patients with varicocele, orchitis, cryptorchidism, and those males who taking herbals or medications that might affect seminal parameters in the last 3 months prior to the study, and 9 patient dropped out because of incompliance of treatment; 58 treated with L-carnitine 2 mg given orally in 2 divided doses a day. The treatment period was 3 months. Seminal fluid analysis and serum levels of LH, FSH, testosterone, and inhibin, was done prior to the onset of the study and after the end of the treatment course. Semen samples were collected after 3-5 days of sexual abstinence and the standard manual semen analysis was performed according to the WHO guidelines⁽²⁾. During the study period, the patients were interviewed monthly to assess their compliance with treatment.

Infertility assigned depending upon (WHO) guidelines. Infertile males, with more than 1year infertility, in spite of regular coitus with a normal female partner were chosen. The diagnosis was made after clinical assessment that includes: history; clinical examination especially for varicocelle and testicular volume which further evaluated by sonography of genitalia. Semen analysis; Follicular stimulating Hormones (FSH), Leutinizing Hormone(LH), testosterone, and inhibin

levels were done for each patient before and after treatment course. The semen parameters, including sperm concentration, total and forward sperm motility (percentage at one hour after ejaculation) and sperm morphology (percentage of atypical forms), according to WHO standard procedures. Data presented with simple tables and analyzed statistically to test significance at p value < 0.05

Result

In this prospective study we considered a total of 58 patients with infertility due to unexplained astheno, oligo, and/or teratospermia before and after treatment with L. carnitine for 3 months. The mean age was 29.7 ± 5.07 years. The mean duration of infertility was 3.9 ± 4.65 (1.5 to 11 years). 58 patients given L carnitine for three months. The median seminal fluid volume, total sperm count, normal appearance, the actively motile and Viabile sperm percentage of the treatment group before treatment were 2.1 vs. 3.1ml, 21 vs. 41million, 21% vs. 51%, 28% vs. 47% and 36% vs. 72% respectively, which a noteworthy increment ($P < 0.05$).

Additionally a significant drop in sluggish and non-motile sperm percentage, as well the teratospermia percentage (47% vs. 23%, 43% vs. 26% and 58% vs. 29% respectively) was beheld. ($P < 0.05$).

Table (1): Semen parameters before and after 3months treatment with L. carnitine

Parameters	Mean \pm S.D. before	Mean \pm S.D. after
Volume (ml)	2.10 \pm 0.39	3.12 \pm 0.74*
Count	21 \pm 2.3546	41 \pm 3.7651*
Active	28 \pm 5.887	47 \pm 6.416*
Sluggish	47 \pm 5.226	23 \pm 3.709*
Non Motile	43 \pm 5.472	26 \pm 3.756*
Normal	21 \pm 4.561	51 \pm 5.103*
Abnormal	58 \pm 5.082	29 \pm 4.110*
Viability	36.88 \pm 12.31	72.7 \pm 5.2*

* P value < 0.05

As it is clear in table 2, after 3 months of 2gm of L-carnitine for the selected infertile patient with hypofertility, a significant decline in the serum levels of gonadotropins (FSH, LH) 9 vs. 5 IU/L, and 6 vs. 4 IU/L respectively. On the other hand, a notable elevation in serum testosterone and inhibin B levels (4 vs. 7 ng/ml and 99 vs. 232 pg/ml respectively) have been recorded.

Table (2): Hormonal assay before and after 3months treatment with L. carnitine

	Before L-carnitine	After L. carnitine
FSH (IU/L)	9.534(\pm 1.418)	5.650(\pm 0.721)*
LH (IU/L)	6.346(\pm 9.112)	4.234(\pm 1.109)*
Testosterone ng/ml	4.556(\pm 1.167)	7.122(\pm 0.571)*
Inhibin B pg/ml	99.436(\pm 6.472)	232.756(\pm 5.945)*

* P value < 0.05

Discussion

In the near past time, male has not been accused as a cause of infertility. Male hypo-fertility has no distinct existence but it displays a diversity of pathophysiologic mechanisms. Sperms in the environment of Epididymis use a various substrates as sources of energy, but oxidation of fatty-acid which involves carnitine dependent system appears to be the crucial energy vouchsafing operation⁽²²⁾.

Mazzilli et al divulged a solid relation between spermatocytic cytoplasmic L-carnitine reserve with spermatocytic activity and viability in the mucus of uterine cervix of bovine. This correlation could be described by the fact that fats are prime energy resource for sperms in cervical mucus plug and to utilize these fats, it is important to have adequate cytoplasmic spermatocytic L-carnitine. L-carnitine not only aids in metabolism of lipids, but it adjusts the hoards of the free CoA as well, which is vital for tri-carboxylic acid cycle adjustment. That's why, L-carnitine reserves can be regarded as an index of spermatocytic activity extent in cervical mucus.²³

The refinement in the fertility tally achieved by L-carnitine supplement allocated by the noteworthy upgrading in sperm concentration and total counting, volume of ejaculate and proportion of highly motile spermatozoa in our trial could be explained by the inkling

that L-carnitine is a vital cofactor that may enhance lipid metabolism and play a crucial role in mitochondrial beta-oxidation of long-chain fatty acids for cell life maintenance and energy production.^(24,25)

A controlled trial conducted in (2004) by Lenzi et al. written account of a noteworthy relations between LC/LAC and ameliorations in all seminal indices in 56 infertile males with unexplained Oligo-Asthenospermia who treated by 2 g/day of LC and 1 g/day of L-acetyl carnitine (LAC) for a 180 days duration.⁽²⁶⁾ An observational study of infertile men conducted by Haseen and his team research in (2017) approved that free LC seminal proportions were further down in hypo-fertile male than in control group, and a sturdy positive relations were noticed between semen plasma LC proportions and sperm number, activity, and normal morphology.⁽⁴¹⁾

A randomized trial conducted by Ramesh Babu and his team in (2004), described an increment with significant differences ($p < 0.05$) in the mean FSH and LH levels in all of non-fertile males studied when compared with the control arm of the study. Though, difference in the mean levels of testosterone in both arms was insignificant.⁽²⁸⁾ Reports as early as (1994) demonstrated by Zabul and followers when they established that gonadotropin (FSH and LH) levels were significantly higher in non-fertile men in comparison to the levels in controls with proved fertility.⁽²⁹⁾

FSH is mandatory for initiation of production and evolution of spermatozoa. FSH is regarded as a reliable marker of damage of germinal epithelium, so it's found in higher concentration, in the sera of hypo-fertile men, and it was shown that this elevation is associated with azoospermia and severe oligozoospermia.⁽¹⁹⁾

Upswing of seminal fluid indices, after 3 months of 2gm daily dose of L-carnitine that has been noticed in our trial suggesting the boosted spermatogenesis and maturation of spermatozoa that seemed to be governed by the antioxidant power of L-carnitine, and by enhanced level of serum testosterone. While the induced spermatogenesis, and increased levels of serum testosterone and inhibin hormones may be the stand behind factors that resulted in reduction of LH and FSH hormones levels by its negative feedback effects.

Conflict of Interest - (nil – There are “No Conflict of Interest”).

Source of Funding - By both researchers (**self**).

Ethical Clearance: Committee members are approved to perform a study about “The impact of L-carnitine supplement on semen variables and the levels of sexual hormones (Serum LH, FSH, Testosterone, and Inhibin) in males with infertility” after discussion of study plan with researchers.

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Assessment of the Understanding of Medical Ethics Subject among Anbar Medical Group Students

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Abstract

Background: Future doctors and medical students are expected to learn about the important moral ethical communication with their patients and health care personnel.

Objectives: The study aimed to have opinion of medical students on medical ethics education.

Methodology: Cross sectional study carried out in both medicine and pharmacy colleges of at Anbar University for a period extended from 4th of November 2018 till the 28th of May 2019. The study was conducted on total sample size of 211 both males and females in medical and pharmacist students at Anbar University who age group ranging from 20-24 years old.

Results: About 86.3% of students under study believe that medical ethics subject is important in the curriculum of medical group colleges so as to learn basic knowledge of attitude (47.8%), and about 48% have the opinion of taking such subject in the first/second year of college. At the same time, 45.6% of students believe that the subject is boring and patient communication lecture was the highest percentage (47.9%) chosen by students as the most important item among the medical ethics subject.

Conclusion: Low perception and knowledge about the importance of medical ethics subject among medical group students in their near future career.

Keywords: *Understanding, Medical Ethics, Medical students*

Introduction

Huge social change is undergoing and people is aware of social determinants of health, so nowadays, the public has a negative view and low trust towards medical doctors because they believe that doctors are putting their own interests before those of their patients. These believe has resulted in reducing the compliance of the patient and increasing the communication conflict between doctor and his patient⁽¹⁾. For these reasons, doctors should be aware of these determinants that influence patients'; and a process of effective and good doctor-patient communication should be established to improve patient compliance and recall, adherent to treatment and even symptom reduction. In addition community participation, health services and social groups can share and built right communication between the two sides^(2,3).

Healthcare professionals should understand ethical communication with their patient and begin to practice it in their career which includes, autonomy, justice, beneficence and non-maleficence⁽⁴⁾. Hippocratic Oath and Helsinki declaration put these ethical philosophies to be practice in real medical life⁽⁵⁾. Although in developing countries this item and matter it is still challenging, but future doctors should learn these moral ethical principles and such programme for medical professional ethics shouldn't be weak in such countries⁽⁶⁾.

Incorporating ethical elements into the medical group education curriculums is an ongoing process in medical institutions and it gives an accreditation of medical schools⁽⁷⁻⁹⁾.

Medical students as future healthcare professionals better to enhance their knowledge on professional practice and safeguarding ethics and their rights as well

as their patient's rights⁽¹⁰⁾.

Assessment of the students is also required in medical ethics education, just like in other fields of medicine^(10, 11). Proper assessment of students should be performed in a way to ensure efficiency of ethics education and to help students recognize the humanitarian aspect of medicine and gain necessary skills to analyze ethical dilemmas in clinical practice⁽¹²⁾.

Medical students in Iraq in the last three academic years in the college are in direct clinical practice experience with health care personal and with patients in both hospitals and primary health care centers, while in the last academic year, pharmacy students are in orientation and clinical practice with health care services and patients. The current study aims to assess the knowledge of medical and pharmacy students in Anbar University for medical ethics subject and practice.

Methodology

After taking the ethical approval from both medical and pharmacy colleges, informed consent and permission from students, this cross sectional study carried out in both college of medicine and pharmacy in Anbar University for a period extended from 4th of November 2018 till the 28th of May 2019. The study was conducted on total sample size of 211 both males and females in medical (4th, 5th and 6th grades) and pharmacist (3rd, 4th, 5th grades) students at Anbar University who age group ranging from 20-24 years old. A non-response rate or incomplete information of 6% only.

All students in all grades included in the study have taken medical ethics subject in their curriculum "medical students at fourth, fifth, & sixth grade, while pharmacy students at third, fourth, & fifth grade".

The questionnaire include demographic characteristics of students (age, grade, type of study, and gender) in addition to questions related to the importance of medical ethics, about the year they prefer to take the subject, ethical attitude towards different aspects of the subject in college and hospital. Their relationship with medical staff in their future career. Questions about the intension to apply what they have learned in their career and the fields covered by the curriculum lectures in medical ethics were also included.

The questionnaire form has been distributed to students and was collected at the end of the day, some

students have the time and opportunity to answer the questions immediately through closed and opened ended questions.

Data and variables were coded and entered in IBM SPSS Statistical Packages for Social Sciences version 25. Data were presented as frequency and percentages and descriptive results were done for each questionnaire in form of tables and charts.

Results

Table 1 describes the basic characteristic of study population of students. Male represent 43.6% in the study while female were 56.4% of the total sample size. 54.4% were medical students (fourth, fifth, & sixth grade) and 45.5% were pharmacy students (third, fourth, & fifth grade).

Table 1: The basic characteristic of study population (n=211)

		No	%
Gender	Male	92	43.6
	Female	119	56.4
College	Medicine	115	54.5
	Pharmacy	96	45.5
Grade	Third pharmacy	34	16.1
	Fourth pharmacy	38	18.0
	Fifth pharmacy	24	11.4
	Fourth medicine	46	21.8
	Fifth medicine	27	12.8
	Sixth medicine	42	19.9

Regarding medical ethics subject, table 2 shows that 86.3% of students agreed that medical ethics is important subject in medical and pharmacy colleges curriculum "and better to be taken at first/second years of study (47.9%)". 47.8% of students think that it is important as it provides basic knowledge to student's attitude while only 7.7% relates its importance as it is studied in all other universities and it provides students with guidelines (44.5%).

Table 2: The importance of medical ethics subject

		No	%
Think the subject is important	Yes	182	86.3
	No	29	13.7
Why it is important	Basic knowledge to attitude	87	47.8
	Important & studied by other universities	14	7.7
	Provide students with guidelines	81	44.5
At which year students prefer to take the subject	First/Second year	101	47.9
	Third year	64	30.3
	Fourth year/Higher	46	21.8

Results of the study revealed that 73.0% of the students like the subjects and finding it interesting (46.8%), easy (34.4%), good marks can be get in it (11.7%), taught in good aspect by teachers (2.6%), the subject focused on important ethical issues (1.3%), and finally help them to learn how deal with patients in good manner (3.2%). The rest (27.0%) who did not like the subject, they believe that the subject is boring (45.6%), has no clinical knowledge (35.1%), difficult to be understood (3.5%), and teacher couldn't deliver the subject properly (15.8%) (Table 3).

Table 3: Students like the subject or not and why.

		No	%
Do you like the subject	Yes	154	73.0
	No	57	27.0
Why do you like the subject	Interesting	72	46.8
	Easy	53	34.4
	Good marks can be get in it	18	11.7
	Taught in good aspect by teachers	4	2.6
	Focusing on important ethical issues	2	1.3
	Learn how to deal with patients in good manner	5	3.2
Why you did not like it	Boring	26	45.6
	No clinical knowledge	20	35.1
	Difficult to be understood	2	3.5
	Teachers could not deliver the subject properly	9	15.8

The intension of students was explored and showed that 38.9% would always apply what they have learned in their future career while only 8.5% reported that they rarely or never use it later on in practice life (Table 4).

Table 4: The intension of students to apply what they learned.

		No	%
Do you have the intension to apply what you have learned in your career	Always	82	38.9
	Not always	50	23.7
	May be	61	28.9
	Rarely	10	4.7
	Never	8	3.8

Regarding items provided by lectures, table 5 shows that patient communication item was among the highest percentage (47.9%) chosen by students, then confidentiality, respect patient, and relationship with other colleagues (27.0, 26.5 & 24.6% respectively) followed by euthanasia (16.1%).

Table 5: The opinion about the most important lecture in the subject.

		No	%
In students opinion, the most important lecture they took that will be of concern about in their career	Patient communication	101	47.9
	Confidentiality	57	27.0
	Respect patient	56	26.5
	Relationship with colleagues	52	24.6
	Euthanasia	34	16.1
	Medical report	16	7.6
	Anonymous	8	3.8
	Breaking Bad News	2	0.9

Table 6 describes how to deal with colleagues mistakes, 34.6% believed they should give him an advice after his mistake while 22.7% believe one should correct his mistake, tell other colleagues (14.2%), warn hospital management (11.4%) and even tell his patients about the mistake (10.9%).

Table 6: Dealing with colleagues' mistakes and deal with other health staff.

		No	%
How would you deal with your colleagues mistakes	Give him advice	73	34.6
	Try to correct the mistake	48	22.7
	Tell other colleagues about him	30	14.2
	Warn hospital management	24	11.4
	Tell his patient	23	10.9
	Do nothing	6	2.8
	Don't know	7	3.3

Discussion

In the recent years ministry of higher education in Iraq has been focusing on such subject to be enrolled in the curriculum of medical group colleges including medical, dentistry and pharmacy colleges because of its important for future doctors and pharmacist. In our study, although about (86.3%) of students agreed that the medical ethics is important subject in their curriculum and only (13.7%) of them consider it not that important. Also in our study (44.5%) of students think it gives students and future doctors guidelines for their career in medical practice while (45.6%) and (35.1%) they think medical ethics subject and practice are boring and lack of clinical knowledge respectively. These findings in our study are in agreement with the results reported by other studies that highlighted the presence of major important gaps in knowledge and attitude of doctors in recognizing autonomy, patients' right and ethical principles importance their profession⁽¹³⁻¹⁶⁾. Cruess *et al.* alerts the fact of medicine has lost the autonomy in addition to the influence throughout the world⁽¹⁷⁾. Although our study was mainly on students but it reflects their thinking and attitude towards medical ethics in the near future, as we found in the current study that only 38.9% of students will "always" apply what they have learned in medical college about medical ethics and commitments.

Saeed & Al-Jawadi (2017) in their article identify that 50% of participant in study was not sure about physician's commitment towards their patients and that there physicians are focusing mainly on clinical practice more than ethical practice⁽¹⁸⁾. In our study, about (48%) chose first/second grade in medical group colleges to give medical ethics subject and (30.3%) chose third year medical group colleges to give such subject. In a study done by Sadaf *et al.* suggested that it is important to give these components of medical ethics to third year medical students so as to build trust and respect relationships with patients⁽¹⁹⁾. In this study, (4.1%) of students claim that the teacher couldn't deliver medical ethics subject to students, this make us to think to change learning activities approach or tools such as role play exercises, programmers and interactive seminars⁽²⁰⁾.

In conclusion, low perception and knowledge about the importance of medical ethics subject among medical group students to their near future career. Still medical students thinking towards clinical practice side and view more than ethical side and this give us alarming sign to change learning tools used in teaching such

essential subject in their medical curriculum. Patient communication was among the highest percentage chosen by students concern among other different lecture items. More efforts should be done by the college, department and lecturers to give rise to new teaching approach to this subject and to decide on which grade it should be given to medical group students.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Isolation and Identification of Facultative Anaerobic Bacteria from Feces of Pet Dogs

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Abstract

A fifty fecal swabs (25 from Anbar province and 25 from Salahuddin province) were collected from both sexes dogs with different global breeds, different ages. These swabs were cultured onto blood, nutrient and MacConkey agars, then the colonies were purified on nutrient and MacConkey agars. A gram stain and biochemical tests were done including catalase, oxidase and TSI. The results of isolation and identification showed that *Salmonella* spp. were isolated from 5 out of 14 puppies (35.7%), while *E. coli* from 9 (64.3%) and *Serratia* spp. from 1 (7.1%), whereas, from adults, *salmonella* spp. isolated from 9 (25%) dogs and *E. coli* from 24 (66.7%) out of 36 adult dogs.

It is concluded that *Salmonella* spp. and *E. coli* are the most prevalent in asymptomatic dogs and puppies in Anbar province and Salahuddin which means that the dogs are a reservoir for these bacteria and it is considered as a bad indication for transmission of this pathogen to human being and other animals.

Key words: Facultative anaerobic, dog, *E. coli*, *Salmonella*, puppies.

Introduction

Dogs are the pet animals that have been kept from 14 centuries, numerous studies have shown that pets play an important role in human life, and the infected pets threaten the lives of individuals, especially those immunocompromised, it has been found that pet dogs that live in contact with human have a significant role in transmitting diseases to their own^(1; 2).

Dogs transmit viral and bacterial diseases to humans being through saliva, contaminated feces and urine or via direct contact, and the most important bacteria that transmitted by dogs are *Salmonella* spp., *Yersinia* spp., *Capnocytophaga* spp., *Coxiella burnetii*, *Staphylococcus intermedius* and *Leptospira* spp., in addition to MRSA⁽³⁾. It has been documented that dogs are potential reservoirs of pathogenic *Salmonella* spp. and *E. coli*⁽⁴⁾. The most common sources of *Salmonella* spp. and *E. coli* in dogs are from chicken and meat that undercooked⁽⁵⁾.

The subclinical carrier cases in dogs are regarded as the common form of salmonellosis seen in dogs which shed these organisms in feces without showing clinical

signs and contaminate the surrounded environments⁽⁶⁾.

It has been reported that the prevalence of dogs which carry *E. coli* is 26.9%⁽⁷⁾, whereas⁽⁸⁾ reported that the *Salmonella* prevalence in dogs varies greatly between 5% to 70%.

The most prevalent bacteria isolated from dogs were *Salmonella*^(9; 10, 11, 12), *E. coli*^(13, 14, 15; 16).

This study was aimed to isolate the facultative anaerobic bacteria from canine feces.

Materials and method

Animals

From March 2019 to the end of April 2019, A fifty dogs (25 dogs from Anbar province and 25 from Salahuddin province) from different global breed and both sexes at 2 months-6 years of age were used in this study.

Examination of animals

All animals were examined clinically for

temperature, pulse and respiratory rates and for presence of any abnormal clinical signs.

Collection of the Samples:

A fifty fecal swabs with transport media were collected and transported anaerobically by special containers to the college of veterinary medicine, universities of Fallujah and Tikrit lab's for bacterial isolation and identification.

Bacteriological examination:

The isolation and identification of bacteria from samples were done according to (17), all swabs were cultured on nutrient, blood and MacConkey agars and incubated for 24-48 hours. at 37°C. in anaerobic jar with 10% CO₂. The colonies were subjected to Gram stain, then suspected isolates subcultured on MacConkey, EMB

and nutrient agars for purification and characterization of the colonies. Catalase, oxidase and other biochemical tests includes TSI, Indole and citrate were done for identification of the isolated bacteria.

Results

All animals that were clinically examined showed normal signs and parameters and appeared to be healthy.

1. Bacteriological isolation:

In the present study, culturing of faecal samples from 50 dogs and puppies revealed a presence of some gram negative bacteria including *E. coli*, *Salmonella* spp. and *Serratia* spp.

Cultural and biochemical characteristics of different species of bacteria isolated from faecal samples of affected dogs are depicted in figure 1.



a) *Salmonella* spp. on SS agar



b) *E. coli* on EMB agar



c) Indole for *E. coli*



d) TSI, *Salmonella* spp. on right and *E. coli* on left

Figure 1. Different cultural appearance and biochemical tests

2. Rate of infection

Out of 14 puppies, only 5 (35.7%) had a subclinical infection with *salmonella* , 9 (64.3%) with *E. coli* and 1(7.1%) with *Serratia* spp., while the adults revealed 9(25%) dogs with *salmonella* spp. and 24 (66.7%) with *E. coli*, while there was not infection with *Serratia* spp. (Table 1).

Table (1) Rates of subclinical infection with *Salmonella* spp., *E. coli* and *Serratia* spp. of puppies and adults.

Animals	No. of animals	Animals positive For <i>Salmonella</i> spp.	%	Animals positive For <i>E. coli</i>	%	Animals positive For <i>Serratia</i> spp.	%	Animals negative for culturing	%
Puppies	14	5	35.7	9	64.3	1	7.1	0	0
Adults	36	9	25	24	66.7	0	0	2	5.6
Total	50	14	28	33	66	1	2	2	4

Discussion

Many studies were done to estimate the incidence of *Salmonella* spp. in puppies and dogs, Carter and Quinn⁽¹⁸⁾ and Sanchez *et al.*⁽⁶⁾ found that the percentages of *Salmonella* in clinically appeared healthy dogs was ranged between 0- 44 % , this results were in agreement with our results.

At the opposite side, the current results were disagree with many researches, the study of Shimi *et al.*⁽¹⁹⁾ in Iran was performed to detect *Salmonella* in feces of 181 dogs, they found that 28 (15.5 %) were carry the *Salmonella*. Also, Kocabiyik *et al.*⁽²⁰⁾ found that dogs positive for *Salmonella* were 11 % in Turkey, also , Fukushima *et al.*⁽²¹⁾ examined stray dogs that appeared healthy and found that the percentages of carrying *Salmonella* was 5.9 % in Japan. While the percentages of *Salmonella* in feces of stray dogs found in Taiwan were 6.3 %⁽²²⁾.

The reason for presence a higher percentages of *Salmonella* as observed in our study may be due to the potentially higher exposure of dogs to this genus of bacteria.

The results of the current study are compatible with the results of Ojo *et al.*⁽⁷⁾ who showed that the percentage of *E. coli* in apparently healthy dogs was 26.9% , while the presented results were disagree with Beutin⁽²³⁾ who examined the healthy dogs for presence of *E. coli* and they found that the percentages of this bacteria ranged

from 3.2 to 12.3%. Also, it has been reported that the percentages of *E. coli* was 1.1% in healthy dogs⁽²⁴⁾, while in Japan was 0.16%⁽²⁵⁾.

Serratia spp. and *Escherichia coli* were also isolated from bacteriological culture of fecal swabs obtained from dogs^(26;27).

Hancock *et al.*⁽²⁸⁾ reported that the higher percentages of *E. coli* and other bacteria is due to younger age susceptibility, transport, sudden alteration in feed and using of antimicrobial therapy which may lead to disorder in microflora of intestine.

Conclusion

These results refer to that large percent of dogs that appear clinically healthy may carry *E. coli*, *Salmonella* spp. or other bacteria and may be act as a source for infection to human being and other animals , and this is considered as a bad indication for transmission of these pathogens to human , and the dogs act as a good reservoir.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Molecular characterization of *Eae* and *Stx_s* genes for *E. coli* O157:H7 isolates from Calves

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Abstract

This study aimed to detect *eae* and *Stx* genes of thirty two *E. coli* O157:H7 isolates recovered from calves. These isolates were isolated and identify by traditional methods of culturing and latex agglutination test from fecal swabs of four diarrheic calves and twenty eight apparently healthy calves. The *eae* and *Stx* genes were detected by a realtime PCR applied on the extracted bacterial DNA. The results showed that 19 isolates had *stx1* gene, 10 isolates had *stx2* gene and 17 isolates had *eae* gene. It is concluded that molecular characterization by using real time PCR is a good test for confirming infection with *E. coli* O157:H7 and detection of their *eae* and *Stx* genes .

Keywords: Real time, PCR, *stx*, *eae*, Calves, *E. coli* O157:H7.

Introduction

Escherichia coli regarded as one of the main cause of calf diarrhea in newborn livestock, by causing high economic losses, the prevalence of enterohemorrhagic *E. coli* (EHEC) in calves with diarrhea ranged between 70 – 75.6 %⁽¹⁾. It has been stated that cattle may act as reservoir for EHEC⁽²⁾. Also, Osman *et al.*⁽³⁾ reported a prevalence of O157 serotype in 63.6% of their studied calves.

Escherichia coli strain O157:H7 is one of the most significant bacteria that convey by the food, it mostly cause a series of clinical signs , such as diarrhea, haemorrhagic colitis and hazardous problematics in other body organs or systems. It have many virulence factors, most significant one was *Stxs*⁽⁴⁾, therefore, the strain nomenclatured as shiga-toxic *E. coli* (STEC)⁽⁵⁾.

It infects adult cattle even the calves⁽⁶⁾; human being⁽⁷⁾; ovine⁽⁸⁾; canine⁽⁹⁻¹¹⁾ and other animals , and may cause fatal disease in human being and other animals,

The most significant confirmatory tests used for detection of ETEC and STEC are PCR⁽¹²⁾ or realtime PCR (RT- PCR)⁽¹³⁾ which is considered as an appropriate, dependable way for confirmatory diagnosis of *E. coli* O157:H7⁽⁹⁾.

The aim of the presented study was to corroborate the *eae* and *stx* genes of virulent *E. coli* O157:H7 isolated from calves by using realtime PCR.

Material and Method

Source of bacteria : A number of 32 isolates of virulent *E. coli* O157:H7 were used in this study and obtained from college of veterinary medicine / University of Fallujah and were confirmed previously by⁽³⁾.

Bacteriological Method: All 32 isolates were identified as shown in a previous study⁽¹⁴⁾ prior to the PCR test to confirm the presence of *Eae*, *Stx1* and *Stx2* genes.

Serotyping was made as mentioned in⁽¹⁴⁾ and⁽¹⁵⁾.

PCR assay:

This test was performed on the thirty two virulent *E. coli* O157:H7 strains, a bacterial DNA extraction was done by using Geneaid kit, USA. The assay of RT- PCR was done via using Applied Biosystems™ RapidFinder™ STEC Screening Assay in Sacace Real-Time PCR System. A twenty eight micron of water free nuclease was added to two micron of DNA. The conditions of RT- PCR were adjusted as follows: hold at

95 °C for 2 min., then denature at 95°C for 1 second and lastly, anneal/ extend at 60 °C for 20 seconds, for 40 cycles.

Results and Discussion

The RT- PCR assay of the examined virulent isolates exposed that nineteen isolates had *stx1* gene and 10 isolates had *stx2* gene , while 17 isolates had *eae* gene and this is compatible with previous results of Yousif and Hussein, 2015 who found the same results by using conventional PCR on the same isolates (Fig. 1).

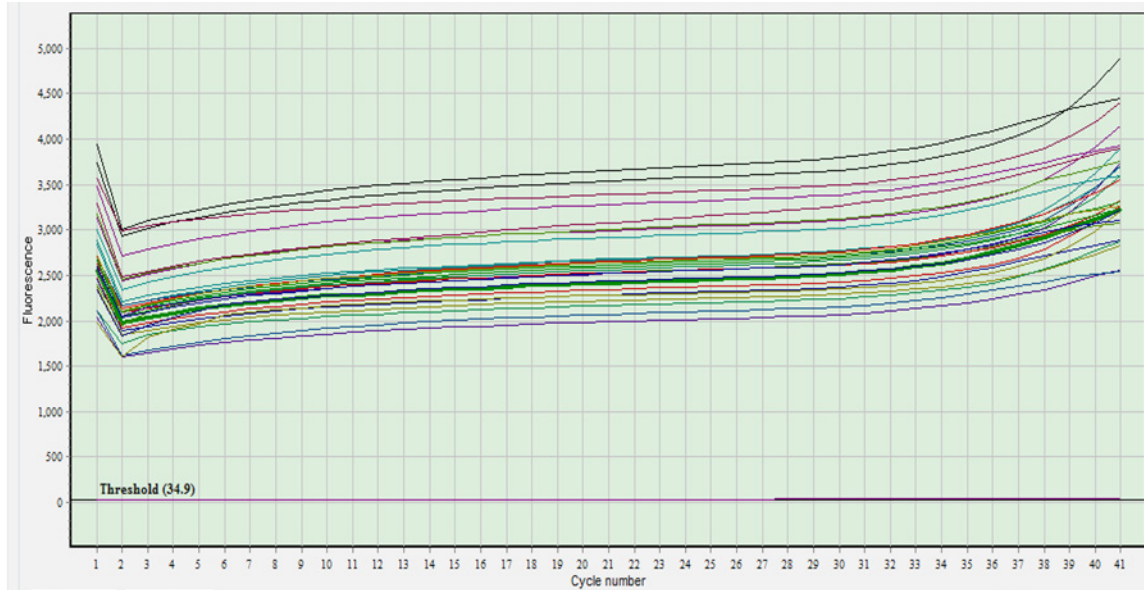


Figure (1) Results of RT-PCR, positive samples were Cycle Threshold (CT) less than 35

It has been reported that RT-PCR is a screening and effective method for detecting shigatoxigenic *E. coli* from fecal samples ⁽¹⁶⁾.

The current results were in compatible with results of Rebekka *et al.* ⁽¹⁷⁾ who reported that real-time PCR has a high sensitivity and accuracy for recognition of EHEC and they mentioned that RT- PCR is a quick method for detection presence or absence of EHEC.

RT- PCR method described as a “golden test” for identification of EHEC ⁽¹⁸⁾. Other studies reported similar results, where Abbasi *et al.* ⁽¹⁹⁾ reported that the RT- PCR conventional form is the quicker and more accurate assay and it doesn’t need any other ways for confirming the diagnosis when it used to detect the incidence of virulence factors of *E. coli* isolated from diarrheic children, as well as , Mondani *et al.* ⁽²⁰⁾ used RT-PCR for detect STEC, they found that this test have many advantages from these: reduction the time and reducing the limitations which found in alternative traditional tests.

Also , a study done to estimate the efficacy of RT-PCR test in testing the presence or absence the virulence

genes *rfbO157*, *Stx1*,*Stx2* from pediatric stool samples, out of fifty nine samples that positive for PCR, a twenty nine samples were +ve for *Stx* and they concluded that this test is quick way for diagnosis STEC in pediatric ⁽²¹⁾.

Conclusions

The Real time PCR test is an exact method for specific recognition of EHEC O157:H7 and their *eae* and *Stxs* genes.

Ethical Clearances: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Estimation of Serum Cystatin-C as early marker of Kidney Dysfunction in correlation with Serum Ferritin among β -Thalassemia Major Patients

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Abstract

The Cystatin C is early predictor for evaluation the kidney functions. The Serum Cystatin C is a cysteine proteinase inhibitor, that the nucleated cells produce it at stable rate. It is filtered through the glomerular filtration membranes of kidneys, and the filtration rate will be unaffected by external factors. A group of recessively inherited hemoglobin disorders called Major Beta-thalassemia and considered the most common genetic disorder all over the world, which could be noticed by the reduction in of β -globin chain synthesis.

Objective: To study Serum Cystatin-C estimation as early marker of renal function in relation with other parameters in beta thalassemia patients.

Materials and Method: A case-control study was executed on thalassemia patients between February and April 2019 at Al-Zahra'a Teaching Hospital in Najaf/Iraq.

Results: the results in this study showed there are significant differences ($p \leq 0.05$) between major beta thalassemia patients and control group in regarding to hematological parameters. The result of biochemical parameters showed there are variations between patients and control where there were significant statistical increases in our thalassemic patients comparing to the control about Cystatin-C (1.27 ± 0.33 and 0.7 ± 0.24 ng/ml respectively).

Conclusion: the cystatin -C is useful marker at major beta thalassemia patients that suffering from renal dysfunction.

Keyword: cystatin -C, Ferritin, liver enzymes.

Introduction

A group of recessively inherited hemoglobin disorders called Major Beta-thalassemia and considered the most common genetic disorder all over the world, which could be noticed by the reduction in of β -globin chain synthesis⁽¹⁾. Most of the types come from severe anemia that requires even transfusion of the blood. For fifth decades of life, the grouping of chelation treatment and transfusion has lengthened the

life of thalassemia cases^(2,3). The totally insufficient production of hemoglobin Hb A ($\alpha_2\beta_2$) in human adult is the Thalassemia disease, which is produced from the absence or decrease in the synthesis of alpha α - or beta β - globin chain and thalassemia is categorized into α and β thalassemia based on those chain disorders. Important medical indications of these patients are severe anemia, hemolysis, and ineffective erythropoiesis^(4,5). The autosomal receding genetic anemia is Beta-thalassemia major (β -TM) in which there is a lack in creating of 1 globulin chain resulting hemoglobin (Hb) molecule. Generally, in the first year of life, blood transfusion is needed for patients of beta thalassemia⁽⁶⁾. For instance, renal difficulties are one of the new unrecognized difficulties appeared with the progresses in chelating

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and treatment agents of β -TM patients (7). Numerous researches proved that common difficulties among β -TM patients are low urine osmolarity, aminoaciduria, proteinuria, dysfunction, and proximal tubular (8,9). All human nucleated cells can secrete and synthesize the Cystatin-C, which is a low-molecular-weight non-glycosylated protein, and has the ability to inhibit cysteine protease (10). Cystatin-C is not reabsorbed back into the serum or secreted by the renal tubules due to its sensitivity as a biomarker for glomerular filtration rate (GFR). It is better than creatinine clearance in the renal function impairment diagnosis, because muscle mass, diet, sex, and height could not affect it (11). Cystatin-C is a cysteine protease inhibitor that is secreted into the blood after it is synthesized from all human cells. In comparing to the creatinine clearance, the benefit of measuring Cystatin-C is that height, sex, diet, and muscle mass could not affect it (12).

Materials and Method

A case-control study conducted between February to April 2019 in the Thalassemia Center at the Teaching Hospital of Al-Zahra'a in Najaf/Iraq. A group of 40 β -thalassemia major intermedia patients (10 females and 30 males) have been enrolled in this research, as well as 40 healthy control, ranged between 4 and 20 years old. Both control and patients were matched in gender and age. 5ml of blood was taken from beta-thalassemia patients as well as from healthy control for *biochemical tests*.

The patients are employed for measuring of the following parameters:

1. *Determination of Human CST3 (Cystatin C) concentration in serum by using ELISA kit performed by (Abcam, USA).*
2. *Determination of Creatinine concentration in serum using automated chemistry instrument from LANDWIND Company.*
3. *Determination of urea concentration in serum using automated chemistry instrument from LANDWIND Company.*
4. *Determination of ALP concentration in serum using automated chemistry instrument from LANDWIND Company.*

5. *Determination of AST concentration in serum using automated chemistry instrument from LANDWIND Company.*

6. *Determination of ALT concentration in serum using automated chemistry instrument from LANDWIND Company.*

7. *Determination of hematological parameters (complete blood count) by using automated hematological analyzer instrument from MINDRY Company.*

Statistical Analysis

Statistical Package for Social Sciences (SPSS) program version 24 has been used for data analysis. T-independent test was used to find the variances between patients and control, the results were expressed as (Mean \pm SD). Pearson correlation coefficient (r) were calculated to evaluate the correlation between parameters. A p-value of (<0.05) has been considered significant and (<0.001) has been considered highly significant.

Results and Discussion

Hematological Parameters of Study Groups

Our study included 40 beta thalassemia major patients their age ranging between 4-20 years (30 males and 10 females), and the control group included 40 healthy participants their ages and sex mated with patients group. There were statistically highly significant differences between beta thalassemia major patients and control as regarded with hematological parameters (CBC) included in this study, sever anemic presentation were seen in patients indicated by the levels of hemoglobin (7.7 ± 1.2) (13.8 ± 1.1) and RBCs count (3.83 ± 1.01) (5.22 ± 1.4) in comparison with the control. The hypochromic microcytosis observable in patients than control with MCH and MCV values (17.2 ± 2 fl) and (62.3 ± 6 pg) in patients compared to (30.7 ± 2.6 fl) and (84.7 ± 5.4 pg) in controls, with p-value 0.001 for both. In addition, a remarkable significantly increases in platelets count reported in patients (378 ± 80.3) as compared with control (246 ± 82.7) with p-value 0.001. Furthermore, a highly important leukocytosis also realized in patients than control (11.12 ± 1.18) and (7.04 ± 1.8) respectively (table 1).

Table 1. Hematological parameters of study groups

Parameters	Patients (n=40)	Control (n=40)	P-value
	Means ± SD	Means ± SD	
Hb g\dl	7.7± 1.2	13.8±1.1	<0.001**
MCV(fl)	17.2±2	30.7±2.6	<0.001**
MCH (pg)	62.3± 6	84.7±5.4	<0.001**
RBCX 1012/L	3.83±1.01	5.22±1.4	<0.001**
WBCX 109/L	11.12±1.18	7.04±1.8	<0.001**
PLT 109\ L	378±80.3	246±82.7	<0.001**

** : highly significant

The beta-thalassemic patients enrolled in the present study showed a significantly changed specially with red blood cell mass (RBC count and Hb) in association with RBCs indices (MCV and MCH) attendant to a significantly observable microcytosis, the plain anemic appearances have been seen in the patients where hemoglobin levels as comparing with the controls. The RBC related differences are also related to an important secondary leukocytosis and thrombocytosis, these results agrees with Hagag et al. ⁽¹³⁾, and Ayyash & Sirdah ⁽¹⁴⁾. Arshad et al. ⁽¹⁵⁾, described that thalassemic patients have different problems related with less Hb level, because of the reduction of erythrocyte numbers and lessened values of RBC indices (MCV, MCH, MCHC, HCT). So, those patients undergo anemia resultant in less oxygen content in blood. The study carried out by Shanthi et al. ⁽¹⁶⁾, concluded that the decreasing in the RBCs count, PCV and levels of Hb, that detected in beta thalassemia patients are because of continuous breakdown of erythrocyte and increased early degradation, as the presence of abnormal globin molecule leads to erythrocytes ruptured before maturation. Regarding to leukocytosis and thrombocytosis in our thalassemia patients due to the severe anemia that complemented by hyper cellular (thrombocytosis and leukocytosis) that causing encouragement of erythropoietin hormone which acts on bone marrow to increase proliferation of

blood cells, or resulting from the activation of immune system by receiving blood from various donors ⁽¹⁷⁾.

Biochemical Parameters of Study Groups

The result of biochemical parameters showed a variation in the serum level (Cystatin-C, ferritin, creatinine, urea and liver enzymes includes AST, ALT and ALP) in beta thalassemia major patients as compare with control. When compared to control, there were statistically significantly increase in the our thalassemic patients regarding Cystatin-C (mean=1.27±0.33 and 0.7±0.24 ng\ml respectively), Ferritin (mean=3480±232 and 90.6± 43.5ng/ml respectively), Creatinin (mean=1.02±0.4 and 0.5±0.16 mg\dl respectively), Urea (mean=25.9±4.8 and 17.4±3.9mg\dl respectively),AST (mean=67.47±26.3 and 23.14±8.1U\l respectively), ALT (mean= 75.79± 28.6 and 21.49±8.81 U\l respectively), and ALP (mean=289.78±113.43 and 97±52.12 U\l respectively) table (2). There was statistically positive correlation between creatinine and cystatin (fig.1) (r=0.569) and urea (fig.2) (r=0.137), the result agrees with Behairy et al. ⁽⁶⁾. In accordance with our results, Elbedewy et al., concluded that beta thalassemia major patients suffer from glomerular and tubular dysfunction due to poor chelation therapy and inadequate transfusion ⁽¹²⁾.

Table 2: Biochemical parameters of study groups.

Parameters	Patients (n=40)	Control (n=40)	P-value
	Means ± SD	Means ± SD	
Cystatin C (ng/mL)	1.27±0.33	0.7±0.24	<0.001**
Ferritin ng/ml	3480± 232	90.6± 43.5	<0.001**
Creatinine (mg/dl)	1.02±0.4	0.5±0.16	<0.001**
Urea (mg/dl)	25.9±4.8	17.4±3.9	<0.001**
AST U/L	67.47±26.3	23.14±8.1	<0.001**
ALT U/L	75.79±28.6	21.49±8.81	<0.001**
ALP U/L	289.78±113.43	97±52.12	<0.001**

** : highly significant

The DFO, iron overload, chronic hypoxia, and long-standing anemia implicated in the mechanisms of tubulopathy in patients with β-thalassemia major (6). In the current study, there were highly significance increases in the levels of urea, creatinine, ferritin, cystatin shown by thalassemic patients. These results were in agreement with Ali and Mohmoud, as they reported considerably higher levels of serum ferritin and serum creatinine in thalassemic group than controls (18). Serum Cystatin-C is supposed to be a more potent endogenous marker of GFR than creatinine as it is believed to be produced at a constant level by all nucleated cells, generously

filtered by the glomeruli, minimally bound to proteins, and completely reabsorbed and metabolized in the proximal tubule (12). Our result show increase in serum level cystatin when compared with control. Some study found a positive association between serum ferritin and serum cystatin Papassotiriou et al. (19). Serum ferritin in our result at high levels this indicate to iron overload and many studies concluded that cirrhosis of liver is associated with increase in serum ferritin levels (20), this accordance with the result of our study that show highly significant increases in the liver enzymes (AST, ALT and ALP) when compared with control group.

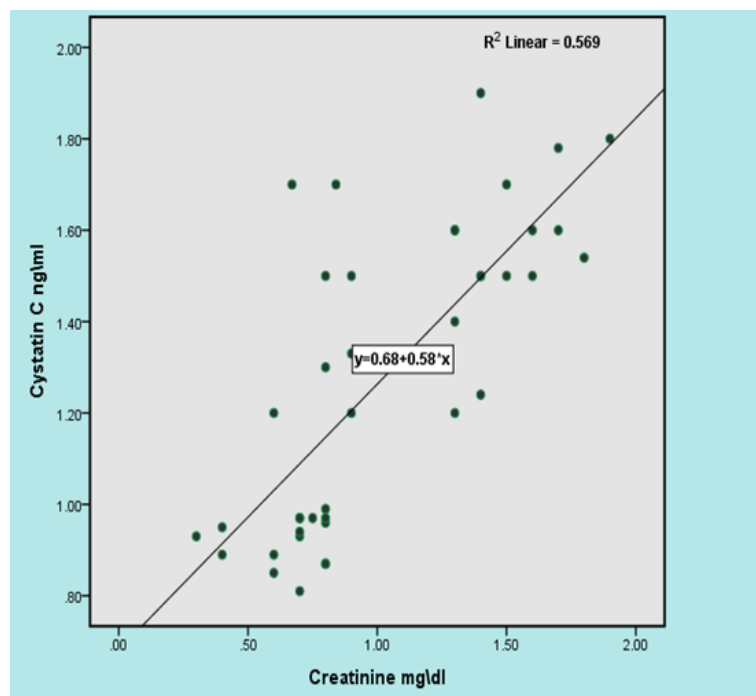


Figure 1: Correlation between Cystatin-C and creatinine in beta thalassemia patients.

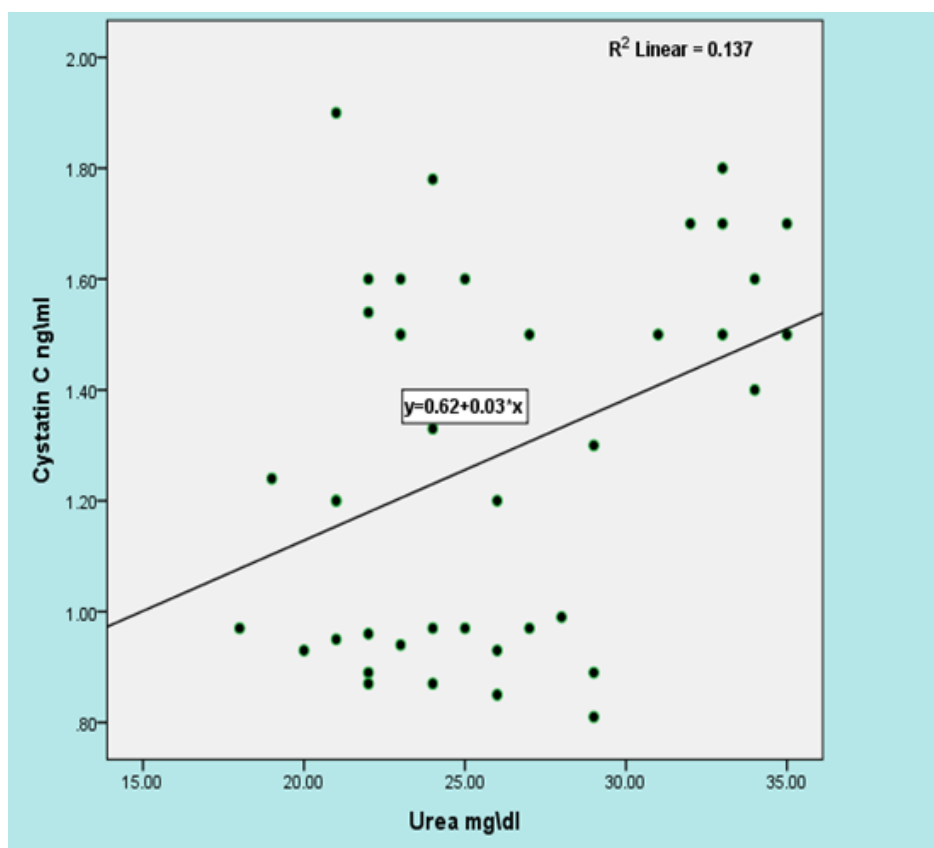


Figure 2: Correlation between Cystatin-C and Urea in beta thalassemia patients

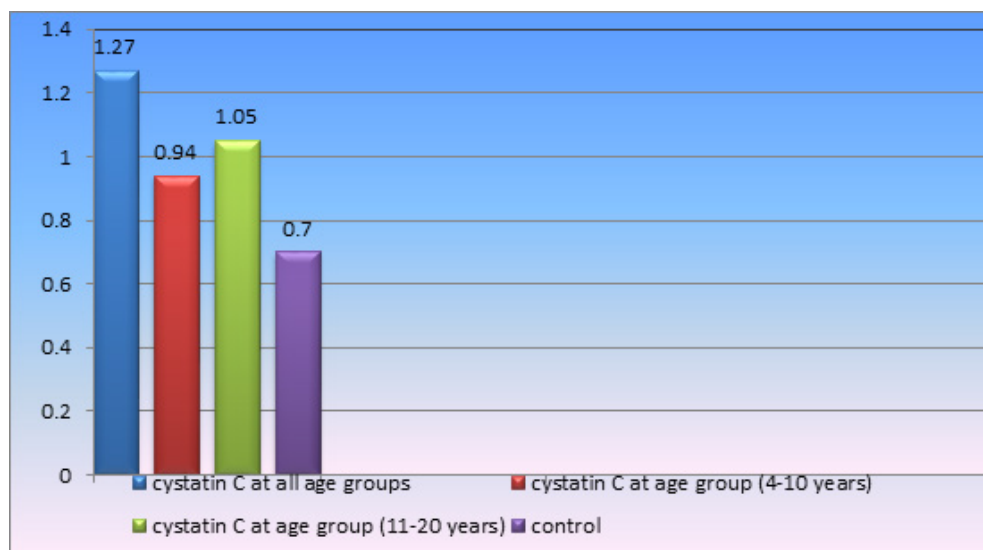


Figure 3: The Cystatin –C concentration distribution at age groups.

Conclusion

In this paper, we concluded that Cystatin C could be used as early predictor for major beta-thalassemia patients, which can be developed for renal dysfunction in the future.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of

both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Comparative Assessment of Patients' Satisfaction in Secondary and Tertiary Outpatients of Marjan Medical City in Babil Across Sectional Study

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Abstract

Introduction: Patient satisfaction is a basic measure by which the value of health care facilities is assessed. It is a personal assessment of the service received and the person's prospects. This study would have significant input in assessing the level of patients' satisfaction in secondary and tertiary outpatient health care services. **Methods:** Across-sectional study of 300 patients random sample visit outpatients of Marjan medical city the interview was conducted at general and specialist outpatient only. The specialist outpatients include cardiac, gastrology, nephrology and diabetology outpatient. 150 patients from secondary outpatient & 150 patients from tertiary outpatient. The purpose of study was to assess the level of patients' satisfaction in secondary and tertiary outpatient health care services. **Results:** Majority of patients visit general and specialist outpatients with age 31-50 (45.5%, 46%), female (57.3%, 62.75%), low income patients <500000ID (61%, 53%), majority of patients visit general outpatients are rural and primary education (50.7%, 49.3%) and visit specialist outpatients (54%, 42%), most patients came for follow-up for both types of outpatient (56%, 62%), and seen by consultants themselves for both types of outpatients (78.7%, 88%), majority referred by their family medicine (62%, 48%), and came from far distance > 5 km (77%, 79%), the majority of patients were not satisfied with health services produced to them (53%, 63%) **Discussion:** showed no. of patients not satisfied health services more than patients satisfied, majority of patients with low income and just primary level of education, the majority of patients came to outpatients from rural area these data for both secondary and tertiary outpatient. Patients with bad satisfaction are 18-50 years, self-referral to tertiary outpatient, not satisfaction also in urban patients.

Keywords: patient's satisfaction. Outpatients. health services. Marjan medical city

Introduction

Patient satisfaction is a basic measure by which the rate of health maintenance facilities is assessed^{1,2}. It is well-defined as a personal assessment of the facility received contrary to the person's prospects³. Patients' decision of hospital facility class and their opinion are important in class of care checking and development^{4,5}. Patient satisfaction information are usually saved and recycled for incessant quality development by health-care organizations and hospitals in developing states^{6,7}. Patient satisfaction is dignified over a widespread of health facility scopes, including obtainability, accessibility and suitability of facilities, interpersonal skills, procedural ability of the workers, and the physical background where services are provided^{3,8,9}. Patient opinions of quality are a lot subjective by their

communication with the health worker; the care with which the suppliers observe and connect with them¹⁰. It has been presented that when patients are glad with the quality of facilities gotten from a hospital they agree medical recommending by taking their medications suitably and continue friendly relationship with the hospital workers¹¹. Patient satisfaction studies in developing republics are progressively, being stimulated as a means of accepting wellbeing care quality. Asking patients what they reflect about the care and management they have expected is a vital step towards progressing the class of care, and confirm the health facilities are gathering patients' requirements¹². Assessing patient satisfaction has become an essential part of hospital/ clinic management approaches crossways the world. Also, the quality guarantee and certification progression in most countries need that the satisfaction of patients

is measured on a systematic root13. The knowledge of satisfaction may also be related to pleasure, prosperity and class of a lifetime. Henceforth, satisfaction tends to reflect the quality of health facilities transported14. This study would assess the level of patients' satisfaction in secondary and tertiary outpatient health care services, classify the elements affecting the patients' satisfaction, and afford a recommendation on an enhanced health service supply that will be helpful to fill research awareness holes which eventually contribute to improve quality of patient services in the hospital and develop the level of patients' satisfaction.

Method

Study participants:

Across-sectional study of 300 patients random sample visit outpatients of Marjan medical city from January 2019 to March 2019, the interview was conducted at general and specialist outpatient only (for adult 18 years and above). The specialist outpatients include cardiac, gastrology, nephrology and diabetology outpatient. We take 150 patients from general outpatient and 150 patients from a specialist, comparison assessment about the satisfaction of patients for health services. The sociodemographic data include gender, the age of patients, income, place of living, education level if it is first to visit or follow up, see by a consultant or not, referral system and finally distance of the hospital. Satisfaction assessing by modify questionnaire (patients satisfaction questionnaire PQ1815,16 consist of 3 points Likert scale give agree=2, I don't know=1 and disagree=0. 27 and

above mean patient satisfied on health services, the time of interview after taking permission from the patient was 15 minutes, The team managing the questionnaire contained an MBBS student posted in the Department of family and community medicine, was educated for the determination. Sample size thus produced was of nearly 300 patients. Statistical analysis done by SPSS 23 use chi-square and Fischer test for categorical variable and put p value < 0.05 mean significant.

Results

Among the 300 patients questioned during the data gathering, all patients included in the statistical and no missing data. Majority of patients visit general and specialist outpatients with age 31-50(45.5%,46%), females visit generally and specialist outpatients more than male(57.3%,62.75), low income patients <500000ID more than other patients visiting general and specialist outpatient(61%,53%), majority of patients visit general outpatients are rural and primary education (50.7%,49.3%)and visitspecialistoutpatients(54%,42%), most patients came for follow-up for both types of outpatient(56%,62%), most patients see by consultants itself for both types of outpatients(78.7%,88%), majority of patients visit general and specialist outpatients refer by his family medicine(62%,48%), most of the patient came to general and specialist outpatients from far distance > 5 km(77%,79%), the majority of patients visit generally and specialist outpatients are not satisfied with health services produced to them (53%,63%), All showed in table 1, fig 1 and 2.

Table 1: frequency and percentage of study variable.

variable	General outpatient	%	Specialist outpatient	%
Age 18-30	33	22.0	28	18.7
31-50	68	45.3	69	46.0
above 50	49	32.7	53	35.3
Gender male	64	42.7	56	37.3
female	86	57.3	94	62.7
Income <500,000 ID	92	61.3	80	53.3
500000-1000000	47	31.3	57	38.0
above 1000000	11	7.3	13	8.7
Place rural	76	50.7	81	54.0
urban	74	49.3	69	46.0
Education primary	74	49.3	63	42.0
secondary	47	31.3	37	24.7
graduate	29	19.3	50	33.3
Visit first	66	44.0	57	38.0
follow up	84	56.0	93	62.0

Cont... Table 1: frequency and percentage of study variable.

Consultant yes	118	78.7	132	88.0
no	32	21.3	18	12.0
Referral self	51	34.0	67	44.7
family medicine	93	62.0	72	48.0
other	6	4.0	11	7.3
Distance near 5 km	34	22.7	31	20.7
far 5 km	116	77.3	119	79.3
Satisfaction no	79	52.7	95	63.3
yes	71	47.3	55	36.7

Comparison between satisfaction of patients according to studied variable in general and specialist outpatient show in table 2, according to the age there is positive correlation and significant association with age group 31-50y who are not satisfied, while in general outpatient age undependable, in place of living there is significant association between place and nonsatisfaction in general outpatient with negative correlation, also the level of education significant associated with

nonsatisfaction in both types of outpatients with negative correlation, significant depending between nonsatisfaction and patients visit for follow up in specialist outpatient with positive correlation, and finally there is a significant association between referral variable and patients satisfaction with positive correlation. All other variables have not significant (undependable) association with patients satisfaction.

Table 2: comparison association and correlation between patients satisfaction and study variables

variable	General outpatient		P-value	R*	Specialist outpatient		p-value	R*
	*Sat.	No sat.			Sat.	No sat.		
Age 18-30	16 10.7%	17 11.3%	0.98	N.S.	3 2%	25 16.7%	0.001	0.42
31-50	32 21.3%	36 24 %			18 12%	51 34%		
above 50	23 15.3%	26 17.3%			34 22.7%	19 12.7%		
Gender male	28 18.7%	36 24%	0.51	N.S.	20 13.3%	28 18.7%	1.000	N.S.
female	43 28.7%	43 28.7%			35 23.3%	43 28.7%		
Income <500000	47 31.3%	45 30%	0.48	N.S.	25 16.7%	55 36.7%	0.32	N.S.
500000-1000000	19 12.7%	28 18.7%			24 16%	33 22%		
above 1000000	5 3.3%	6 4%			6 4%	7 4.7%		
Place rural	43 28.7%	33 22%	0.02	-0.81	27 18%	54 36%	0.39	N.S.
urban	28 18.7%	46 30.7%			28 18.7%	41 27.3%		
Education primary	46 30.7%	28 18.7%	0.001	-0.3	30 20%	33 22%	0.034	-0.21
secondary	18 12%	29 19.3%			13 8.7%	24 16%		
graduate	7 4.7%	22 14.7%			12 8%	38 25.3%		
Visit first	26 17.3%	40 26.7%	0.1	N.S.	13 8.7%	44 29.3%	0.009	0.22
Follow up	45 30%	39 26%			42 28%	51 34%		
Consultant yes	57 38%	61 40.7%	0.6	N.S.	52 34.7%	80 53.3%	0.071	N.S.
no	14 9.3%	18 12%			3 2%	15 10%		
Referral self	20 13.3%	31 20.7%	0.26	N.S.	10 6.7%	57 38%	0.001	0.23
family medicine	47 31.3%	46 30.7%			45 30%	27 18%		
other	4 2.7%	2 1.3%			0 0%	11 7.3%		
Distance near 5 km	16 10.7%	18 12%	1.00	N.S.	15 10%	16 10.7%	0.14	N.S.
far 5 km	55 36.7%	61 40.7%			40 26.7%	79 52.7%		

*P value < 0.05 is significant. * R : correlation.

Discussion

Patient satisfaction organizes an important element of the feature of health care facilities. . Since health care facilities cannot be ‘kept for upcoming use’ and they are predisposed by many issues, it is solid to quantify the class of service. The attendance of many powerful factors such as situations related to patients, medical staff, and organization complicate measurement of the class of the facility. This study was done to measure the satisfaction of patients with the health services produced in the secondary and tertiary outpatients in Marjan medical city, so in study showed that most patients not satisfied to the health services produced in secondary and tertiary outpatients but more no satisfied patients are in tertiary outpatient 95%it may be similar to study in Uganda “The mean patient satisfaction score was fairly little”¹⁷ but another study in Delhi showed high satisfaction¹⁸. In our study there was significant association and positive correlation between age and satisfaction of patients towards health services in tertiary outpatient in age group 31-50 years majority not satisfied may be health services not suitable to them, the above than 50 years had most satisfaction it may be due to availability of health services more toward them similar to study done in Riyadh, and USA^{1,19} while in secondary outpatient the age not significant association with satisfaction similar to study done in Nepal²⁰. According to gender there was no significant association with satisfaction although there were no significant differences between men and women, we should not completely simplify the findings to all outpatients similar to paper in Uganda¹⁷, the income of patients not significant association with satisfaction for both group of outpatients in compare to study do in Uganda and China the income and satisfaction is strongly association may be due to the health services in Iraq are semi-free^{17,21}. According to place of living there was significant association between satisfaction and place of living in secondary outpatient with negative correlation mean more patients from urban area lead to decrease satisfaction may be due to decrease health literacy and lower socioeconomic are more in patients live in rural area compared to urban colleagues similar to study done in Nepal²⁰, while in tertiary outpatient there was no significant association between and living place it may be due to all cases referral from primary and secondary outpatient to tertiary so all patients well preoccupied about health services. In our study the education level had significant and important association with patients satisfaction in both types of outpatient with negative correlation mean when increase the level of

education may lead to decrease in satisfaction so we see the primary education level more satisfy may be due to able to follow instructions compared with those with secondary and graduate education level those had more information about health services and not satisfy by little quality of services similar to study done in Uganda Malaysia and Riyadh^{17,19,22}.

In our study the association between satisfaction and types of visit was significant with positive correlation in tertiary outpatient mean patients with came for follow-up more satisfy than patients came for first visit possible description for improved satisfaction could be that chronic patients are self-selected for large observed satisfaction at this hospital but the insights of those who first visit maybe because of reduced satisfaction are not taken similar to study do in Uganda and South Africa¹⁷, while in secondary outpatient the types of visit not associated with satisfaction.

Our study appeared the significant relation between referral system and satisfaction especially in tertiary outpatient with positive correlation mean patient referral by his family doctors more satisfied than patients came by itself or other way of referral may be due to family physician more orient to disease of all family members and health services and referral system and how to deal with health problem, similar to study do in Delhi, Poland¹⁸ but referral system in secondary outpatient not association with satisfaction but still patients more satisfied when refer from family physician.

Conclusion

Our study showed no. of patients not satisfied health services more than patients satisfied, the majority of patients with low income and just primary level of education, the majority of patients came to outpatients from rural area these data for both secondary and tertiary outpatient.

Patients with bad satisfaction are 18-50 years old and self-referral system in only tertiary outpatient, not satisfaction also in urban patients visit the medical city.

Secondary and tertiary level of education had bad satisfaction in both secondary and tertiary outpatient. Further study is recommended to know the causes of all this bad satisfaction.

Good satisfaction appears in patients referred from his family physician also this may need farther study to

improve the health system in Iraq.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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High Levels of Tumor Necrosis Factor-Alpha and Interferon-Gamma in Patients with Gingival Recession

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Abstract

Background: Gingival recession considers as a common condition that associated with transposition of the margin of the gingiva in to the position apical to the cemento-enamel junction which consequently result in an exposure of the root . Inflammatory biomarker including interferon-gamma and tumor necrosis factor-alpha associated with a significant role in periodontal tissue destruction . The main goals of current study were to compare the levels of interferon-gamma and tumor necrosis factor-alpha in patients with different degree of gingival recession and control participants.

Material and method: Blood samples taken from twenty four male participants and they grouped in to three groups as: group 1(8 control subjects) , group 2 (8 patients with class 1 and 2 gingival recession)and group 3 (8 patients with class 3 and 4 gingival recession). Enzyme-linked Immunosorbent Assay was utilized to evaluate tumor necrosis factor-alpha and interferon-gamma levels.

Results : The levels of both biomarkers were greater in group 3 than group 1 and group 2 as well as group 2 had higher levels of these biomarkers than group 1.

Conclusion: Interferon-gamma and tumor necrosis factor-alpha could reflect periodontal destruction in patients with gingival recession.

Keywords: *gingival recession, interferon-gamma, tumor necrosis factor-alpha and Enzyme-linked Immunosorbent Assays.*

Introduction

The deposition of the gingival margin in an apical direction which consequently leads to revealing of the root surface to oral environment is called gingival recession ⁽¹⁾. Periodontal disease, tooth malposition, trauma, aberrant frenal attachment strongly considered as etiological factors of gingival recession ⁽²⁾.

It is a very common condition , about 50% of persons in the populations have at least one or more sites of 1 mm of root exposure or more ⁽³⁻⁵⁾ . Besides aesthetic shortcomings ^(6,7) , gingival recessions have a high

predisposition to be associated with functional problems related to root exposure, such as dentinal hypersensitivity ⁽⁸⁻¹⁰⁾, plaque retention, gingival inflammation, root caries ⁽¹¹⁻¹⁵⁾ , alveolar bone loss and eventually tooth loss ^(15, 16).

According to Miller (1985) , 4 classes of gingival recessions were proposed. In class I the recession not includes mucogingival junction (MGJ) , if the recession includes the MGJ the case considered as class II, both classes presenting no interproximal bone loss. In class III the recession extend to or include the MGJ with destruction of the interproximal bone and/or malpositioning of the tooth. Lastly, class IV presented with a severe destruction in the interdental bone and/or serious malpositioning of the tooth ⁽¹⁷⁾.

Proteins that are formed by different types of cells and represent a messenger to another cells are called

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cytokines. They start , control and mediate inflammatory and immune reactions; as well they control differentiation and growth of cells⁽¹⁸⁾. Cells of gingival epithelium secrete a wide variety of cytokines, like , tumor necrosis factor-alpha (TNF- α), interleukin- 1a (IL-1a), interleukin-1b (IL-1b), interleukin-6 (IL-6) and interferon-gamma (IFN- γ) these are the pro-inflammatory cytokines while the anti-inflammatory cytokines include interleukin-10 (IL-10) and interleukin-4 (IL-4)⁽¹⁹⁻²¹⁾.

In chronic inflammation, cytokines like TNF, IFN, IL-1, and IL-6 perform a significant role in bone destruction by activating osteoclasts⁽²²⁻²⁴⁾.

Material and Method

A total twenty four male subjects with age range (30-40) were included in present study. Patients presenting at least two buccal gingival recession were enrolled while control showing no gingival recession . The participant were categorized as control (group 1) and patient groups furthermore patients divided in to two groups according to Miller gingival recession classification⁽¹⁷⁾ . The first group include class 1 and 2 gingival recession (group 2) while the second group include class 3 and 4 gingival recession (group 3).

All patients were signed a written informed consent to participate in present study . Periodontal measurements involving plaque (PI) and gingival (GI) indices were recorded for each patients^(25, 26).

Exclusion criteria include:

Patients with systemic diseases.

Patients with previous periodontal treatments or who take medication.

Tooth with restoration or crown involving cemento-enamel junction (CEJ).

Tooth with root abrasion at the CEJ.

Presence of periodontal pocket.

Blood collection and storage:

Blood were collected using sterile disposable syringes from each group. Clotting of the blood samples were gained by leaving the blood samples overnight at 4°C or for 2 hours at room temperature then centrifuge for 15 minutes at 1000×g. Supernatant were collected and stored at -20. °C, the assay was carried out during

the first month after storage.

Quantitative determination of cytokines:

Quantitative determination of both biomarkers in serum of patients groups and control group using Sandwich- Enzyme-linked Immunosorbent Assays (ELISA) as in manufacture instructions (Elabscience Biotechnology Co., Ltd).

Statistical analysis .

Statistical analysis include mean and standard deviation (SD) also analysis of variance (ANOVA) test was utilized to estimate the differences among groups . *P* value less than 0.05 regarded as significant.

Results

Means of TNF were (17.48± 11.93) ,(52.76 ± 18.81) ,(72.27 ± 42.54) in control group ,group 2 and 3 respectively with significant difference between groups (P=0.003) as shown in table 1 and figure 1. Regarding IFN- γ control group had the lowest mean (47.59 ± 29.33) while group 3 had the highest mean (280.08 ± 121.35) also there was a high significant difference among groups as shown in table 1 and figure 2.

The results of present study revealed that there were highly significant differences in plaque and gingival indices among groups (P<0.001) as shown in table 1.

Table 1: Mean and standard deviation of plaque index, gingival index, TNF- α and IFN- γ of all groups.

	Group 1 Mean ± SD	Group 2 Mean ± SD	Group 3 Mean ± SD	p- value
PI	0.34±0.10	1.56 ±0.26	1.75 ± 0.24	0.000
GI	0.35±0.09	1.80 ±0.24	1.87± 0.24	0.000
TNF- α	17.48 ±11.93	52.76 ±18.81	72.27± 42.54	0.003
IFN- γ	47.59 ± 29.33	140.14 ± 81.76	280.08 ±121.35	0.000

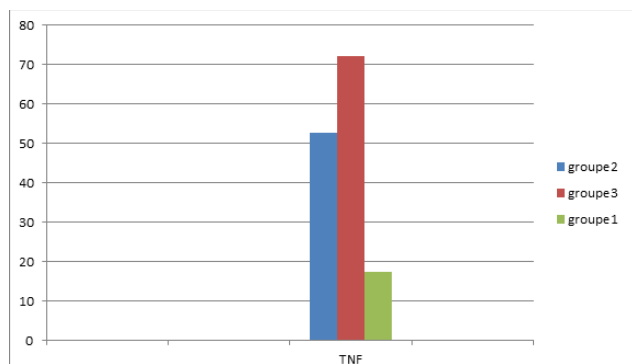


Figure 1- The mean of TNF in group 1, 2, 3.

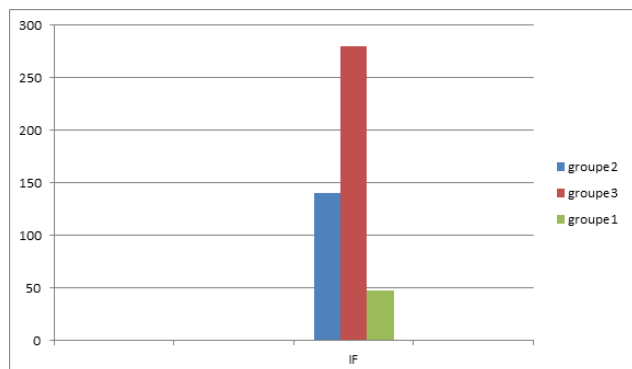


Figure 2- The mean of IFN- γ in group 1, 2, 3.

Discussion

Gingival recession may occur in dentitions with otherwise healthy periodontium. About the significance of gingival inflammation and dental plaque in progression of gingival recession, other researches have revealed that the most common cause of gingival recession was gingival inflammation. They proposed that the breakdown of connective tissue caused by a localized inflammatory process. Gingival recession results from epithelial cells reproduction into the connective tissue which cause a collapsing of the epithelial surface (27,28). Current study showed that the patients with gingival recession in both groups had higher gingival and plaque indices than control group and these results were in concurrence with other studies who revealed that the gingival recession was related to the high levels of both dental plaque and calculus as well as it related to the gingival bleeding on probing (27,29-33). Also, a study conducted by Goutoudi et al. (34) shown that the gingival recession was concomitant with both high plaque scores and inflammation. One study (35) revealed a negative association between gingival recession and dental plaque.

The proinflammatory cytokine, TNF- α , induces the secretion of collagenase by the fibroblasts, bone and cartilage destruction. Tumor necrosis factor - α is part of

the main proinflammatory cytokines which are usually produced on inflammatory sites by the mononuclear cells infiltration (36,37). In consequence, this cytokine is part of the periodontal tissue destruction. Previous studies reported an elevated levels of TNF- α in serum of periodontitis patients (38,39). Our results are corroborating with the previous data as we found great levels of TNF- α in serum of subjects with gingival recession (40).

Raised levels of numerous inflammatory mediators, like TNF- α , IFN- γ , IL-1, IL-6, and prostaglandinE2 (PGE2) have been identified in gingival crevicular fluid (GCF) and in gingival tissues of subjects presented with periodontal diseases (41,42).

The structure of bone tissue relies on the equilibrium between bone destruction and bone formation (43, 44). As key factors that contribute to the breakdown of periodontal tissue, several proinflammatory cytokines were identified, involving IL-1, TNF- α , IFN- γ , and IL-6 (45,46). It is possible that the higher levels TNF- α and IFN- γ found in our patients may have acted as an important osteoclastogenic factor by inducing the local osteoclast differentiation that could culminate in bone destruction.

Conclusion

Gingival recession presents an increase in inflammatory markers such as TNF- α and IFN- γ , which could be predictors of local bone destruction and disease spreading.

Ethical clearance : All participants received learned consent to join in current study, the study was accepted by Ethics team of Collage of Dentistry / Babylon University.

Source of Funding : Self funding.

Conflict of Interest : no conflict of interest in current study.

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Efficiency of *Aspergillus* Species to Produce the Lipase Enzyme from Various Types of Oil Seeds

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Abstract

Filamentous fungi can easily degrade agroindustrial wastes in solid- state fermentation processes synthesizing many important commercial biocompounds such as lipolytic enzymes. Lipases have various applications in industry so the aim of this study to evaluate the effect of the composition of the solid culture medium on the production of lipolytic enzymes by various species of *Aspergillus*, so in this study we use different types of oil seeds to isolate different species of *Aspergillus* and study their effect on production of lipase enzyme by using of this different seeds as a substrate for culturing of this fungi and in this study *Aspergillus niger* that are isolated from *pistacia vera* seeds is more efficient for production of the lipase enzyme.

Keys word: *Pistacia vera* (pistachio), *Anacardium accidentae* (kazoo) ,*Prunus delicis*(almonds) ,*Arachis hypogavae*(pistachio slaves), *Juglanis regis*(walnut)

Introduction

The demand for microbial lipases is on the increase owing to their application in a wide variety of industrial process and it is used in food, dairy, cosmetic and pharmaceutical industries due to their hydrolytic reaction⁽⁷⁾.

Various types of microorganism, such as fungi are widely recognized as a good source of extracellular lipase⁽²⁾*Aspergillus* is the best candidate because it can produce more enzymes than other microbes in microbial engineering research development related to very high lipase⁽³⁾. The best species of fungi to produce the lipase enzyme is *Aspergillus niger* because it is classified as GRAS (Generally Regarded A Safe) by the FDA (Food and Drug Administration of the United States of America)⁽⁴⁾. So that the lipase from this fungi can be used in various fields including food and pharmaceutical industry⁽⁵⁾. Solid state fermentation is a fermentation technique that allows the use of simple substrates such as oil seeds, marine water, solid waste of agroindustrial products that are induced by using oil such as olive oil⁽⁶⁾.

Lipase (triacylglycerol acyl-hydrolases EC 3.1.1.3) are enzymes capable of hydrolyzing the ester bands of insoluble substrates in water at the substrate – interface⁽⁷⁾.

Many researcher worldwide direct their activities to the screening of new lipase producing microorganism, and subsequently to the optimization of the medium composition to increase the efficiency of the microorganism to produce the lipase enzyme because the composition of the medium can effect on the characteristic and efficiency of the lipase enzyme and change its properties⁽⁸⁾.

Material and Method

I-Isolation and diagnosis of the *Aspergillus* from oil seeds

The fungi used in this study was isolated from oil seeds of (*pistacia vera*(pistachio), *Anacardium accidentae*(kazo), *Prunus delicis*(almond),*Arachis hypogavae*(pistachio slaves),*Juglanis regis*(walnut)),various *Aspergillus* species was isolated from there various oil seeds by washing these seeds well by distilled water and sterilized by adding of 1% sodium hydrochloride solution (Naocl) for one minutes and then this seeds cultured on potato dextrose agar (PDA) that sterilized by adding of streptomycin, and this plates was incubated at (28°C ± 1) for 7 days. The species of *Aspergillus* was identified by macro and micro-morphological analysis⁽⁹⁾. The macro morphological characteristics observed were color, relief and edges of the colonies.

II-Isolation of the *Aspergillus* spp. from the soil

The samples that are used for isolation *Aspergillus* spp. from the soil that taken from 2-5 cm deep and cultured on (PDA) agar with added chloramphenicol in 10µg/ml with 3 dilution for each sample and incubated at 28°C for (2-8 days), then *Aspergillus* spp. colonies was isolated depending on macro- morphological characteristics.

III-Screening for extracellular lipase production

Modified basal salt medium (BSM) containing (g/L): NH_4NO_3 , (1) K_2HPO_4 (1.5) $\text{MgSO}_4 \cdot 7 \text{H}_2\text{O}$ (0.025) CaCl_2 (0.025) $\text{FSSO}_4 \cdot 7 \text{H}_2\text{O}$ (0.015) $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ (0.005), plus distilled water 1000ml and PH must be adjusted to 7. Sterilization of the medium is done and then adding of 250 mg of streptomycin and 1% (VIV) sterilized tween 80 were added.

Then 1 ml of the *Aspergillus* colonies suspension was transferred to 30 ml of the previously prepared medium. The flask that contain the fungi cultures were incubated at 28°C for 5 days, under shaking (150 rpm) and then filtrate was centrifuged under cooling at 1000 xg for 30 min at 4°C, and the supernatants was subsequently collected for lipase activity determination. Lipase activity was determined by using ⁽¹⁰⁾.

IV-Screening of *Aspergillus* spp. for lipase production

Screening was carried out using mineral medium described by ⁽⁷⁾ with olive oil emulsion as the carbon source. Strains that showed by hydrolytic halos on this medium were selected for further lipase determination.

V- Extraction of pure lipase.

The production of lipase was studied in 250 ml flask containing 50 ml of mineral medium with olive oil as a carbon source, it also contain 3 gm of KNO_3 , 1 gm of KH_2PHO_4 , 1 gm of $\text{Mg So}_4 \cdot 7 \text{H}_2\text{o}$ and 2% of sterile olive oil, then the strain of isolated *Aspergillus* was inoculated and incubated at 28°C on a rotatory shaker at 120 rpm up to 7 days, and then the growth was filtered through Whitman No.1 filter paper. The clear culture filtrate then was assayed for lipase activity.

VI- Effect of initial PH.

The fungi can grow on culturing medium at different initial PH ranging from 2 – 12. The initial PH

was adjusted by 0.1 m HCL OR 0.1 M Na oH. After 6 days the fungi mass was grown and yield of lipase produced was determined.

VII- Effect of temperature on lipase activity and stability.

The effect of reaction temperature on the activity and stability of lipase was determined by incubation the enzyme at different range of temperature ranging from 30-70 °c. Immediately after incubation at each temperature, the enzyme activity was then determined at 30°C.

IX- Measuring of enzymes activity.

The enzymes activity was determined using the method standardized by ⁽¹¹⁾ which is based on titration with NaoH of fatty acids released by the action of lipase on the extract on the triacylglycerol of olive oil was added to 250 ml flasks, 2 ml buffer prepared, 5 ml of olive oil and then 1 ml of enzyme extract was added to this system and it was incubated for 30 min. at 30°C. After incubation the reaction was stopped by adding 15 ml of acetone: ethanol: water (1:1:1) and released fatty acids were titrated with a solution of 0.01 mol/2 NaoH using phenolphthalein as indicator.

One unit of activity was defined as the amount of enzyme that releases 1 mol of fatty and per minute per ml of enzyme extract of the submerged fermentation under the test condition.

Results:

In this study 3 species of *Aspergillus* was isolated from soil and different oil seeds included *Aspergillus niger*, *Aspergillus flavus* and *Aspergillus fumigatus* and each one of these species was tested for its ability for production of lipase enzyme, and activity of this enzymes also was studied. The frequency of isolation of *Aspergillus* spp. from different types of substrate. We found that the most common isolate was the *Aspergillus niger* that was isolated from all types of oil seeds that are used in this experience in addition to soil.

As was showed in the table (1) the most active species for secretion of active lipase was *Aspergillus niger* isolated from (*Pistacia vera*) pistachio while (*Pistacia vera*) *Aspergillus fumigates* that are isolated from pistachios show no lipase activity, while *Aspergillus flavus* isolated from pistachios (*Pistacia vera*) showed

moderate lipase activity. *Aspergillus flavus* that were isolated from walnut (*Jugans regis*) also showed – ve activity for lipase production. While all species isolated from soil and pistachios slaves showed activity of lipase enzymes in various values. from this study we noticed

that lipase enzymes can be produced by different species of *Aspergillus* and activity of these enzymes are depended on the substrate that are used for isolation of these enzymes, but the best one is *Aspergillus Niger* and the best substrate was the pistachios (*Pistacia vera*).

Table (1) Efficiency of enzyme lipases that are isolated from *Aspergillus* spp. according to types and substrates:

Types of <i>Aspergillus</i> spp	types of substrate	Efficiency of lipase
- <i>Aspergillus niger</i>	Soil	+++
- <i>Aspergillus flavus</i>	Soil	++
- <i>Aspergillus niger</i>	<i>Pistacia vera</i>	++++
- <i>Aspergillus flavus</i>	<i>Pistacia vera</i>	++
- <i>Aspergillus niger</i>	<i>Arachis hypogavae</i>	++
- <i>Aspergillusfumigatus</i>	<i>Seasum indicum</i>	++
- <i>Aspergillus niger</i>	<i>Seasum indicum</i>	++
- <i>Aspergillus niger</i>	<i>Anacardium accidentae</i>	+++
- <i>Aspergillus flavus</i>	<i>Anacardium accidentae</i>	+
- <i>Aspergillus niger</i>	<i>Prunus delcis</i>	+++
- <i>Aspergillus flavus</i>	<i>Juglans regis</i>	++
- <i>Aspergillus niger</i>	<i>Juglans regis</i>	-
- <i>Aspergillusfumigatus</i>	<i>Juglans regis</i>	+

Discussion

This study appears that the most common species that are isolated from soil and oil seeds were the *Aspergillus niger* and it was the most efficient producer of lipase enzyme by using of pistichios (*Pistacia vera*) as a substrate and this was gone with the study of Tim. ⁽¹⁾. The suitability of pistichios for lipase production may be attributed to the oil present in it. This oil may have induced the production of this enzyme without an additional of carbon source while supplementation of glycerol favored enzyme production ⁽¹²⁾.

Also there are many studies appear that the enzymatic activity of *Aspergillus niger* that are cultured

on solid state fermentation were higher than using other methods. As approved by studies done by ⁽¹³⁾.

This study approves that substrate type can effect efficiently on the types of *Aspergillus* species and their efficiency for production of lipase enzymes and also the activity of these enzymes, that are based on the analysis conducted on the unite of lipase and approved also by study ⁽⁶⁾.

Although the primary function of the substrate was to support the growth of *Aspergillus* but the lipid content in the substrate medium could increase level of lipase activity generated.

Study done by ⁽¹⁴⁾ agree with our study that using of solid lipid substrate that are served as the sole source of nutrient for lipase production may have a combined benefit of utilizing a low-value waste material while producing a commercially valuable product due to using the inexpensive culture media comparison and stability of the enzymes over longer period.

Study of ⁽⁷⁾ approved that the best species of *Aspergillus* to produce lipase enzyme was *Aspergillus*

niger, next to it was *Aspergillus fumigatus*, while *Aspergillus flavus* showed the least potential for lipase production.

We conclude from this study that oil seeds considered as a good substrate for lipase production because beside being a source of carbon and supporting the fungus has lipids that assist in the production of this enzyme. The addition of lipid substrate as oil is essential to obtain highest lipase production.

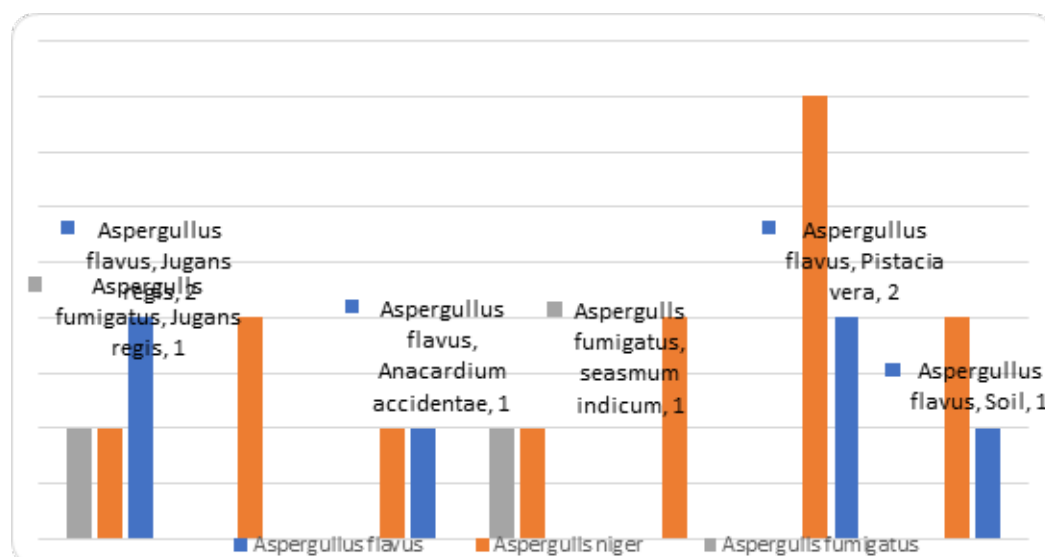


Figure (1) show frequency of isolation of *Aspergillus* from different source of substrate

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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Seroepidemiology of *Toxoplasma gondii* Infection in Drivers Involved in Road Traffic Accidents in Baghdad City

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Abstract

In this study, a total of (200) people (170 men and 30 women), aged (20-60) years were enrolled during a period of 10 months in Baghdad city. The informed consent of the studied groups was first taken and the blood alcohol levels after accidents showed negative results. The control group consisted of 100 individuals (60 men and 40 women), residents of the same region and in the same age group with no clinical signs and symptoms of toxoplasmosis. The commercial IgG and IgM ELISA kits were used to examine the collected serum samples. The serological test results of the studied group (SG) showed that 92(21.90%) were IgG positive, 75(17.85%) were IgM positive when compared with the control group (CG) who showed 11(2.61%) IgG positive and 33(7.857%) IgM positive. We can conclude that there is a high traffic accident risk to the drivers because of the high seroprevalence of latent toxoplasmosis. Prospective studies are still recommended and latent toxoplasmosis of the car drivers should be considered while strategies are being designed to prevent traffic road accidents in Baghdad.

Key words: *Toxoplasma gondii*, drivers, road traffic accidents.

Introduction

Toxoplasmosis is a global disease caused by an obligate intracellular protozoan known as *Toxoplasma gondii*. The infection is usually caused by consumption of undercooked or raw pork or lamb meat that contains bradyzoites in addition to vegetables and fruits which contain the oocysts. The pregnant women can also transmit the infection to their newborn congenitally, and people can acquire the infection via blood transfusion or organ transplantation and it can also be transmitted to the butchers or people who handle infected tools or accidentally through their exposure to contaminated blood ¹. In about (80%) of the human population, toxoplasmosis develops with no symptoms since tissue cysts have the ability to persist for ever during the life of the host. In immunocompromised people, the tissue cysts act as reservoirs where local or disseminated infections may emerge ³, especially in patients with (HIV/AIDS) ⁴. Many serious diseases can be caused by

T. gondii such as the fatal encephalitis, pneumonitis, myocarditis and choreoretinitis. In Czech people infected with *Toxoplasma gondii*, personality changes were also detected ^{5,6}. Moreover, impaired motor performance and slow reaction times were shown in persons with latent infections ^{7,8}. The behavioral changes can be explained by the high levels of dopamine, because the genes of *T. gondii* encode for the aromatic amino acid hydroxylase enzymes, that result in metabolism of phenylalanine to tyrosine and tyrosine to L-DOPA, which is the dopamine precursor. It is suggested that the higher dopamine levels can lead to changes of neurotransmitters and as a result, to a change in the behavior ^{9,10}. Schizophrenia has been found to be correlated with latent toxoplasmosis ³. The mental disease patients in Mexico showed (37.24%) anti-toxoplasma antibodies, which is (18.26%) higher than those in the whole population ⁴.

Motor cycle accidents were recorded as the leading cause of death by the Ministry of health within the (15-19) years age group, and as the second leading cause in the (20-50) years age group. *T.gondii* was found to cause choreoretinitis, due to their prolonged reaction times and the impaired motor performance. This study

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aimed to identify the IgM and IgG Anti-*Toxoplasma gondii* antibodies prevalence in drivers who had traffic accidents in Bab-Al-Muadham and Al-Nahdha public transport garages in Baghdad governorate. The study also aimed to determine ocular impairments and risk factors related to *T.gondii* seropositivity in such individuals in comparison with the control group.

Materials and Method

Study population

This group involved (170) men and (90) women drivers presented with injuries, and a positive alcoholmeter test was used as an exclusion criterion.

Study of the population who were not involved in traffic road accidents

This group was composed of (160) drivers, (100) of them were men and (60) were women. All of this study group resided in Baghdad city. They have never been previously involved in traffic road accidents, and were selected randomly from Bab-Al-Muadham and Al-Nahdha public transport garages in Baghdad governorate. These drivers were considered as a control group for comparison of results.

Sample and data collection

From all drivers, blood samples have been obtained during the period from October 2015 to March 2016. For all studied groups, data on sociodemographic, clinical and risk factors associated with *T.gondii* infection were collected through a structured questionnaire form. Information regarding consumption of raw vegetables and fruits, consumption of raw or undercooked meat, cats at home, organ transplantation and blood transfusion have been also taken, while clinical information involved presence of an underlying ocular impairment such as (Astigmatism, hypermetropia, presbyopia or myopia).

Serological test for *T.gondii* antibodies

Blood samples were sent to Biochemistry laboratory / Institute of medical technology / Baghdad – Bab Al-Muadham. Centrifugation of clotted blood has been used to obtain serum sample, which have been kept frozen at (-20C) until use. The commercially available enzyme linked immune sorbent assay (ELISA) kit (Platelia TM Toxo , BioRad, Marnes_la_Coquette_ from France) was used to detect IgG and IgM antibodies to *T.gondii* in the sera of all the studied groups. The wave lengths

(450/620 nm) were applied for reading the results of the plates and the standard curve in (IU/ml) was used for plotting the optical density. For latent infections, a titer less than (6 IU/ml) was considered as negative, (6-9) as intermediate and more than (9-200) as a positive titer. A duplicate testing was done to samples with values more than 200 IU/ml. The manufacturer's guidelines were used to perform all investigations.

Results and Discussion

The results of our study revealed that 211(50.23%) out of 420 traffic accident participants and 33(20.62%) out of 160 controls had positive anti-*T.gondii* IgG antibody results. This finding in part explained the negative relationship between the presence of anti-*T.gondii* IgG antibody titers and the ages of the traffic road accident groups, a result that has not been observed in the control group. As a result, univariate ORs for the relationship between many categorical variables and the traffic road accidents showed a deviant protecting effects on the age group (40-49) years. Tables (1) and (2) show serum testing results in both the experimental and the control groups. As seen in table (2), IgM and IgG antibodies were found in both groups. It has been demonstrated that the number of IgG seropositive results was significantly higher in comparison with the control group. Therefore, it can be concluded that the incidence of chronic toxoplasmosis was three times higher than the control group among people involved in the traffic road injury accidents, and this finding indicates that there is a relation between the road accidents and acute and chronic toxoplasmosis. The anti-*T.gondii* IgG antibody titers were found to be correlated with the occurrence of traffic accident risks. The fact that seropositive status as a categorical variable is not associated with the traffic accident risk is proven when IgG antibodies are considered as continuous variables suggesting that the high antibody titers could be marker of an acute infection or a subclinical reactivation. However, this hypothesis is supported by the finding which revealed that increased IgG levels took place in people who showed seropositivity to anti-*T.gondii* (IgM) antibodies. In general. It is thought that the mechanism in such conditions is correlated with dopamine level modulations (decreased or increased) because of the existence of toxoplasma parasite in the brain tissues [11,12]. The prevalence of IgG anti-*T.gondii* antibodies was shown to be increased with the age of both groups. Similar results were demonstrated in the blood donor individuals where the prevalence of anti-*T.gondii* elevated after (20) years of age [4]. Regarding

the relationship between gender and anti-*T. gondii* antibodies, it was demonstrated that the percentage of positive males to those antibodies was more than those of females despite the statistical variation. These results were consistent with a previous study conducted by Hye Jin Ahn (2012) who indicated that there was a significant difference in the antibody concentration between males (20.6%) and females (13.1%) ($P < 0.05$)¹³. There was a statistical significant difference in the frequency of recent toxoplasmosis determined by IgM anti-*T.gondii* antibodies between traffic accident drivers (75(35.54%) and the control group 11(6.87%)¹⁴.

There is an interrelation between socioeconomic strata variables and the educational levels. No significant statistical variation was found in our study between the demographic data and existence of anti-*T.gondii* antibodies. Similar results have been revealed within the same geographic region⁴, as well as in the study conducted in Durango state, Mexico¹⁵. However, anti-*T. gondii* positive drivers with low and medium socioeconomic levels showed a trend for a risk in traffic road accidents in comparison with the high socioeconomic level drivers. The same results have been detected in Mexican population in Durango state when significant statistical difference was revealed in anti-Toxo antibody titers between low socioeconomic levels and workplace accident individuals¹⁴.

In our study, it was shown that some toxoplasmosis risk factors like consumption of raw vegetables and fruits, consumption of raw or undercooked meat and cats at home are not correlated with anti-*T.gondii* antibody existence, and other risk factors like drinking of contaminated water may clarify the highly prevalence of anti-*T.gondii* antibodies. However, in our study, contaminated water was not included¹⁶.

In regard to visual and ocular results determined by the questionnaire form designed in our study, both the involved groups showed the presence of ocular abnormalities. The control group revealed more frequency of astigmatism, presbyopia, myopia and glaucoma than the experimental group. No ocular injury due to toxoplasma infection in drivers with positive serum anti-toxoplasma has been shown in studying the ocular fundus. In immunocompetent persons, the toxoplasmosis ocular signs and symptoms did not result from the toxoplasma parasite itself but from the inflammatory immune responses. In the current study, all individuals positive to IgG anti-*T.gondii* antibodies had no signs and symptoms related to visual toxoplasmosis. Probably, the strains of Toxo which infect our study population differ from the type-1 virulent toxoplasma, and this strain was found to be related to visual toxoplasmosis among healthy Brazilian populations^{17,18}.

Table (1): Prevalence of toxoplasmosis in the experimental and control groups by ELISA test according to gender

Group	Examined samples	Elisa test	
		Positive %	Negative %
Men	270	148 (54.81%)	122 (45.18%)
Women	150	63 (42%)	87 (58%)
Total	420	211 (50.23%)	209 (49.76%)

Table (2): Prevalence of IgG and IgM anti-Toxoplasma gondii antibodies in the experimental and the control groups

Group	Anti - <i>T. gondii</i> +ve				Anti – <i>T.gondii</i> -ve		Odd ratio (1.95)	p-value
	IgM		IgG		Men	Women		
	Men	Women	Men	Women				
Experimental samples	45(38.4%)	30(33.33%)	72(61.52%)	20(22.22%)	53(31.17%)	40(44.44%)	0.566	0.001
Control	6(6%)	5(8.3%)	25(25%)	8(13.3%)	69(69%)	47(78.33%)	0.614	

Table (3): Prevalence of toxoplasmosis among the traffic accident participants in Baghdad city according to gender

Toxoplasmosis	Traffic accident / No				Odd radio (1.95)
	Men	Women	Men	Women	
Yes	53(35.81%)	43 (29.05%)	95(64.18%)	20 (42%)	0.259
No	62(50.81%)	62 (71.76%)	60 (49.18%)	25(28.73%)	0.416

Table (4): Association between (IgG) and (IgM) anti -*T.gondii* seropositivity and risk factors

	The traffic accident drivers / Anti-Toxo V+e (%)	The control group drivers / Anti-Toxo V+e (%)	The odd ratio
Age groups / years			
20-30	14/40 (53%)	5/30 (16.66%)	2.8
31-40	60/80 (75%)	30/50 (50%)	1.4
41-50	64/80 (80%)	7/50 (14%)	3.2
51-60	20/70 (28.57%)	2/20 (20%)	3.5
Age groups in men			
20-30	20/30 (66.66%)	7/15 (46.66%)	2.85
31-40	45/60 (75%)	15/35 (42.85%)	1.05
41-50	25/40 (62.5%)	7/30 (23.33%)	1.25
51-60	27/40 (67.5%)	2/20 (10%)	4.82
Age groups in women			
20-30	10/50 (66.66%)	2/10 (20%)	5
31-40	25/45 (55.55%)	8/25 (32%)	0.625
41-50	8/15 (53.33%)	1/15 (6.66%)	1.6
51-60	7/15 (46.66%)	2/10 (20%)	0.14
Educational level			
Illiterate	27/40 (67.5%)	7/20 (35%)	3.85
Primary school	70/120 (58.33%)	17/70 (24.28%)	1.06
Secondary and above	60/110 (32.0%)	20/70 (28.57%)	0.77
Socioeconomic level			
Low	45/60 (75%)	17/30 (56.66%)	2.64
Medium	102/180 (56.66%)	20.80 (25%)	0.18

Cont... Table (4): Association between (IgG) and (IgM) anti -*T.gondii* seropositivity and risk factors

High	10/30 (33.3%)		0.54
	No. of samples tested	Prevalence of <i>T.gondii</i>	
		Infection No. %	
Cats at home			
Yes	90	42.65	0.54
No	121	57.34	
Raw or undercooked meat consumption			
Yes	60	28.43	0.69
No	151	71.56	
Raw fruit and vegetable consumption			
Yes	150	71.09	0.87
No	61	28.90	

Conclusion

Toxoplasmosis may show no symptoms in approximately (80%) of immunocompetent host in the latent stage. Cysts may persist in the host's muscles and brain for a life span. However, the motor function may be diminished to represent a major factor of traffic road accident of toxoplasmosis among humans. In our study, we could not explain the relationship between traffic road accidents or toxoplasma infection and parameters like longer reaction times and impaired motor performance, because we did not evaluate these parameters. Further studies should be done in the future to detect the effect of neurological damage caused by toxoplasmosis on the driver's motor reflexes.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Institute of Technical Medicine/ Middle Technical University/ Baghdad – Iraq and all experiments were carried out in accordance with approved guidelines.

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Therapeutic Evaluation of the Partial Movement of the Center of the Nerve Bundle

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Abstract

Neuroscience in the human body is one of the basic components and any defect in it, although it has a simple effect in many aspects of organic or inorganic because it is the precise organizer of most movements and instructions and others, and the problem is based on the most important reasons that it was observed that most of the activities and activities carried out by An individual in his daily life must be in accordance with mechanical foundations such as load weights, sudden movements, sitting, abnormal sleep and other things that have a direct impact on the movement of the nerve beam from its exact position may be up or down, making the body in an abnormal state, And move them out of place as a result of these factors that we mentioned are natural factors and not satisfactory and also cause some of the problems of organic diseases, such as diarrhea, vomiting and inability to eat in addition to pain in the lower abdomen and the symptoms of inorganic.

Keywords: *Nerve bundle, Therapeutic evaluation*

Introduction

The combination of science between them in order to find appropriate solutions to the problems that hinder work wherever they are and topical treatments is one of the important procedures in this aspect, and the process ¹ of appropriate diagnosis of the movement of the nerve bundle due to exposure to movement from its natural position in response to sudden movements or carrying some weights and other things Is important in the treatment methods, including topical treatment ² of the follow-up procedures of one of the nerve endings associated with the nerve bundle, and this type is special to return this package to its natural position without medical interference, through the simple procedure ³ that does not have any side effect on the body . As a result of the therapeutic application of the partial motion of this package we obtained a clear amount of improvement of most of the injured by a very high rate ⁴. The degree of scientific progress in obtaining better results and greater development in the process of acquiring information for development, which helps in the acquisition of information and development in which we achieve the requirements of success at the required level, and the concept of comprehensive measurement means the accuracy of accurate decision-making,

measurements of tools Which can be identified on many indicators through the analysis or quantification of the components that indicate the knowledge of scientific ⁵ facts and the amount of prediction between them during what is required of the performance of the athlete, which achieves development rates in the side that works by this contribution to the formation of a scientific experience for coaches Or workers within their specialties and thus we may get to the desired optimum performance in the sports movement according to a scientific measure, which is a direct goal in this aspect ⁶. The research in the field of tests and measurement in the field of sports has proven qualitative changes in order to secure the requirements of athletic achievement and raise the level from the health aspect, by giving us a precise description and analysis of this variable which has a simultaneous or cumulative health effect occurring to different body cells when practicing sports activity ⁷ The calendar is the program or measurements to determine the correct starting point, which determines the available characteristics or the objective treatment that is related to the subject of the reform, that this type of role after the diagnosis for the scientific interaction of microprocessors ⁸. The importance of the research to some non-chemical procedures to treat the sudden movement of the movement of the nerve bundle, which

has no side effect or other complications. The researcher noted the lack of scientific research on the movement of the motor neuron, as well as the lack of interest by athletes or workers in this field to this type of injury, which may be an obstacle in sports performance, which result from the misuse of the optimal mechanical aspects of pregnancy Balances and sudden movements such as jumps or rapid fall from different places and other natural factors that help move the abdominal nerve bundle from its natural place⁹, which has an effect in some aspects of organic nausea and diarrhea and lack of desire to eat and inorganic ones idle and lack of movement promise M sense of activity and other related things, hence we want to highlight the treatment of this injury without chemical interference¹⁰.

Research Objectives:

1 - Application of scientific methods to address the movement of the nerve bundle in the members of the research sample.

2- To know the effect of the scientific methods in the treatment of this type of origin.

Research hypotheses:

1 - the presence of different rates of movement of the nerve bundle in the members of the research sample.

2 - the effect of the treatment methods used for this type of injury in the members of the research sample.

Research Areas:

a - The human field: - The players of the individual and the individual games in the province of Thi - Qar.

b. Time domain: 1/1/2015 to 23/6/2015.

c - Spatial field: - Laboratory physiology in the Faculty of Physical Education and Sports Sciences at the University of Thi - Qar.

Methodology

The choice of the curriculum usually depends on the exact solutions and objectivity through which to find a solution to the problem, so the researcher adopted the descriptive method in the survey method to suit the nature of the research.

Community and Research Sample:

The methods and methods of selection of the

research sample are numerous and multiple, but there are things to consider when selecting the sample of the research. "The selected sample should represent the community of origin in a real and real representation so that the researcher can later circulate the results of his research to the community" Athletes with this type of injury were selected after their diagnosis by scientific methods and according to the precise measurements of the (20) players from various individual and individual events in the province of Dhi Qar.

Tools used: Stopwatch to calculate the pulse period, cotton, pot, water.

Exploration Experience:

The researcher conducted a survey of 2 members of the research community. The experiment was conducted within one day during which the measurements were conducted. The purpose of the experiment is as follows:

- Ensuring the total time to carry out the experiment.
- Ensure the work and field and the extent to which the implementation of measurements.
- Know the obstacles that appear and avoid the occurrence of errors and overlap in the work.
- Know the time needed to make measurements for each individual.
- Know the errors that occur in this experiment to avoid in the final experiment.

Procedural Methods:

The process of scientific evaluation should be objective so that we can accurately evaluate and the treatment method is appropriate. There are many ways and many, we do not take the scientific direction in this research has resorted to the researcher to choose the appropriate measurement method leads us to the diagnosis of appropriate and simple according to common symptoms such as nausea and loss Anorexia nervosa in the ventral nerve bundle area is close to the nerve center with a clear pulse appearance in the center. The measurements that have been adopted are:

A - Pulse Sensitivity Test¹:

If the pulse is directly under the finger, such as the heartbeat, this indicates that the system is compatible and that the packet is controlled, or vice versa, you will

notice the movement of the pulse from the center of the region either up or Down or you may not find the throbbing at all and you may find a weak pulse, we show that the beam moving from its place and the period is calculated to feel the pulse of a steady non-oscillating within ten seconds.

B- Direct pressure measurement ² :

The large finger is pressed at the center point of the leg joint from the back after lying on the abdomen. Both legs, which have a very strong pain in this area, indicate that the abdominal nerve bundle is moving from its normal position and can be treated from the leg which is

Where the source of the mother was calculated and the emergence of pain when the pressure on the region within a period of ten seconds.

Calendar: After confirming the scientific presence of a partial movement of the center of the nerve bundle according to the measurements that have been conducted, we do some of the following:

a - lying injured upright on the ground and the back facing the top and the arms stretched back.

b. The body is completely relaxed.

c. We take a piece of cotton with the size of the palm and put a quantity of water, we scan the leg from the middle of the knee to the end of the leg from the back, to facilitate the withdrawal of the nerve.

d - We press both thumbs on the center of the knee from the back and then drag down to the end of the leg.

e - Push the entire body through the feet forward in order to adjust the procedure for the withdrawal and return of the package.

Main experiment:

The main experiment was conducted on 23/6/2015 after completion of the exploratory experiments and the validity of the application and the time of the diagnosis, after which the researcher emptied the data with special forms for the purpose of conducting statistical treatments on them.

Statistical Methods

The researcher used the statistical bag (spss) in the extraction of the search results.

1. The arithmetic mean 2. The standard error, 3. The link box difference,

4. The simple correlation, 5. The degree (t) of the sample, 6. The contribution ratio.

Some statistical means of the sample of the research, which indicate the extent of achieving the objectives desired by the researcher according to the contribution rates and the amount of measurements that have been applied and the field of achieving its impact in the sample of the research chosen by the researcher, the researcher finds through these results there are a set of reasons that Led to this change in the level of therapeutic evaluation of individuals in this research, including us that the movement of any part of the nerve package from the original basis shows a defect in the functional aspects in addition to a defect in the physical aspects, and that the movement of the result of multiple causes, but weightlifting inappropriate and jump The sudden Or abnormal movement is one of the most important reasons for this move, and as a result of the diagnosis process, which most of the cases are dysfunction in the functional side as well as the motor side, the movement, although partially causing imbalance in the overall balance of the body because of its direct association with members of the body, The abdominal nerve bundle from its center has a clear effect on the various organs of the body and it is considered one of the important signs of moving this package from its place, because it is a center for mechanical distribution, but the main regulator of the process of balance in the body. The movement of the abdominal nervous system, although a simple movement has a significant impact in the spasms of the muscles of the diaphragm, which cause respiratory imbalance, where the diaphragm is one of the most important organs responsible for natural breathing, and believes “movement of the abdominal nerve plexus is a factor in the spasm of the surrounding muscles Diaphragm, which helps him in all his movements in order to complete breathing operations, and the connection of the nerve bundle abdominal through the abdominal artery near the stomach “³ The nerves are one of the main receptors of the instructions and that the occurrence of free, but simple, it prevents the arrival of the orders required for the performance of the motor and where it emphasizes that “the nerves of multiple benefits directly and the other directly and that any disorder in the organization leads to the lack of access to the natural doubt Affects the desired movement performance. On the sporting side, the integration of performance requires

safety in all machines function fully, as the presence of symptoms of organic and inorganic affect directly on the progress of performance and the athlete cannot give any amount of normal to the real level, but it could lose several properties and potential due to the existence of such These obstacles, which confirms that “the injury, although minor, has to have a direct impact on the performance of the sport and have additional aspects, whether they are accumulated or accumulated”^(4,6). These are the injuries that have an effect on the level of sport through the loss of motor balance due to the movement of the nerve beam that causes the presence of abdominal pain continuously, and have no chemical treatments for pain relief because it is caused by the simple movement of this package and is considered inorganic pain to be Treatment of the chemical side, where he points out that “the movement of the nerve bundle, although partially by its natural position, is working on the imbalance so that this imbalance is evident, especially in sports performance.”⁵.

Conclusions

The level of the two measures measured for diagnostic processes varied. There is a high correlation between the two methods of measurement that have been diagnosed. The presence of high contribution rates in achieving the level of the evaluation process on the members of the research sample. The presence of direct impact through the amount of differences obtained statistically.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Physical Education and Sports Sciences / Dhi Qar University, Iraq and all experiments were carried out in accordance with approved guidelines.

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Investigating the Level of Vitamin E, C and Superoxide Dismutase in Patients with Allergic Asthma and Allergic Asthma with Helminths Infection

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Abstract

The aim of this study was to investigate the relationship of antioxidant activity, vitamin E, vitamin C and superoxide dismutase with the severity of allergic asthma by estimating their level in the patients' sera, as well as evaluating their association with the level of total and specific serum IgE in allergic asthmatics and allergic asthmatics with helminths infection. The study applied on 180 subjects divided into three groups, 100 patients with allergic asthma and 50 patients having allergic asthma with helminths infection. The group of patients included 50 males and 100 females age 15-60 years. The control group comprised of 30 healthy individuals, included 14 males and 16 females age range 16-60 years. For each participant, the medical history was considered; the total and specific IgE levels, vitamin E, vitamin C and superoxide dismutase levels were determined in the patient's sera using ELISA technique. The present study has demonstrated an increased level in serum total IgE in the patients' groups (allergic asthma group and allergic asthma with helminths) compare to the control group, mean 374.54 IU/mL; 472.24 IU/mL; 29.21 IU/mL respectively. The level differences among the three groups are highly significant when compared statistically.

Keywords: Allergic asthma, vitamin E, vitamin C, superoxide dismutase, antioxidant, asthma with helminths infection, total IgE, specific IgE.

Introduction

Asthma is a major public health problem affecting many people around the world; men and women, young and old all over the world ¹. Asthma is a chronic disease of airways with acute lung inflammation and bronchial hyperresponsiveness that characterized by different respiratory symptoms including wheezing, dyspnea, chest discomfort, cough and variable airflow limitation (2,3). These symptoms are often caused by several factors such as allergen exposure, exercise, irritant exposure, viral respiratory infections or change in the weather ⁴. Asthma is believed to be trigger by a combination

of complex genetic and environmental interactions. It is divided into two types, both of them have the same signs. These types are allergic (or extrinsic) asthma and non-allergic (or intrinsic) asthma ⁵. Allergens can activate the inflammatory cells in the airways and lungs. This activation leads to generate oxidants (free radicals) (6,7). The antioxidant such as vitamin E, vitamin C and superoxide dismutase (SOD) terminate and inhibits oxidant reaction. As a result of this reaction, antioxidant reducing external attacks in the lung ⁸. However, asthma's patients have been reported to have reduced antioxidant defences in their peripheral blood ⁹. Vitamin E is an important antioxidant vitamin in the body, playing a protective role by which damage free radical and scavenge reactive oxygen species (ROS) ¹⁰. Vitamin E becomes oxidized itself while preventing the oxidation of other factors more important metabolically ¹¹. In allergic asthma and allergic lung inflammation, vitamin E acts as an anti-inflammatory factor and blocks the airway hyperreactivity by regulating leukocytes'

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signals of trans-endothelial migration from the blood to the lung¹². Vitamin E intake is associated with low serum IgE concentrations and low frequency of allergen sensitization¹³. Vitamin C is a critical water soluble vitamin that presents into two active forms, ascorbic acid which is oxidized derivative and dehydroascorbic acid. Vitamin C can act as a hydrogen donor to converse oxidation; therefore, it functions as a non-enzymatic antioxidant which deactivates and reacts with the free radicals^(14, 15).

Materials and Method

Subjects

The current study included 150 allergic asthmatic patients, 100 with allergic asthma and 50 having allergic asthma with helminths infection confirmed by general stool examination (GSE). The group of patients comprised of 50 males and 100 females age 15-60 years. These cases were followed up in the Specialized Center of Allergy in Baghdad/ Al-Rusafah and Al-Zahraa Center of Allergy in Baghdad/ Al- Karkh for the period from July 2018 to January 2019.

Exclusion criteria were included: smoker, oral corticosteroids, respiratory tract infection, cancer, any chronic disease other than asthma, parasitic infections other than helminths and pregnant females.

The control group involved 30 healthy individuals 14 males and 16 females with age ranged between 16-60 years. Exclusion criteria were chronic respiratory disorders, current or past history of allergy, helminths infection and all chronic diseases mentioned in reference to the study group above.

Study design

All patients underwent a detailed clinical examination included total immunoglobulin E test (T.IgE), specific immunoglobulin E test (S.IgE), general stool examination (GSE) and serum level of vitamin E, vitamin C and superoxide dismutase (SOD).

Five milliliters of peripheral blood sample were taken from each subject using disposal 10ml syringes under sterile conditions. The blood collected in a gel tube to get the required serum for serological tests (T.IgE and S.IgE). Samples were centrifuged for 10 minutes at 2500 rpm, then serum divided onto five Eppendorf tubes, one for each test. All serum samples kept frozen at -20°C until they used.

Determination of T-IgE, vit. E, vit. C and SOD

The level of serum T.IgE, vit. E, vit. C and SOD were determined using enzyme linked immunosorbent assay (ELISA) based on the manufacturer's instructions, where microtiter plates have pre-coated with antibodies. The standard and samples were applied on the wells, followed by adding the conjugate, then the TMB substrate to produce a blue color which will be changed to yellow when adding the stop solution. The concentration is proportional to the density of the produced yellow color, which is read using the microplate reader at 450nm to find the concentration of T.IgE, vit. E, vit. C and SOD.

Determination of S-IgE

The determination of S-IgE was performed using ELISA (polycheck kit, Germany). The polycheck strips were firstly coated with the allergens and calibrators, followed by adding the patients' and control sera which incubated on the rocker shaker. In the next step, the conjugate was applied followed by the substrate to quantify the IgE by the scanner and the computer. The inhalation profile kit that used to diagnose the types of allergens contains 20 parameters from the common allergens including: *Dermatophagoides pteronyssinus* (D1), *Dermatophagoides farina* (D2), Timothy Grass pollen (G6), Rye pollen (G12), Plantain pollen,(W9), Mugwort pollen (W6), *Cladosporium herbarum* (M2), *Aspergillus fumigatus* (M3), *Penicillium notatum* (M1), *Alternaria alternata* (M6), Dog epithelia (E2 / E5), Cats epithelia (E1), Horse epithelia (E3), Guinea epithelia (E6), Hamster epithelia (E84), Rabbit epithelia (E82), White Oak pollen (T7), Birch pollen (T3), Hazel pollen (T4) and Alder pollen (T2).

Investigation of helminth infections

The association of helminths infection in the group of allergic asthmatic patients were investigated using the GSE. Fecal samples were collected from the patients and control groups. The specimens were directly examined under 10X and 40X objectives.

Statistical Analysis

Statistical analysis was conducted with Statistical Program for Social Science software (IBM SPSS 23.0). Parametric quantitative data was presented as the mean ± standard error. Least significant difference test (L.S.D) was used to compare among the means of over than three (compare the concentration of T.IgE and vitamin

E, vitamin C and SOD in asthmatics, asthmatic with helminths infection and control groups). Correlation analyses between data were performed using Spearman’s tests, with the correlation coefficients presented as “R”. Level of significance was defined by using ANOVA test with probability $P \leq 0.05$ (significant), $P > 0.05$ (none significant) or $P < 0.01$ (highly significant).

Results and Discussion

Studying the relationship between the infection with allergic asthma and serum level of antioxidants vit. E, vit. C, SOD as well as its relationship with the level of total and specific serum IgE has been addressed in this study. In addition, the effect of the association of helminths infection with allergic asthma and the effect of this association on the immune response of allergic asthmatic patients was investigated for the first time in

this study, particularly in regard with the biomarkers mentioned above.

The current study has observed a significant elevation in the levels of the total serum IgE parallel with declined serum level of antioxidants in allergic asthmatic subjects and allergic asthmatics with helminth infection compared with healthy individuals. The mean serum level of total IgE of asthmatics was 374.540 ± 10.394 IU/mL, which is highly significant than its level in healthy control, mean value 29.216 ± 1.786 IU/mL, $p < 0.01$. In addition, the mean T.IgE level in allergic asthmatic subjects with helminth infection is 472.242 ± 6.273 IU/mL which is highly significant than that of the control. However, the T-IgE level in the patients with allergic asthma and helminth infection was higher than its level in the patients having only allergic asthma, the full comparison is presented in Figure 1.

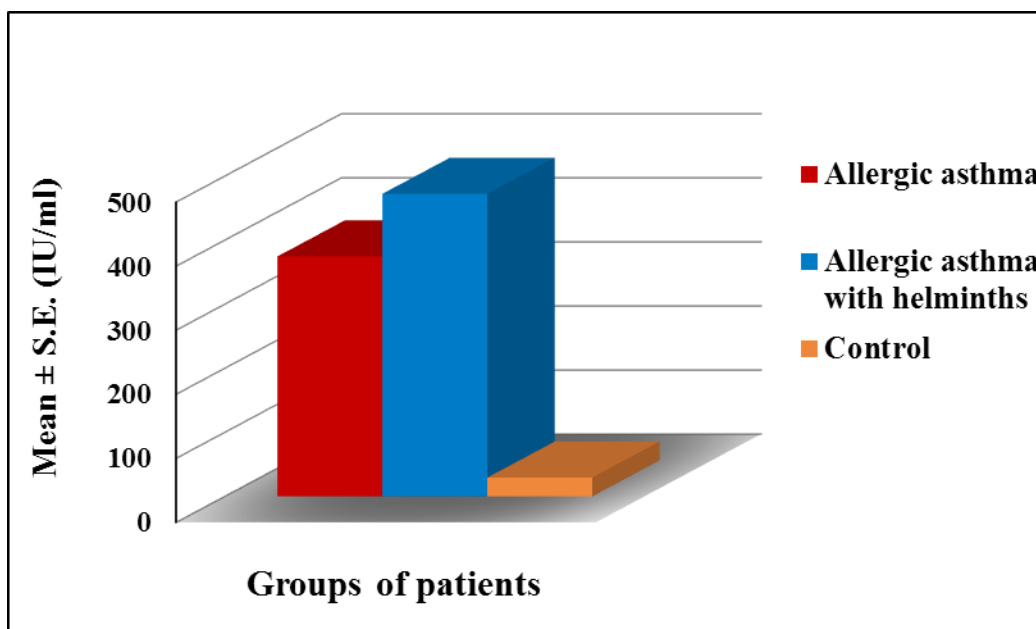


Figure 1: Serum levels of total IgE in the groups of allergic asthma, allergic asthma with helminths and control.

Allergens sensitization test was also performed in the current study by evaluating the level of serum S.IgE. The results have disclosed that the frequency of the most common allergens in 113 allergic asthmatic patients with positive specific IgE was as in the following: D1

(27%), D2 (26%), G12 (25%), T7 (23%), T2 (22%), W9 (21%), G6 (17%), E1 (17%), T3 (14%), E2 / E5 (14%), W6 (14%), E3 (12%), T4 (11%), M3 (7%), M2 (4%), E82 (3%), M1 (2%), M6 (2%), E6 (1%), E84 (1%), as shown in Figure 2.

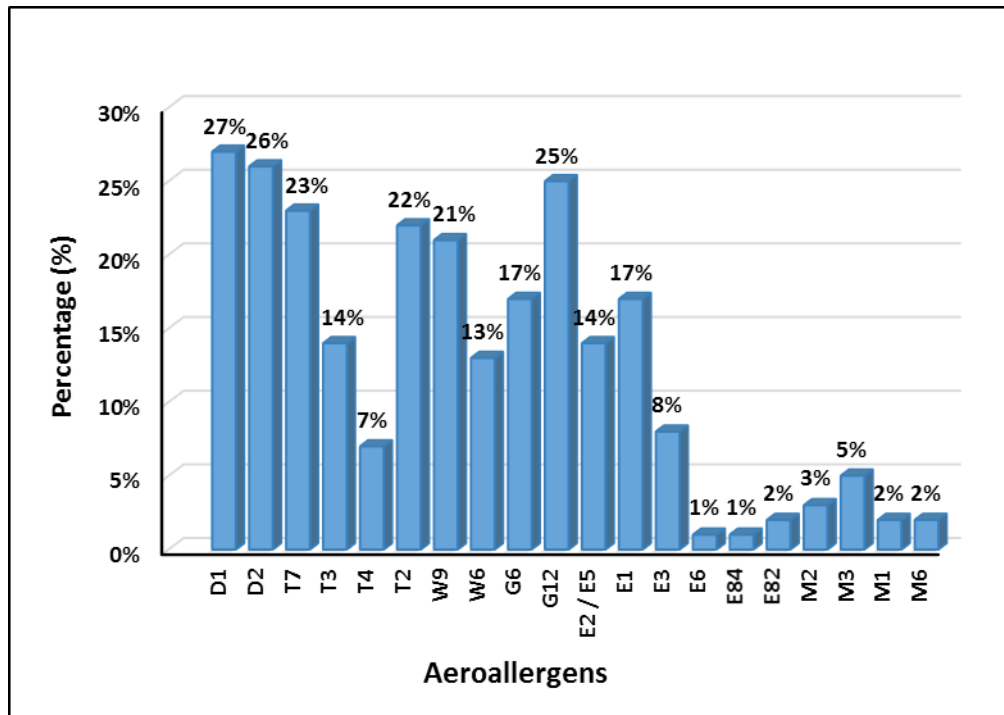


Figure 2: The percentage of aeroallergens that sensitize asthmatic patients’ groups.

As shown in Table 1, the mean level of vitamin E in allergic asthma patients was 11.545 ± 0.320 IU/ml and it was 9.413 ± 0.180 IU/ml in allergic asthma with helminths as compared to its mean level in healthy control group that was 23.253 ± 0.726 IU/ml. Statistical analysis shown that there are a highly significant differences when compared between patients’ groups and control group and also between allergic asthma and allergic asthma with helminths.

Table 1: Show the variation in vitamin E concentration among patients’ groups and control.

Groups	Vitamin E ($\mu\text{g/mL}$) Mean \pm S.E.	L.S.D. P-value
Allergic asthma	11.545 ± 0.320	$P1= 0.00^{**}$
Allergic asthma with helminths	9.413 ± 0.180	$P2= 0.00^{**}$
control	23.253 ± 0.726	$P3= 0.00^{**}$

****Highly significant ($p < 0.01$)**

P: probability, $P1$ =Allergic asthma Vs Allergic asthma with helminths, $P2$ =Allergic asthma Vs control, $P3$ = Allergic asthma with helminths Vs control.

The serum level of vitamin C in allergic asthmatics was 36.040 ± 1.367 $\mu\text{g/ml}$, while the recorded mean level in allergic asthmatics with helminths infections was 21.163 ± 0.793 $\mu\text{g/ml}$. The statistical analysis reached that vit. C level in both patients’ groups are significantly different from the level of vit. C in the sera of the control group which was 76.288 ± 2.708 $\mu\text{g/ml}$. On the other hand, there was a highly significant difference in the level of vitamin C between the two patients’ groups as shown in Table 2.

Table 2: Show the difference in the level of serum vitamin C in the groups of allergic asthma, allergic asthma with helminths and control.

Groups	Vitamin C ($\mu\text{g/mL}$) Mean \pm S.E.	L.S.D. P-value
Allergic asthma	36.040 \pm 1.367	P1= 0.00**
Allergic asthma with helminths	21.163 \pm 0.793	P2= 0.00**
control	76.288 \pm 2.708	P3= 0.00**

**Highly significant ($p < 0.01$)

P: probability, P1=Allergic asthma Vs Allergic asthma with helminths, P2=Allergic asthma Vs control, P3=Allergic asthma with helminths Vs control.

Moreover, it has been found that superoxide dismutase is also decreased in both patients' groups. Statistically, there were highly significant differences between the both patients' groups (Table 3) and between the patients in the two groups and the control too. The level of SOD in allergic asthmatic group was 149.048 \pm 6.447pg/mL, whereas, it was 78.271 \pm 3.635 pg/mL in the group of allergic asthma with helminths. Nevertheless, the SOD level in the serum of the control group was 1034.157 \pm 32.659.

Table 3: Demonstrate the difference in the level of superoxide dismutase (SOD) in the groups of allergic asthma, allergic asthma with helminths and control.

Groups	SOD (pg/mL) Mean \pm S.E.	L.S.D P-value
Allergic asthma	149.048 \pm 6.447	P1= 0.00**
Allergic asthma with helminths	78.271 \pm 3.635	P2= 0.00**
control	1034.157 \pm 32.659	P3= 0.00**

** Highly significant ($p < 0.01$)

P: probability, P1=Allergic asthma Vs Allergic asthma with helminths, P2=Allergic asthma Vs control, P3=Allergic asthma with helminths Vs control.

Table 4: Show the variations in the level of antioxidant according to different groups of T.IgE level.

Antioxidants		T.IgE lower than (300) group	T.IgE between (300-500) group	T.IgE upper than (500) group	L.S.D. ANOVA (p-value)
Vitamin C ($\mu\text{g}/\text{mL}$)	Mean \pm S.E.	37.162 \pm 2.110	27.380 \pm 2.021	25.257 \pm 1.632	P=0.00**
Vitamin E ($\mu\text{g}/\text{mL}$)		11.179 \pm 0.348	11.101 \pm 0.602	9.821 \pm 0.240	P=0.01**
Superoxide dismutase (pg/mL)		138.149 \pm 8.281	116.647 \pm 12.328	100.637 \pm 8.320	P=0.03*

*Significant ($p < 0.05$) **Highly significant ($p < 0.01$)

S.E.= standard error

Allergic asthma is the most common phenotype of asthma among patients. The IgE is a well-known component of allergic reactions where it is produced during the process of sensitization which is triggered on the first exposure to the allergen. However, the level of T.IgE is increased with helminths infections too²². The results observed in current study indicating that the T.IgE playing a central role in the initiation and propagation of the inflammatory cascade of the allergic response and also in the immune response to the helminths infection, as shown in Figure 1.

Conclusion

The level of antioxidants, vit. E, vit. C and SOD are correlated with the severity of allergic asthma, where asthmatic patients having antioxidant insufficiency due to the increased oxidative stress. In addition, antioxidant activity has a negative correlation with pathogenesis parameters of allergic asthma such as total and specific IgE as well as with helminth infections.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Science, Mustansiriyah University, Baghdad-Iraq and all experiments were carried out in accordance with approved guidelines.

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The Role of Cytomegalovirus (CMV) and Vitamin D in Multiple Sclerosis (MS)

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Abstract

Multiple sclerosis (MS) is one of the autoimmune demyelinating diseases involved in the central nervous system (CNS) and its etiological factors believed to be both environmental and genetic factors . The disease affected brain and spinal cord with various characteristic involved defect of myelination , chronic inflammation , pathological effect on axon and oligodendrocyte . The herpesvirus family is play a vital role in pathogenicity of disease . Cytomegalovirus (CMV) from these family members which detected to have a role in MS and our results investigated a significant relation of CMV with MS between patients and controls . Besides a previous data which approved the effect of the level of vitamin D on MS development and modifications in patients . In this study the results achieve significant differences in the levels of vitamin D between the two groups under study .

Key words: *multiple sclerosis (MS), Cytomegalovirus (CMV), (25- hydroxyvitamin D), Vitamin D.*

Introduction

One of the diseases involved in the central nervous system (CNS) is multiple sclerosis (MS) ¹ . The disease affected brain and spinal cord with different clinical features such as blemish of myelination , chronic inflammation , pathological effect on axon and oligodendrocyte ² . Generally , the disease pathogenesis may related to genetic factors of an individual or due to environmental conditions surrounding the patients ³ . The environmental factors can be suggested to related to distribution of the disease , in some population like Jordanians the disease incidence , is ranged from 20-60 cases per 100,000 persons ⁴ . In spite of World Health Organization , showed the incidence of MS reported to be 4 in 100,000 ; in South Asia reported to be region with a medium to high risk for MS ⁵ . While the prevalence in northern Europe or Canada is about 0.1 - 0.2% in population ³ . Multiple sclerosis is considered as idiopathic disease, and many factors can be associated with its progression ; from these are the genetic factors such as the role of the genes responsible of DNA repair in activation of MS and lesions formation ⁶ . As well as the role of polymorphisms in human leukocyte antigen (HLA) genes class II ⁷ . Numerous of genes associated with the disease are the regulatory genes affected the immune cells and their function which lead to

dysregulation of the immune system ⁸ . Auto-reactivation of T cells against myelin may contribute to pathogenesis, and there is increasing attention of the role of human viruses in autoimmune diseases and its progression ⁹ . There is a significant increasing damage in nuclear and mitochondrial DNA in lesions of MS comparing with normal brain white matter and this highlights on the role of repair genes in DNA ⁶ .

Studies shown that multiple genes such as base excision repair genes involved in DNA repair may expressed in lymphocytes and lesions of MS when compared with tissues of control ¹⁰ . The environmental factors are strongly approved to be associated with the triggering of MS , like viral infection , high radiation of UV , climate and temperature , fat intake from animal sources , consumption of dairy products and levels of vitamin D ¹¹ . genotoxic agents ,like cigarettes and nitric oxide may support and involve in MS induction ¹² .

The Role of Vitamin D :

Vitamin D concedes as essential nutrient for the bone homeostasis and plays a role in many disorders like cardiovascular and autoimmune diseases ¹³ . Although the deficiency of vitamin D is common in all ages but it hard to occur in the young and elderly ; and not only bone disorders , but many disorders can be related to

it , such as cardiovascular , autoimmune and neuro-related diseases such as schizophrenia ¹⁴ . In the immune system it is proposed to play a vital and supportive role in controlling of several diseases, as a cancer and neurodegenerative disease and possible relation with MS ¹⁵ .

Enhancement the function of vitamin D is by binding to the vitamin D receptor (VDR) on the cells ; by the ability to converting 25(OH)D to the active form 1,25(OH)2D. The VDR concedes as a mediator for the signaling, and its regulation is unclear until now ¹⁶ More than 2,000 genes can be regulated directly or indirectly by 1,25(OH)2D ; as well as there are at least eighty various metabolic processes regulated by these genes such as repair of DNA , apoptosis , alteration of function of the immune system , oxidative stress ¹⁷ .

Many factors and there accurate roles must be examined because they preventing and treating many disorders related to with VDR and its function by facilitating and improving strategies ¹⁸ . Many studies indicate the protective role of vitamin D on MS patients, and the risk of disease is reduced by Vitamin D supplements and exposure to sunlight ¹⁹ . Moreover, expression of VDR induced by 1,25(OH)2D in both resting and activated cells ; and for homeostasis of T cell during MS , vitamin D plays crucial role , and supplementation of it should be appropriate to treat the disease severity ²⁰ .

Multiple Sclerosis and Viral Association :

Studies connect between viral etiology and MS; that due to the association of viral infection and encephalomyelitis , demyelinating processes in the nerves and axonal damage ; all that may precede the lesions of MS; as well as plaques of active demyelinating caused by T CD8 lymphocytes which involved in viral immunity ²¹ . Processes of cortical and axonal damage with lesions absence are detected in viral demyelinating , are seen generally in MS , and there is a resemblance of relapsing remitting MS form and periods of reactivation and latency of many viruses, such as the herpes virus ²² .

Cytomegalovirus (CMV) , Epstein- Barr Virus (EBV) , Human Herpes Virus 6 and 7 (HHV-6 and HHV-7) are members of the family *Herpesviridae*, and are from plausible viral agents associated with triggering of MS, as well as endogenous retroviruses also considered to be significant agents in MS ²¹ . The infection by CMV may activate the reaction of the immune system

against the constituents of myelin of peripheral nerve ²³ . A wide of inflammatory diseases and brain cancer , CMV was concerned to be as a co-etiological agent ²⁴ . Furthermore a wide range strategies can be caused by CMV can be targeting the host defenses, from disturbing the pathways processing of antigen to modulating of cytokines ; and this establishing success coexistence of CMV during active infection , and in many tissues and organs this virus can be found , as well as in fluids of body ²⁵ .

Types of MS :

There are 4 clinical types according to the course of disease; relapsing-remitting MS (RR-MS), secondary-progressive MS (SP-MS), primary progressive MS (PP-MS), and progressive-relapsing MS (PRMS) ; the first type is the major one and approximately 85% of patients are identified with it , in which exacerbations symptoms is noticeable and remission period is followed by , and the symptoms either progress or withdraw ; in a number of patients RR-MS types of disease may developed into the second type (SP-MS) in which the disease continues to be deteriorate with remission period or without ⁴ . The third types of disease (PP-MS) about 10 percent of total patients be affected ; and the symptoms gradually worsening without remissions or relapses, the rare types of MS is the last one (PR-MS) which affecting less than 5 percent of total patients and from the onset of disease it is progressive intermittent flareups with no remission periods and the symptoms are worsening the way ²⁶ . In the adolescence the disease onset initiates and the peak reaches among the persons in late 20s and the beginning of early 30s , and the females developed the disease in doubling than males ²⁷ . In Arabic populations , all ratio of gender designate that the females affected more over than males ²⁸ .

Materials and Method

In this case control study sixty patients participating . They had MS from all types ,who attendance the MS center in medical city, their ages range between (19-53) years . And the confident diagnosis was confirmed according to examination clinically and neurologically by neurologists . Sixty persons ; females and males included in this study as a control with normal clinical and neurological status and with no history of MS , and their ages approximately matched to that of patients .venous blood samples were collected and the serum separated from patients and control . Vitamin D immediately

examined while the rest of serum stored in -4°C until Anti-CMV antibodies examined . CMV IgM ELISA kit provided by (CALBIOTECH / USA company) .

used to compare means of (Vitamin D and Anti-CMV antibodies) serum level between two groups (patients and controls) . A p-value ≤ 0.05 was considered as significant ²⁹ .

Statistical Analysis

The statistical analysis of this study included the calculation of mean values and percentage. The association between Vitamin D and Anti-CMV antibodies was done by calculated of Chi square and P value with 95% confidence interval (95%CI). T-test was

Results and Discussion

In present study 60 for each of patients and control group taken . All the types of MS included in this study and 38 (63%) were detected with the first type (RR-MS) . The results obtained is illustrated in the Table (1) .

Table (1) : The ages , mean of ages and gender of patients and control groups .

Groups	Ages	Mean of ages	P value	Females	Males
Patients (n=60)	(19-53) years	34.73±8.9	0.9	43(72%)	39(65%)
Control (n=60)	(17-56) years	34.93±10.4		17(28%)	21(35%)

P-value ≤ 0.05 is significant

In this study we found that there is no significant differences of ages between two groups and , the prevalence of females is more than males , our results matched with previous studies who told that , generally MS presents in women higher than in men ; and this may be due to variations in the nervous or the immune system , differences in hormones , variations in the genetic , differences in the environment and modern lifestyle between men and women ³⁰ . And there are markedly increasing of this disease in women than men in last years ³¹ .

This increasing possibly pointed to unclear changes in nutrition or environmental conditions which lead to predominance of this disease in women ³² . Also there is a different response of females and males against factors in the environment ; such as the sun light and supply of Vitamin D ³³ . Moreover , increasing intake of dietary salt may be suggested to develop autoimmune diseases by activation of T-helper 17 cells ³⁴ .

The role of CMV in MS patients :

The level of anti-CMV antibodies of patients and control groups were detected by ELISA kit and our results represented that , there is a significant differences of anti-CMV antibodies between two groups . And CMV showed to have a positive role in MS disease ; table (2) .

Table (2) : Anti-CMV antibodies of patients and control group .

Groups	Anti-CMV antibodies positive (number and %)	Anti-CMV antibodies negative (number and %)	Mean of Anti-CMV antibodies positive (IU/mL)	Border line (number and %)	P value
Patients (n=60)	40(66.66%)	16(26.66%)	2.21±1.5	4(6.66%)	0.005
Control (n=60)	26(43.33%)	29(48.33%)	1.46±1.2	5(8.33%)	

P-value ≤ 0.05 is significant

Many studies about *Herpesviridae* family, talk about the role of these family members in triggering and pathogenesis of MS; and most of these studies recorded the significant role in induction of MS; these viruses have periods of latency and exacerbations within CNS; Epstein-Barr, cytomegalovirus, human herpesvirus 6 and human herpesvirus 7 viruses from these viruses which are possibly triggering MS²¹. Several studies proved a high rates of infection with CMV in MS patients; but with more benign characteristic of this disease²³. In comparison, the high titers of antibodies against CMV, the patients have disease reactivation in lower rates and cerebral atrophy in fewer signs with those patients who had lower antibodies titers³⁵.

Sanadgol *et al.*, support the hypothesis of contribution of CMV with MS and establishment of systemic infection by CMV in induction of immune response²³. As well as induction of demyelinating lesions may be caused by myelin-specific lymphocytes which triggering by CMV³⁶. In contrast of that Najafi *et al.*, revealed, there is no significant differences between the anti-CMV antibodies and MS based on statistical analysis³⁷.

Many surveys correlate between the role of infection by CMV and some types of autoimmune disease; and these studies demonstrated the role of CMV infection in attacking of the immune system to own cells of patient's by antigenic mimicry, and a high titers of IgG antibodies against CMV found in certain autoimmune disease³⁸. In other hand probably CMV is capable to evade the immune system and induce the mechanisms of immune regulation, which may decrease the reactivity of MS disease in patients with MS³⁹.

In general There is controversy about the role of pathogenesis of CMV in MS patients; some studies suggested a positive relationship between MS activity disease and infection with CMV; while others investigated negative role between MS and CMV infections⁴⁰. Many studies needed to improve the role of CMV in MS induction by taking larger samples of patients of MS and healthy control.

The role of vitamin D in MS :

In this study the level of Vit. D is measured and the results of two groups shown in the following table.

Table (3) : the level of vitamin D of patients and control group .

Groups	Deficiency (number and %) of Vit.D level	Sufficiency (number and %) of Vit.D level	Mean of Vit.D deficiency (ng/ml)	P value
Patients (n=60)	47(78.33)	13(21.66)	21.78±13.1	0.000
Control (n=60)	19(26.66)	41(68.33)	36.43±14.1	

P-value ≤ 0.05 is significant

The result revealed that, there is a significant differences between two groups in levels of vitamin D. The patients with MS suffering from deficiency in vitamin D level and Sintzel *et al.* pointed to relationship between vitamin D levels in serum and development and activity modifications of MS in patients; besides the lower level of vitamin D, the higher risk of MS development⁴¹.

Besides the levels of (25- hydroxyvitamin D) in many cases of MS are much lower when compared with healthy peoples, as well as the patients with active form

of disease have lower levels of vitamin D than those with the disease with less active state, and this indicated a significant inverse relationship between serum 25(OH) D and the activity of clinical state of MS⁴².

Evaluation the relationship between the intake of vitamin D from diet or supplements and the risk of development of MS showed that, the women with highly intake of vitamin D supplement had a lower incidence with 33% less of MS development in comparison with women who taking low or no supplements of vitamin D; moreover, the women that used supplements of vitamin D had a 41% reduction in development of MS disease in comparison with non-user women; and that predict to

reducing the onset of MS risk ⁴³ .

Furthermore , an individual etiological factor for MS , vitamin D reported to interact with other causes of MS like , genetic factor as HLA-DR1 to environmental factor as a smoking ⁴² . Decrease in serum level of vitamin D due to genetic causes supposed to increase the susceptibility to MS by fifty percent ; while increasing the level of 25(OH)D by 50% may decrease getting MS at about 50% ⁴⁴ . On the other hand a vitamin D daily dose or a gestational dose per day ; may “*keeps the MS doctor away*” is not proven until now ; in addition in a large majority , the level of serum 25(OH)D may not prevent MS of many peoples ⁴⁵ .

Runia *et. al.* told that risk of relapse may reduce significantly in individuals with medium (20-40 ng/mL) or high as (> 40 ng/mL) levels of vitamin D in comparison to those individuals with levels lower than ⁴⁶ . The association between MS lesions development and the levels of vitamin D showed that individuals with high levels of vitamin D are developing much lower newly lesions and of enhancing lesions gadolinium (Gd+) ⁴⁷ . Moreover increased level of 25(OH)D related to less active rate of new lesions and relapse rate at 57% ⁴⁸ .

The receptors of vitamin D especially for 25(OH)D found in many cells of immune system like macrophages and ; and stimulation of these cells through the receptors can inhibit the immune response and cytokine production ; and in patients with MS , vitamin D supplements can the level of IL-2 mRNA in mononuclear cells ⁴⁹ . In patients with MS, the immunomodulation by 25(OH) D ,can increase the anti-inflammatory cells and inhibit the pro-inflammatory cells , which reduce the severity disease ; after the intake of vitamin D dietary(1000 IU/day) also the cytokine profile modification can reduce inflammation and this can be demonstrated in patients with MS ⁵⁰ .

As well as in the genomic level vitamin D receptor (VDR) gene polymorphisms have been demonstrated to be link to numbers of diseases such as MS ⁵¹ . Furthermore a similar result showed the significant differences between the patients and controls of genotype distribution of (VDR) genes ⁵² . On the other hand , Cakina *et al.* showed that , there is no significant differences between MS patients and control groups ⁵³ .

Conclusion

In spite of the controversy role of CMV in triggering

of MS ; this virus play a major role in this disease either by induction of disease by activation of immune system against the myelin of CNV by molecular and antigenic mimicry or by reduce the reactivity of disease and lesion formation due to evasion of immune system by periods of latency of these viruses. Vitamin D is not only act a vitamin it is a gene and cell regulator . It is play a crucial role in induction of many diseases like cardiovascular disease , diseases related with the nervous system and immune system . And its role in MS induction and activation is clear , and its role of it and its receptors need for more investigations.

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Potential Factors Associated with Epilepsy among Epileptic Patients Attending Middle Euphrates Neurosciences Center - Al-Najaf City

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Abstract

Objective: To identify the some factors associated with epilepsy. A Case-control study was carried out at Middle Euphrates Neurosciences Center in An-Najaf City- Iraq, the study was conducted from mid of October 2016 until mid of March 2017. Participants recruited in the study were selected as conveniently, (74) of them were already diagnosed by neurologist as epileptics patients and considered as cases, while (140) were non-epileptic from same setting considered as control group. instrument structured for this purpose, data collection was done using pretested questionnaire which consist of two parts, first one included: biographical data (age, gender, marital status, level of education, occupation, and resident). The cases and control groups are age and sex matched. Epileptic patients had a significantly low level of education (Not read and write) 34.4% as compared to healthy control group 13,3% this difference is statistically significant $p < 0.05$ the Odds Ratio (OR) was 2.1., the following possible risk factors were significantly associated with epilepsy in this study; unemployment OR= 2.7 , positive family history OR=1.8, central nervous system lesions OR= 4.3 and natal defects OR=8.3.

Keywords: epilepsy, risk factors, Iraq

Introduction

Epilepsy is a common health problem that effect peoples and it is featuring as a seizure attacks with differences in clinical events, that need to be treated by use of medications ⁶. Epilepsy can occur at any age, race, ethnic ⁵. More than 10 % of people around the world were effected with single attack of abnormal movement, generally single attack not classified as epilepsy if not affected at least two unprovoked seizures attack separated by 24 hours, but the person at risk for recurrent and appear as epileptic patient ⁸. About 724,500 epileptic patients are distributed in Arab countries according to epidemiological review in Arab countries for epilepsy ¹. The risk evolving for epilepsy in life of person along life time is 1.4-3.3 % ¹³. Many factors are associated with occurrence of secondary epilepsy or considered as risk factors for it if present in person like family history, any brain lesion (tumor, trauma, and cerebrovascular accident), and central nervous system infection. Otherwise if not associated with any mentioned factor consider primary (unknown

cause) epilepsy ⁹. People who are affected with epilepsy are interesting to identify the risk factors related to underling health condition ¹¹, 25%-45% of epileptic patients, were affected with epilepsy related to many causes such as hereditary, brain structure lesion, or metabolically disturbances cause, while other peoples with epilepsy considered an idiopathic affect ⁴. Family history according to antecedent studies consider one of major risk factors affecting young age ⁸. It is important to predict the potential risk factor for epilepsy to take preparation of health planning contribution ³. This study was conducted to identify the risk factors associated with epilepsy.

Methodology

A Case-control design was carried out at Middle Euphrates Neurosciences Center in An-Najaf City which is the single specialist center established in (2010) to cover the needs of neurological consultations for population in south region of Iraq, the study period from 16 October 2016 until 16 March 2017. Data were

collected from (214) patients selected as a convenience sampling, (74) of them were already diagnosed with epilepsy considered as cases group, while (140) were non-epileptic from the same setting considered as control group. This data were achieved verbally by direct interview with both who attend as outpatients of the center, structured questioner was constructed for this purpose, the using form consist of two parts, the first one includes: demographical characteristics (age, gender, marital status, level of education, occupation, and residence), while the second part consists of questions about potential risk factors for epilepsy such as family history, history of central nervous system lesion that result from (infection, congenital defect, trauma, tumor, and other defects for CNS), pregnancy and delivery factors, other potential risk factors, and unknown risk factors for epilepsy. Reliability of the questions was (0.68) of the form were calculated after carrying out a pilot study which included (20) participants who excluded from the study sample, the validity of the study tool was done

through reviewing by panel of (10) experts. The selection of patients considered the clinical diagnosis of patients and using of chronic disease identification form which used for free medications and the diagnosis confirmed by electroencephalograph (EEG). Statistically analysis was done using Odds Ratio (OR) with measure the risk, OR more than one considered as a positive association.

Results and Discussion

The current case-control study includes 74(35.2%) epileptic patients and 140(64.8%) non-epileptic patients. Table (1) shows differences in distribution of socio-demographic characteristics among case and control group, males 117 (54.7%) more than females 97 (45.3%) in all sample. Most of them were married 128 (59.8%) and 86 (40.2%) were single. 45 (21.0%) were read and write, while 3 (1.4%) had higher academic level of education. The highest 77 (36.0%) were not working, 136 (63.6%) were living in urban area.

Table (1) Distribution of Socio-demographic characteristics of sample

Socio-demographic characteristics		Cases	Control
		No. (%)	No. (%)
(Age groups) years	(1-18)	40 (54%)	17 (12.2%)
	(19-36)	18 (24.3%)	60 (42.9%)
	(37-54)	9 (12.2%)	46 (32.8%)
	(55 and more)	7 (9.5%)	17 (12.1%)
Gender	Male	41 (55.4%)	76 (54.3%)
	Female	33 (44.6%)	64 (45.7%)
Marital status	Single	53 (71.6%)	33 (23.6%)
	Married	21 (28.4%)	107 (76.4%)
Levels of education	Not read and write	24 (32.4%)	20 (14.3%)
	read and write	14 (18.9%)	31 (22.1%)
	Primary school	19 (25.7%)	22 (15.7%)
	Secondary school	14 (18.9%)	30 (21.4%)
	Academic holder	3 (4.1%)	37 (26.4%)
Occupation	Not working	47 (63.5%)	30 (21.4%)
	Free working	10 (13.5%)	25 (17.9%)
	Office holder	15 (20.3%)	40 (28.6%)
	House wife	2 (2.7%)	45 (32.1%)
Place of Residence	Urban	40 (54.1%)	96 (68.6%)
	rural	34 (45.9%)	44 (31.4%)

Table (1) shows that (1-18) years were the highest age group in case, while in control group the age group (19-36) years was the highest.

In consideration of gender in case group the male were 41 (55.4%) more than female 33 (44.6%), like that in control group the male group was 76 (54.3%) more than female 64 (45.7%).

Regarding to marital status 53 (71.6%) were single case group, while in control group 107 (76.4%) were married.

The highest percentage were not read and write related to level of education in case group was 24 (32.4%), while in control group the highest were 34 (24.3%) for Academic holder.

Regarding to place of residence most of cases 40 (54.1%) were living in urban area in case group and control group 96 (68.6%).

Table (2) Distribution of the Associated Risk Factors Among the Study Group

Risk factors	Exposed	Cases	Control	OR
		F (%)	F (%)	
Family history	Not Exposed	39 (52.7%)	94 (67.1%)	1.83
	Exposed	35 (47.3%)	46 (32.9%)	
CNS lesion	Not Exposed	34 (45.9%)	110 (78.6 %)	4.31
	Exposed	40 (54.1%)	30 (21.4%)	
Antenatal def.	Not Exposed	45 (60.8%)	130 (92.9%)	8.37
	Exposed	29 (39.2%)	10 (7.1%)	
Others diseases	Not Exposed	70 (94.6%)	135 (96.4%)	1.54
	Exposed	4 (5.4%)	5 (3.6%)	

CI (confidence interval)=95%, OR= Odds Ratio

Table (2) presented the distribution of OR (1.83) for (74) epileptic patients in case group 35 (47.3%) patient exposed with family history and 39 (52.7%) are not exposed, in control group 46 (32.9%) exposed and 94 (67.1%) are not exposed, OR (4.31) for 40 (54.1%) exposed to CNS lesion and 34 (45.9%) are not exposed in case group, while in control group 30 (21.4%) exposed to same lesion and 110 (78.6 %) are not exposed, for 29 (39.2%) exposed and 45 (60.8%) not exposed to natal defects in case group, and 10 (7.1%) exposed and 130 (92.9%) not exposed the OR was (8.37). With history of other chronic disease potential risk factor the OR (1.54) for 4 (5.4%) exposed in case group and 70 (94.6%) are not exposed in same group, but in control group the exposed to these factors were 5 (3.6%) and not exposed were 135 (96.4%). The current study carried out to identify the risk factors for epilepsy in 74 participants who classified as disease compared with 150 participants no disease as control group. This study explain the association between different factors studies

such as family history, brain lesion, natal and postnatal defects, the Odds ratio in all these exposure are more than 1.5 this means the associations are positive and the factors studies are related to the development of this disease. Family history is one of the major risk factors for epilepsy as that found by ¹⁰. in their study in Iran at 2007, in current study family history had positive affect for occurrence of epilepsy. Central nervous system lesion included infection, congenital defect, trauma, tumor and other defects are positively associated with the study in occurrence of epilepsy in population, this finding is similar to Bhalla D. and Lotfalinezhad E. in their study at 2016 when presented that stroke is a significant risk factor for epilepsy. Wang H. et. al. in their study of Influential factors of epilepsy following aneurismal subarachnoid hemorrhage found that many aneurismal subarachnoid hemorrhage cases result in epilepsy that confirm the reality of brain lesion effect in occurrence of epilepsy. Prenatal, antenatal and post-natal defect history detect in this study have positive effects this defect distributed among (asphyxia, low weight, premature, trauma during delivery, jaundice, febrile seizure) this

finding agree with ⁷ who find in their study of Epileptic Encephalopathy in Children as Risk Factors for Brain Damage effect of prenatal and perinatal brain defect history on occurrence of epilepsy of many children. In view of point family history considered a risk factor in occurrence of epilepsy together with exposure to trauma and exposure to congenital anomalies and antenatal, post natal.

Conclusion

There are a strong association between epilepsy and family history, nervous system lesion, natal defect and other diseases.

Conclusion

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon –College of Nursing, Iraq and all experiments were carried out in accordance with approved guidelines.

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Acute Infective Bloody Diarrhea in Children Below Five Years Admitted to Children Welfare Hospital in Medical City - Baghdad During 2015

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Abstract

Bloody diarrhea in young children is usually a sign of invasive enteric infection that carry a substantial risk of serious morbidity and death. Objectives : to identify the proportion of infective bloody diarrhea out of total number of gastro-enteritis cases ,also to identify the prevalence of different etiological agents and to find the relation between the main infective etiological types of bloody diarrhea and some sociodemographic factors of this study. Retrospective study was conducted in Children Welfare Teaching Hospital / Baghdad during period extending from 1st of January to 30th of June 2016. Information was collected by reviewing the records of patients with acute infective bloody diarrhea under 5 years of age admitted during 2015. The study revealed that the proportion of infective bloody diarrhea was 10. 9% out of the total gastroenteritis (788) cases admitted during 2015, and Entamoeba Histolytica was the most common isolated pathogen in the study 42 (48%) patients. followed by E.coli 15 cases (17.4%), shigella, salmonella 7(8%) and 4(4.7%) respectively . The most vulnerable age was those below 2 years (58%) and males were affected more than females (1.3:1), (37%) were bottle fed. The majority had chlorinated tap water supply (82.6%).

Key wards: *bloody diarrhea/children/under 5/children*

Introduction

Diarrhea is a preventable and treatable disease however it is still a major public health problem particularly in developing world It ranks as the third leading cause of both mortality and morbidity among infectious diseases, placing it above tuberculosis and malaria ¹. About 80% of deaths due to diarrhea occur in the first two years of life. The main cause of death from acute diarrhea is dehydration. Other important causes of death are dysentery, malnutrition and serious infections such as sepsis ². Bloody diarrhea in young children is usually a sign of invasive enteric infection that carries risk of serious morbidity and death. Non-infectious causes account for a very small proportion of episodes of bloody diarrhea ³ About 10% of diarrheal episodes in children under 5 years of age have visible

blood in the stool and these account for about 15% of diarrhea-associated death in this age group worldwide ⁴. Compared with the watery diarrhea, bloody diarrhea generally lasts longer, is associated with more complications, is more likely to adversely affect a child growth and has a higher case fatality rate ^(5,6,7). There is also a synergism between bloody and persistent diarrhea accompanied by malnutrition; therefore the control of bloody diarrhea will prevent most of deaths attributed to malnutrition and persistent diarrhea ^(2, 8, 9). According to WHO, in Iraq, the sanitary condition and general hygiene all over Iraq had been deteriorated during the last decade, particularly following the last war 2003 ^(2,10). However, only a few studies have described the epidemiology of bloody diarrhea among this age group.

Aim of Study

1. To identify the proportion of infective bloody diarrhea cases and their different etiological factors out of total number of gastro-enteritis.
2. To identify the predisposing factors of bloody diarrhea.

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3. To find the relation between the main infective etiological types of bloody diarrhea of the admitted patients and some sociodemographic factors of this study.

Patients & Method

Study design: A Cross-sectional retrospective study.

Study period: it is carried out during the period extending from 1st of January to 30th of June 2016.

Study population: Children under 5 years.

Study place: Children welfare Teaching hospital/ Baghdad.

Study sample: (86) cases of bloody diarrhea out of (788) gastro-enteritis cases admitted in the above mentioned hospital during 2015.

Data collection method:

Patients with bloody diarrhea (three or more loose bowel motions / day with visible blood in stool)¹. Those with surgical conditions were excluded from the study (e.g. volvulus, intussusception), reports were reviewed and data collected from the case files of the patients (name, age, gender, address, type of feeding, type of water supply, boiling of drinking water, the presence of domestic animals).

Confirmation of diagnosis: for each patient the following was done by the same qualified laboratory personnel by stool culture and slide agglutination test was also done but it was not possible to identify the causative agents in 18 (21%), this could be due to infection with other organisms not routinely investigated in the stool samples or due to the lack of sensitivity of some laboratory procedures that used in this hospital or not present at all, this was similar to studies conducted in our country^(10,11).

Statistical Analysis

The data were analyzed statistically by using computerized SPSS system version (20). Descriptive statistics including observed frequencies and percentages. And Chi square test was used to assess the association between two categorical variables. P-value less than 0.05 was considered as a statistically significant, and value less than 0.01 was considered to be highly significant.

Results

Number of patients with bloody diarrhea was (86) from total number of patients of gastroenteritis (788) admitted to Children Welfare Teaching hospital during 2015 so the proportion of bloody diarrhea cases was (10.9%).

Results of examination and stool culture (86) patients identified as follows

Table (1): Isolation rate of enteropathogenes in children with bloody diarrhea:-

Enteropathogenes Isolated	Number and percentages of cases.
E. histolytica	42 (48.8%)
E. Coli	15 (17.5%)
Shigella	7 (8%)
Salmonella	4 (4.7%)
No isolate	18 (21%)
Total	86(100%)

The proportion of causative agents in descending order, E. histolytica 42 (48.8%), E. Coli 15 (17.5%), Shigella 7 (8%) . Salmonella 4 (4.76%) , & 18 (21%) of cultures showed no isolates.

Table (2): Age Distribution of the patients according to etiological agents:

Age(month)	Etiological agent			Number of patients
	Bacterial	Amoebic	Unknown	
1-12	4 (18.1%)	13 (59%)	5(22.7%)	22(25.6%)
13-24	9(32.2%)	17 (60.7%)	2(7.1%)	26(32.6%)
25-36	4(40%)	3 3(30%)	3(30%)	10(11.6%)
37-48	7(46.6%)	4(26.7%)	4(26.7%)	15(17.4%)
49-60	2(18.1%)	5(45.5%)	4(36.4%)	11(12.8%)
ToTotal	26	4242	18	86

X²= 20.95 ,P value = 0.001.

The majority of bloody diarrhea cases 50 (58.2%) found in those who were below 2 years. There is highly statistically significant difference (p value < 0.01) between different etiological agents and age group.

Table (3): Sex distribution of the patients according to the etiological agents :

Sex of child	Etiological agent			N. No of Patients
	Bacterial	Amoebic	Unknown	
Male	16(32%)	23(46%)	11(22%)	50 50(58.2%)
Female	10(27.8%)	19(52.8%)	7(19.4%)	36(41.8%)
Total	26	42	18	86

X²= 1.97, P value = 0.04

Males were more affected 50 (58.2%) than females 36(41.8%) There is significant difference between total number of cases and gender of the patients p< 0.05.

Table (4): Distribution of the patients and their etiology according to the type of feeding

Type of feeding	Etiological agent			No. of patients
	Bacterial	Amoebic	Unknown	
Breast	12 (46.1%)	9 (34.6%)	5 (5(19.2%)	26(30.2%)
Bottle	6 (18.7%)	20 (62.5%)	6 (6(18.7%)	32(37.2%)
Diet	4 (30.7%)	6 (46%)	3 (3(23%)	13(15.1%)
Mixed	4 (30.7%)	7 46.6%)	4 (4(26.6%)	15(17.5%)
Total	26	42	18	86

X² X²= = 12.47, P=0.002 .

There are statistically significant differences (P value < 0.05). Between number of cases of bloody diarrhea and different types of feeding showed more patients admitted with bottle feeding 37.2%.

Table (5): Distribution of the patients and their etiology according to the types of water supply:

Water supply	Etiological agent			NO. of patients
	Bacterial	Amoebic	Unknown	
Tap water	21 (29.5%)	36(50.8%)	14(19.7%)	71(82.6%)
Others like river, irrigation, canal, wells	5 (33.3%)	6(40%)	4(26.7%)	15(17.4%)
Total	26	42	18	86

X² X²= = 24.7., P value = 0.001

There is a highly significant (P value < 0.01) relationship between total number of patients and different types of water supply. 71(82.6%) of patients used tap water. There is also a relationship between different etiological factors and type of water supply. Tap water associated with more amoebic diarrhea 36 (50.8%) than bacterial 21(29.5%).

Table (6): Distribution of the patients and their etiology according to the habit of boiling water:-

Boiling of water	Etiological agent			NO. of patients
	Bacterial	Amoebic	Unknown	
Yes	7(46.7%)	5(33.3%)	3 (20%)	15(17.44%)
No	19(26.8%)	37(52.1%)	15 (21.1%)	71(82.56%)
Total	26	42	18	86

X² X²= = 5.6, P value = 0.001
 There is a highly significant P value < (0.01) relationship between total number of patients and habit of boiling water , showed more patients of bloody bl diarrhea were using un boiled water 71(82.5%) .

Discussion

The study revealed that the number of cases of bloody diarrhea was (86) cases from (788) cases of total gastroenteritis admitted during 2015, the percentage was (10.9%) this result is similar to ⁷ in Baghdad .

Entameoba histolytica was the most common isolated pathogen as it was detected in stool sample of the patients. This finding was similar to that observed in studies conducted in Basrah by (^{12, 13 , 14}) in Baghdad. Also in other studies done by (^{15, 16,7}).

The opposite finding was reported in many studies in different countries which showed that shigella species

were the most common agent associated with bloody diarrhea (^{5,6,17 ,18,19}) the reason for this difference could be explained by the fact that invasive amebiasis is an important public health problem and occur globally in endemic areas ³ . On the other hand, probably amebiasis is routinely over diagnosed and laboratory reports may be of little value, a study done by Walsh support that ²⁰ .

Entameoba histolytica cyst was found in (38 %) of bacterial bloody diarrhea. This means that more than one pathogen may be isolated from patients with bloody diarrhea. This is in agreement with studies done by (^{21,16}). ²² found that association of *E. coli* with *Entameoba histolytica* infection will enhance amebic virulence.

It was not possible to identify the causative agent in 18 cases (21%). This could be due to infection with other organisms not routinely investigated in the stool samples or due to the lack of sensitivity of some laboratory procedures, This is in agreement with other studies (10,6,18).

The age of the most affected children was between (7-12) months. A similar result was also found by (8, 23) . Susceptibility of this age group to bloody diarrhea may be explained by many factors such as declining level of maternal immunity , introduction of solid food which may be contaminated by enteropathogens , together with introduction of foreign material to the mouth of these children as they have learned to crawl up and pick subjects in their hands by this age ,which increases the risk of exposure to fecal pathogens (24,25) . Also most of the admitted cases were in this age group ,because of high worry of the families toward their children at this age group (2,10) .

Male sex was affected more than female with ratio of 1.6:1. This is agreement with other studies (10,6,17), while the opposite found by 18.

The significant difference in sex distribution was in those amebic dysentery, male to female ratio 2.2:1. This was also found by (25,26,27) in Ethiopia .

A high percentage were bottle fed 32 (37%) while breast fed is less 26 (30%) and this strengthen protective value of breast milk against diarrhea, weather bloody or watery. Similar results were found by (2,23,25,28)

The majority of the patients included in the study had tap water supply 71 (82.6%) while other sources is just 15 (17.4%).However, even chlorination of water cannot kill amoebic cyst or some other enteropathogenes this was aided by some studies (1,10), or it may be due to contamination of water system by ground water responsible for outbreak of amoebic dysentery 29.

Conclusions

1. The proportion of infective bloody diarrhea out of total gastroenteritis cases was relatively low .
2. Entamoeba histolytica is one of the most frequent offending pathogen in patients with bloody diarrhea in our society.
3. Children below 2 years are the main affected group and male sex affected more than females .

4. Bottle feeding preference, non-boiling of drinking water make children more prone to have bloody diarrhea.

5. Tap water use was associated with cases of bloody diarrhea.

Source of Funding: Self-funding.

Ethical Consideration:Approval to conduct this study was obtained from concerned authorities (Children Wefare Hospital in Baghdad),as well as the name of the participants was kept hidden.

Conflict of Interest: Nil

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Comparison between Hypertensive and Non-Hypertensive Individuals in the Value of Response to Salt Administration

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Abstract

Background: consumption of salt (sodium-chloride) causes increment of blood pressure (B.P) in both normal and hypertensive individuals, that is why, the use of diuretics which eliminate salts from the body decreases the B.P. and used as a line of treatment, in hypertension.

Objective: the study aims to know whether there is any difference in the increment of B.P. both systolic and diastolic between normal people and hypertensive people after giving salt orally.

Method: one hundred individuals were involved in the study, 50 patients were hypertensive, individuals (25 males and 25 females) and labelled as group A, and 50 persons (25 males and 25 females) were normal individuals and labelled as group B and played as control. After full physical examination including 3 times B.P. checking before and after giving 6 gm of sodium-chloride (table salt) orally ; after 2 hours the values of B.P. were recorded and statistical analysis was done to know the difference, between the two groups.

Results: in all individuals of both groups, the B.P. increased, after salt consumption. In group A (the hypertensive group) the mean increment, of systolic B.P. (S.B.P.) was (15.98) mmHg and the mean diastolic B.P. increment (D.B.P.) was (9.4) mmHg , while the mean S.B.P. increment, in group B was (8.7) mmHg and mean D.B.P. increment was (8.0) mmHg.

Conclusion: the study showed significant difference in the increment of B.P., both systolic and diastolic between the two groups, showing that hypertensive group is more sensitive to salt consumption than normal individuals (the control group).

Keywords: *systolic B.P. , diastolic B.P., increment, sodium-chloride.*

Introduction

Hypertension (HTN) is a major health problem world wide ¹. It is defined as chronically elevated blood pressure (B.P.) and the British hypertensive society defined B.P. as :1- optimal if the B.P. > 120 mmHg systolic, and less than 80 diastolic, 2- normal B.P. as > 130/85 mmHg and 3- high normal of 130/89 mmHg ².

Elevated arterial B.P. is a major cause of premature vascular disease leading to cerebrovascular events, coronary heart disease, and peripheral vascular disease ³.

In the past 1-2 decades, hypertension varied in prevalence, from western compared with eastern countries e.g. it was very high in Germany and lowest in China. Now a days, the differences are less ⁴.

Recently no much difference was found between developed, and developing countries, although it is still high, especially among black Africans (40-45-%) prevalence rate.

According to WHO reports in 2008, the prevalence, of high B.P. in Iraqi people was 40% among 25 years, old and above , in Oman also 40% (NCD/ Oman country WHO [https:// www. WHO. Int/ beat – ncd / countries/ Oman/ enl](https://www.WHO.int/beat-ncd/countries/Oman/enl)). In Indian WHO 2008 also reported a prevalence, rate of (32-5)% . In November 16, 2006 the largest rise in prevalence of adults has been in Canada & U.K.

It is documented that HTN immediately, rises after the age of 60 years ⁵.

Essential hypertension,has no single or definite cause, there are multiple factors e.g. heredity, environmental,factors e.g. obesity, alcohol, smoking,and high salt intake and,probably other factors³.The effect of salt,consumption on B.P. differs among different,people and high potassium intake does the opposite effect.

Japanese who live north east of Japan eat more apple,which is rich in potassium suffer from low,cardio-vascular hypertension complications e.g. apoplexy compared with other regions in,Japan⁶.

A positive linear correlation between,salt intake and B.P. which has been considered,since ancient times⁷.

Experimental observations over the,few past decades have indicated that B.P. can significantly be reduced with salt restriction,and enhancing sodium excretion in urine,with the use of diuretics (8, 9, 10).

Diner stein in August. 9. 2018 wrote that 1 gm of salt consumed,increases B.P. by 3 mmHg¹¹.

Patients and methods:

One hundred individuals were a dopted to this epidemiological,study. Fifty patient with hypertension,either having uncontrolled or controlled,B.P but should have BP less than 160/100 mmHg to avoid complication during the study.

This group is labelled as group A, they were 25 males,and 25 females. The same for normal individual, as control(group B) , for comparison they accepted to carry out the study,by their own wish (volunteers).

The study was conducted in the Al-Hussain teaching,hospital (Al-Hussain medical city), at the out patient medical,clinic. Hypertensive patients were labelled as group A and companions,of patient were labelled as control.

The study was conducted,from first February to first June 2019. For every individual after complete physical examination,including taking B.P at sitting position 3 times with 5-10 minutes,intervals in between, taking the mean B.P for both group, then 3 ml of blood was taken from each person for routine,blood test e.g.RBS, or (FBS) B. urea, S. creatine ,S. uric acid and CBP.

Blood pressure was taken,according to the strict B.P guide line, suspected white coat hypertension persons, pregnant,ladies and patient with renal failure were

excluded from the study as well as patient,with B.P higher than 160/100 mmHg.

Then each individual was given 6 gm. of pure salt (measured by gold balance). Two,hours later the B.P was re-measured as before taken the average B.P. finally all data were collected,and statistically analyzed.

Results and Discussion

One hundred,individuals were studied. Fifty hypertensives and 50 normals as group A and as group B respectively. Each group,contained 25 males and 25 females they were matched for age and sex. Their ages ranged from 35-78 years with a mean of 60 + 5 SD. The majority of individuals,lie in the age group 57-78 years (69%) , (table 1).

The prevalence rate of hypertension,for females and males differ slightly with 37.8% vs. 38.5% respectively – (table 2). The degree of increased,in S.B.P. among group A ranged from 1 to 20 mmHg with a mean of 15.98 - (table 3), while the degree,of increment of D.B.P. was also from 1-20 with a mean of 9.4 mmHg.- (table 4).

In group B the average,value of increment of S.B.P. was 8.2 mmHg and for D.B.P was 8.0 mmHg (table 6)

Table (1): Age distribution of both groups (n = 100)

Age groups in years	No. of individuals
35 – 45	11
46 – 56	20
57 – 67	33
68 – 78	36
Total no.	100

Table (2): Prevalence to Hypertension in both groups matched with age

Sex	Prevalence rate
Males	38.5
Females	37.8

Table (3): value of increment of Systolic B.P. in group A in mmHg (patients)

Value of increment	No. of patients	Average
0 – 5	1	15.98
6 – 10	8	
11 – 15	23	
16 – 20	15	
< 20	3	
Total no.	50	

Table (4): value of increment of Diastolic B.P.in group A in mmHg (patients)

Value of increment	No. of patients	Average
0 – 5	18	9.4
6 – 10	20	
11 – 15	11	
16 – 20	1	
Total no.	50	

Table (5): value of increment of Systolic B.P. in group B in mmHg (control)

Value of increment	No. of individuals	Average
0 – 5	25	8.7
6 – 10	15	
11 – 20	10	
Total no.	50	

Table (6): value of increment of Diastolic B.P.in group B in mmHg (control)

Value of increment	No. of individuals	Average
0 – 5	22	8.0
6 – 10	23	
11 – 20	5	
Total no.	50	

In industrialized societies the high degree of inter-individual variability or difference of sodium intake compared to much smaller inter individual difference may obscure potential biological association probably better solved by quantitative, statistical method using urinary sodium estimation¹². The age distribution in the study (table 1) showed higher prevalence, value as the age advances. It is reported that the average systolic, B.P (SBP) rises with age while the diastolic, B.P. (D.B.P.) rises up to the age of 50 years and then declines¹³. The sex difference in prevalence, rate also showed little difference with slight male preponderance. After adjusting for age no significant difference between sexes in mean prevalence except for higher prevalence among men in developed, countries¹⁴. The average male prevalence rate in developed, countries is 40.8% VS 32.2% in developing countries, while in female the prevalence rate was 33.0% VS 30.5% respectively, these figures are not far away from the study figures (table2). High salt intake is the major cause of raised B.P and, accordingly leads to cardiovascular disease as well as, recently showed association with increased risk of obesity through sugar- sweetened beverage, consumption¹⁵. Uptill now the exact pathophysiology, of how increased salt intake, increases B.P is unknown, but the known fact is that high salt intake, increases B.P, while reducing daily, salt intake reduces B.P, as well as by using diuretics¹⁶.

Conclusion

The study showed that salt intake, increases both S.B.P. and D.B.P., but the increment is different in the two groups (A & B) e.g the value of increment is more obviously higher in group A (the hypertension, group), than group B (the control group) as shown in, tables from 3 to 7. especially noted by highly significant increment

of the S.B.P. in group A compared,with group B but to a lesser extent regarding,increment in DBP between the two groups.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the AL- Safwa University College, Karbala province, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effect of Lactic Threshold Exercises using us Ginseng in the Development of Some Functional Variables of the Lungs and Lactic Tolerance and the Performance of Complex Offensive Skills in Basketball Youth

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Abstract

The aim of the study is to prepare the lactic threshold exercises using US ginseng in improving some functional variables of the lungs and the lactate tolerance and performance of the offensive skills of the young basketball players. The researcher used a curriculum Alter Webby B test kisses me and posttest of the two groups of experimental (Experimental and first trial) . Dosages of US ginseng were used in the form of capsules (400 mg) and 5% ginsosides, equivalent to 20 mg. Thus, the total US ginseng for the program is 60 g, Sexosides. The superiority of the first experimental group was determined by the second experiment with all the research variables. Effect of lactic threshold exercises using American ginseng in the development of some functional variables of the lungs, lactation and complex offensive skills in basketball for youth.

Keywords: *Lactic threshold exercises, Lungs, Lactic tolerance*

Introduction

The modern sports training depends on the concentration of its objectives for the development of energy production systems and the associated functional changes. The more aerobic or anaerobic exercise is possible, the more direct it will be on the level of physical and professional performance. Training also leads to many changes, whether physical, functional or chemical. The most important chemical changes that are affected by the training is the concentration of lactic acid in the muscles and blood as the anaerobic training, which lasts for (1-3) minutes, oxidizes the sugar to anaerobic, which leads to the production of acid. The higher the duration of the anaerobic action, the higher the ratio of the accumulation of lactic acid in the muscle, which in turn leads to slower other chemical processes. As the game of basketball is a game in which the work of the anaerobic system (Lactic) high rate and this is a sign that during the games there will be accumulation of lactic acid in large quantities so players have to bear this accumulation in the muscle and blood and not stop

the player and work fatigue early. This is also related to the functional variables of the lungs, which work on many important functions of runners, including oxidation of oxygen through the vesicles pulmonary. , Nutrition science is now one of the applied sciences that depend on it in the field of physical education and sports. Nutrition has been associated with exercise for health because it has an important role in weight control and control of body composition. Nutrition has also been linked to the competitive sports field during its various stages. In training or in competition, nutrition plays an important role in the ability to tolerate training, delay the onset of fatigue, as well as the speed of recovery, as evidenced by its important role in the competition to raise the level of performance.

Methodology and field procedures

Research Methodology

The researcher used a curriculum Altger Webby B) Pre and post test for the experimental groups (first and second

experimental) to suit the nature of the research.

The research community and its design

It was identified research society my players basketball youth belonging to the Sports Club MAHAWEEL ages (16-18 years) training for the season 2018-2019 and the 14 players. The sample was selected in a comprehensive inventory method and the sample was divided into two experimental groups with seven players per group.

Homogeneity and equivalence of the sample:

In order for the work of the researcher to proceed in the right direction and the objective of the work of the researcher , he found the homogeneity and equivalence between the two groups of research in terms of physical measurements (length, mass, and training age and time as well) on the functional variables of the lungs and lactic endurance and offensive skills complex using the appropriate statistical treatments to know the truth Differences between the two research groups as shown in Table (1, 2).

Table (1) Shows the homogeneity of the sample

T	Variables	measruing unit	Test Phrase Leven)		Indication of difference
			Calculated	Standard error	
1	Age	Year	1, 6 46	0, 4 22	Not significant
2	Training age	Year	0.3 9 2	0, 5 29	Not significant
3	Bloc	Kg	0, 089	0, 9 71	Not significant
4	Length	cm	1, 5 70	0, 4 20	Not significant

Table (2) It shows circles and standard deviations and the values of (t) And the significance of differences in the tests examined between the experimental groups in the pre- test

Variables	measuring unit	The second experimental group		First experimental group		Values t Calculated	mistake percentage	Significance of differences
		s	P	s	P			
Compulsive dynamic capacity	L / d	3.64	0.6 67	3.535	0.347	0.542	0.5 31	random
Forced volume is one second	L / d	3.566	0.3 87	3.387	0.382	0.1 87	0.3 22	random
Maximum lung ventilation volume	L / d	102.9	12.201	100.9	12.68	0.2 83	0.3 43	random
Pick up and jump by 2 points	Degree	4.2 71	1.6 67	4.267	1.318	0.1 42	0.4 22	random
Pick up and jump 3 points	Degree	1.1 48	0.7 93	1.9 59	0:561	0.0 7 7	0.3 0 1	random
Receiving and high-pitched finished pacification	Degree	5.3 91	1.9 63	4.891	0.8 29	0.1 41	0.2 06	random
Hold the locket	Accurate	1.331	0.1 19	1.410	0.1 11	0.5 87	0.4 73	random

* Significant at the level of significance (0.05) if the error level is less than (0.05).

Determination of measurements and tests used :

1/ measurement of lung function variables.

Functional variables of the lungs were measured through a device Vica test Spirometer. The variables are:

- 1- Compulsive dynamic capacity Forced Vital Capacity .
- 2- The expiratory volume is forced for one second Forced Explorative Volume in one Second
- 3- Maximum lung ventilation volume Maximum Voluntary Ventilation .

Measuring tolerances Lactic :

The researcher has access to a lot of scientific studies concerned with the physiological domain where Kojnham and Vlawkins test run for carrying lactic ² . Where a questionnaire was distributed to a number of experts to clarify the validity of the tests and their suitability to the sample and after a statistical analysis proved to be valid for measuring the variables under study .

Measuring offensive basketball skills:

Through the researcher’s knowledge of many sources and scientific studies in the field of basketball has been identified offensive skills compound is : (receipt + jump correction / two points) . (Receiving + jump correction / three points) and (receiving + high pitched + peaceful correction). And have been identified for offensive skills tests the vehicle surveyed by seeing a lot of references and scientific studies Ot three tests churned the nomination (Faris Sami) ³ . Where were distributed a questionnaire to a number

of gentlemen experts form to clarify the extent of the validity of the tests and the suitability of the sample after it was found statistically analyzed in his favor to measure the variables under study.

Determination of US ginseng doses:

The US was determined Alzhinsnj doses used in research where the researcher reference studies, research and scientific references survey ⁴ Which dealt with the use of US ginseng to identify the permissible and effective doses in the human body, where it was found that:

- 1- Effective doses of adults aged 20-30 should be between 50-75 g and 2 to 8 g for a period of 8-12 weeks maximum.
- 2- American ginseng should be taken every 12 hours, twice a day.
- 3- It is best to take the American ginseng before eating to increase the absorption speed of the food and to take advantage of it more.
- 4- Use of US ginseng should not exceed 3 months because it leads to vitamin deficiency B6 In the body leading to feeling numbness and depression.
- 5- The good product for American ginseng is the one that contains ginsocide Ginsenoside By between 4 and 7 percent.

On this basis it was used doses of American Alzhinsnj in the form of capsules (400) mg and Psonbh Jnsosadat 5% is equivalent to 20 mg, bringing the total US Alzhinsnj program completely is (60 g), and the equivalent of (3 g) of Gansusaadat, table The following illustrates this.

Table (3) US ginseng dosages used in research

Subject	size Capsule	The dose Per day the one	The dose the college Of the program (10)weeks	The dose the college Of the program (G)
Ginseng American)capsule (	400milligrams	800 mg (2 capsules)	800 x 75 days = 60,000 mg	60 g
Sexesides	20 mg	40 mg	40 x 75 days = 3000 mg	3 g

8 - reconnaissance experience:

The researcher conducted the pilot experiment on a sample of (5) players on 5/12/2016 at 3:00 pm in the stadium of Al Mahaweel Sports Basketball Club. The exploratory experiment led the researcher to identify:

- 1- The validity of the equipment and tools used in the research.
- 2- The time taken to perform the tests.
- 3- Stand on the difficulties that may be exposed to it when the researcher giving a C of the President tests.

1/ scientific transactions for testing:

I. Honesty:

The researcher concluded the validity of the tests in question through the questionnaire distributed to the experts and specialists who indicated its validity to measure the (tactical endurance and complex offensive skills).

2 - Persistence: The researcher tried to find the coefficient of stability of the tests, by finding the correlation between the results of the first and second test after retesting on the survey sample after three days of the first test, and after calculating the coefficient of correlation (Seberman) of the ranks between the results of the first and second test and As shown in Table (4), the correlation coefficients were extracted by T-law. It was found that the correlation was significant at the degree of freedom (3) and the significance level (0.05). The calculated value (T) was greater than the maximum scale (2.11) The test has a high degree of stability.

III. Objectivity: The objective researcher concluded by finding the correlation between the results of two judgments. The correlation coefficient (Siberman) for the rank between the results of the two sentences confirms that the test is highly objective, since the value of (T) (2,11), at the degree of freedom (3), and the level of significance (0.05), see Table (4).

Table (4) Shows the value of the coefficient of stability and objectivity and statistical significance of the tests examined

the test	measuring unit	Stability coefficient	Values(T) calculated	Statistical significance	Subjectivity coefficient	Values(T) calculated	Statistical significance
Lactic endurance	Accurate	0, 897	4 , 221	moral	0, 878	3 , 998	moral
Pick up and jump by 2 points	Degree	0. 889	4.229	moral	0. 889	3. 987	moral
Pick up and jump 3 points	Degree	0. 889	5.129	moral	.873	4.228	moral
Receiving and high-pitched finished pacification	Degree	.858	3. 987	moral	0. 890	4.721	moral

Values (t) Table 2.11 at degree of freedom 3 and level of significance 0.05

9 / tribal tests: The researcher conducted tribal tests on Sunday , corresponding to 10/12/2018 three o'clock in the afternoon and after giving researchers a brief explanation of how to perform the tests and the aim of made and then taking measurements to height, weight, age and the time training and then conducted skills tests

And physical research on the sample .

1. Presentation, analysis and discussion of the results of the two groups that are not involved in the variables investigated.

a- display the results of the differences between the pre and post tests experimental group first in the surveyed variables and analysis.

Table (5) Shows the difference in the computation and its standard deviation and the value of (t) And the significance of the differences between the results of the pre - and post - test of the first experimental group in the variables under consideration

the exams	measuring unit	Tribal Test		Post-test		Values t Calculated	Error level	Significance of differences
		s	P	s	P			
Compulsive dynamic capacity FVC	(L)	3.535	0.347	4.398	0.712	2.793	0.000	moral
Forced volume is one second FEV 1	(liter)	3.387	0.382	3.787	1.397	2.561	0.021	moral
Maximum lung ventilation volume MVV	(L)	100.9	12.68	108.6	12.71	4.670	0.011	moral
Receiving +correction 2 points	Degree	4.276	1.218	7.876	2.132	7.761	0.000	moral
Receiving +correction 3 points	Degree	1.999	0.541	3.761	1.897	5.776	0.023	moral
DOOR STEP +clapotement+ peaceful correction	Degree	4.221	0.869	7.359	2.111	7.136	0.000	moral
Lactic Stress Test	Accurate	1.510	0.101	2.81	0.29	4.698	0.003	moral

* Significant at the level of significance (0.05) if the error level is less than (0.05)

Show me from the table (3) The level of error ranged from (0.00 to 0.023) For all search variables which is smaller than (0.05) b , indicating the significance of the differences between the tribal and remote tests at the level of error (0.05) in front of the degree of freedom (6) and for the post-test.

b- display the results of the differences between the pre and post tests of the experimental group second in the surveyed variables and analysis.

Based on the above results (Table 5 . 6 . 7) is clear we have significant differences in the number of lung function variables between pre and post tests for the two sets of research for the benefit of the post test, attribute the researcher the reason for this to the evolution in the level of players through the use of threshold training The importance of physiological abilities in improving construction and development as a natural result of training that contributed to the development of lung variables. The researcher also attributed this improvement to the improvement in the lungs by increasing the capacity of the vital, and increase the strength of breathing muscles and large volume of breath, To Zia The exchange of gases with the blood more after the training of the threshold of Latakia differential (8) weeks with (3) weekly training units. He confirmed (Mohamed Osman , 1990 “The world has started to rely entirely on energy systems in sports training. This has been demonstrated by the field experiments that have emphasized the need to match the special performance requirements during the exercise with the energy system working during the competition to ensure the largest percentage of the contribution of special exercises in refining the athlete and achieving the required achievement “⁵.

CONCLUSION

Lactic threshold exercises using ginseng have contributed to the development of the investigated variables (combined offensive skills, lactation tolerance, and functional variables of the lungs) by: The results showed a superior superiority between the tribal and remote measurement in the (combined offensive skills) of the players of the first experimental group and for the benefit of the post measurement. The results showed a superior superiority between the tribal and remote measurement in the (non-tactical endurance) of the players of the first experimental group and for the benefit of the telemetry. The results

showed a superior superiority between the pre - and post - natal measurement in the functional variables of the lungs for the first experimental group and for the post - measurement . The first experimental group is superior to the second experimental group in the telemetry of the investigated variables and for the benefit of the first experimental group .

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Kerbala /college of Education for pure Sciences, Iraq and all experiments were carried out in accordance with approved guidelines.

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Preoperative Anxiety and Fears among Adult Surgical Patients in Baghdad Teaching Hospital, Iraq

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Abstract

Background: Surgery was suggested as a major life change that negatively affects the patient's recovery and post-operative pain.

Objectives: The study aims to assess the preoperative anxiety levels among surgical patients, to determine the fears related to surgery and to find out the relationships between some variables; age, sex, marital status, educational level and experience of previous surgery and level of anxiety.

Methodology: a cross-sectional study was conducted on patients undergoing surgery under a general anesthesia in general surgery unit of Baghdad Teaching Hospital from 1st August 2018 to 30th May 2019.

Results: the current study indicated that all patients 80 (100%) were experience a preoperative anxiety in different levels; 36.2% of them had a high level of anxiety, 32.5% had a moderate level of anxiety and (31.2%) had a low level of anxiety. The main source of patients' fears was; fear of death (51.2%), post-operative wound pain (48.8%), and fear of post-operative nausea and vomiting (47.5%) There was a significant relationship between age and level of anxiety. No difference in level of anxiety in respect to gender and previous surgery.

Key words: *preoperative, anesthesia, anxiety, surgery, patients.*

Introduction

Anxiety has been described as a normal psychological response to stress. It is uneasy and unspecified feeling. The preoperative period is a worrying event for surgical patient. Patients may perceive the day of surgery as the largest and most dangerous day in their life ⁽¹⁾. The psychological symptoms of anxiety can be observed during preoperative period which may include increased tension, irritability, apprehension, aggression, nervousness and insecurity ⁽²⁾. Many studies suggested that factors of pre-operative anxiety depend on age, sex, marital status, educational level, uncertainty of the precise day of operation, the pre-operative patient anxiety caused by many fears which include; fear of unknown, fear of medication, concern about pain, loss of control, and fear of death ⁽³⁾. The extent of anxiety levels differs from person to person, it varies over time; different patients respond perioperative period in different ways, some of them experienced it as a stressful event; they

were concerned about their distress or concerned about the achievement of the operation ⁽⁴⁾. The anxious patient response differently to anesthesia and analgesia when compared with non-anxious patient; patient who experience high level of anxiety requires more anesthetic to achieve sedation and needs to increased doses of analgesia to relief pain. Research studies suggested that pre-operative anxiety increased post-operative pain, fatigue, nausea, delay recovery period and depression ⁽³⁾. Provide patients with appropriate information during the period prior to anesthesia will decreases patient's anxiety. Many studies suggest that patients receiving pre-anesthetic information experience low levels of anxiety ⁽⁴⁾. **Objectives of the study:** To assess the preoperative anxiety levels among patients undergoing a surgery. To determine the fears related to surgery. To find out the relationships between some variables (age of patients, sex, marital status, level of education and experience of previous surgery) and level of anxiety.

Methodology

A descriptive study was conducted on patients undergoing surgery under a general anesthesia in general surgery unit from 1st November 2018 to 30th April 2019. A purposive (non-probability) sample of 80 adult patients from both sexes who were admitted for semi-elective surgery in Baghdad Teaching Hospital from 1st December to 31 December 2018. A questionnaire was constructed to achieve the study objectives, it consists of 3 sections:

- 1- The socio-demographic characteristics of patient.
- 2- The data related to previous surgery and fears about anesthesia.
- 3- Assessment the level of anxiety using the (STAI) scale: State Trait Anxiety Inventory for adults of Spielberger, 1977 which contain (20) items ⁽⁵⁾. The

researcher translated the scale to Arabic language. Some items reflect a positive response while others reflect a negative response, so the scoring and rating for negative items is (not at all=1, sometimes=2, moderately=3, very much=4) and positive items is (not at all=4, sometimes=3, moderately=2, not at all=1). The levels of anxiety measured according to cut to off point and the range of scoring is: 0-20 = no anxiety, 21-35= low anxiety, 34-51= moderate anxiety, 52-77= high anxiety.

The questionnaire was presented to (5) experts in psychiatric mental health nursing in order to test its validity. For the purpose of measuring the reliability of the questionnaire the Cronbach's alpha (coefficient alpha) used to estimate the internal consistency for the level of anxiety scale which= 0.746. The data has been collected by interviews the patients before 1/2 an hour of surgery after obtaining oral consents in the preparatory room.

Results and Discussion

Table (1): The demographic characteristics of surgical patients

No.	Variables	f	%	
1	Age	18-27	30	37.5
		28-37	20	25
		38-47	16	20
		48-57	8	10
		58-67	6	7.5
	Total	80	100%	
2	Sex	male	47	58.8
		female	33	41.2
	Total	80	100%	
3	Marital status	married	44	55
		divorced	8	10
		widowed	6	7.5
		single	22	27.5
	Total	80	100%	

Cont... Table (1): The demographic characteristics of surgical patients

4	Educational level		8	10
		Read & write	9	11.2
		Primary	12	15
		Intermediate	8	10
		Secondary	9	11.2
		≥ Bachelor	34	42.5
		Total	80	100%
5	Employment	employed	44	55
		retiree	5	6.2
		not employed	31	38.2
		Total	80	100%
6	previous surgery experience	Yes	39	48.8
		No	41	51.2
		Total	80	100%

Table (1) revealed that the patients aged between (18-67) years old with mean of age around 35 years and Standard Deviation (SD) = 12.482. More than half of them are males (58.8%) and married (55%). As regarding to their level of education, the highest percentage of them were had a bachelor degree (42.5%). And 55% of patients were employed. Approximately half of them were not experience a previous surgery (51.2%).

Table (2): Distribution of patients according to fears related to anesthesia and surgery

No	Items	Yes		No		Total	
		f	%	f	%	f	%
1	Fear of being unconscious as a result of anesthesia	31	38.8	49	61.2	80	100%
2	Fear of postoperative wound pain	39	48.8	41	51.2	80	100%
3	Fear of not wake up again next the operation	37	46.2	43	53.8	80	100%
4	Fear of an inadequate anesthetic effect and stay conscious during surgery	32	40	48	60	80	100%
5	Fear of post-operative Nausea and vomiting	38	47.5	42	52.5	80	100%
6	Fear of death	41	51.2	39	48.8	80	100%

Table (2) indicated that the main source of patients' fears were; fear of death (51.2%), postoperative wound pain (48.8%), fear of post-operative nausea and vomiting ((47.5%), fear of not wake up again next the operation (46.2%) and (40%) of them were fared from staying conscious during surgery and (38.8%) of them were afraid from unconsciousness results from effect of anesthesia .

The result of the current study was congruent with Mavridou et al, (2013) and Biro and Maurer, 2015 who reported in their studies that patient's fears of anesthesia mostly focus on post-operative wound pain, post-operative nausea and vomiting, not waking up after surgery and that they might stay conscious during surgery that they might not wake up again after the operation ^{(6) (7)} . Nigussie et al, 2014 mentioned that the most common pre-operative fears were fear of death, financial loss, result of surgery and awareness during surgery ⁽¹⁾.

Table (3): Distribution of patients according to Level of anxiety

No.	Level of anxiety	f	%
1	Low anxiety	25	31.2
2	Moderate anxiety	26	32.5
3	High anxiety	29	36.2
Total		80	100%

Table (3) indicated that all patients 80 (100%) experience a preoperative anxiety in different levels; (36.2%) of them had a high level of anxiety, (32.5%) had a moderate level of anxiety and (31.2%) had a low level of anxiety.

This result was congruent with Mavridou et al (2013) who reported that (81%) of patients experience preoperative anxiety ⁽⁶⁾. Bakr et al (2014) mentioned in their study that most patients had moderate to severe anxiety levels and others had mild anxiety levels. Ramesh et al (2017) reported that most of patients had increased preoperative anxiety ⁽⁸⁾.

Table (4): Analysis of variance for level of Anxiety among Patients with their Demographic Characteristic (N=80)

Anxiety Characteristics	Source of Variance	Sum of Squares	df	Mean Square	F	P-value (Sig.)
Age	Between Groups	1796.988	4	449.247	2.766	.033 (S)
	Within Groups	12182.562	75	162.434		
	Total	13979.550	79			
Marital status	Between Groups	952.429	4	238.107	1.371	.252 (N.S)
	Within Groups	13027.121	75	173.695		
	Total	13979.550	79			
Educational level	Between Groups	1072.174	5	214.435	1.229	.304 (N.S)
	Within Groups	12907.376	74	174.424		
	Total	13979.550	79			
Employment	Between Groups	52.568	3	17.523	.096	.962 (N.S)
	Within Groups	13926.982	76	183.250		
	Total	13979.550	79			

(df: degree of freedom, S: significant, N.S: non-significant)

Table (5) revealed that there is a statistical significant relationship between the age and level of anxiety while there is no statistical significant relationship between marital status, educational level and employment with the level of anxiety. This result was supported by Bakr et al (2014) and Almalki et al (2017) who founded in their studies a highly significant relationship between age of surgical patients and anxiety levels ⁽⁸⁾⁽⁹⁾.

As regards to other socio-demographic characteristics variables the current study revealed that

there is no significant relationship between anxiety level and marital status, educational levels, employment and income. These findings were consistent with a study of Ramesh et al (2017) who reported that was no association between socio-demographic variables such as education and occupation with the level of anxiety ⁽¹⁰⁾. Woldegerima et al (2017) found that no statistical significant relationship between anxiety and level of education ⁽²⁾. In a study of Matthias and Samarasekera (2012) reported that there was no relationship between the anxiety level and educational level and marital status ⁽¹¹⁾.

Table (5): Significant Difference for level of Anxiety among Patients with respect to their Gender and Previous Surgeries (N=80)

Anxiety Variable			Independent t-test					
			M	SD	t	df	P ≤ 0.05	Sig.
Gender	Male		43.212	13.411	-.369	2	.713	N.S
	Female		44.333	13.324				
Previous Surgery	Yes		41.962	13.543	1.306	2	.195	N.S
	No		45.561	12.951				

Table (5) indicated that there is no difference between males and females in level of anxiety while there is no statistical significant association between presence of previous surgery and anxiety level. This result was congruent with a result of the study of Nigussie et al (2014) who reported that there was no variance between males and females in anxiety level ⁽¹⁾. Some studies have discovered that women experience elevated rates of anxiety compared to men. The results also supported by Almaliki et al (2017) who were found that no significant relationship between exposure of previous surgery and pre-operative anxiety level ⁽⁹⁾.

Conclusions

All patients were experience a preoperative anxiety in different levels; the highest percentage had a high level of anxiety. The main source of patients’ fears was; fear of death, post-operative wound pain, fear of post-operative nausea and vomiting. There was a significant relationship between the age and anxiety level while there was no significant relationship between level of anxiety and the demographic characteristics of patients; level of education, marital status and employment. There was no difference in anxiety level among male and

female patients and there was no significant relationship between level of anxiety and the experience of previous surgery.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Institute of Medical Technology - Baghdad / Middle Technical University and all experiments were carried out in accordance with approved guidelines.

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The Prevalence of Parasitic Infection in Domestic Chicken: A Review

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Abstract

The relative contribution of poultry to total animal protein production in the world is increasing, the major increase in developing countries. Many types and species of ectoparasites and Endoparasites are known to infect chickens; one of the actual problems that cause economic bias in animal farms and rural areas that raise chickens annually is parasitic diseases. The common parasitic infections that occur in poultry can be divided into External parasites include arthropods Lice, Mites, Fleas and Ticks which are isolated from skin and feathers. Internal parasites include protozoa, cestodes, nematodes, trematodes which are isolated from the digestive tract, blood and pooled poultry droppings. The external and internal parasites that infect hosts possess features such as small size, cylindrical body, hook and hard body, which enhance their adaptation to the long life and effect on the poultry industry by affecting the growth rate of chickens, leading to little egg production, and death in severe infections. Prevalence of helminthic infection (cestodes and nematodes infecting the digestive tract) was high in farms and rural areas of chickens from the different studies in different sites in the world, followed by protozoa infection by blood, followed by arthropod infection by skin and feathers and followed by prevalence by trematodes.

Keywords: Prevalence, Chicken, Helminthes, External parasites, Internal parasites

Introduction

The history of chickens (*Gallus domesticus*) is still a bit of a puzzle. Scholars agree that they were first domesticated from a wild form called red junglefowl (*Gallus gallus*), a bird that still runs wild in most of southeast Asia, most likely hybridized with the gray junglefowl (*G. sonneratii*), that occurred probably about 8,000 years ago¹. Recent research suggests, however, there may have been multiple other domestication events in distinct areas of South and Southeast Asia, southern China, Thailand, Burma, and India. Since the wild progenitor of chickens is still living, several studies have been able to examine the behaviors of wild and domestic animals. Domesticated chickens are less active, have fewer social interactions with other chickens, are less aggressive to would-be predators, are less susceptible to stress, and are less likely to go looking for foreign food sources than their wild counterparts. Domestic chickens have increased adult body weight and simplified plumage; domestic chicken egg production starts earlier, is more frequent, and produces larger eggs². Parasites are organisms that live on or in another organism, referred to as the host, and gain an advantage at the expense of the

host³, the internal and external parasites that infect hosts possess physiological and morphological features for example lesser size, shape of the body, hook and tough body, add to their adaptation to the long life also presence of hordes, these organisms are a major factor controlling of the fowl industry by affecting the rate of growth in the host, leading to organ dysfunction and ultimately death⁴. Parasitic infection or their concurrent infections also result in immunosuppression, especially in response to vaccines against some poultry diseases⁵. Parasitism has resulted in reduction of weight gain (17%) in growing chicken and reduction in egg production (12.5%) in laying hens in Bangladesh⁶. Chickens can carry ectoparasites; such as ticks, lice, mites, and Endoparasites, such as protozoans, cestodes, nematodes and trematodes. It has been recorded that they are considered a most important source of transmission of diseases and infection. Poultry has been accepted as one of the most important sources of animal protein for humans in the world, as well as consumers have high preferences for poultry products particularly during festivals. Furthermore, it is that poultry products provide proteins of high biological value⁷.

The protozoan parasites

There are many external parasites that attack poultry by either feathers or feeding on the skin or sucking blood, in small herds it is problematic to prevent contact with external environment, The protozoan parasites encountered were *Eimeria tenella*, *E. brunetti*, *E. mitis*, *E. acervulina*, *E. necatrix*, *E. maxima* and *E. mivati*. *E. tenella* was the most prevalent, while the parasite belonging to species *Eimeria mivati* the minimum abundant, the most parasites belonging to protozoa indicated the highest predominance through the wet period than the waterless period, telling us this warm environmental conditions and lower humidity favor the development of this parasite, clinical signs of parasitism are lack of development, feed conversion and poor growth, low egg production, and even death in severe infections. Moreover, the parasites can make the herd less resistant to disease and exacerbate existing of disease in herd⁽⁸⁻¹⁰⁾. Cryptosporidia are protozoan parasites classified within the class sporozoa and the subclass coccidian, They inhabit the brush border of the small intestinal mucosa of a variety of mammals¹¹. Cryptosporidiosis is a disease or infection caused by cryptosporidia. This parasite is not confined to the cryptosporidia of birds and can infect other animals, even mammals and chickens. Cryptosporidia is often spread from one animal to another on the feet of people and animals and can be borne by overland birds. Cryptosporidia is common, and symptoms are usually mild. Often, the only symptom is pale skin in yellow-skinned breeds. Cryptosporidiosis can be contracted by inhalation, leading to more severe respiratory inflammation of the intestinal form. There are no drugs for this parasite of cryptosporidiosis. Providing supportive treatment and protection from secondary infection are the only workflows. Once recovered, the birds are immune to future infections, There are a great diversity of *Cryptosporidium* species and genotypes recorded from fish, amphibians, reptiles, birds and mammals^(12,13) Haemosporidians are intracellular protozoan parasites found within the blood cells and tissues of their avian hosts, they are worldwide distributed and occur in a variety of avian species, including domestic chicken, the avian haemosporidian parasites (Phylum Apicomplexa) are taxonomically diverse and cosmopolitan in distribution infecting most bird families¹⁴. "The most commonly recorded parasites in smears of peripheral blood are unicellular eukaryotic parasites of the genera, *Haemoproteus*, *Leucocytozoon* and *Plasmodium*"¹⁵.

The greatest important groups of haemoparasites that infected chickens are *Leucocytozoon*, *Haemoproteus* and *Plasmodium*. The chickens haemoparasites have been recorded in the different countries of the world such as Bolivia, Pakistan, Italy, Czechoslovakia, Nigeria, Tanzania, Kazakhstan, India and South and East-Southern Asia,^(16,17).

Helminth parasites

A-The cestode parasites

Chickens is greatly susceptible to the contagion by a multiplicity of intestinal helminthes which leads to severe commercial losses during meddling with fit development in the system of late growth chiefly the chickens, making adult chickens exposure to secondary contagions, actually reduced chickens production¹⁸. Parasitic worms are common in large-scale poultry, while intensive infections are common in heavily managed stocks that cause severe pain that affects the natural activities of birds that lead to death. The cestode parasites encountered were *Raillietina tetragona*, *R. echinobothrida*, *R. cesticillus*, *Choanotaenia infundibulum* and *Hymenolepis carioca* out of which *R. cesticillus* was the least prevalent while while the parasite belonging to species *Hymenolepis carioca* was the most prevalent, cestodes are known to interfere with the metabolisms of certain compounds: they absorb glucose and galactose and stored them as glycogen as well as absorbed amino acids, polypeptides and proteins, the clinical signs include loss of ruffled feathers, drooping wings, appetite, increased mortality and decreased egg production, although with less pathogenic species, the only signs will be poor growth, weight loss paralysis, leg weakness, and a sudden raise in mean of mortality, Also stated that it is every so often possible to talk if a chicken is infested by cestodes simply by observing at the droppings. Egg of Tapeworm is observable white pellets struck in its feces^(19,20).

B- The nematode parasites

recovered included *Ascaridia galli* Shrank 1788, *Heterakis gallinarum* Shrank 1788, *Hartertia gallinarum* Theiler 1919, *Gongylonema ingluvicola* Ransome 1904, *Syngamus trachea* Montagu 1811 out of which only *A. galli* and *H. gallinarum* were most prevalent and the remaining rare⁴.

These helminthes affect on the metabolism of the host, causing in lowly feed utilization, thus impairing

growth and production ²¹.

The Arthropoda parasites

Common ectoparasites of village chickens range from lice, mites, fleas and ticks ⁶. They may constitute a clinical problem and transmit a number of infectious diseases and can also act as transport/ intermediate hosts of a range of helminth parasites ⁽²²⁻²⁵⁾. Some of the ectoparasites, especially tick and mites acts as vectors of poultry diseases such as Pastuerellosis, Fowl Pox, Newcastle disease and possibly chlamydia ^(26,27).

Table (1): shows the local studies on parasitic infection in domestic chickens.

Anthers and year	Parasites	Site of isolation parasites	samples	the prevalence %	country
Al-Zughaybi and Al-Gharawi (2010) (28)	Worms and Protozoa	digestive tract	250	10.4,1.2,7.2, 27.2	Babylon province , Iraq
Abdullah (2013) (29)	haemoparasite	blood	170	52.6,19.5 ,13.5	Sulaimani Province, Iraq
Abdullah and Mohammed (2013) (30)	External and Internal parasites	skin and feathers digestive tract	65	62.72,72.92,54.17,39.58,37.5, 10.42 81,31,8.62,1.72 55.17,31,10.34, 6.9, 3.45	Sulaimani region, Kurdistan, Iraq
Al-Dulaimi (2013) (31)	. Nematodes	digestive tract	45	8.9,8.28,17.7,15.5	Babylon province, Iraq
Al-Zubaidei (2015) (32)	Endo and ectoparasites	digestive tract skin and feathers	107	12.4,4.67,18.64 4.67	Diyala province ,Iraq
Hasson (2015) (33)	Haemoproteus spp. Plasmodium spp. Leucocytozoon spp.	blood	50	13.2,2.6 , 0	Diyala's localities ,Iraq

Table (2): The prevalence of parasitic infection in domestic chickens in different sites of the world.

Anthers and year	Parasites	Site of isolation parasites	samples	the prevalence %	country
Al-Natour et al. (2002)(34)	Eimeria spp	digestive tract	200	50	farms in northern Jordan
Hassouni and Belghyt (2006) (35)	Worms	digestive tract	300	0.7, 3.7,5.7,7,9.3 12,6,15.3,10,2.7 5.3,9,3.3	Morocco
Luka, and Ndams (2007)(10)	Protozoa Cestode Nematodes	Small and large intestine	92	67.6 43,10.9,25.0 43.8,33.7,1,1.2.2	Zaria Nigeria

Cont... Table (2): The prevalence of parasitic infection in domestic chickens in different sites of the world.

Khayatnouri et al. (2011)(36)	Heterakis gallinarum	digestive tract	120	21.66	Tabriz, Iran
Kumar et al. (2015)(37)	Worms and protozoa Gallinarum Infundibulum	Pooled poultry dropping	58	73.33,26.6,20 6.67,0,6.67 6.67,6.67	Uttar Pradesh and Uttarakhand India
Sreedev et al. (2016)(38)	Cestodes Nematodes Eimeria spp	digestive tract	492	32.47, 39.87,39.9	Andhra Pradesh India
Butboonchoo and Wongsawad (2017)(39)	Worms	digestive tract	120	50.8,86.7,1.7,0.8 48.3,57.5,12.5,35. 8,14.2,32.5	Phayao province northern Thailand
Muhammad et al. (2017)(40)	Plasmodium Haemoproteus, Leucocytozoon	Blood	384	31.5, 24.4,13	District Layyah, Punjab, Pakistan
El-Dakhly et al. (2018)(41)	Cestodes Nematodes	digestive tract	156	16.02,10.98,6.41 1.28,15.38,8.97 1.28	Aswan province, Upper Egypt
Van et al. (2019)(42)	Nematodes Cestodes Trematodes	small intestine	210	63,49,19,14 1	The Mekong Delta region southwest of Vietnam

Conclusion

These parasites inhibit with the metabolism of host, causing in lowly feed utilization, thus decreasing growth, parasites could be increase capability then cooperation the immunological restraint to injection of treatment.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the college of Education for Pure Sciences, Al Muthanna University, Samawah, Iraq and all experiments were carried out in accordance with approved guidelines.

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Hygienic Practices of Street Food Vendors and Schools in Some Iraqi Governorates

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Abstract

“The study was conducted during the period from December 2018 to May 2019, to assess hygiene practice in schools and street food vendors inside two Iraqi cities (Babylon and Thiqr). The Codex code for practice of general principles on food hygiene, observations and other relevant documents to provide information that may clarify certain misconceptions on hygienic practices related to street food vendors. 110 street food vendors and schools were studied in all Babylon and Thiqr. Specially designed questionnaire form was used, allowed fast data collection. Many noncompliance was found in the hygienic practices and requirement, personal hygiene, hygiene of equipment, food preparation and food service. Babylon Governorates in term of hygiene of equipment and food preparation generally showed higher conformity than in Thiqr Governorates. The level of fulfillment of the hygienic requirements was most strongly influenced by the type of schools and street food vendor in both section of personal hygiene and hygiene of equipment and food preparation and serving for Babylon and Thiqr. The results of this work should not discourage to eat street food, but to minimize food poisoning risk, support the reasonable choice of eating-places according to basic food hygiene knowledge.”

Key words: food safety, schools, street food, food hygienic practices.

Introduction

Food poisoning is still causing a growing risk to public health. European Food Safety Authority (EFSA) indicated that foodborne diseases raising also in the EU European union. EFSA reported that in year 2010 about 48.7% of foodborne illness were associated with catering establishments ^{5,7}. Significant part of the foodborne probably result of inappropriate hygienic practices of food service sector. The safety of street vended food in countries where such a food plays an essential part of life and culture is of particular concern ^{16, 4}. According to the WHO, worldwide epidemiological studies showed that, in the majority of cases, outbreaks of foodborne diseases are due to the incorrect handling of food by food workers. “Causes of foodborne disease by food handlers include cross contamination between

raw and processed food items; “storage and cooking of food in adverse conditions; and utilizing contaminated utensils and equipment. Food handlers are defined as “employees who are employed directly in the production and preparation of foodstuffs. Those include employees in the manufacturing, catering and retail industries as well as those who are undertaking maintenance or repair of equipment in food handling areas, whether permanent staff, workers on contract or visitors to food handling areas ¹. Food handling, comprises all stages of food treatment from farm to fork ^{8,1} probability that food handlers could carry pathogens while not showing any symptoms and transmit those pathogens in food such as salmonella, staphylococci, and E. coli ⁶. A new concept called Street Food Safety Objective (SFSO) was also introduced by ² in an effort to approach the safety of street food with the FSO concept. In order to achieve the SFSO a well-planned programme of good hygiene practices should be applied starting from the safety of the ingredient and raw materials entering the street food chain. In particular, there is a special provision setting down requirements for street food vendors. The

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regulation is based on Codex Alimentarius (CA) general principles of food hygiene (CCFH, 2003). And this basic code of practice is used also by the CA for publication of regional codes of practice pertinent to street foods e.g. for Asia (CCASIA, 2017). Those requirements comprise willingness to abide by food hygiene requirements and may reflect lack of knowledge about transmission of microorganisms¹⁷.

Materials and Method

Sampling Plan

“The information was collected from 110 food vendors in two governorates (Babylon and Thiqr) having either direct or indirect contact with food in Iraq restaurants through a questionnaire. “The field period of the survey lasted from December 2018 to May 2019”. “The information was collected through questionnaires and face to face interviews to ensure the accuracy of responses”. “Participation by respondents was voluntary and sufficient time “20-30 minutes” was allowed to answer the questions”. The general characteristics of the vendors were analyzed according to Governorates of vendor’s placement their location in the city, type of facility, type of food sold or served and number of employees in premises,

“Observations”

“Inspections were carried out by direct and discreet semi-structured observation using a specially determined questionnaire which allowed fast evaluation and observation. Interviews with respective food handlers were not carried out”. “The food handlers were also not aware of the observation carried out to minimize influence on food handlers’ attitudes during inspection”. “Each observation lasted for about 20 min”.

Statistical analysis

“ Analysis of such a large number of variables required using several statistical methods”. “To characterize the level and distribution of scores the mean scores, median, mode, standard deviation, coefficient of variation, skewness and kurtosis coefficients were used”. To investigate the dependence of country, vendor’s location, type of food sold and number of employees on the obtained scores, a variance analysis - SPSS - was used. for Windows, version (24.0) . Two analyses were conducted: “for the first and for the second part of questions was performed using Spearman’s

correlation coefficient”. The two-sided p-value of < 0.05 was applied and considered to be statistically significant

Results and Discussion

Overall characteristics

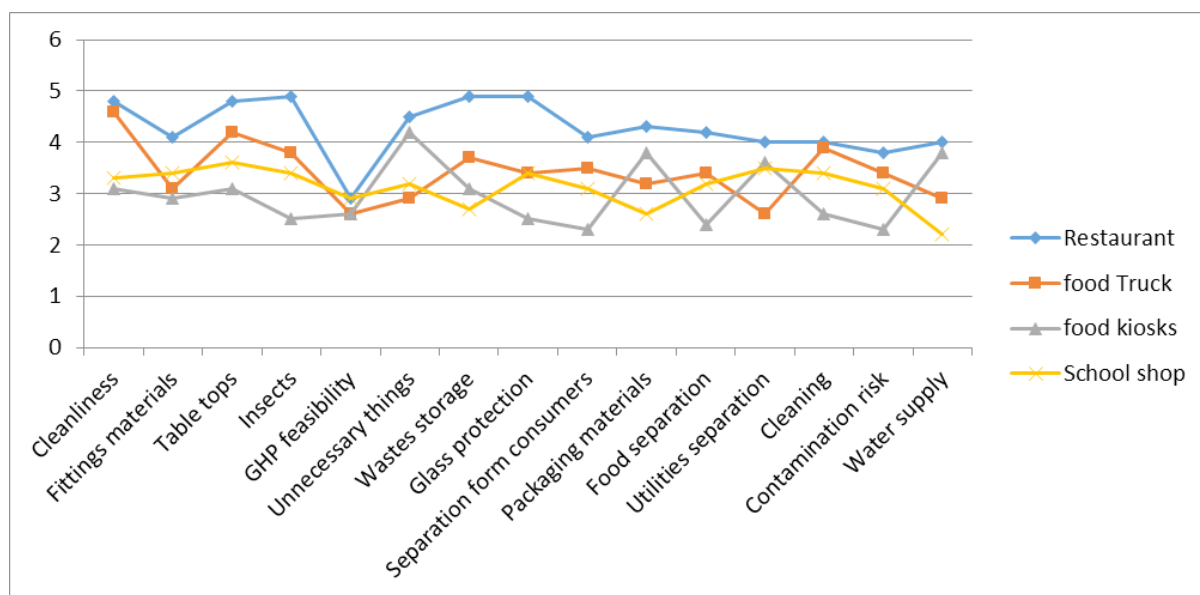
“The socio characteristics of one hundred and ten (n=110) food handlers in restaurants in Iraq the first one grouped vendors selling fresh fruit, vegetables, fish, meat, eggs . “The second one grouped higher rated vendors which were vendors selling meat and fish meals, falafel and other dishes such as shakes, ice cream, coffee, tea”.” The first analysis, concerned the hygiene of equipment, personal hygiene and food preparation indicate that, The largest groups were small street restaurants “30.3%” followed by food kiosks “25.2%”. mobile food vendors for example food cart bike “21.7%” and stands selling street food “20.7%”. The smallest group was food trucks “2.3%”. In most street food vendors meat or fish meals were produced and popularly sold “44.6%”. fruit and vegetable meals for example squeezed juices and pilled and sliced fruits and vegetables “22%” fresh fruits vegetables meat fish and eggs “19.8%” and others “10%””. The largest group of street food vendors that appointed one employee “61%” next with two employees “24.1%” and the smallest group was vendors with three or four employees “14%”. “Most of the street food vendors were located in the outskirts and suburbs of the cities “45.5%” city center “28.6%” and tourist sites “25.9%”. (40.9%) of them have an education at College/ University level”. “Approximately (55.4%) of food handlers with direct or indirect contact with food have 1-6 years of experience in the food sector”.” More than half (75.0%) of the respondents have not participated in any food safety training program”. “From these respondents, only (1.3%) have attended a food safety course more than two years ago”. “ (54.9%) of the total number of respondents had a medical examination card by the Ministry of Health, Iraq.

Hygiene of equipment and food preparation

“The analyzed data, which concerned the hygiene of equipment and food preparation presented in Fig.1”. “The Mean scores, SD and values of statistical coefficient in street food vendors’ hygiene of equipment and food preparation”. “The distribution of questionnaire scores of all street food vendors on two group, the first one grouped vendors selling fresh fruit, vegetables, fish, meat, eggs”. The second one grouped higher rated vendors which were vendors selling meat

and fish meals, falafel and other dishes such as shakes, ice cream, coffee, tea. The degree of compliance i.e. fulfillment of requirements, in hygiene of equipment and food preparation was differentiated the Mean score was 2.7 The mean scores for all questions were below the suppositional Mean score 3.5, with Standard deviation 0.91 , degree of compliance was 68 %. The Mean score level Is not equal mode and median, which confirmed that the distribution of scores for each question was left asymmetric negative skewness. :Negative skewness indicated a greater dispersion and variability in the lower scores As indicated value of Skewness and Kurtosis coef. were (1.66 , 1.39) respectively” . “Indicating that the answers of street food vendors and the low level of assessment, do not give high attention to the Hygiene of equipment and food preparation. Which indicates the cleanliness of food production and preparation equipment in Babel governorate is very low”.

“The data revealed the hygiene of equipment and food preparation the SPSS analysis indicated that the level of assessment of street food vendors in the significant and consistent manner was strongly influenced by three characteristics, Insects, Unnecessary things, and Water supply”, “The other characteristics i.e. location of facility and other variables, had a lesser impact on the assessment scores”. “Statistically there are no significant relationship between other variables and location of facility”. “Also, there was a statistically significant relationship between type of food and Water supply only, other variables are having no significant relationship”. “There was a statistically significant relationship between Location of facility in the city with Insects, and Water supply and there is a very low significant relationship between the other variables which makes it reflect negatively on the hygiene of equipment and food production-preparation and serving in Babel governorate”.



“Fig 1 Questions abbreviation according to the hygiene of equipment and food production-preparation and serving (Part I of the questionnaire) in Babel governorate”.

The analyzed data, which concerned the hygiene of equipment and food preparation presented in Fig.2. The Mean scores, SD and values of statistical coefficient in street food vendors’ hygiene of equipment and food preparation”. The distribution of questionnaire scores of all street food vendors on two group, the first one grouped vendors selling fresh fruit, vegetables, fish, meat, eggs. The second one grouped higher rated vendors which were vendors selling meat and fish meals, falafel and other dishes such as shakes, ice cream,

coffee, tea. The degree of compliance i.e. fulfillment of requirements, in hygiene of equipment and food preparation was differentiated the Mean score was 2.88. The mean scores for all questions were below the suppositional Mean score 3.5, with Standard deviation 1.07, degree of compliance was 72 %. The Mean score level is not equal mode and median, which confirmed that the distribution of scores for each question was left asymmetric negative skewness. Negative skewness indicated a greater dispersion and variability in the

lower scores. The value of Skewness and Kurtosis coef. (0.91 & 1.15) respectively. Indicating that the answers of street food vendors that the level of assessment low, Do not give high attention of “Hygiene of equipment and food preparation Which indicates the cleanliness of food production and preparation equipment in Thiqr governorate is very low”.

The data in Fig 2 revealed the hygiene of equipment and food preparation The SPSS analysis indicated that the level of assessment of street food vendors in

the significant and consistent manner was strongly influenced by three characteristics, Insects, unnecessary things and food separation. Statistically there are no significant relationship between the other variables and location of facility. There was a statistically significant relationship between Food separation with Type of food, Type of facility and Insects. There is a very low significant relationship between the other variables which makes it reflect negatively on the hygiene of equipment and food production-preparation and serving in Thiqr governorate”.

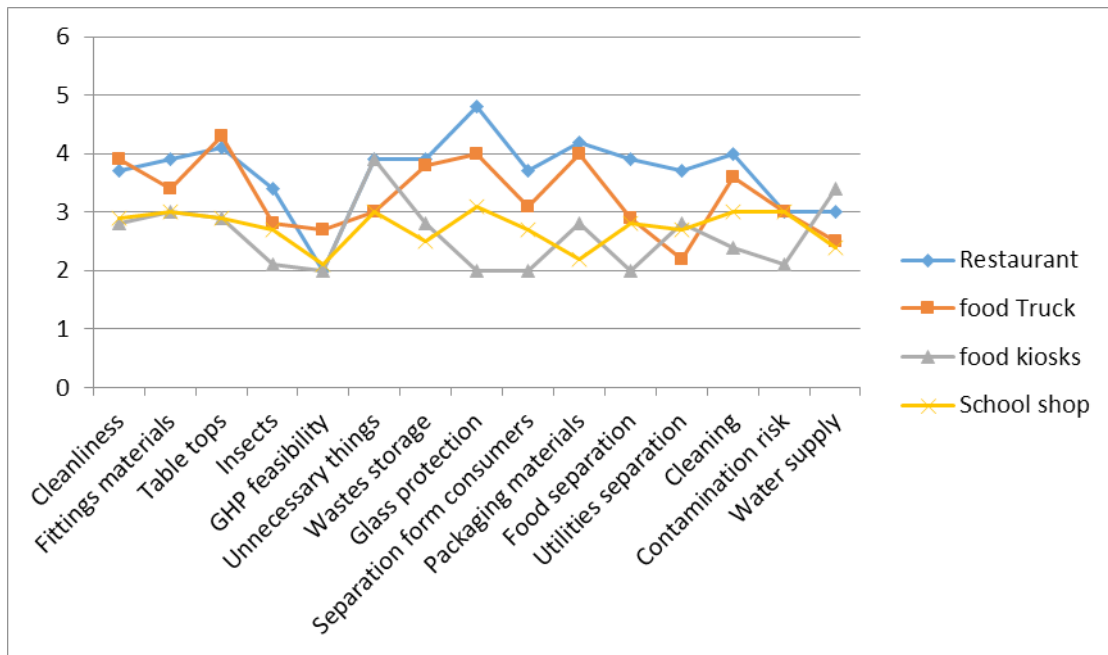


Fig 2 questions abbreviation in the evaluation of street food vendors hygiene of equipment and food preparation according to the hygiene of equipment and food production-preparation and serving (Part I of the questionnaire) in Thiqr governorate.

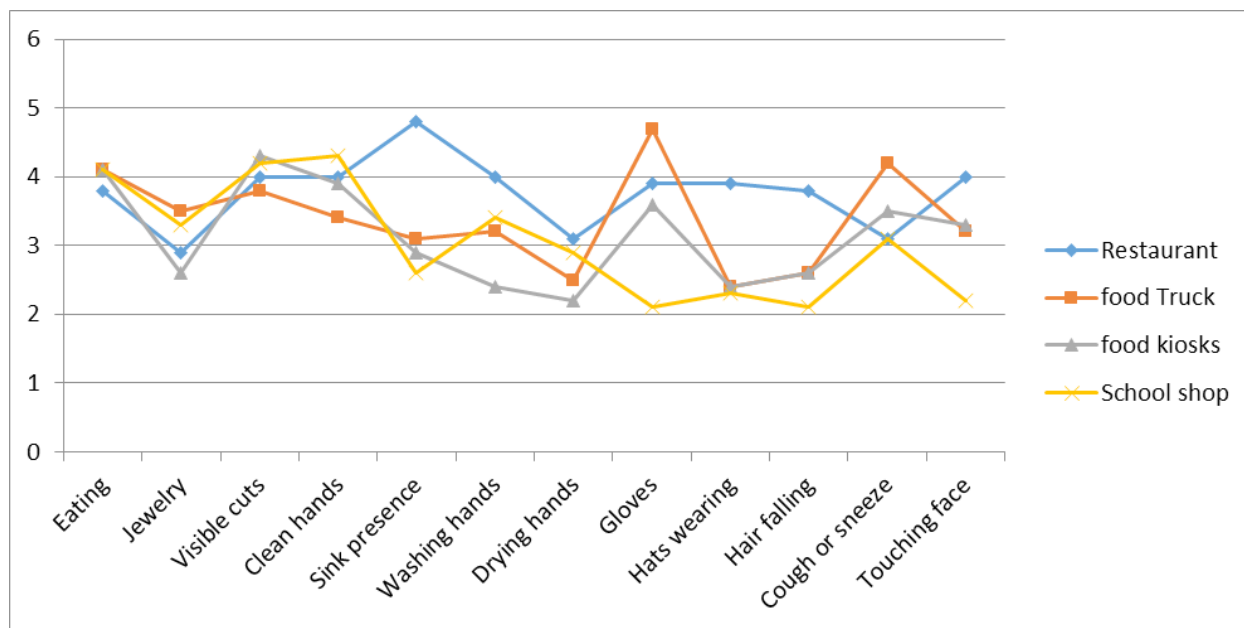
“Personal hygiene”

fig 3 shows that the Mean score of this part was 2.65. The mean scores for all questions were below the suppositional Mean score 3.5, with Standard deviation 0.86,” “degree of compliance was 64 % The Mean score level indicated that The mean scores Is not equal to mode and median, which confirmed that the distribution of scores for each question was left asymmetric negative skewness”. “Negative skewness indicated a greater dispersion and variability in the lower scores as indicated value Skewness coef. 1.72, Kurtosis coef. 3.58 . In other words, data Skewness coef. Towards the right of the normal distribution curve. Indicating that the answers of street food vendors that the level of assessment low, Do not give high attention of Hygiene of equipment

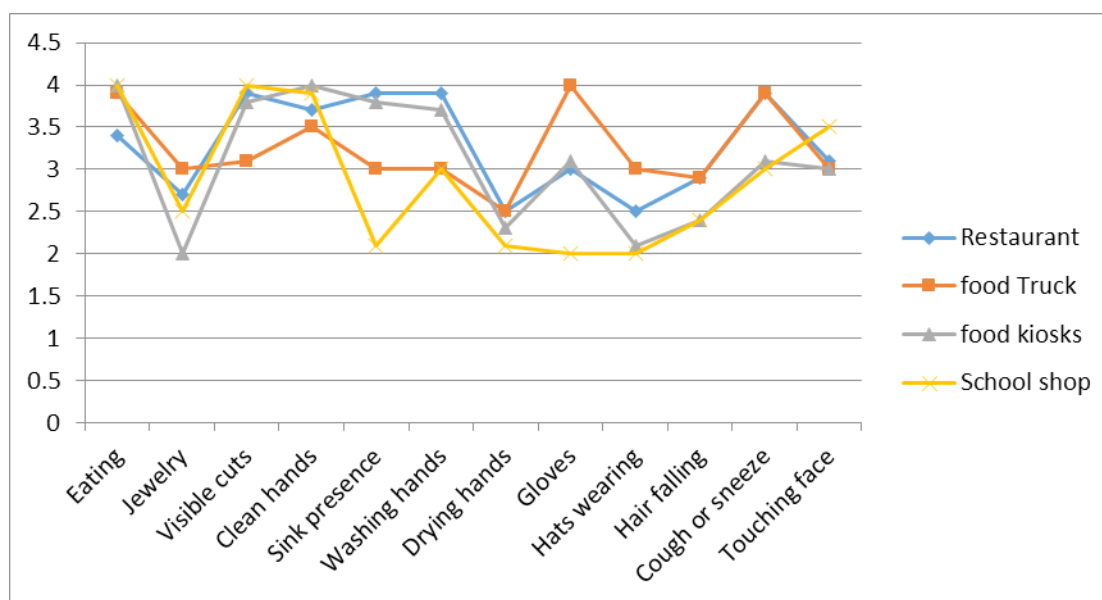
and food preparation Which indicates the cleanliness of food production and preparation equipment in Babel governorate is very low”.

the SPSS analysis of personal hygiene. there was a statistically significant relationship between Jewelry and Visible cuts with Location of facility in the city”.” Also, there Is no statistically significant relationship between other variables and location of facility”. There was a statistically significant relationship between Washing hands with Type of food only. there was a statistically significant relationship between Location of facility in the city with Visible cuts, and Gloves with Location of facility in the city, and Touching face with Type of food and there is a very low significant relationship between the other variables which makes it reflect negatively on

the hygiene of equipment and food production-preparation and serving in Babel governorate”.



“Fig 3 Questions abbreviation according to personal hygiene (Part II of the questionnaire). in Babel governorate”.



“Fig4 questions scores in the evaluation of street food vendors personal hygiene according to the vendor's characteristics (Part II of the questionnaire)”. in Thiagar governorate.

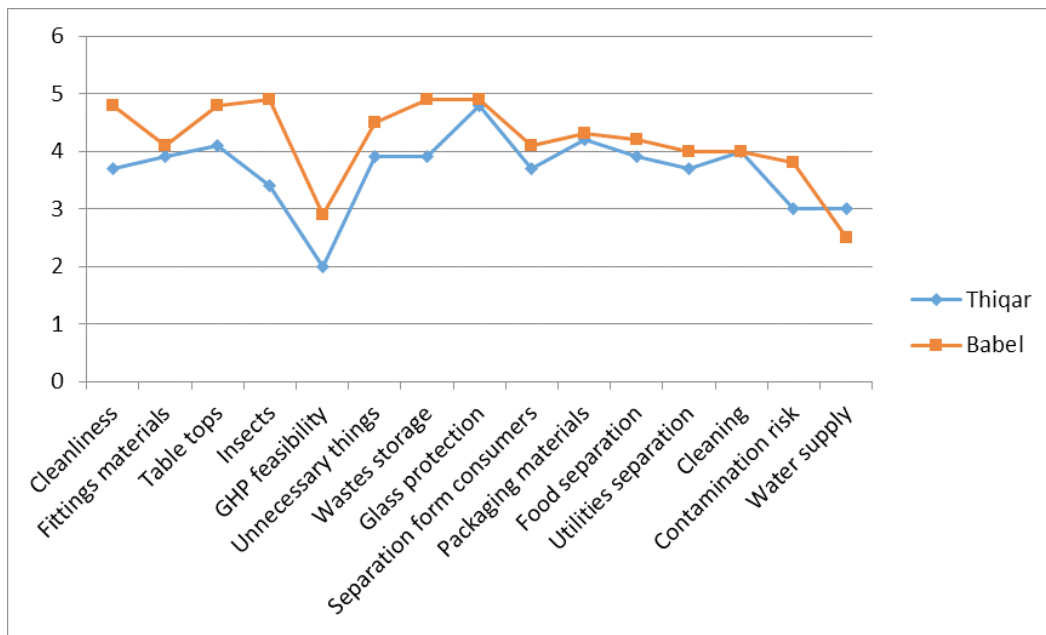
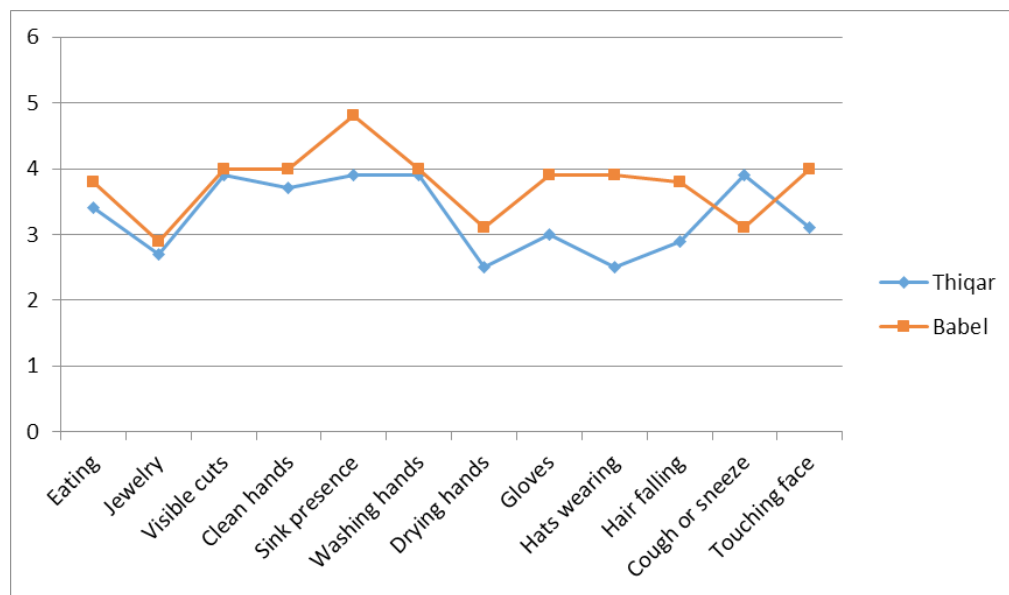


Fig 5 Comparison between Babel and Thiagar according to the hygiene of equipment and food production-preparation and serving.



“Fig6 Comparison between Babel and Thiagar according to the personal hygiene”.

Conclusion

The level of fulfillment of the hygienic requirements was most strongly influenced by the type of schools and street food vendor in both section of personal hygiene and hygiene of equipment and food preparation and serving for Babylon and Thiagar. The results of this work should not discourage to eat street food, but to minimize food poisoning risk, support the reasonable choice of eating-places according to basic food hygiene knowledge.”

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Food Science /Al-Qasim Green University and all experiments were carried out in accordance with approved guidelines.

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Estimation of Serum Lipid Profile among Pre and Post-Menopausal Women in Baghdad City

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Abstract

This study aimed to determine the lipid profile concentration in the sera of women before and after the menopausal age in Baghdad city, since it is one of the main causes of cardiovascular diseases. The study included 100 women (40 premenopausal women with their ages ranged between (25-45 years) and 60 postmenopausal women with their ages ranged between (50-65 years). Blood samples were collected and total serum cholesterol (TC), S. triglycerides (TG), S. high density lipoprotein (HDL), S. low density lipoprotein (LDL) and S. very low density lipoprotein (VLDL) were measured. The results showed no significant difference ($P>0.05$) in the level of total cholesterol (TC) between the two groups of women, while there was a statistically significant increase ($P<0.05$) in the level of serum triglyceride (TG) in postmenopausal women (144.32 ± 43.16) mg/dl when comparison with premenopausal women (101.92 ± 32.44) mg/dl, and a significant decrease ($P<0.05$) in HDL level in postmenopausal women (33.56 ± 10.65) mg/dl when compared with premenopausal women (43.13 ± 14.23) mg/dl. The results of LDL level also showed a significant increase ($P<0.05$) in postmenopausal women (107.57 ± 21.28) mg/dl when compared with premenopausal women (77.23 ± 30.40) mg/dl, and a significant increase ($P<0.05$) in VLDL level in postmenopausal women (31.86 ± 8.16) mg/dl when compared with premenopausal women (21.32 ± 7.12) mg/dl.

Key words:-*dyslipidemia, postmenopausal, premenopausal, lipid profile.*

Introduction

Menopause is the period of absence of the menstrual cycle for more than six months, and it is a natural phenomenon that occurs in all women and represents a transition from the age of fertility to the stage of inability to reproduce (childbearing). It is often caused by the termination of ovarian eggs, and thus ovaries stop producing estrogen hormone, and this stage is accompanied by many symptoms that vary in severity between one woman and another ¹. Women often reach the menopausal age gradually, where the menstrual cycle becomes irregular in the year before the menopausal age, where the menstrual cycle occurs frequently and then begins spacing every two months or more, but sometimes women reach the menopausal age suddenly where the menstrual cycle stops suddenly after months or years of regular cycles ². The menopausal age period is of two types: the first period is the premenopausal, which represents the reproductive period, i.e before the absence of the menstrual cycle ³, while the second type is the post menopause, which is the period of the

woman's life that comes after the last menstrual cycle, where the ovaries stop functioning for whatever reasons whether natural or pathological ⁴. Hyperlipidemia is a major cause of cardiovascular diseases and is the most common cause of death for females after the menopausal age ⁵.

Cholesterol is an organic molecule found in food, and can be absorbed slowly from the digestive system. It plays a vital role and found in the membranes of all eukaryotic cells ⁶. While LDL carries the largest part of cholesterol and represents the bad cholesterol. Cholesterol is carried in blood by low density lipoproteins. LDL carries cholesterol from liver to tissues, and represents cholesterol ester-containing globular particles. HDL is the good cholesterol which carries cholesterol from the vessels to the liver to get rid of it, thereby it prevents cholesterol precipitation on the walls of the arteries ⁷. Triglycerides act as essential sources of energy in the body. They are organic compounds composed of glycerol bound to three fatty acids. Triglycerides move in blood and stored in fatty cells. Triglycerides have

an important function in the body, since they provide the body with activity and energy. Studies have shown a link between triglycerides and heart diseases ⁸, and even most studies indicated the risk of triglycerides increase on cardiovascular diseases ⁹. The current study aimed to estimate the lipid profile levels in the sera of postmenopausal age women and compare them with the premenopausal age women.

Materials and Method

This study was performed on randomly-selected healthy women before and after menopausal age who visited Baghdad teaching hospital and some health care centers in Baghdad city during the period from (October 2017 to February 2018).

After blood sample collection, laboratory tests were performed on the study groups which included 100 women (40 premenopausal women with their ages ranged between (25-45) years and 60 postmenopausal women with their ages ranged between (50-65 years). Data on age, weight, life style, demographic and menopausal status were recorded precisely in a questionnaire form for each of the study samples, who were selected according to selection and investigation criteria. Women with dyslipidemia, Diabetes mellitus, hypertension, kidney diseases, cardiovascular diseases, acute infections, liver diseases and other chronic diseases were excluded from our study.

Serum levels of cholesterol, triglycerides, HDL, LDL and VLDL were estimated by enzymatic method. Data obtained from our study were analyzed using the SPSS program according to the (T-test) by which means and standard deviations were obtained, and ($P<0.05$) was counted as significant while ($P<0.01$) was counted as a highly significant.

Results and Discussion

In this study, the lipid profile concentration including total serum cholesterol (TC), S. triglycerides (TG), S. high density lipoprotein (HDL), S. low density lipoprotein (LDL) and S. very low density lipoprotein (VLDL) were estimated for women before and after the menopausal age. The study included 100 women (40 pre-menopausal women with their ages ranged between (25-45) years and 60 post-menopausal women with their ages ranged between (50-65) years.

Results in table and figure (1) showed an increase in the level of lipids in the sera of pre-menopausal women in comparison with their levels in the sera of pre-menopausal women. There was a remarkable but non-significant increase in serum total cholesterol level among post-menopausal women (167.63 ± 43.16) mg/dl when compared with its levels among pre-menopausal women (138.85 ± 38.31) mg/dl.

There was a statistically significant elevation ($P<0.05$) in the level of serum triglyceride (TG) among post-menopausal women (144.32 ± 43.16) mg/dl as compared with pre-menopausal women (101.92 ± 32.44) mg/dl, and a significant decrease ($P<0.05$) in HDL level in post-menopausal women (33.56 ± 10.65) mg/dl when compared with premenopausal women (43.13 ± 14.23) mg/dl. The results of LDL level also showed a significant increase ($P<0.05$) in post-menopausal women (107.57 ± 21.28) mg/dl when compared with pre-menopausal women (77.23 ± 30.40) mg/dl, and a significant increase ($P<0.05$) in VLDL level in post-menopausal women (31.86 ± 8.16) mg/dl when compared with pre-menopausal women (21.32 ± 7.12) mg/dl.

Table (1): Lipid profile levels in pre and postmenopausal age women

Lipid profile	Mean \pm SD (mg/dl)	
	Premenopausal women (25-45) years	Postmenopausal women more (50-65) years
S.TC	138.85 \pm 38.31	167.63 \pm 43.16 Ns
S.TG	101.92 \pm 32.44	144.32 \pm 43.16**
S.HDL	43.13 \pm 14.23	33.56 \pm 10.65*
S.LDL	77.23 \pm 30.40	107.57 \pm 21.28*
S.VLDL	21.32 \pm 7.12)	31.86 \pm 8.16*

TC(total cholesterol). TG (triglyceride), HDL (high density lipoprotein), LDL (low density lipoprotein), VLDL (very low density lipoprotein).

** Highly significant $P\leq 0.01$, * Significant $P\leq 0.05$, Ns: No significant.

Results obtained from our study regarding cholesterol levels agreed with other studies such as Igweh et al ¹⁰, who found a non-significant increase $P>0.05$ in total cholesterol levels. Our results also were in agreement with Fatma et al ¹¹, who demonstrated a

non-significant increase in cholesterol levels.

Our findings were consistent with the study conducted by Swapnali et al, who indicated a significant increase in the mean levels of TG, LDL-C and VLDL-C during the postmenopausal age, and a significant decrease in the mean levels of HDL-C in postmenopausal age women in comparison with its levels in premenopausal women, while their results regarding TC levels did not agree with our findings when they found a significant increase ($p<0.05$) in TC levels in postmenopausal age ¹².

Our current results disagreed with those of Kalavathi et al and Muzzio et al who found a significant increase in TC levels in the postmenopausal age due to estrogen hormone deficiency after the menopausal age ^(13,14).

In a study conducted by Kanwar et al, it was shown that the mean and standard deviation differences of TG were non-significant between the pre and postmenopausal women, with a significant decrease in VLDL-C levels ($P<0.05$) in postmenopausal age women in comparison with the premenopausal women. However, their results agreed with our findings in regard to HDL-C and LDL-C and TC ¹⁵.

Table (2): Lipid profile levels in premenopausal age women

Lipid profile	Mean \pm SD (mg/dl)		P value
	Premenopausal women 25-34 years	Premenopausal women more than 35-44 years	
S.TC	146.04 \pm 48.05	128.95 \pm 32.59	NS
S.TG	109.65 \pm 42.06	95.23 \pm 22.59	
S.HDL	43.05 \pm 18.02	44.48 \pm 11.96	
S.LDL	82.50 \pm 32.16	64.49 \pm 28.09	
S.VLDL	23.02 \pm 9.23	17.96 \pm 4.92	

TC(total cholesterol). TG (triglyceride), HDL(high density lipoprotein), LDL (low density lipoprotein), VLDL (very low density lipoprotein).

Table (3): Lipid profile levels in postmenopausal age women

Lipid profile	Mean \pm SD (mg/dl)		P value
	Postmenopausal women 50-59 years	Postmenopausal women more than 60-65 years	
S.TC	156.95 \pm 38.75	176.23 \pm 23	NS
S.TG	138.23 \pm 35.43	148.15 \pm 35.85	
S.HDL	35.68 \pm 10.96	34.5 \pm 8.73	
S.LDL	93.92 \pm 19.04	117.02 \pm 27.82	
S.VLDL	26.85 \pm 6.87	28.98 \pm 7.01	

TC (total cholesterol). TG (triglyceride), HDL (high density lipoprotein), LDL (low density lipoprotein), VLDL (very low density lipoprotein).

The premenopausal age women group (40 samples) whose ages ranged between (25-45) years was also subdivided into two groups: the first group (25) women whose ages ranged between (25-34) years, and second group (15) women whose ages ranged between (35-44) years.

There was a very little and non-significant increase ($P>0.05$) in the levels of TC, TG, HDL, LDL and VLDL among the second group of women at premenopausal age whose ages ranged between (35-44) years (146.04 ± 48.05), (109.65 ± 42.06), (43.05 ± 18.02), (82.50 ± 32.16), and (23.02 ± 9.23) mg/dl respectively when compared with their levels among the first group of premenopausal age women (128.95 ± 32.59), (95.23 ± 22.59), (44.48 ± 11.96), (64.49 ± 28.09) and (17.96 ± 4.92) mg/dl respectively as shown in table (2).

While the postmenopausal age women group (60 samples) whose ages ranged between (50-65) years were also subdivided into two groups: the first group (40) women whose ages ranged between (50-59) years, and second group (20) women whose ages ranged between (60-65) years.

There was a little and non-significant increase ($P>0.05$) in the levels of TC, TG, HDL, LDL and VLDL among the second group of women at postmenopausal age whose ages ranged between (60-65) years (176.23 ± 23), (148.15 ± 35.85), (34.5 ± 8.73), (117.02 ± 27.82) and (28.98 ± 7.01) mg/dl respectively when compared with their levels among the first group of postmenopausal age women whose ages ranged between (50-59) years (156.95 ± 38.75), (138.23 ± 35.43), (35.68 ± 10.96), (93.92 ± 19.04) and (26.85 ± 6.87) mg/dl respectively as shown in table (3).

The study performed by poonam, showed coincident results with our findings as they found no change in TC levels between the pre and postmenopausal age women ¹⁶.

Results obtained by Yassin et al were in agreement with our results regarding HDL and LDL levels, while their results did not agree with ours regarding TC and TG ¹⁷.

Our findings also agreed with those of Anthony et al in regard to TC, HDL, TG and VLDL, while they did not agree with us in regard to LDL levels ¹⁸.

It is worth mentioning that the absolute value of total

cholesterol is not the most important factor to identify cardiovascular diseases, but the abnormal levels of the cholesterol types TG, HDL-C and LDL-C are the most important factors in such disease, and this is attributed to the variation in races and genetic types as well as other interfering factors. The values of lipid profile obtained in our study match with women in Baghdad city with all the similar statistical differences of the racial and genetic variations in other parts of the world. It is estimated that an increase of 1 mg/dl in HDL-C level leads to a 3% reduction in the risk of the coronary artery diseases and a 4.7% reduction in the risk of death and cardiovascular diseases ¹⁹. In our study, the level of HDL-C decreased, while the level of LDL-C increased, which is a great and important indicator of cardiovascular disease development, and this finding was reported by many studies ²⁰.

Undoubtedly, the postmenopausal changes in lipid profile levels in our study are unhealthy changes and can be harmful to the cardiovascular system.

Conclusion

Menopause causes lipid profile alteration through increasing the levels of Tc, TGs, LDL, VLDL. Therefore the risk of cardiovascular disease will be higher. Post-menopausal women are always at highly risk of cardiovascular disease development, due to the change in their lipid pattern and loss of estrogen effect in protecting the cardiovascular system.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Institute of Medical Technology/ Baghdad/ Nursing Department, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effect of Zinc Oxid Nanoparticles on the Oxidative Stress (Malonaldehyde MDA, Lipid Peroxidation Level LPO) and Antioxidants (GSH glutation)

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Abstract

The plant was selected as the source of the nanoscale study because it possesses more chemical compounds than the other plants, ZnO nanoparticles (ZnONPs) were prepared from the plant *Artemisia herba alba* extract and from the flavonoid compound. The samples were diagnosed by Atomic Force Microscopy (AFM) and Fourier transform infrared (FT-IR) spectroscopy, and effect ZnONPs the synthesis from *Artemisia herba alba* extract, from the flavonoid compound, *Artemisia herba alba* and flavonoid on the criteria for oxidative stress (Malonaldehyde MDA, Lipid peroxidation level LPO) and antioxidants (GSH glutation) were determine effective time and effective dose. The results showed that MDA and LPO showed a significant decrease compared with the control group, while the period of 32 days showed a significant decrease compared to 62 days. The analysis of GSH found that the coefficients of the study showed a significant increase compared with the control, while the period of 32 days showed a significant decrease compared with 62 days.

Key words : ZnO Nanoparticles, *Artemisia herba alba*, Flavonoid, MDA, LPO, GSH

Introduction

Nanoparticles is one active modern science, rapid growing field with technology and science for the purpose manufacturing new materials at nanoscale level ¹, The term nanotechnology was first used by Norio Taniguchi, using the word to describe tools that use nanoparticles, Nanotechnology is defined as the ability to monitor, measure, process and manufacture nanomaterials, and the nanometer-nm is one billionth of a meter, which is very small ². ZnO nanoparticles was one of the most nanoparticles used for used make ointments and cosmetic creams, etc.. which protect skin from cancerogenic and burns of ultraviolet radiation ³ Free radical generation is a natural consequence of living in an oxidising environment, cells generate small amount of free radical or reactive oxygen species (ROS), accumulation of ROS may damage biological macromolecules such is DNA, carbohydrate, protein, lipid ⁴, External factors such infection, radiation, heat, toxins and exercises can lead to increase free radicals and other ROS ⁵, oxidant damage may be minimised by antioxidant defence mechanism that protect the cell

against cellular oxidant and repair system that prevent the accumulation of oxidatively damaged molecules, antioxidant enzyme play a vital role in protecting cellular damage from harmful effect of ROS ⁶ plants contain phytochemicals are any compound such as phenol, terpenoid, polysaccharide and flavone that contribute in reduction and stabilizing nanoparticles ⁷, plants are natural antioxidant sources which are used in traditional medicine for healthy of many disease ⁸ as *Artemisia herba alba* plant (Asteraceae family commonly known as annual wormwood) is a plant used many centuries in medicine treatment of many of disease ⁹, moreover, *Artemisia* leave a high content of cineole, *Artemisia* ketone, camphene ¹⁰ being a rich source of various phenolic compounds as a source of natural antioxidant ¹¹. Such flavonoid have great potential to inhibit the generation of reactive oxygen species (ROS) and once they are formed perform antioxidant function, flavonoid are found in the chloroplast which play role as scavenger of oxygen and stabilizers of chloroplast outer envelope membrane ¹² Since our food is rich in antioxidants, including flavonoids, and the current time research

has been manufactured with some caveats and that nanoparticles have taken into account the application of biological, industrial and medical in an attempt to reduce the oxidant stress, so the study aimed at:-1- synthesis ZnO nanoparticles from *Artemisia herba alba*, 2 - preparation best of ZnO nanoparticles,3- studying evaluation properties antioxidant – oxidant of *Artemisia herb alba* extract Flavonoid,4- analysis oxidant strese Malonaldehyd (MDA) and Lipid peroxidase (LPO). 5-analysis antioxidant glutation GSH.1: Materials and method

1-1-plants collection: *Artemisia herba alba* obtain from karbalaa city in 2018 during the flowering stage the plant were air dried and at oven degree 45c° and powder.

1-2-Soxhlet Extraction : 50 gm of fin powder was plased in to an extraction thimble and extracted with 50 ml of (80%) methanol in flask round volum (500 ml) for 24 hours, (Iqbal, 2012) then evaporated at (45C°) by a rotary evaporator and using freez drayer (lyophilizer) to dried crude extract.

1-3-Exrtraction of total flavonoids from *Artemisia herba alba* : Material has been according to this method ¹⁴.

1-4: preparation ZnO nanoparticles from the extraction *Artemisia herb alba* and flavonoid. Material has been done according to his method ¹⁵.

1-5: Diagnosis using FT-IR infrared spectrum: Work has been done according to his method ¹⁶

1-6-Diagnosis using Atomic Force Microscope AFM:

1-7 Design experiment: Atotal adult male rat , weight (200-320) gm, age (8-10) weak , wer used in this study and were isolated in a relatively controlled environmental at temperature of about 25C° in animal house , rats were divided in to 5 groups , G1-the control group has given normal saline (0,9%) only, G2- injection 150 mg/kg B.W of *Artemisia herb alba* extracted , G3- injection 150mg/kg B.W of Flavonoid extracted, G4- injection 0. 4 mg/kg B.W ZnO nanoprticles synthesis from *Artemisia herba alba* extract, G5- injection 0.2 mg/ kg B.W ZnO NPS synthesis from Flavonoid.

1-2- Oxidant -Antioxidant analysis :

1-2-1 : Malondialdehyde (MDA) U/ L: Work has been done according to his method ¹⁷

1-2-2 Lipid peroxidation : Work has been done according to his method^(18, 19).

Results And Discusion

Identification of nanoparticles :

Atomic Force Microscopic (AFM):

The topography of surface was studied using AFM , Fig (1) showed two dimention image semispherical and spherical of ZnONanoparticles synthesis extract of *Artemesia herb alba* and Flavonoid compounds , nano particles high to the ZnO show 33.33nm , 18.00 for ZnONanoparticles synthesis extract *Artimesia herb alba* and Flavonoid in tabl 1,

comparison with study of ²⁰ the morphological character of ZnO nanoparticles by flavonoid was analysis by SEM which showed spherical shape and cluster.

Tabl (1) show shape , nanoparticles , size particles , diameter average of ZnONPS *Artimesia herb alba* and ZnONPS Flavonoid.

Sample	Sample	Nanoparticles	Size particle	Diameter average
ZnO Artimesia herb alba	Semispherical	33-33 nm	55-100.00nm	80-55 nm
ZnONPS Flavonoid	Spherical	18.00 nm	55-85.00 nm	75-04 nm

Fourier Transform infrared (FT-IR) analysis: The FT-IR spectra of the four samples are shown in figure (1), The results of FTIR spectrum of ZnONPs A.herba alba presence of alcohols and phenols with a peak at 3411.19 , 3344.68, 3300.31, 3219.30 , 3173.01, 3117.07 , 3057.27 cm-1 , The peak at 2960.83 , 2883.68 and 2883.68 cm-1 to the C-H stretching presence some, fatty acid , alkene compounds, wax, carotenoid and phytosteroil are present. The peak 17570.21 cm-1 presence to the C-C stretching which means that some glycoside, The peak value at 1614.47 cm-1 assigned to the C=O stretching which means the presence of some Flavonoid, polyphenol and catechins. The peak value at 1508.38 cm-1 assigned to the C=C stretching which means that some aromatics , flavonoid . The peak values at 1396.51, 1332.86 cm-1 assigned to the C=N stretching confirms aromatic

amines. The peak value at 1274.99 cm-1 assigned to the C-N stretching confirms aliphatic amines, The peak value at 1168.90 , 1111.03 cm-1 assigned to the C-O stretching which means that Alcohols , ester, carboxylic acids, and the peak value at 852.56, 781.20 , 617.24 cm-1 assigned to the C-N stretching which means that Aliphatic amines and secondary alcohols , the absorption at in peak 478.36 cm-1 identifies the presence of ZnO nanoparticles , compared with result of ²¹ which indicate the presence of ZnO nanoparticles at peak 450-540cm-1 that synthesized from aqueous leaf extract of coriandrum sativum using zinc acetate sodium hydroxide as in Figure 1 and Table 3 . the studies (^{22,23}) at peak between 1543-1028 cm-1 the affinity of the confirmed material of the nanoparticles of ethylene glycol and ethyl alcohol .

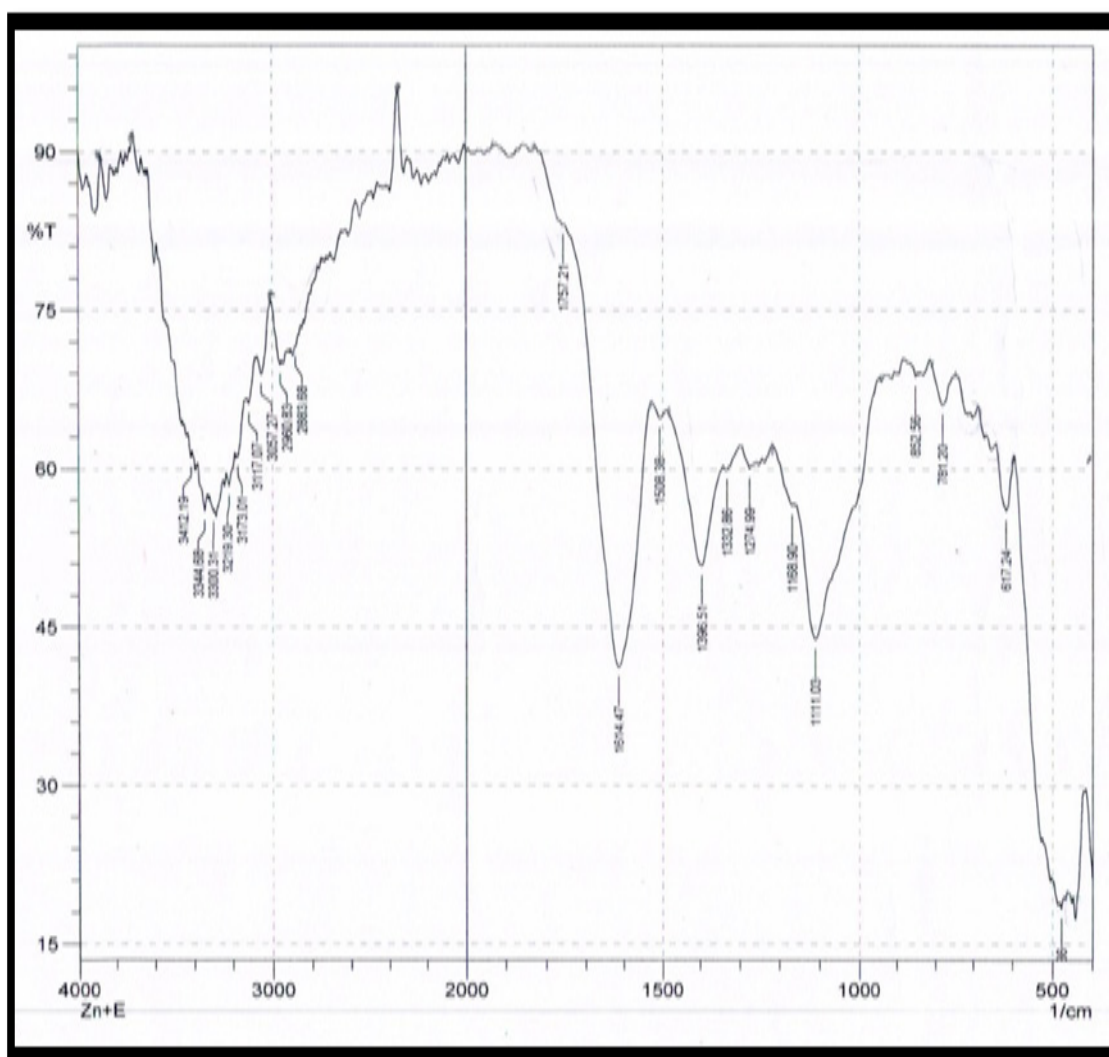


Fig (1) FTIR ZnO synthesis from *A. herba alba*.

The results of FTIR spectrum of Flavonoid at peak 3205.80 cm⁻¹ the presence of alcohols and phenols The peak at 2993.62 cm⁻¹ and 2071.62 cm⁻¹ presence to the C-H stretching alkene compounds , fatty acid , carotenoid and phytoSteroil are present. The peak value at 1633.76 cm⁻¹ assigned to the C=O stretching which means that Flavonoid , polyphenol and catechins , The peak value

at 1396.51, 1332.86 cm⁻¹ assigned to the C=N stretching which means aromatic amines. The peak value at 1274.99, 1238.34 and 1047.38 assigned to the C-O stretching which means alcohol, ester, carboxylic acid , the peak values at 985.66 and 729.12 cm⁻¹ assigned to the C-N stretching which means Aliphatic amines as in Figure (6) (24, 25,26, 27)

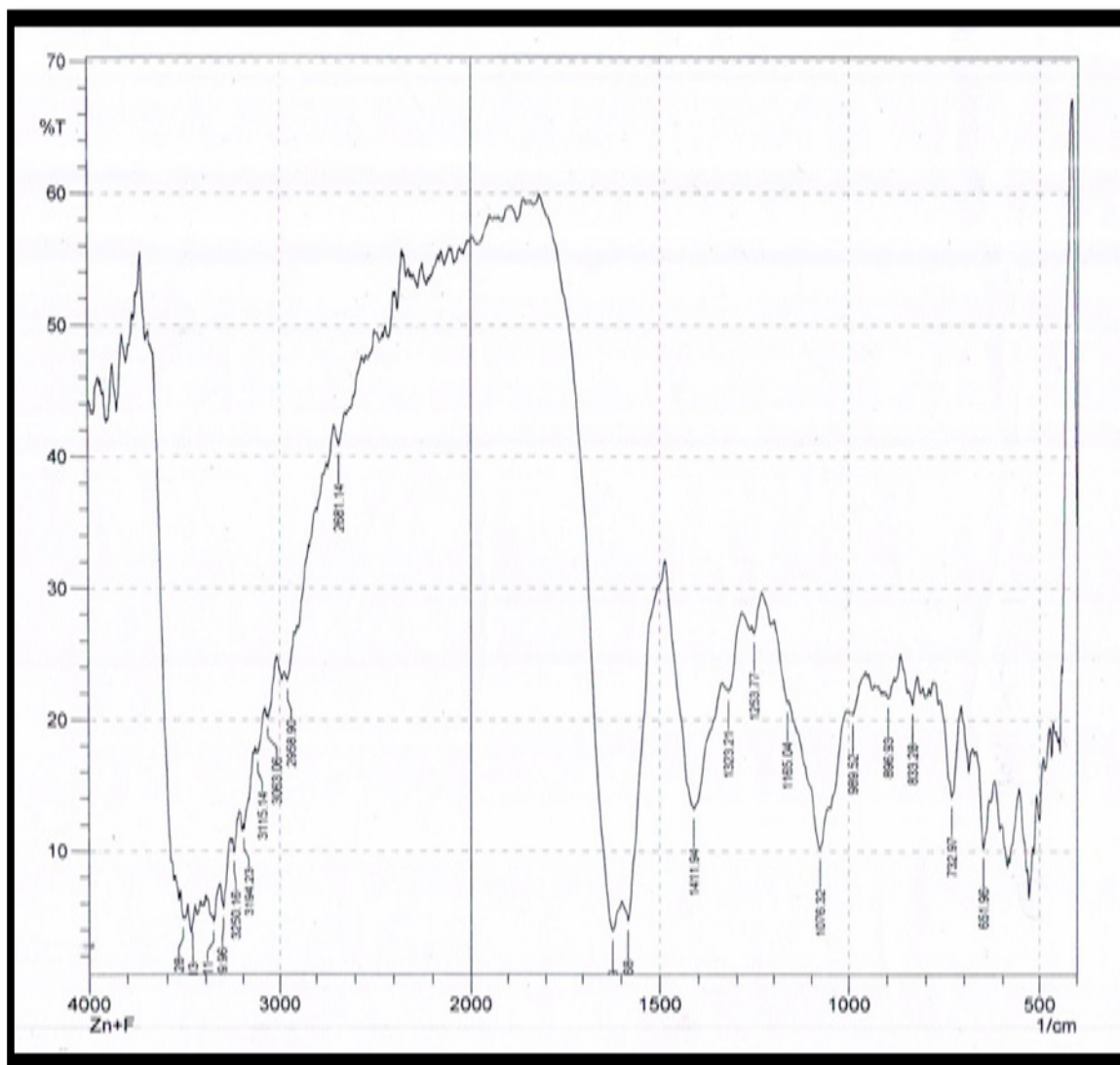


Fig (2) FTIR of the ZnO nanoparticles from Flavonoid.

oxidant – Antioxidant assay :

Determination of Malonaldehyde (MDA) level U/L:

MDA level of group G2, G3,G4,G5 of rat showed significant decrease (1.95±0.26, 2.26±0.17, 1.38±0.26, 1.21±0.19) respectively compared with contro

2.26±0.17at 30 day , while at 60 day G2,G3,G4,G5, show significant decrease (2.06±0.24 , , 2.01±0.17 , 1.49±0.24, 1.29±0.22) for respectively compared with control 2.31±0.17 Table (4).

While groups at 32 day of MDA show significant decrease (2.26±0.17, 1.95±0.26, 2.26±0.17, 1.38±0.26,

1.21±0.19) of control , G2,G3,G4,G5, respectively compared with at 62 day (2.31±0.17, 2.06±0.24 , 2.01±0.17 , 1.49±0.24, 1.29±0.22) of control , G2,G3,G4,G5, respectively.

Table (2) MDA percentage for rat groups treated with study coefficients.

At 32 day		
Group	mean± SD	Sig
Control	2.26±0.17	0.23
G2	1.95±0.26	
G 3	2.26±0.17	1.00
G4	1.38±0.26	0.00*
G5	1.21±0.19	0.00*
Sig between group	0.000	
At 62 days		
Control	2.31±0.17	
G2	2.06±0.24	0.41
G 3	2.01±0.17	1.00
G4	1.49±0.24*	0.00*
G5	1.29±0.22*	0.00*
Sig between group	0.000	
n	5 at p ≤ 0.05	

Determination of Lipid peroxidation (LPO) assay :

LPO level of group G2, G3,G4,G5of rat showed significant decrease (19.71±3.7, 16.19±3.25, 12.57±7.37, 12±4.24) respectively compared with control 24.28±7.37at 32 day , while at 62 day G2,G3,G4,G5 show significant decrease (20.28±7.24, 16.86±5.84, 15.99±2.12 , 14.57±5.84*) respectively compared with control 24.28±5.72. table (4)

While groups at 32 day of LPO show significant decrease (24.28±7.37, 19.71±3.7, 16.19±3.25, 12.57±7.37, 12±4.24) of control , G2,G3,G4,G5, respectively compared with at 62day (24.28±5.72, 20.28±7.24, 16.86±5.84, 15.99±2.12 , 14.57±5.84*) of control , G2,G3,G4,G5, for respectively.

Table (3) LPO percentage for rat groups treated with Study coefficients.

LPO AT 32 days		
Group	mean± SD	Sig
Control	24.28±7.37	
G2	19.71±3.7	0.83
G 3	16.19±3.25	0.31
G4	12.57±7.37*	0.05
G5	12±4.24*	0.37
Sig between group	0.31	
At 62 days		
Control	24.28±5.72	
G2	20.28±7.24	0.87
G 3	16.86±5.84	0.34
G4	15.99±2.12	0.23
G5	14.57±5.84	0.11
Sig between group	0.98	

Determent Glutathione (GSH) level:

GSH level of group G2, G3,G4,G5, of rat showed significant increase (2.79±0.81, 2.94±1.38, 3.24±1.11, 3.97±0.66,) respectively compared with control 2.502±1.12 at 32 day , while at 62 day G2,G3,G4,G5 show significant increase (2.354±0.96, 2.80±0.96, 3.09±0.62, 3.82±0.61) respectively compared with control 1.47±0.90.

While groups at 32 day of GSH show significant increase (2.502±1.12, 2.79±0.81, 2.94±1.38, 3.24±1.11, 3.97±0.66) of control , G2,G3,G4,G5 respectively compared with at 62 day (1.47±0.90, 2.354±0.96, 2.80±0.96, 3.09±0.62, 3.82±0.61) of control , G2,G3,G4,G5, respectively table (4)

Table (4) GSH percentage for rats groups treated with study coefficients.

GSH at 32 days		
Group	mean± SD	
Control	2.502±1.12	
G2	2.79±0.81	0.99
G 3	2.94±1.38	0.98
G4	3.24±1.11*	0.88
G5	3.97±0.66*	0.27
Sig between group	0.04	
At 62days		
Control	1.47±0.90	
G2	2.354±0.96	0.51
G 3	2.80±0.96	0.13
G4	3.09±0.62	0.38
G5	3.82±0.61	0.01
Sig between group	0.001	

Discussion

The experiment result show that (*A. herb alba* , flavonoid ,ZnONPs) improved antioxidant enzyme activity and effectively free radicals scavenger that can enhance the antioxidant capacity ,because *Artemisia* contained bioactive substance such polysaccharide and flavonoid which has very good radicals scavenging capacity and antioxidant effect. Because flavonoid have antioxidant effect at extracellular or intracellular antioxidant substance levels and act inhibition xanthine oxide activity is free radicals defense mechanism .that has conversion of xanthine oxide product to xanthine dehydrogenase so that decrease free radicals substance produce. ZnO nanoparticles is able to protect cell membrane against radical ferr damage , increase antioxidant enzymes and decrease MDA level and decrease level ROS.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology/ University of Kufa and all experiments were carried out in accordance with approved guidelines.

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Molecular Identification of Sarcocystis Species Infection in Sheep in Karbala Governorate – Iraq

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Abstract

Sarcocystis spp. are causative agents of ovine muscular stiffness, myopathies and/or inflammations of the mucosa of the intestine, diaphragm Heart and skeletal muscles, which are generate important economic loss when causing clinical and subclinical cases, ovine Sarcocystis spp. are a protozoan parasite of worldwide distribution transmitted by canids, most commonly associated with subclinical infection in sheep, our study were described in unorganized five different localities in Karbala governorate for sheep Sarcocystis spp. investigation and classified in to two ages groups, less than 18 months-old and over 18 months-old, Macroscopic and microscopic and certain biochemical tests were used for parasite observation, Molecular assay PCR assay was used to confirm this protozoan, Currently, PCR assay based on certain regions of the cytochrome oxidase 1 sequences is considered and used widely as an inexpensive, rapid and precise molecular approach to identify the Sarcocystis spp.

Keyword: Sheep Sarcocystis, PCR, Macrocyts and microcyts.

Introduction

Sarcocystis is anobligatory intracellular protozoan that belongs to the phylum apicomplexan and has the ability to infect a broad spectrum ofvertebrates' poultry, livestock, and humans with more than 150 knownspecies¹⁶ and⁷. It is a heteroxenous parasite that has anobligatory two host's life cycle in order to thrive, one host,being an intermediate onewhich is usually herbivores or omnivores in which the parasite will have its merogonystage and results in cyst formation inside the skeletal muscles of these hosts which are commonly referred to as (sarcocysts). The other host is the definitive (final) host which in turn would usually be a carnivores or omnivores in which the parasite undergoes it's sporogony and gamogony stages of development that leads to shedding of infective sporocysts and oocysts in the stool of these animals¹⁴. The same animal species can be infected with more than one species of Sarcocystis, for example, sheep as intermediate hosts, can be infected with more than four different species of Sarcocystis and are intermediate hosts these are *S. gigantea*(*S. ovifelis*), *S. tenella* (*S. ovicanis*), *S. arieticanis*, and *S.medusiformis*¹. The prevalence of Sarcocystis varies with respect to its species were *S.gigantea* is known

to have a global distribution whereas *S.medusiformis* on the other hand has been only reported in only a few parts of the world like Australia, New Zealand²³. The pathogenicity of Sarcocystis varies with respect to its species. The inspected sheep meat which turns to be heavily infested with macrocysts in Iraqi abattoir most of the time will be condemned as unfit for human consumption .Another point of concern involves the fact that nearly all investigations on ovine Sarcocystis infection are limited to just inspecting the carcasses at the slaughterhouse without paying attention to determine the exact species of Sarcocystis involved which may return harmless and fit for human consumption and thus reducing the economic losses²⁹ and¹⁹.

Materials and Method

Animals: During the course of this study which extended from December 2018 to May 2019, tissue samples involving the esophagus were randomly collected from 412 (289 male and 123 female) sheep slaughtered at five different localities in Karbala. Careful examination was conducted prior to slaughtering to make sure that all included sheep were healthy before being slaughtered. The estimation of sheep age was made on the basis of teeth examination to calculate the number of

temporary teeth as well as the erupted permanent incisor count ²⁶. The gender of each sheep was recorded. The animals were categorized into two groups according to their age (Table 1).

1- Group A: this group included all sheep 18-month of age irrespective to their sex. It included (211) sheep with (155) male and (56) female. The ages of this group of male members ranged from 10-18 month (16.8 ± 1.61) and that of the female group member ranged from 14-18 (15.38 ± 2.27) month.

2- Group B: this group included all sheep with an age of equal to or more than 18-month. It included (201) sheep with (134) male and (67) female. The ages of this group male members ranged from 18-32 (27.26 ± 2.03)

month and that of the female group member ranged from 18-38 (28.35 ± 2.46) month.

Macroscopic examinations.

After washing and removing of tunica adventitia, each collected esophagus underwent careful and thorough inspection in the search for macrocysts of the *Sarcocystis* parasite. Any specimens found to have macrocysts was isolated, its cysts were excised and liberated out of the esophageal tissue to be collected in a petri dish (Fig. 1), and underwent subsequent classification based on the physical features like shape, color, and size. The cysts ranged (3 -14 mm) in length (11.2 ± 1.3 mm). Their colors varied from opalescent white to pale yellow and their shapes included both round and oval forms.

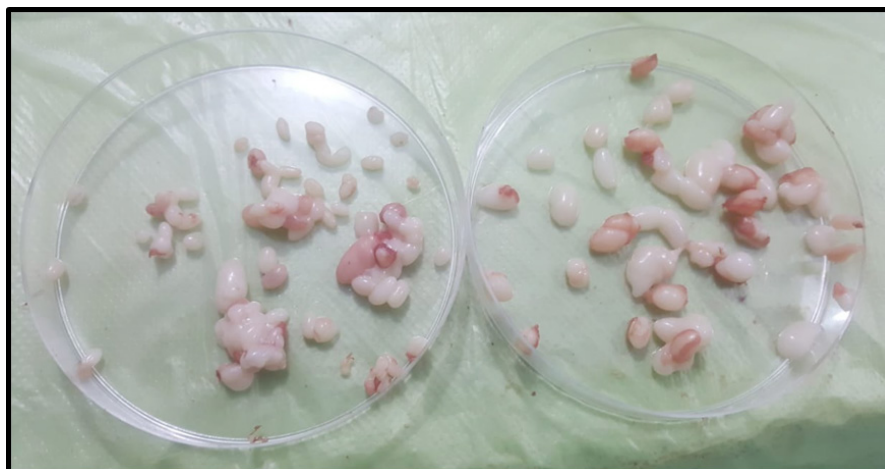


Figure 1: Macrocysts of different sizes and shapes isolated from infected esophagi.

Microscopic examination:

Three samples were taken from each esophagus with an approximate weight of at least 25 g in order to be used for *Sarcocystis* bradyzoites that are harbored in the microsarcocysts which are typically banana shaped (Fig. 3) with a length of about 3.08 to 7.45 μm that were estimated using ocular micrometer. All parts were labeled with information representing the age, gender, and date of slaughtering. Each collected esophagus was examined with the following three methods:

Peptic digestion method.

For performing this procedure, a modified technique commonly used by similar studies was adopted ¹⁰ were 2 grams of pooled muscular tissue obtained from the esophagus after removing fat and tunica adventitia. The

extracted piece was in turn cut into smaller and smaller pieces using a scalpel after that it was placed into 10 ml test tube followed by adding 7 ml of peptic digestion solution and incubated at 40 C° for 30 minutes. The digestate was filtered through 3 layers of medical gauze into 10 ml centrifuge tube and centrifuged for 7 minutes at 2000 rpm. The supernatant was discarded and 0.5 ml of 0.9 % physiological saline was added to the precipitant, mixed thoroughly and a drop was taken and placed over a glass slide in order to be examined by microscope for the presence of bradyzoites under the power x 40 ¹⁷.

2- Meat mincing by garlic presser:

As described by ²¹, 4 grams esophageal muscle sample placed in a metallic garlic presser and firmly squeezed to extract a liquid from the meat from which a drop was taken via Pasture pipette and placed on a

glass slide, covered with a cover-slip and examined by microscope at force 40 X.

3- Slide squash method (Trichnoscopy):

A meat sample was cut into as small pieces as possible using a scalpel in a direction parallel to that of muscle fibers. 2 x 2 mm piece placed over a glass slide and covered with two coverslips. After placing the slide on a firm ground, it was pressed by thumb as hard as possible to crush the sample then the upper glass slide was removed and the sample examined at 40 X ²⁷.

Molecular study

For molecular analysis, soft cysts of the macrocysts were dissected, washed several times in 0.01 M phosphate-buffered saline (pH 7.2), and stored at -20 °C until DNA extraction.

DNA extraction

G-spin™ Total DNA Extraction Mini Kit, Korea was used for DNA extraction where according to provider’s protocol and after collecting extracted macrocysts in a Petri dish, 20 mg of macrocysts placed in 1.5 ml Eppendorf tube smashed into liquid state using a sterile wooden stick and mixed up with 200 µl of tissue lysis solution followed by adding 20 µl proteinase-K. The

mixture incubated at 60 °C in a water bath for 30 minutes with constant shaking using vortex every 5 minutes. 200 µl binding buffer added and mixture incubated at 60 °C for 10 min then 100 µl of absolute alcohol added. The mixture was transferred into a collection tube for centrifugation at 13000 rpm for 1 minute. 700 µl of washing buffer 1 solution added and another run of centrifugation at 13000 rpm was conducted. After discarding the supernatant, washing buffer 2 added and the mixture was replaced in 2 ml tube together with 200 µl of buffer and let dry at room temperature for 5 minutes. The tube was centrifuged at 13000 rpm for 1 minute then the DNA containing fluid was stored at -20 °C for further evaluation.

PCR-reaction.

PCR was conducted on all esophageal samples using *Sar* primers including *Sar-F1* Forward 5’GCACTTGATGAATTCTGGCA3’ and *Sar-R1* Reverse 5’CACCACCCATAGAATCAAG3’ (2, 12, 13).

PCR reaction was carried out in 30 µl of Premix (AccuPower PCR PreMix, Korea). Twenty-five microliters of TaqMaster Mix were used with 10 ng template DNA, 0.1 µM of each primer and distilled water. Cycles of PCR are summarized in (Table- 2):

Table 1: age, sex, and type of infection together with the detection method used for detecting prevalence of microcystic infection in sheep included in the study.

	Males		Females		Total
	< 18	≥ 18	< 18	≥ 18	
Age group (month)	< 18	≥ 18	< 18	≥ 18	
Number of sheep (N)	155	56	134	67	412
Macroscopic cysts (n1)	2	4	5	12	23 (5.58%)
Microscopic cysts (n2)					
Pepsin digestion	140	126	52	56	374 (90.78%)
Trichnoscopy	138	111	46	49	344 (83.50%)
Mincer	91	82	40	43	256 (62.14%)

N = total number of sheep in any subgroup.
 n1 = number of sheep infected with macrocysts in any subgroup.
 n2 = number of sheep infected with microcysts in any subgroup.
 % = (n/N) x 100.

Table2: Summary of steps involved in PCR.

Primer Volume Reference	Amplification program			
	Stage	Temperature (C°)	Time	RPM
Forward:5'GCACTTGATGAATTCTGGCA3' Reverse:5'CACCACCCATAGAATCAAG 3' Product: 600 Bp Bahari, <i>et al.</i> ,2014))	Denaturation	95	5 sec	35
	Denaturation	95	30 sec	
	Annealing	55	45 sec	
	Extension	72	30 sec	
	Terminal	72	10 min	

The amplified DNA obtained after PCR procedure was electrophoresed using 2% agarose gel, stained with Ethidium Bromide (0.5 µg/ml) and visualized under the UV light.

Statistical Analysis

Statistical analysis was done to evaluate the results with a confidence interval of 95% using non-parametric χ^2 test using SPSS (Version 22; IBM, USA). A probability values of $p < 0.05$ were regarded as statistically significant.

Results and Discussion

The results of this study concluded that after examining esophageal muscular tissue samples, sheep had been infected with both macroscopic and microscopic cysts figure (2 &3). With respect to infection with the macroscopic form of the parasite, it was found that among total of (N=412) examined sheep by naked eye, there was (n=23, 5.82 %) confirmed infections with macrocytic form, while the infection rate with the microscopic form of the parasite was (n=374, 90.78%). These finding are consistent with those of similar studies on prevalence of Sarcocystis in livestock in Iraq, were it was found that a prevalence rate for macrocysts of about (4.1 %) was reported in the south of Iraq²¹ likewise, a prevalence of (97.5%)for microcysts was reported in north of Iraq¹⁹.

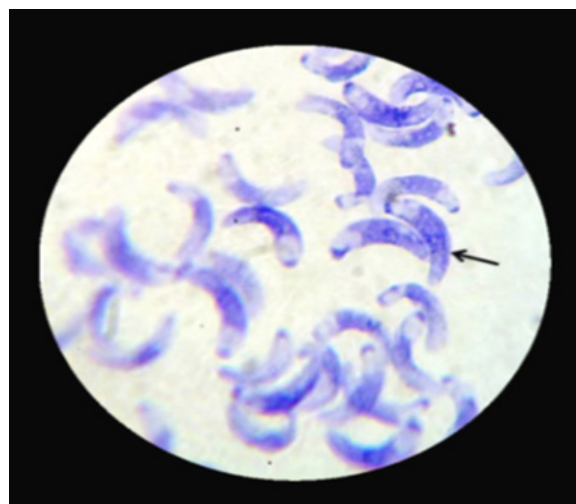


Figure 2: Sarcocystis bradyzoites extracted from microcysts showing typical banana shaped appearance after staining with Giemsa stain and examining using x200 power

Upon comparing the prevalence of infection between both age groups, it was evident that infection rate was significantly higher from the statistical point of view in sheep with older age when compared to those with younger age (7.96% vs. 3.32%, $P < 0.05$) for the first and second groups respectively. It was also noticed that there was a statistically significant difference in infection prevalence between males and females members of both groups ($P < 0.05$). Infection rate was higher in females when compared to males (8.93% vs. 1.29%) respectively for the first group. The same was true with respect to members of second group (17.91% vs. 2.99%) for females and males respectively. It was found the females in both age groups were having the highest prevalence of infection with the macroscopic form when compared to

males ($P \leq 0.05$) as shown in table (1). The results also concluded that older sheep had more prevalent infection were there was a statistically significant difference ($P \leq 0.05$) upon comparing infections in both age groups.

Table 3: age, sex, and type of infection together with the detection method used for detecting prevalence of microcystic infection in sheep included in the study.

	Males		Females		Total
	< 18	≥ 18	< 18	≥ 18	
Age group (month)	< 18	≥ 18	< 18	≥ 18	
Number of sheep (N)	155	56	134	67	412
Macroscopic cysts (n1)	2	4	5	12	23 (5.58%)
Microscopic cysts (n2)					
Pepsin digestion	140	126	52	56	374 (90.78%)
Trichnoscopy	138	111	46	49	344 (83.50%)
Mincer	91	82	40	43	256 (62.14%)

N = total number of sheep in any subgroup.
n1 = number of sheep infected with macrocysts in any subgroup.
n2 = number of sheep infected with microcysts in any subgroup.
% = $(n/N) \times 100$.

Regarding infection with the microscopic form of the parasite, there was no seasonal variation in the rate of infection among study months ($P=0.41$). The results of this study which encompassed 412 esophageal samples from slaughtered sheep in Karbala/ Iraq, revealed that macrosarcocysts when compared to microsarcocysts had a lower prevalence in the examined sheep. On the other hand, PCR amplification of Sarcocystis parasite with mentioned primers revealed an electrophoretic bands (Fig. 3) but, in the same time our isolates demonstrated a Sarcocystis specific 600 bp band. We easy used molecular technique for detection of Sarcocystis compare with microscopic examination, it is take long time may be need more expertise for Ophthalmic screening, other wise it is an inexpensive, rapid and precise molecular approach to identify this parasite.

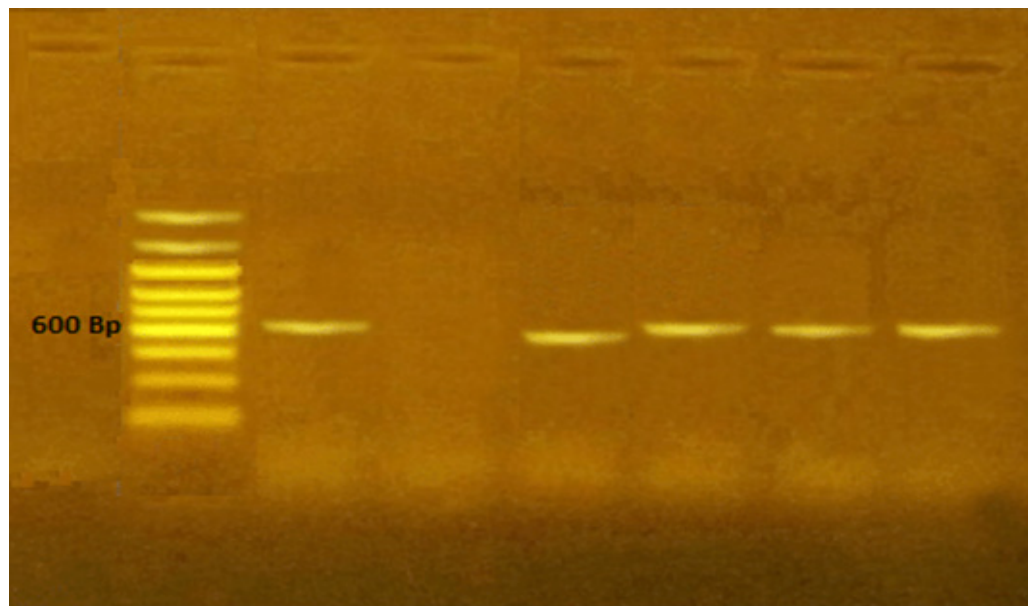


Figure 3: 2% agarose gel electrophoresis of DNA produced by PCR and stained with ethidium bromide showing bands detected at 600 bp region of 1100 Bp ladder.

At yet, special molecular procedures such as cytochrome oxidase 1, agarose gel electrophoresis staining with safety red DNA staining, have been employed for diagnosis of sarcocystosis in meat samples. These methods are genus no specific and just performable on slaughtered carcasses, so it is different with some researcher who have designed some nucleotides primer have ability to form genus-Specific PCR (28, 18).

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, College of Education For pure Science, University of Kerbala and all experiments were carried out in accordance with approved guidelines.

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International Crimes and the Legal Basis of the International Committee of the Red Cross in Armed Conflict

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Abstract

International and non-international armed conflicts and other acts of violence are conflicts that cause death, persecution, suffering, internal displacement and destruction of the nation's infrastructure. These conflicts, with their various names, revolve around most of the world. There are international conflicts between two states and conflicts involving armed groups within the state known as armed conflicts Non-international, and there are internal tensions and tensions known as internal conflicts (other violence). International and non-international armed conflicts govern international law. International humanitarian law is the basis for the rule of these disputes, which is defined as the laws of war. The definition and classification of disputes and their conditions leads to the identification of serious violations of international humanitarian law and the applicable international law. Article 2 of the four Geneva Conventions of 1949, Additional Protocol I of 1977, which deals with international armed conflicts, and non-international armed conflicts apply Article III, in particular Additional Protocol II of 1977 Which complemented Article 3 common to fill the deficiency and imbalance in this article.

Key words: *Crimes, Legal Basis, International Committee*

Introduction

Armed conflicts are a reality and a legal issue, especially if we recognize that the United Nations since 1945 prohibits the use of armed force in relations between States, except in cases of self-defense or aggression¹. The definition of aggression as a crime under international criminal law was adopted only in 2010. In addition, there is no international legal definition of armed conflict per se. Since 1949, article 2 common to the four Geneva Conventions has defined the international armed conflict that² entails the application of humanitarian law. (Known as Common Article 3) to the minimum rules applicable to non-international armed conflicts, without giving a clear definition of this dispute, the expansion of Additional Protocol I to the Geneva Conventions of 1977, as well as the jurisprudence of the³ courts International standards in the definition of international armed conflicts and included the criteria for interpreting this definition. The problem entailed in those definitions lies in the obligation to respect the traditional and customary rules of humanitarian law⁴, which are particularly applicable to international armed conflicts, rather than the more restrictive rules applicable

to non-international armed conflicts⁵. The law applicable in armed conflict is international humanitarian law, which can be defined as “a branch of public international law whose customary and customary rules are intended to protect the affected persons in the event of armed conflict. This is done to protect the money that is not The armed conflict and the ensuing humanitarian suffering, destruction and long-term effects on the societies and individuals who are engulfed⁶ in it have created international mechanisms to limit and control violations and to assist victims of conflicts. An International Red Cross mechanism that has given confidence to its leading role in this field. The importance of this research lies in the knowledge of international crimes, the consequences of armed conflicts, their classification, and what may apply to each of these conflicts of international law⁷, the role of the International Committee of the Red Cross and its legal basis in international norms, the importance of this NGO and its humanitarian role in providing humanitarian response and clarification. Its international standing in accordance with international conventions⁸.

Methodology

This research is based on the analytical and

descriptive approach through which we analyze the legal texts that can be applied in armed conflicts and what international crimes are adopted by the ICRC in its humanitarian tasks.⁹

Definition of international crimes and armed conflicts

International crime has long existed. The United Nations has recognized the existence of violations against peoples, most of them war crimes, and there is a threat to the vital interests of the international community, the oldest of which is the crime of piracy. Some have argued that there is no international definition of armed conflict, since the circumstances that may or may constitute or constitute an armed conflict are different and different from each other. To know this, one must refer to each case of conflict to see whether it constitutes an international or non-international armed conflict and we will refer to international and non-international armed conflicts and internal conflicts in accordance with the opinions of jurists and international law in two sections:

Section I: Definition of International Crimes and International Armed Conflicts.

Section II: Definition of armed and non-international conflicts and internal conflicts.

Section I: Definition of International Crimes and International Armed Conflicts.

First, the international crime was defined by the jurist Glacier as “any act that violates the law because it harms the interests protected by this law within the scope of international relations and is described as a criminal act that requires the application of punishment to the actor.” This definition is not subject to the international criminal justice, As “acts contrary to the rules of international law, which entail international responsibility and are of such gravity that they may cause disturbance and disturb the public security of the international community.»¹¹

International crimes include three pillars: the physical pillar, the moral pillar and the international corner. International crimes under the Rome Statute are divided into four crimes: war crimes, genocide, and against humanity and aggression.

1. War crimes: Article 8, paragraph 2, which refers to war crimes:

a. Grave breaches of the 1949 Geneva Conventions

include acts against persons and property protected by the Geneva Conventions.

b. Serious violations of the laws and customs applicable in international armed conflicts.

2. Genocide: is defined in article 6 and any act specified in the Rome Statute (such as murder or causing serious harm) committed with intent to destroy, as such, a national, ethnic, racial or religious group, is wholly or partly inalienable.

3. Crimes against humanity: Article 7, any act prohibited and defined in the Rome Statute, when committed in the context of a widespread or systematic attack directed against any civilian population, including such acts as willful killing, extermination, rape, sexual slavery, deportation or Forced relocation of people, the crime of racial discrimination and others. Genocide and crimes against humanity are punishable regardless of their perpetration at the time of “peace” or war.

4. Crimes of aggression: The International Criminal¹² Court does not specify what is meant by this in article 5, paragraph 2, and once a definition has been defined, the Court exercises its jurisdiction.

Definition of International Armed Conflicts

Article 2 of the Geneva Conventions of 1949 states that the definition of international armed conflict as “declared war and armed conflict is between two or more High Contracting Parties, even if no one recognizes the state of war.” In addition to international armed conflicts,⁴ of Article 1 of Additional Protocol I of 1977 to the Four Geneva Conventions of 1949. Jurists have known international armed conflict with multiple definitions, including: Sadiq Abo Hafe defined it as “a struggle between the armed forces of each of the conflicting parties, each aiming to safeguard its rights and interests in the face of the other⁵ Muhammad Bashir al-Shafei defined it as “armed conflict between States with a view to imposing a political point of view in accordance with the means regulated by international law⁶

Jean-Baptiste defined it as “Any difference between states that leads to the intervention of members of the armed forces is an armed conflict⁷

Charles Rousseau defined international armed conflicts as “armed conflict is based on inter-State fighting with a view to giving preference to a political viewpoint according to the means of international law⁸

Third: Conditions of International Armed Conflicts:

1. Status of armed conflict.
2. International parties to the conflict.
3. Declaration of the parties to the conflict of armed conflict between them.
4. Achieving a national interest ⁹

Section II: Non-International Armed Conflicts and Other Acts of Violence.

First: Definition of non-international armed conflicts.

The armed conflicts that were not international were defined as “mixed war.” According to the definition of the jurist Grosius, Bovindov defined them as “wars in which members of one society are fighting among themselves.” Galvo defined them as “confrontations within a single state, Other against the central government) ¹⁰

The international armed conflict has been defined as “confrontations within the territory of a single State in which the armed forces of any other State do not engage this central Government¹¹

It was also defined that “every act of hostility directed against the legitimate government if it represents a collective character and a minimum of organization¹²

The four Geneva Conventions of 1949 are the subject of non-international armed conflicts of international humanitarian law. The 1949 Diplomatic Conference was an important and strategic step in addressing the problem of non-international armed conflicts, but it did not set a specific definition. However, the International Committee of the Red Cross the objective criteria were accepted in order to find an application to the Geneva Conventions on these disputes:

1. The possession of the rebel military force responsible for its actions and organization.
2. To control and work on parts of the Territory capable of respecting the Geneva Conventions. ¹³
3. The authority must be forced to fight with the official government forces.
4. Recognize them as combatants or declare them at war.
5. The inclusion of any dispute over the work of

the Security Council and the General Assembly as a threat to international peace and security or as a state of aggression, ¹⁴ but the Diplomatic Conference was unable to establish a specific definition of non-international armed conflicts¹⁵

The Second Additional Protocol of 1977 defined and defined non-international armed conflicts as (conflicts in the territory of one of the High Contracting Parties between the High Contracting Parties and its armed forces, dissident forces or other armed groups, and acting under the responsible leadership of a part of the Territory Of control, enabling it to conduct continuous, coordinated and capable military operations to implement this Protocol).

The International Criminal Court defined non-international armed conflicts in article (2/8/9) as “armed conflicts occurring in the territory of a State when there is a protracted armed conflict between the authorities .

Governmental organizations and organized armed groups), a definition similar to that of the International Criminal Tribunal for the Former Yugoslavia (ICTY).

Any non-international armed conflicts to which the State is not a party and which is conducted between armed insurgent groups that do not constitute a non-international armed conflict in accordance with Protocol II, because the most important feature that characterizes it and adds to it a non-international character is the State’s being a party of it. ¹⁶

Other violence.

Internal violence and internal disturbances are other violent acts known as internal disturbances resulting from violence but do not amount to armed conflict. This does not necessarily involve military action, but with long-term violence or widespread violence The description of a situation does not require internal tensions to be experienced by state repression, long-term internal tensions, short-term consequences, re-emergence from time to time, or affecting a part or all of the territory of the State or the motive behind it Religiously, ethnically, politically or socially Or other, and the law has distinguished between rebellion, disobedience and civil war.

The second requirement: the legal basis for the ICRC’s work in international and non-international armed conflicts and other acts of violence.

The International Committee of the Red Cross (ICRC) is a unique and unique place in international humanitarian conventions. The ICRC has been established for nearly a century and a half century. It carries a humanitarian message in the protection and assistance of all those who need the wounded, sick, refugees, internally displaced persons and other victims of armed conflict. To carry out its humanitarian work in two branches: its legal basis in international armed conflicts and its second legal basis in non-international armed conflicts and other acts of violence.

Section I: The Legal Basis of the International Committee of the Red Cross in International Armed Conflicts. The facilities used by protected persons and they can speak with them without a censor, with the assistance of an interpreter when necessary. The full freedom of representatives and delegates of the Protecting Powers is given in relation to the choice of places they wish to visit. The delegates of the International Committee of the Red Cross The appointment of such delegates to the consent of the States under whose jurisdiction the territories are to be exercised “, and these privileges for the International Committee of the Red Cross to facilitate their work, as set forth in article 126 Of the Third Geneva Convention, the privileges enjoyed by the ICRC when it visits protected persons, as well as the mandate granted to it under the Statutes of the International Movement in Article (5/2/D), Article 81 (1) of the Additional Protocol I (Right of Initiative), as follows: “Parties to the conflict shall be accorded all possible facilities by the ICRC to the International Committee of the Red Cross The International Committee of the Red Cross to enable it to carry out the humanitarian tasks entrusted to it under the agreements and this Protocol with a view to providing protection and assistance to the victims of conflicts. The ICRC may also carry out any other activity on behalf of these victims provided that the parties to the conflict concerned agree.

In view of the International Committee of the Red Cross (ICRC), it has been granted certain rights to visit prisoners of war or civilian prisoners, to deliver relief materials, to operate the tracing agency and to international humanitarian law of the Geneva Convention , Articles 76, 109, 137, 140, and 143 of the Fourth Geneva Convention, as well as the right to initiate in international and non-international armed conflicts in articles (Common Article 3, Articles 9 / 9 / 9 / 10) Geneva) in assisting victims of international armed conflicts, the ICRC is based on the ICRC The Geneva Conventions

of 1949, in particular the Third and Fourth Conventions and Additional Protocol I of 1977, Article 81, to carry out their work in international armed conflicts, the special status of the ICRC, its neutrality and its being the custodian and observer of the application of international humanitarian law by the signatories to these conventions, Which is the engine of these international conventions in providing services to the combatants of victims of armed conflicts, the right to visit detainees and prisons and to provide aid and humanitarian intervention and interview them unchecked, and has contributed effectively in this area, N talk about the Geneva Conventions without mentioning the International Committee of the Red Cross.

Conclusion

The role of international non-governmental organizations, especially those of a humanitarian nature, has an important role to play in ensuring human rights because this process requires continuity in the defense and sustainability of human rights. These are the International Committee of the Red Cross (ICRC). The ICRC is one of the most important mechanisms of international humanitarian law Which plays a key role in the implementation of international humanitarian law and is based on international law and its statutes, particularly the four Geneva Conventions which have given it an important mandate to carry out its humanitarian tasks.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon / College of Law, Iraq and all experiments were carried out in accordance with approved guidelines.

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Physical Preventive Strategies Related to Children with Leukemia from Mothers' Perspective in Al.Basrah Province

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Abstract

Objectives: To assess mother's preventive strategies concerning physical complication for children with leukemia. A cross-sectional descriptive study consisting of (150) mothers were interviewed at Basrah specialist hospital for children in Basrah Province in a period from 3 February to 21 March 2019. Findings of the study revealed that the highest percent of studied mothers 73(48.7%) had high level related to physical preventive strategies and 74(49.3%) had moderate level related to chemotherapy physical preventive strategies. systematic application a protocol of home care for children having leukemia to help mothers to provide appropriate home care and reduce the incidence of physical complication in children undergoing chemotherapy.

Keywords: Mothers, physical, Preventive, Strategies, Leukemia.

Introduction

Leukemia is a rapidly progressive abnormal white blood "cells" formation that can result in severe scientific consequences such as life-threatening distress with infection and bleeding¹. Pediatric leukemia is one of the deadly malignancies with unusual white blood cells shape and stem cells turn into lymphoblast ("leukemia cells"), which lead to body reaction present by way of lowering the quantity of "red blood cells" and platelets². "Cancer is the second most common cause of death among children aged" between 0 and 14 years old, after accidents. Blood cancer is "one of the most common cancers among children", accounting for about one-third of all cancers in children. It is diagnosed about "3,800" children annually in the United States (United States). Small but steady annual increase between 1975 and 2012, the incidence rate of leukemia in childhood in the United States led to a rise in total by 55% in the annual number of cases during the past three and a half decades³. As long as treatment and management of "childhood acute lymphoblastic leukemia (ALL)" have been advanced, Is transferred from being "life threatening disease to chronic disease." In addition, it leads to the transfer child care from the hospital to the home, which imposes a change in family roles and interest in organizing social activities and work

commitments and all life features. This thorough change in the family life and the fear of losing the ill child has a great effect on the caregiver's health related quality of life^{4,5}. Mentioned that even today, family caregivers are perceived as a major resource for the profit of the child patient, when always present and participating in their treatment in the hospital. Therefore, "Professionals need to help family members acquire skills"; caregivers for "leukemia" children need information, abilities and judgment to take care of their patients, who reduce the burden on them. The capability of family caregiver to deliver excellence care and donate to the administration of prolonged illnesses is a vital source of health care. Health care providers must be reassuring of family caregivers and help them gain awareness and skills in order to maximize the quality of care. Providers need to help family caregivers develop and solve problems, organizational skills and communication skills^{6,7} has confirmed that leukemia requires long-term treatment with unexpected results, and the lack of caregivers of knowledge in providing care for leukemia patients in children with chemo therapy side effects with financial problems, which are issues in many Mainly causing stress and anxiety to patients and their families. Cancer is many times seen as a misfortune event, which is probable to attract additional attention and care from family members which considered A major duties

delivered by the nurses with unlimited such as personal hygiene of the patient, observation changes of patient situations, maintenance an eye “on“ the advancement of treatments such as iv drips, and providing foods ⁸.

Methodology

A cross-sectional descriptive study carried out between the periods of (30 July 2018 to 10 July 2019) in Al.Basrah province. A “non Probability purposive sample of (150)” mothers who have children under eighteen years was selected in “oncology” & hematology clinic and “leukemia” ward at the “Basrah” specialist hospital for children was selected as 10% of the “total” population of “leukemic” children under eighteen years to the main specialist hospital for children in the province after obtaining legal permission from sectors and ethical approval from the sample of study to participate in research. A data was collected through the used questionnaire, which is constructed and developed after a comprehensive review of related literature by the researchers, itis consists of three parts: Part-I the socio-demographical characteristics which comprise of three sections, part-II preventive strategies related to physical complications of leukemia which involves of (22) items and part-III Preventive strategies related to chemotherapy physical complications” which comprise of (25) items. The responses for these items are rated and scored on 3-level type Likert scale as; yes=3, uncertain=2 and no=1. Each mother needs to approximately (25-35) minutes for the answer on the items of the questionnaire. Data were analyzed through using the Statistical Package of Social Sciences (SPSS, version 24) performed with descriptive and inferential statistical data analysis approach.

Results

The uppermost proportion of children estimating as 92 (61.3%) are from early childhood class. Concerning their genders, it shows that 88 (58.7%) were male, while 52 (34.7%) were “4th” and above order among their families, besides, no other children affected with leukemia in the family as estimating in 150 (100%). That the highest percent of sample 49 (32.7%) aged (40-46) years old; 48 (32%) have a primary level of education; logically 136 (90.7%) are unemployed; 89 (59.3%) living in nuclear family type; as regards to economic status, approximating as 93 (62%) in satisfaction with some extend; majority of the population is living in urban estimating as 109 (72.7%). The figure (1) indicates that

the highest percent of study, mothers 73 (48.7%) had high level, while 65(43.3%) of them had moderate level and 12(8%) had low levels.

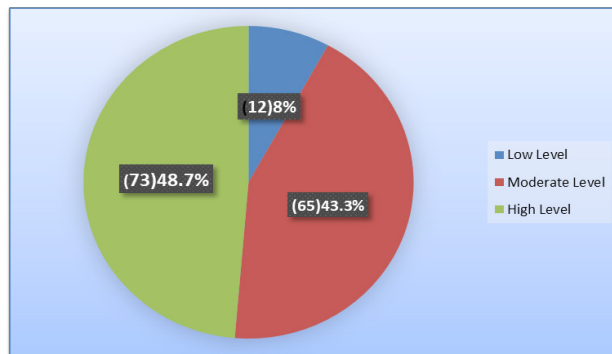


Figure (1). Preventive Strategies Related to Physical Complications of Leukemia

The figure (2) directly below indicated that the highest percentage of mothers involved in the current study had moderate level estimating as 74 (49.3%), while 67 (44.7%) of them had a high level and 9 (6%) had low levels.

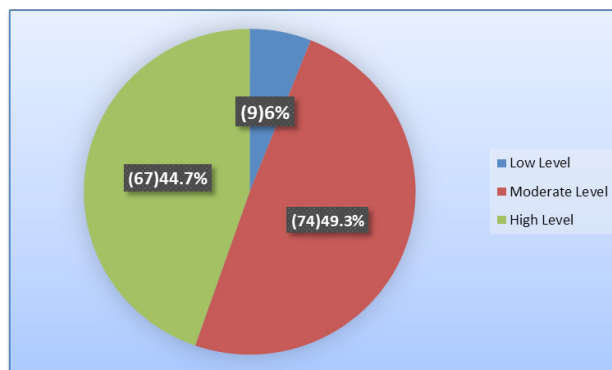


Figure (2) Preventive strategies related to chemotherapy physical complications

Discussion

The uppermost of the studied children within the age groups (2-7 years) who considered as the earliest stage of childhood. More than one-half of those kids were male; with relation to the kid order, less than 0.5 were forth and higher than order within the family, besides, the bulk of those participants don’t have any alternative kids with the malignant neoplastic disease within the family. A study provided by ⁴ who carried out as a cross-sectional study involved parent of (299) children in Malaysia; targeting to assess the correlation between coping strategies and the health-related parental quality of life, who had kids suffering from “acute lymphoblastic leukemia”, reported that less than half

“145” (49.5%) of the studied population was in the age group (6-12 years). While a retrospective study directed by ⁹ about “Patterns of childhood cancer incidence in Saudi Arabia (1999- 2008)”, resulting in all cases under the age of 15 years and both genders. They found that elevated percent (43.1%) of kids studied were in the age group (0-4) years. According to the researcher opinion, based on the results of the study underhand which supported by various studies, reflect the risky age within the early and middle childhood who exposed to many influences that reassure the exposure to cancer including leukemia. While, in another study of (56) “children hospitalized in Pediatric Hematology-Oncology Unit in Athens” conducted by ¹⁰ around “assessment of quality of life of children and adolescents with cancer during their treatment”, findings indicated that 32(57.1%) of the studied subjects’ were male. Genetic differences in immune function or behavioral related factors might be responsible for such a difference between girls and boys ¹¹. In a cross-sectional study described by ¹² which recruiting all children on chemotherapy “attending the pediatric oncology service Zagazig University Hospitals and Tanta Cancer Center, Egypt”. The study aimed to “assess the self-esteem of pediatric patients on chemotherapy for acute lymphoblastic leukemia and the psychological status of their parents”. The results of the study show that about half (52.0%) of children were second in order. The feedback of the existing study showed that less than 0.5% of the intentional mothers (150) was the in age groups (40-46) years, about an educational level less than half were from primary education, with the majority of them were unemployed. More than half percent of the sample, their type of family was unclear. Also, the analysis of the same table revealed that more than sixty percent of mothers, their economic status was satisfied to some extent, more than seventy percent were living in urban as shown in Table (2c) A cross-sectional study support the result of the current study, which conducted by ¹³ in selected hospitals affiliated with the universities of medical sciences in Tehran, included all mothers of (200) children aging 1–15 years with leukemia who had experienced the recurrence of the disease at least one time and who visited blood clinics. The result indicates that “124” (62%) of mother’s age was (30-39) years, this means that the present study had a sample from early middle parenthood who take youngsters with cancer of the blood, additionally reflects that mothers of this age are mature enough to require responsibility for providing take care of their kids. In a quantitative non-

experimental descriptive study done by ¹⁴ “in selected cancer institute, Adyar, Chennai, India on (40) mothers of leukemic children about the knowledge of leukemia, the stress and coping strategies of mothers with leukemic children undergoing treatment”. This study found approximately half, 47.5% of the mothers were illiterate and 22.5% have a primary school education. According to investigator outlook, level of education associated with Iraqi society ladies tradition shaped that the studied sample was from primary education, this result are often true in Iraq wherever most females might solely have the chance to achieve primary education, additionally level of education was a tributary issue that helps the mothers to scan and perceive complication bar for his or her kid with leucaemia, use health data and build them ready to specific whether or not they yes, uncertain and no. A quasi-experimental study design conducted by ¹⁵ on (60) parents at daycare and outpatient “clinic in pediatric hospital of Ain Shams University” aiming to detect “the effect of a psycho-educational training program for Parent’s having children with leukemia on their experience and psychological well being”. The study revealed that 91.7% of the population included in the study were mothers and 50% of them were unemployed, with almost of participants 44 (73.3%) were living in urban. This outcome appears to be the same as the current results as the population included with common graduated from primary level 48 (32%), and logically without employment who, constituting 136 (90.7%), besides, 109 (72.7%) living in urban. Moreover, another study accompanied by ¹⁶ about “Types and Influence of Social Support on School Engagement of Young Survivors of Leukemia in the province of Quebec (Canada)”. They found that the high percent 41 (77%) of the study sample, family structure was consist of “two” parents. While, another study is provided by ¹² who carried out a cross-sectional study involved parents of (178) children “attending the pediatric oncology service Zagazig University Hospitals and Tanta Cancer Center, Egypt” in the direction of “psychological impact of chemotherapy for childhood acute lymphoblastic leukemia in patients and their parents”, who reported that approximately half 107 (59%) of studied parents were living in rural areas According to the researcher’s point of view, it can be explained in a way that people prefer to be within the areas where services are widely distributed primarily in urban areas and are easily accessible. A cross-sectional study conducted by ⁴ among (299) parents of kids with “Acute lymphoblastic leukemia” in Malaysia and Kuala Lumpur. They

found that high percent, 206 (70.3%) Of children were diagnosed as early within the first six months of age. Finally, according to the researcher opinion, this means that more common incidence in children less than one year, whether the first or second half. The result of present study demonstrations that less than half of the study, mothers 73 (48.7%) had a high level around preventive strategies related to physical complications of leukemia as shown in Figure (1). According to the researcher opinion, through the meeting with the sample, the researcher found that mothers are anxious to learn the issues or behaviors necessary to avoid the physical complications of their children with leukemia. The result of the existing study signifies that less than half of the studied mothers 74 (49.3%) had adequate levels around preventive strategies related to chemotherapy physical complications as shown in Figure (2). According to the researcher opinion, the observed physical look deteriorated over time. This result could be due to the side effects of therapy. However, additional research is wanted to know how to assist patients overcome this difficulty, so that they do not become active.

Conclusion

The study concluded that mothers' preventive strategies related to physical, complication of leukemia is perceived within a high level of knowledge, while, the moderate level towards preventive strategies related to chemotherapy physical complications.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Faculty of Nursing, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Incidence of *Entamoeba Gingivalis* and *Trichomonas Tenax* in Periodontitis and Gingivitis Patients Who Attended to Private Clinics in Babylon Province

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Abstract

Trichomonas tenax, a commensal flagellated protozoan, inhabits in human oral cavity. This parasite is cosmopolitan and frequently found in patients with poor oral hygiene and advanced periodontal disease. By using wet mount smear and giemsa staining to detect the prevalence of oral protozoa in patients with oral diseases and a healthy control group. From October 2014 to April 2015, the subgingival dental plaques of 310 patients with gingivitis or periodontitis and 310 controls who attended to clinics periodontics, in Babylon province. 64 (20.6 %) of patients were positive (40.2 % periodontitis, 14.2 % gingivitis) by using wet preparation and Giemsa staining. The prevalence of oral *Trichomonas tenax* in our study (20.6%) and *Entamoeba gingivalis* was (42.9 %) was compatible with many other published reports which mostly has ranged from 12%-32%. The study revealed dependence between the frequency of occurrence of protozoa and the state of periodontitis. The age group (41-50)yr. Have high incidence of *T.tenax* compared with an other groups, as well as the males have high incidence (24.7 %) than females (16.8 %).

Key words: *Entamoeba gingivalis*, *Trichomonas tenax*, gingivitis patients.

Introduction

T. tenax is an anaerobic commensal of the human oral cavity. There are studies that relate to its prevalence in patients with Marginal Chronic Periodontitis^(4,6). Transmission is through saliva, droplet spray, and kissing or use of contaminated dishes and drinking water^(7, 14). World widely, its prevalence in the mouth ranges from 4 to 53%^(17,19,22). Since the organism is believed to enter the respiratory tract by aspiration from the oropharynx and then cause bronchopulmonary trichomoniasis, the importance of oral infections has been increased recently^(1,12, 13). Surprisingly in Iraq there is study of¹¹ which shows a prevalence of periodontitis 8.4 % with *Entamoeba gingivalis* and *T. tenax* by direct smear. The number of trichomonads found in oral washing is rather low, and detection by conventional methods such as wet-mount preparations or staining may be sensitive. In addition, staining is useful for species identification, and culture techniques are routine use^(2,5,15). This study was carried out to determine the prevalence of oral trichomoniasis by direct smear methods and giemsa staining with microscopic observation to detect of *T.tenax* and *E.*

*gingivalis*⁸.

Materials and Method

The *Study population* included 620 individuals; 310 patients (160 females and 150 males) aged ranged 18-60 years old with periodontitis or gingivitis who attended to periodontitis -clinics of periodontics- and 310 healthy controls, who were matched with case group. The kind of oral disease previously was established by periodontist. Direct observation For each patient a sample of subgingival dental plaque from deep pockets obtained and preserved in an individual container of 2 ml Ringer's solution. The containers of fixed plaques duly labeled and examined to the department of Microbiology for identification of oral parasites. Microscopic observations were made three times under dry magnification (400x) and then each sample stained with Giemsa. The identification of *T. tenax* was established as a pear-shaped flagellated trophozoite, about 5-13 μ long and with circular movement. Another oral protozoan, *Entamoeba gingivalis*, if present, was differentiated by its size (10-20 μ), presence of prominent pseudopodia, and sluggish

movement. The statistical analysis was performed by the Chi-square test (signification level 0.05) so as to study the correlation between the kind of oral disease, age and sex with the presence of parasite.

Results

Among the samples 33 (14.2% gingivitis) and 31 (40.2 % periodontitis) of those specimens were detected by wet preparation and Giemsa-stained smears. All the cases of oral trichomoniasis in control group were both

detected by direct smear. The infection rate among the patient with periodontitis and gingivitis was 40.2 % and 14.2 %, respectively (Table 1). There was a significant difference between two last groups [$P < 0.005$]. Oral trichomoniasis was prevalent at age ranged 31-40 yr, and in total males (24.7 %) than females (16.8 %) with no significant difference (Table 2, 3). *Entamoeba gingivalis*, the other oral protozoan, was found in 133 (42.9 %) distributed as 98(42.1%) in gingivitis patients and 35 (45.45 %) in periodontitis patients(Table 2).

Table(1): Prevalence of *Trichomonas tenax* according to type of oral diseases

Oral diseases	Examined No.	Infected No.	%
Gingivitis	233	33	14.2
Periodontitis	77	31	40.2
Total	310	64	20.6
X2 calculated=45.2* X2 tabled=6.63			

*Significant differences

Table(2): Prevalence of *Entamoeba gingivalis* according to type of oral diseases

Oral diseases	Examined No.	Infected No.	%
Gingivitis	233	98	42.1
Periodontitis	77	35	45.45
Total	310	133	42.9
X2 calculated=71.1* X2 tabled=6.63			

*Significant differences

Table (3): Prevalence of oral protozoa with patients periodontal disease(experimental group) according to age.

Age (years)	Examined No.	Positive case	%
20-30	89	13.6	15.3
31-40	132	25.2	19.1
41-50	56	19.4	34.6
50>	33	5.8	17.6
Total	310	64	20.6
X2 calculated=30.4* X2 tabled=11.28			

*Significant differences

Table (4): Prevalence of oral protozoa with patients periodontal disease (experimental group) according to sex.

Sex	Examined No.	Positive case	%
Male	150	37	24.7
Female	160	27	16.8
Total	310	64	20.6
X2 calculated=14.6* X2 tabled=6.63			

*Significant differences

Table (5): Detection of oral protozoa in 310 patients with periodontal diseases and control

Groups	Examined No.	Positive case	Negetive case	%
periodontal diseases	310	64	246	20.6
control	310	6	304	1.94
Total	620	70	550	11.3
X2 calculated=19.2* X2 tabled=6.63				

*Significant differences

Discussion

The prevalence of oral trichomoniasis in our study (20.6%) was compatible with many other published reports which mostly have ranged from 12%-32% (4,6,17,19,20,22).²¹ examined 700 patients with periodontitis and found a prevalence of 26.5%²².⁴ in France reported a prevalence of 28% among the 300 patients⁴. Mahdi in Iraq examined the saliva of 143 patients with poor oral hygiene and reported a prevalence of 8.4%¹¹, but further investigation showed that saliva was not a suitable media for detection of parasite⁸. In Iran 50 patients with periodontitis were examined by wet mount and 46% were found to be infected by *T. tenax* or *E. Gingivalis*¹⁶ but the prevalence of each parasite was not determined. In the most above- mentioned researchs, the methods for detection and identification of *T.tenax* from human oral samples have been based on conventional techniques, such as microscopic observation²² and cultivation²¹, which are poorly reliable in spite of being skill-requiring and time-consuming. Recently small ribosomal RNA (SrRNA) sequences or the corresponding genes have been utilized as targets for PCR³. Similar to our study,

Kikuta in Japan¹⁸ developed a PCR protocol for specific detection of *T. tenax* by using a pair of primers (PT3 and PT7 with nucleotide positions of 407 to 425 and 1164 to 1182, respectively). In his study 55.6% of patients were shown to carry *T. tenax* in subgingival- plaque but no parasites were observed by microscopic examination. Likewise, in present study, we were not able to detect *T. tenax*, using wet mount, in 9 cases that were positive by PCR. To find *T. tenax* in bronchoalveolar fluid, Mallat in France amplified the 5.8S rRNA gene. He suggested that the sequences of this gene presented the advantages of being present in multiple copies in the genome, even between very closely related species¹³. The occurrence of *T. tenax* was not correlated with the age in our study and this finding was not agree with some authors (4, 19,22) who found that the frequency of infection increased with age, while some were believed that oral protozoa were rarely found in children¹⁷. According to our experience, Ringer solution was better than normal saline for transportation and maintenance of samples. But¹⁰ recommended Safranin mixed with patient's saliva as fixative and emphasized that mishandling the plaque, use of different staining techniques, plaque other than

from the extreme base of the pocket, recent medication or hygiene and some types of food, did result in false negatives⁹. As in other reports^(10, 16,17,22) our results demonstrated a link between the presence of *T. tenax* and periodontitis in comparison with gingivitis and it seems that in each case, oral parasites were only found in diseased sites.

It is perhaps appropriate to note here that *T. tenax*, whilst seen less frequently than *E. Gingivalis* in patients with poor oral condition, but due to its role to produce pulmonary trichomoniasis, deserves much closer attention. Conclusively, with development of PCR for detection of *T. tenax*, we suggest an investigation to evaluate the pulmonary trichomoniasis in patients with cancer and chronic lung diseases.

Conclusion

The prevalence of oral *Trichomonas tenax* in our study (20.6%) and *Entamoeba gingivalis* was (42.9 %) was compatible with many other published reports which mostly has ranged from 12%-32%.The study revealed dependence between the frequency of occurrence of protozoa and the state of periodontitis.the age group (41-50)yr. Have high incidence of *T.tenax* compared with an other groups,as well as the males have high incidence(24.7 %) than females (16.8 %).

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Iron Oxide Nanoparticles Induced Histological Alteration and Fetal Skeletal Abnormalities in the Embryo of Albino Rats

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Abstract

The study was carried out to investigate the effect of iron oxide nanoparticle(NP) on the brain, liver, spleen and vertebral colum in the embryo of albino rats at the age of 19 day of pregnancy . The study included twenty (20) embryos divided into two groups ,treated and control group . The results of the histological study reveled the existence of histological alteration in the brain, liver, spleen and vertebral colum of treated groups compared with controls .

Keywords: *Histological Alteration, Fetal Skeletal, Abnormalities.*

Introduction

Nanotechnology is the mere controlling and invention of materials at nano scale level, where characteristics vary with different size, shape ,aggregation and surface area. This technological leads to a revolution in the field of electronics and communications, optics, chemistry, energy and biology ¹. Iron oxide nanoparticles(IONPs) have encouraging characteristics like biocompatibility and magnetic behavior that makes them perfect agents for magnetic resonance imaging, carriers for drug delivery, magnetic hyperthermia, tissue engineering, cell separation, enzyme immobilization, protein purification and biosensing ^(2,3). Moreover, IONPs offer significant improvements in water purification and environmental remediation because of low cost technology ⁴ . Iron and oxygen chemically combine to form iron oxides (compounds ⁵ . The general process of manufacturing nanoparticles include laser ablation, plasma synthesis, combustion, arc method, electrolysis, pyrolysis, diffusion flame synthesis, chemical precipitation and vapor deposition and mechanical processing, wet phase processing and high energy ball milling ⁶ .A recent study on mice reported size dependent bioaccumulation and transport of IONPs in the liver and spleen ⁷ . Pregnant mice treated with multiple doses of IONPs reported biodistribution of iron in the foetal liver, placenta and increased foetal deaths ⁸

Material and Method

This study was conducted in the studying of the effect of IONPs on the brain , liver, spleen and vertebral colum in the embryo of albino rats.

Animals: Thirty six healthy adult female albino rats weight (225±10gm), age (10-12)weeks were purchased from Iraqi Center for Drug Research/ Baghdad. All these animals were housed during the period of experiment in the animal house unit in science college of Babylon University, under controlled temperature (21 ± 1 C 0) and constant light-dark schedule (12 hours light and 12 hours dark cycle), food and water were available. The pregnant rats divided into tow groups:

Group1: administrated orally (150 mg/kg) of body Wight iron oxide NPs by gavage tube for 19 days of pregnancy.

Group2: administrated orally (1ml) distilled water by gavage tube for 19 days of pregnancy.

At 20 day of pregnancy the pregnant rats were killed and the embryo extracted for histological Alteration and Fetal Skeletal Abnormalities study.

Experimental Design:

Twenty embryos divided into two groups .

Group I: Control group (n=10).

Group 2: Treated group (n=10) .

Embryos Extraction and Reservation:

After dissecting pregnant females in the 20 days of pregnancy, the uterus horns were extracted which contain embryos. Then the embryonic membranes were removed surgically by fine surgical tools and dissection microscope and the embryos were taken and washed with normal saline (NaCl 0.9%) into a petri dish. The embryos were fixed directly by Aqueous Bouin's Fixative for 24 hours. After fixation, the embryos were washed several times by ethyl alcohol (ethanol) at concentration 70 % in order to remove the yellow color from embryos⁹ .

Histological Study:

After fixation, serial alcohol was used for dehydration of the tissue samples (brain, liver, spleen and embryo). Tissue specimens were cleared in xylene and embedded

in paraffin. The paraffin blocks were sectioned at 5 microns thickness by microtome. The obtained tissue sections were collected on the glass slides and stained by Hematoxyline and Eosin stain for histopathological examination by the light microscope¹⁰ .

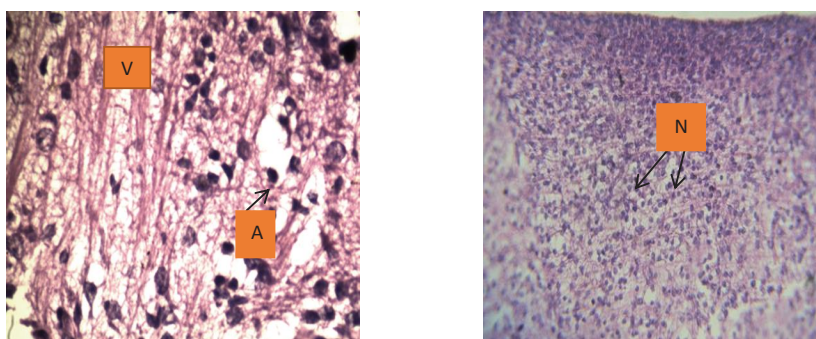
.While the vertebral column of the embryo was prepared and stained by Alizarin stain according to⁹ .

Results

Histological study of the embryo

Histopathology of brain

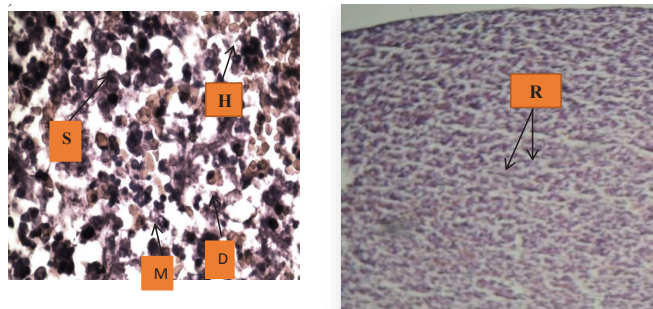
The main histopathological changes of the brain sections show observed vacuolation and degeneration in the neuron cells with glial cells in the embryo at the age 19th day of pregnancy compared with control groups. Figure(1-1)



Figure(1-1): Cross section in the brain of the embryo.(A) showed sever Vocuolation in the nervous tissue(V) with astrocytes (astrocytosis)(A) (H&E 40X).(B) control group (control group) showed normal brain tissue with Normal neuron (N) . (H&E 10X)

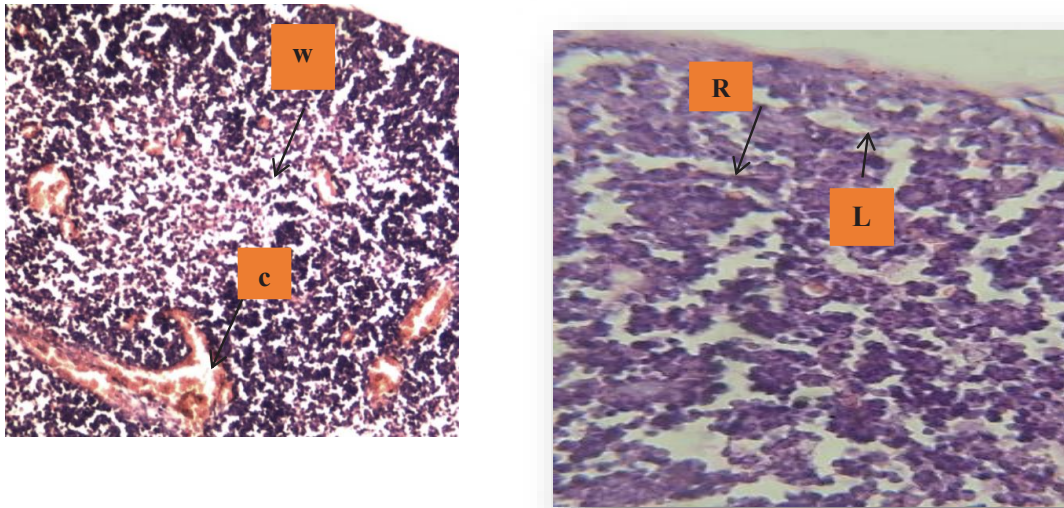
Histopathology of liver

The main histopathological changes of the liver show degeneration of hepatocytes, hemorrhage in the hepatic tissue and infiltration of inflammatory cells and dilation of sinusoids compered with control groups. Figure (1-2)



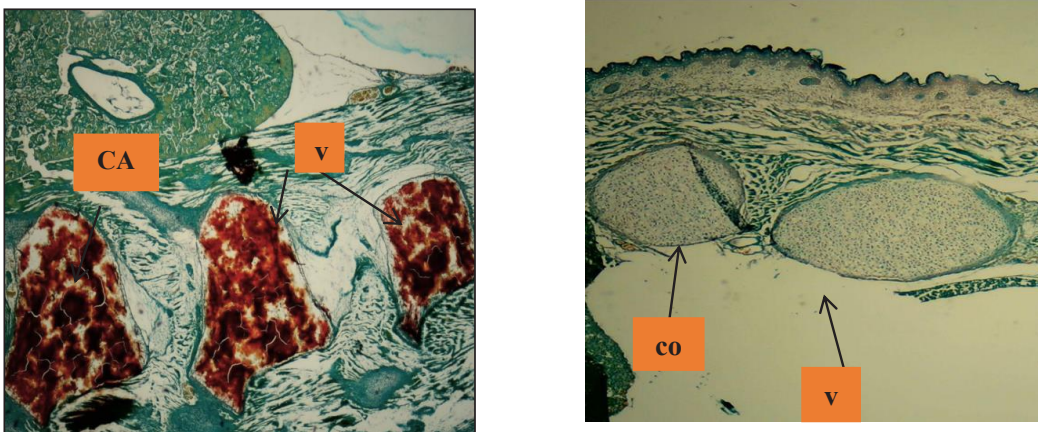
Figure(1-2): Cross section of the liver of the embryo at age 19th day of pregnancy.(A) showed Degeneration of hepatocytes(D), hemorrhage in the hepatic tissue(H) and infiltration of inflammatory cells(M) and dilation of sinusoids(S) (H&E 40X).(B) (control group) showed normal hepatic architecture(R). (H&E 10X)

The histopathological changes of the spleen sections show depletion of white pulp and proliferation of red pulp with congestion of blood vessels in the lymphoid tissue compared with control group. Figure(1-3)



Figure(1-3): Cross section of the spleen in the embryo at 19th day of pregnancy (A) showed depletion of white pulp (W) and proliferation of red pulp with congestion of blood vessels in the lymphoid tissue (C) (H&E ,40X) .(B) (control group) showed proliferation of lymphocyte (L) and proliferation of red pulp(R). (H&E ,10X)

The histological change of skeletal malformation of embryo vertebral Column at the age 19th day of pregnancy show abnormalities in the vertebral column which include irregular and large vertebral with profuse calcification , colour compared with control groups.Figure(1-3)



Figure(1-4) :Cross section in the vertebral column of embryo at 19th day of embryo. (A) show irregular and large vertebral (V)with profuse calcification (CA).(B) (control group) show normal vertebrae (V) with normal proliferation of chondrocyte(CO) stain with Alizarin stain (10X).

Discussion

The cellular toxicity of iron oxide nanoparticle on organs were very clear in our study, NPs may cross the blood-brain barrier (BBB) and accumulate in the central nervous system (CNS), brain very important organs clinical signs in the animals its showed very hyper activity because the change in the brain tissue of treated embryo by iron oxide nanoparticle, the importance of the histological changes of the brain in the embryo the histological change of 19th day embryo include sever Vocuolation in the nervous tissue with astrocytes (astrocytosis) compered to the control groups. These results agree with anther study who recognized that iron oxide nanoparticles may induce damages to the neural tissues as results to accumulation of the iron oxide that induce the increases in levels of oxidative stress and ROS production that induce important roles in some critical diseases such as Alzheimer's and Parkinson's ¹¹. Anther study confirm that IONPs accumulation in tissues triggered ROS generation which significantly altered the antioxidant enzyme levels, the altered antioxidant status and bioaccumulation of IONPs caused histo morphological changes which demonstrate that increase in oxidative stress affects the cellular structure ¹².

The defect in liver tissue is very important and in the histopathological observation showed degeneration of hepatocytes, hemorrhage in the hepatic tissue and infiltration of inflammatory cells and dilation of sinusoids. Nanoparticles are initially reabsorbed by Kupffer cells, cell membranes will be damaged and toxic degradation products of iron oxide magnetic nanoparticles will be slowly imported to hepatocytes from macrophages ¹³. These findings are agreed with ⁴ who described damaging processes generated in the livers of rats after exposure to iron oxide nanoparticles. Another study referred that using of high concentration of iron oxide nanoparticles can caused undesirable effects in the liver with damage to the hepatocyte and elevation the level of liver enzymes, iron oxide nanoparticles (IONPs) can cause damaging in the liver-based presence of inflammation, congestion of the interstitial tissues, peri-central-vein-based fatty degeneration, and necrosis of hepatocytes ¹⁵.

Our study demonstration important change in the spleen, In embryo of 19th day reveled depletion of white pulpe and proliferation of red pulp with congestion of blood vessels in the lymphoid tissue. These results agree with ¹⁶ who found similar effects of the nanoparticles on the spleen of mice. Treatment with Fe₂O₃ caused series

effect in the spleen tissue include red pulp congestion and prominent white pulp in the treated rats ¹⁷.

For skeletal malformation changes, Our results inducted the presence of changes in the vertebral colum of rats embryos compared with control groups, these changes includes irregular and large vertebral with profuse calcification. Oral administration of iron oxide NPs caused some mild and severe defects in the skeletal formation (vertebral colum) in the developing fetuses. The current study indicated that the use of Alizarin Red-S was the best method to detect the osteogenesis in laboratory animals such rabbit fetus simulated that reported in mouse ¹⁸. Moreover the present result as well as that in mouse stated that the red color of the bones was due to the high affinity of the Alizarin Red-S to the calcium ions in the bones ¹⁹. In fact, there are some reports that show some nanoparticles can transfer through placenta and cause embryo toxicity, Iron oxide nanoparticles can accumulate in the sinusoids and hepatocytes of the fetus liver ^(20,21). This is in agreement with Bourrinet who mentioned that ferumoxtran-10 had major fetal skeletal malformations in both rabbits and rats ²². Tsay stated that bone loss has been detected after increased iron ions concentration in mice, Their results revealed dose-dependent elevation of iron content in tissue with bone composition alteration and thinning of trabecular and cortical bone accompanied by high bone resorption, this may be contributed to the increased reactive oxygen species (ROS) production ²³.

Conclusion

The study included twenty (20) embryos divided into two groups ,treated and control group . The results of the histological study reveled the existence of histological alteration in the brain, liver, spleen and vertebral colum of treated groups compared with controls .

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Collage of Science, Babylon University, Iraq and all experiments were carried out in accordance with approved guidelines.

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Clinical Characteristics of Headache among a Sample of Iraqi Medical and Dental Students

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Abstract

Background: Headache is a painful condition related to a major lack of productivity, limitation of social activities and impairment of quality of life.

Method: in this study a structured questionnaire was formulated in a form of multiple choices questions to gather information on the clinical characteristics, associated factors and the triggering factors along with the mode of treatment adopted by dental and medical undergraduate students of the University of Baghdad in the period from January to March 2019. Language of questionnaire was made simple and easily understandable to students. Students were assured of confidentiality and the participation was entirely voluntary.

Results: in this study a total number of 340 students participated, 170 of them were medical students 76(44.7%) males and 94(55.3%) females, and the other 170 were dental students 45(26%) males and 125(74%) females. It was found that 170 medical students had 161 associated symptoms with headache, the most common associated symptoms was scalp tenderness 44(25.9%), while the least common associated symptom was diarrhea 4(2.4%). While 170 dental students had 162 associated symptoms, the most common associated symptoms was scalp tenderness 46 (27.2%), while the least common associated symptom was seizures 2 (1.2%). 170 medical students expressed 385 triggering factors for causation of headache. It was found that the most common triggering factors was irregular sleep 118(69.4%). And 170 dental students expressed 437 triggering factors for causation of headache. It was found that the most common triggering factors was stress 136 (80.5%). In this study the percentage of medical students who taking self medications was 88.82% and 92.35% for dental students also it was found that both medical & dental students had the highest percentage for using Paracetamol as analgesic, 119(70%) for medical students, and 126(74.6%) for dental students.

Conclusions: the results of this study show that the majority of both medical and dental students suffer from headache with self medications used by the majority.

Key words: Headache, clinical characteristics, students

Introduction

Headache prevalence is 96%, with a female predominance. The global active prevalence of tension-type headache is approximately 40% and migraine 10%. Migraine occurs most commonly between the ages of 25 and 55 years and is 3 times more common in females^(1,2). Despite the fact that it causes significant disability, migraine remains under diagnosed and undertreated, trigeminal autonomic cephalgias are rare compared with migraine and tension-type headache. The most common trigeminal autonomic cephalgias is cluster headache, with

a population prevalence of 0.1% and a male/female ratio of 3.5-7:1^(3,4). Chronic daily headaches of long duration include chronic migraine, chronic tension-type headache. Hemicrania continua and new daily persistent headache, worldwide prevalence of chronic daily headache has been consistent at 3%-5% most of which likely represents chronic migraine¹. The International Classification of Headache Disorders (ICHD) was first published in 1988 and has now gone through two revisions, most recently in 2013. By convention, headache classification is based on the characteristics of the individual headache in the prior year, not the individual with the headache, though

features specific to individuals may be used in helping to differentiate between two close diagnostic matches. The ICHD is periodically reviewed and continues to evolve⁵. A primary headache has no known underlying cause. The most common primary headaches include migraine tension-type headache, and cluster headache⁶. Migraine is the third most prevalent disorder according to the Global Burden of Disease Survey and the seventh highest cause of disability worldwide⁷. Risk factors associated with transformation to chronic migraine include coexisting noncephalic sites of pain, mood and anxiety disorders, medication overuse, obesity, and lower educational status⁸. Tension-type headache is far more common, with lifetime prevalence in the general population of up to 80%. There is often a degree of associated disability, and this, combined with the high frequency produces significant socioeconomic impact². Tension-type headache is a dull, bilateral, mild- to moderate-intensity pressure-pain without striking associated features that may be categorized as infrequent, frequent or chronic and is easily distinguished from migraine. Although there may be a genetic element in the development of tension-type headache, environmental factors likely play a larger role than in migraine. Tenderness of pericranial muscles, co-existing mood disorders, and mechanical disorders of the spine and neck may be contributing factors⁹. Cluster headache, often referred to as “suicide headache” because the intensity of the pain, occurs more commonly in men and is usually episodic, characterized by “clusters” of from 2 weeks to 3 months. The pain is extremely severe, with 1 to 8 episodes per day, often awakening the patient from sleep shortly after falling asleep. Features are stereotyped with attacks of severe unilateral orbital pain lasting 15 minutes to hours, usually associated with ipsilateral autonomic symptoms increased lacrimation, nasal congestion/discharge, partial Horner’s and producing a characteristic restlessness^{3, 4}. The aim of this study is to evaluate the prevalence, clinical characteristic, and the use of self-medication of headache among a sample of Iraqi medical and dental students in the University of Baghdad.

Subjects, materials and methods:

Subjects: Total of 513 structured questionnaires were distributed to the 5th class which were (195) undergraduated dental students, and 6th class which were (318) undergraduate medical students. The questionnaires were distributed through the class, in the period from January to March of the year 2019.

Questionnaire: a formulated questionnaire in a form of multiple choice questions was structured to gather information on the prevalence of headache, clinical characteristics, associated symptoms and the triggering factors along with the mode of treatment adopted by dental & medical undergraduate students of the university of Baghdad. Language of questionnaire was made simple and easily understandable to students. Students were assured of confidentiality and the participation was entirely voluntary¹⁰. Severity of headache was assessed by Numeric Rating Scale (NRS). Headache was graded as mild, moderate and severe as per the numerical value marked from 0-10 on NRS by each participant¹¹.

Statistical Analysis: Statistical analysis were performed by the SPSS software version 18.0 (SPSS Inc, Chicago, IL). Results are expressed as mean SD, percentage; Fisher exact and Chi square were used to assess the significance of any differences between the two groups. The statistical significance was set at $p < 0.05$ as significant and $p < 0.001$ as highly significant.

Results

Total of 513 structured questionnaires were distributed to the 5th, and 6th years of undergraduate dental and medical students respectively in Baghdad university.

The total number of the students whom participated in this study were (340) students, for medical students information was provided by only 170 students from total 318 students (53.45%) which were 76 (44.7%) males and 94 (55.3%) females, with mean age = 23.36 ± 0.497 . And for dental students: information was gathered from 170 students from total 195 students (87.17%) which were 45 (26%) males and 125 (74%) females, with mean age = 22.42 ± 0.496 , with females predominance (64.41%) while males were (35.59%). Headache experienced by majority of medical students was frontal 67 (39.4%), dull pressing 80 (47.1%) with moderate intensity 75 (44.1%), duration < 4 hours 119 (70%) and 85 (50.3%) had no impairment of routine activity, 74 (44%) of medical student had family history of headache. While in dental students Headache experienced by majority of dental students was bilateral 64 (37.9%), Pulsatile (throbbing) 83 (49.1%), moderate intensity 91 (53.8%), duration > 4 hours 98 (58%) with no impairment of routine activity 91 (53.8%) and 72 (39.9%) of dental student had family history of headache (Table 1).

Table 1: Headache characteristics of medical & dental students

Characteristics	Number of medical students (%) N=170	Number of dental student (%) N=170
Headache side		
• Unilateral	53(31.2%)	48(27.8%)
• Bilateral	50(29.4%)	64(37.9%)
• Frontal	67(39.4%)	58(34.3%)
Quality		
• Pulsatile (throbbing)	62(36.5%)	83(49.1%)
• Dull pressing	80(47.1%)	78(46.2%)
• Sharp stabbing	28(16.5%)	9(4.7%)
Headache intensity		
• Mild	72(42.4%)	67(39.6%)
• Moderate	75(44.1%)	91(53.8%)
• Sever	23(13.5%)	12(6.5%)
Duration		
• >4 hours	51(30%)	98(58%)
• <4 hours	119(70%)	72(42%)
Impairment of routine activity		
• Complete impairment	17(10%)	7(3.6%)
• Incomplete impairment	68(40%)	72(42.6%)
• No impairment	85(50.3%)	91(53.8%)
Family history		
• Yes	74(44%)	72(39.9%)
• No	96(56%)	98(60.16%)

170 medical students experienced 161 associated symptoms, the most common associated symptoms was scalp tenderness [n=44 (25.9%)], followed by nausea/vomiting, photophobia, vertigo, diplopia and paresthesia, while the least common associated symptoms was diarrhea [n=4 (2.4%)]. While 170 dental students experienced 162 associated symptoms, the most common associated symptoms was scalp tenderness [n=46 (27.2%)], followed by photophobia, nausea/vomiting, vertigo, diplopia and paresthesia, while the least common associated symptoms was seizures [n=2 (1.2%)]. In this study it was found that there is significant difference between the two groups regarding to nausea/vomiting and photophobia as the p value equals to 0.03 as shown in (Table 2).

Table 2: associated symptoms with headache

associated symptoms	Medical students N (%)	Dental students N (%)	P value
Nausea\vomiting	41(24%)	25(14.8%)	0.03*
Scalp tenderness	44(25.9%)	46(27.2%)	0.78
Vertigo	25(14.7%)	26(15.4%)	0.86
Photophobia	28(16.5%)	44(26%)	0.03*
Diplopia	10(5.9%)	7(4.1%)	0.46
Seizures	0(0%)	2(1.2%)	0.155
Paresthesia	9(5.3%)	5(3%)	0.28
Diarrhea	4(2.4%)	5(3%)	0.73
Other	0(0%)	2(1.2%)	0.155
No symptoms	66(38.8%)	59(34.9%)	0.46

* significant p<0.05

In this study 170 medical students expressed 385 triggering factors for causation of headache. It was found that the most common triggering factors was irregular sleep [n=118(69.4%)] & stress [n=105(61.8%)], followed by exertion [n=71(41.8%)], flashing lights[n=31(18.2%)], hunger [n=30(17.6%)], weather changes [n=23(13.5%)], menstruation, specific smells, specific food [n=11(6.5%)], while 170 dental students expressed 437 triggering factors for causation of headache. It was found that the most common

triggering factors was stress [n=136(80.5%) & irregular sleep[n=105(62.1%)] which is a similar result to what we had with the medical students group, followed by hunger [n=57(33.7%)], exertion [n=30(17.8%)], flashing lights [n=29(17.2%)], weather changes [n=29(17.2%)], menstruation[n=18(10.7%)], specific smells[n=15(8.9%)], specific food [n=10(5.9%)], in this study there was high significance regarding to stress/exertion / hunger, as the p value was equal to 0.0002/0.0000/0.0007 respectively Table 3.

Table 3: triggering factors for headache

Triggering factors	Medical students N (%)	Dental students N (%)	p. value
Stress	105(61.8%)	136(80.5%)	0.0002 **
Flashing lights	31(18.2%)	29(17.2%)	0.7953
Specific smell	11(6.5%)	15(8.9%)	0.32
Specific food	11(6.5%)	10(5.9%)	0.83
Weather changes	23(13.5%)	29(17.2%)	0.35
Exertion	71(41.8%)	30(17.8%)	0.0000 **
Irregular sleep	118(69.4%)	105(62.1%)	0.16
Hunger	30(17.6%)	57(33.7%)	0.0007 **
Menstruation	11(6.5%)	18(10.7%)	0.17
Other	1(0.6%)	4(2.4%)	0.17
Nothing	1(0.6%)	3(1.8%)	0.31
** highly significant p<0.001			

In this study the percentage of medical students who taking self medications was 88.82% and 92.35% for dental students also it was found that both medical & dental students had the highest percentage for using Paracetamol as analgesic, 119(70%) for medical students, and 126(74.6%) for dental students (Table 4).

Table 4: Medications used by medical and dental students

Medications	Medical students N(%)	Dental students N(%)
Paracetamol	119 (70%)	126 (74.6%)
Paracetamol+ibuprofen	20 (11.8%)	20 (11.8%)
Paracetamol+propyphenazone	4 (2.4%)	3 (1.8%)
Aspirin	7 (4.1%)	0 (0%)
Diclofenac	3 (1.8%)	4 (2.4%)
Migranil	1 (0.6%)	4 (2.4%)
other	48 (28%)	20 (11.8%)

Discussion

In this study it was shown that high prevalence of headache among both medical and dental students and this agree with previous studies ^(10, 12); with female predominance and this agree with other studies that demonstrated high prevalence in females ^(10,13).

In this study the prevalence of positive family history was 42.9%, in other previous studies like Oman study reflect 58% of students ¹⁴ while in an Indian study only 20.16% of students had positive family history ¹⁰.

The most common associated symptoms in this study was scalp tenderness for both groups, while the most triggering factors for the causation of headache were stress and irregular sleep and this agrees with other study that found similar results ¹⁰. It is being widely reported that medical students undergo major stress. Causes for the same are varied, from their interpersonal problems to their course overload to uncertainties of future career prospects, in this study dental students had shown high level of stress than medical students and that in concordance with other study ¹⁵. In this study the percentage of medical students who taking self medications was 88.82% and 92.35% for dental students and this can be reasonably explained by the fact that being in medical profession, students possess theoretical knowledge about the medications, for this reason they prefer to seek self medications using over the counter drugs ¹⁰. The most self medications used by both groups was paracetamol due to be a simple analgesic and reachable.

Conclusion

In this study the results showed that both medical and dental students had high prevalence of headache and scalp tenderness was the most associated symptoms with headache for both groups, stress and hunger most significant triggering factors for causation of headache among dental students, while exertion was most significant among medical students. The majority of both medical and dental students used self medications for treating headache. The improvement of the academic performance of the students needs the precise diagnosis and proper treatment for headache among them.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the department of oral diagnosis, College of Dentistry, University of Baghdad and all experiments were carried out in accordance with approved guidelines.

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Antioxidants Activity of Date Seed Extraction of Some Date Varieties

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Abstract

The study included preparing aqueous , alcoholic, and oil extractions of date seed power of (*Phoenix dactylifera*) Al Hillawi, Al Khadrawi and Al ZAHDY date varieties estimating its total contents of phenol and flavonoids, and then it is studied its antioxidants activity, reduction strength and ability to bon Ferrous ion. The results showed that total contents of phenolic compounds are ranged from 56.16 to 67.32 mg/ml for the ethanol extraction, 56.6 to 65.6 to 65.32 mg/ml for methanolic extract and 27.88 to 40.06 mg/ml for aqueous extraction. While the total contents of flavonoids of aqueous extract is ranged from 22.12. to 33.32 mg/ml, 40.21 to 52.16 mg/ml in the ethanolic extract and from 35.11 to 46.16 mg/ml in the methanol extraction. Indeed, aqueous and alcoholic extract of (*Phoenix dactylifera*) Al Hillawi, AlKhadrawai and Al Zahdy give Antioxidation activity are ranged from 37.50% to 88.70%, reduction strength is ranged from 0.895 to 2.63 and the value of Ferrous ion bon is ranged from 41.92% to 60.93%.

Keywords: Date seed, antioxidants and phenolic compounds

Introduction

Dates seeds are deemed of the most important waste of date industry representing very important economical resources and at same time may cause environmental problem if it is accumulated considerably in the nature²². The new studies reported that dates seeds have high level of phenolic compounds, Flavonoids, antioxidants, Dietary fibers higher than those are reported in flesh part. there are high levels of α -Tocopherol, Ascorbic acid and Glutathione and of polyphenol compounds such as Sinapic acid , Caffeic acid with quantities of protocatechnic acid¹¹, also it is diagnosed multi-aromatic in dates seeds includes alcohols, citrates, aldehydes, Ketones, saturated and unsaturated hydrocarbonates¹⁵. The study discussed Phenolic , Flavonoids contents and Antioxidant of date seed extracts, it is also observed that Dietary fiber extracted from date seed are Polyphenoles-riche¹⁹.⁹ suggested that the date seed contents in Phenolic compounds are ranged from 21.0 to 62.0 mg Gallic acid/100g . In addition to studies that was made to extract oil from date seed and use it in food, Pharmaceutical, Plastic industries¹⁰. Whereas date seed is rich source of important components such as oil, protein, dietary fibre, carbohydrate are deemed source of phenolic compounds and antioxidants; and to exploit these materials which respecting a valuable by-

product of date fruit processing industries and there was no local study approach this matter in detail; therefore, we found that it is necessary to perform this study to extract bioactive compounds from date seed powder and to estimate of Phenolic and Flavonoids compounds and their antioxidant activity.

Method and Materials

(*Phoenix dactylifera*) Halawi , Khadrawi , Zahdi date seed were obtained from Local market , Basrah . Separate seed from date , then their wishes , drier and milling to smooth powder then care in sterilize and close cups to uses then .

2-Preparation of Date seeds Extract s

A- Aqueous Extract

By applying method of¹⁴, be weighed 20g from date seed powder and their add 500ml of distilled aqueous , drop out in Shaking incubator for 24 hours at 28C° then centrifuged at 2500 Round/min for ten minutes , then filtration by Whitman No1, concentrated of filtrate by Rotary Vacuum Evaporator to thick liquid then placed in incubator at 37C° for 48 hours get at dry powder of extract , take care in showdown and obscured glasses package and cured in refrigerator at 4C°.

B- Ethanolic Extract

Ethanolic extract were prepared by weighting 100g of date seed powder dissolved in 500ml ethanol (98%) and mixed well , left for 24hours at laboratory temperature (25-30C°), filtration by Whatman No1 , concentrated by Rotary Vacuum Evaporator at 40C°and left at laboratory temperature to get at dry powder , take care in showdown and obscured glasses package and cured in refrigerator at 4C°⁸. .

C- Methanolic Extract

Two steps applied in paragraph A to extract Methanolic date seed powder.

D- Oil Extracts

It is extracted date seed oil from seed powder to study variety according to ⁵ using mixture of aqueous , methanol and chloroform solvents.

Determination of total phenols*

It is estimated total phenolic compounds in date seed extracts by using (Folin –Ciocalteu) received in ²¹, and uses Standard curve from Gallic acid in concentration between 10 to 200 mg/ml to calculating phenolic amount in extracts depending the scatter graph between acid concentration and absorption at 760 nanometer .

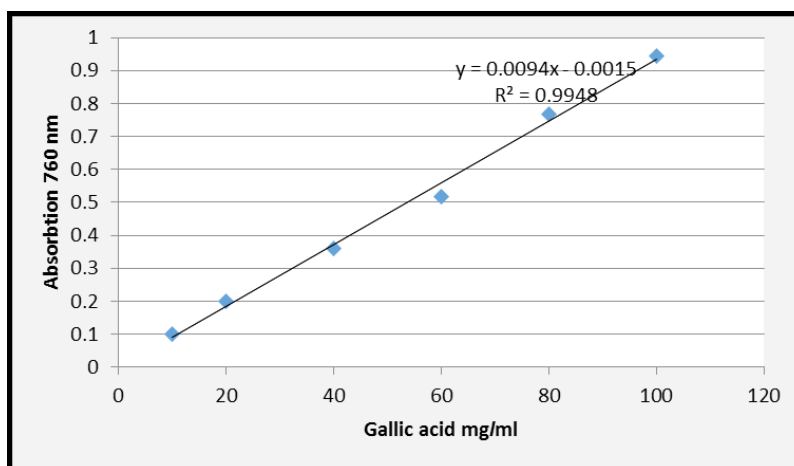
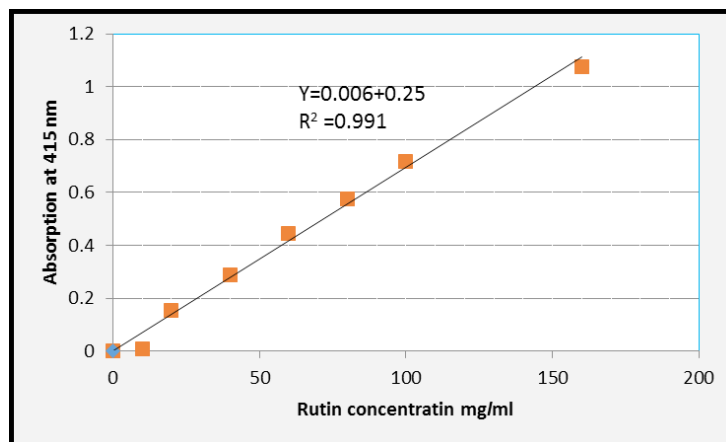


Fig 1: Standard curve of Gallic acid

*** Determination of total Flavonoids**

It was solved of 1gm from date seed extract in 1.5 ml ethanol, add it Aluminium chloride AlCl₃.6H₂O (2%) this perpetrated in 100ml methanol , mixed well, after 10 minutes calculate Absorption at 367 nanometer, and preparation to concentration of Flavonoid compound (Rutin) from 0 to 100 mg/ml, then determination of Flavonoids depending on correlation between concentration of rutin standard solution and Absorption at 415 nm.



.Fig 2: Standard curve of Rutin

Antioxidant activity

1-Scavenging of free radical ability

it is assessed ability to date seed extracts for scavenging of free radical according to ¹⁷, and used the equation for calculate activity:

$$\text{Scavenging of free radical \%} = \left[1 - \frac{\text{Sample absorption}}{\text{Control absorption}} \right] \times 100$$

2-Reducing power

It is applied the method by ¹³, the increase of absorption to mixture interaction it was indicator stating high reduction power.

3-Chelating of ferrous ion

Followed the method Decker and Welch (1990), calculated of chelating ability by next equation :

$$\text{Chelating of ferrous ion \%} = \left[1 - \frac{\text{Sample absorption}}{\text{Control absorption}} \right] \times 100$$

Results and Discussion

1-Total Phenolic Content

Results of the total phenolic compounds on Halawi, Khadrawi, Zahdi date seed is presented in Figure 6 below, the result of Statically analysis showed presence Significant differences (P<0.05) in phenolic contents by difference solvent extracts and seed source, Alcoholic extracts (Ethanolic and Methanolic) exhibited the highest content of phenolic compound compared with aqueous extracts .

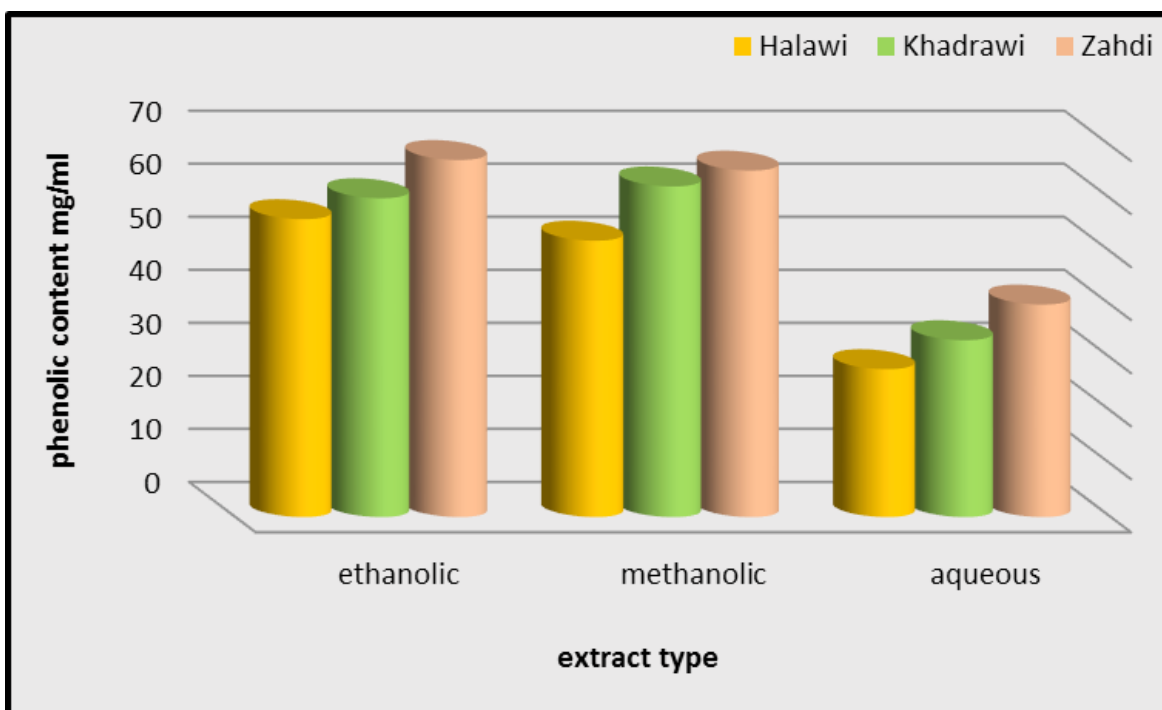


Fig 3: Total phenolic content of date seed extracts

The results is in agreement with ⁶ and ¹⁸ as it is found that e phenolic content in aqueous extract lower than ethanolic date seed extract, and the Statically analytic showed Significantly affected ($P < 0.05$), the higher content of phenolics in Zahdi date seed that all extracts reach 67.32 , 65.32 , 40.06 mg/ml for ethanolic , methanolic, aqueous respectively, and then Khadrawi 60.11 , 62.33 , 33.34 mg/ml for 3 extracts respectively and the lower content of phenolic compound was Halawi date seed 56.16 , 52.11 , 27.88 mg/ml respectively, as it is agreed with same results of ⁶.

2-Total Flavonoids content

Figure 7 clarified Flavonoids content in date seed extracts as the result showed that there is important differences between aqueous and alcoholic extracts ($P < 0.05$), ethanolic extract of Zahdi seed excellence in Flavonoids reach to 52.16 mg/ml and ethanolic extract of Khadrawi 50.11 mg/ml then ethanolic extract of Halawi seed 40.21 mg/ml , followed methanolic extracts , Halawi extract was the lowest in flavonoids 35.01 mg/ml , then Khadrawi 40.83 mg/ml and methanolic extract of Zahdi reach to 46.16 mg/ml , then aqueous extracts 22.12, 27.00 , 33.32 mg/ml of Halawi ,Khadrawi , Zahdi date seed respectively, the central reason in differences of Flavonoids return to growth condition, maturity stage,

geographic location , manuring method , soil disease types, storage conditions and extracts system ⁴ . .

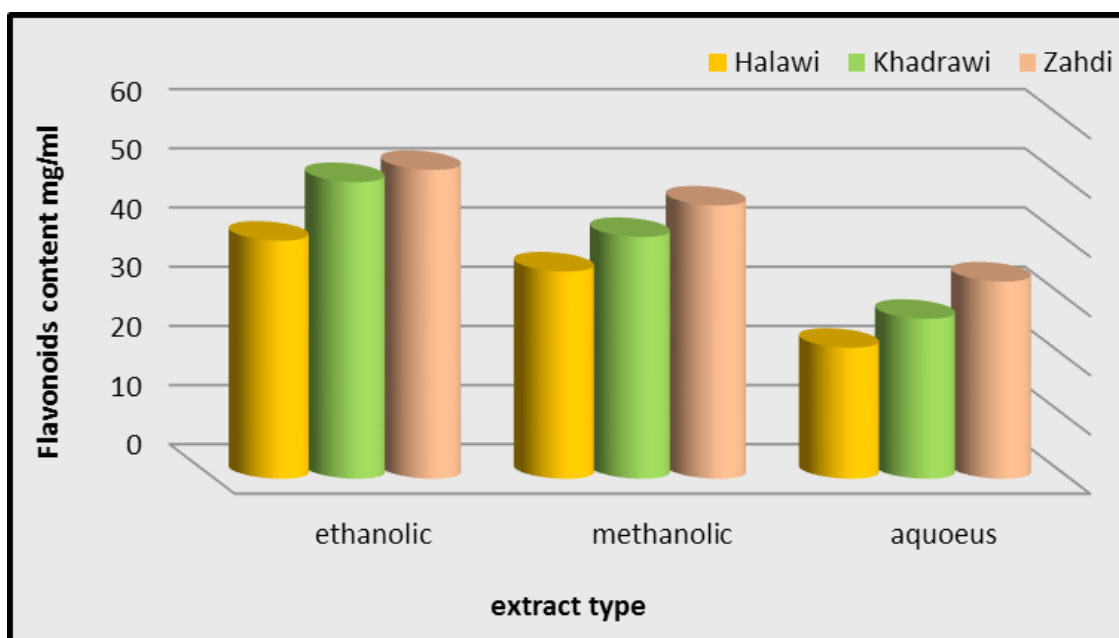


Fig 4: Total Flavonoids content of date seed extracts

Antioxidant activity of date seed extract

It is determined antioxidant activity by measure of date seed ability to free radical scavenging by uses(DPPH reagent) Diphenyl-1-Picrylhydrazyl compared to(BHT) Butylated Hydroxy Toluene , explain to Figure 8 A,B,C , the result of Statical analysis showed Significantly differences ($P < 0.05$) of antioxidant activity to extracts as difference of seed source , and there were noticed the antioxidant activity increasing when concentration increased for all extracts , As Halawi

date seed (A) the methanolic extract showed the higher antioxidant 83.20% at 1.25 mg lml , when antioxidant activity of BHT 88% as the same concentration , then oil extract of antioxidant activity reach to 83.10% and ethanolic extract 61.2% , while the aqueous extract reach to 37.5% as the same concentration. The antioxidant activity of Halawi date seed differs at solvent extract of differences , it was posses the highest of scavenging of free radical DPPH compared to BHT , this due to presence bioactive compounds these posses antioxidant activity

to responsible to termination oxidation reaction by presence hydroxyl group donate hydrogen and reaction with free radical their convert to stable products, and the result is shown in Figure B antioxidant activity (DPPH) to Kadrawi date seed extracts, when ethanolic extract give a higher activity than methanolic, oil and aqueous reach 88% at concentration 1.25mg/ml it was equal BHT activity 88%, these results is in agreement with¹² when they found ethanolic extract of date seed give a higher antioxidant when uses DPPH radical as compared with aqueous extract, that return to a high content of phenolic compound and flavonoids which posses scavenging free radical due to presence hydroxyl group which donate electron to free radical, then oil extract of Khadrawi seed reach 85.2% and methanol extract 85%, while aqueous extract of Khadrawi seed gives the lowest antioxidant reach 42.4% as the same concentration because of a little content of phenolic compounds due to a limit ability of water to extract phenolics 162g/kg and flavonoids 17 g/kg from date seed due to a low solubility to these compounds in water², in addition of the uses of water alone induce to extraction other compounds such as protein, polysaccharides and induce to appearance inclusions through filtration and hardness to disposed³.

Reducing power

The result of statical analytic showed height significantly ($P < 0.05$) in reducing power values as increasing of extracts concentration to all types of seed, in Figure A4 Halawi date seed gives clear reducing power compared with α -tocopherol which reach to 2.689, and noticed the methanolic extract appear the higher reducing power compared with other extracts through Absorbance values when increase Absorbance that mean a higher reducing power reach to 0.864 for methanolic extract as concentration 0.25 mg/ml and increase when concentration increasing reach to 2.527 at 1.25mg/ml, while ethanolic extract reach to 0.4, 0.7, 1.09, 1.513 and 1.733 at concentrations 0.25, 0.5, 0.75, 1 and 1.25mg/ml respectively when reducing power reach to 0.762, 0.822, 0.94, 1.223 and 1.552 for oil extract at concentration 0.25, 0.5, 0.75, 1, 1.25 mg/ml respectively. were aqueous extract appeared the lowest reducing power ranged from 0.362 to 0.895 when concentration increase from 0.25 to 1.25 mg/ml. Also, the result showed in Figure 9 B reducing power of Khadrawi date seed, ethanolic extract appeared the higher reducing power compared with methanolic, oil and aqueous reach to 2.650, while reducing power for other extract reach to 0.8, 1.223, 1.534, 1.923 and 2.223

for methanolic extract at concentration 0.25, 0.5, 0.75, 1, 1.25 mg/ml, and 0.223, 0.433, 0.622, 0.792 and 0.834 for aqueous extract and 0.752, 0.866, 0.993, 1.523 and 1.690 for oil extract as the same concentration, in Figure C noticed reducing power for ethanolic extract of Zahdi date seed 2.632 equal reducing power α -tocopherol at concentration 1.25 mg/ml followed methanolic extract reach to 2.342 then oil extract reach to 0.821, 0.892, 1.003, 1.45, 1.732 at concentration 0.25, 0.5, 0.75, 1, 1.25 mg/ml, and that were the lowest reducing power for aqueous extract reach to 0.432, 0.634, 0.793, 0.875 and 0.993 at concentration 0.25, 0.5, 0.75, 1 and 1.25 mg/ml.

Chelating of ferrous ion

The percentage of date seed extracts ability to chelating of ferrous ion compared with Ethylene Di-amine Tetra acetic acid Di-sodium, the statical analytic showed significantly differences ($P < 0.05$) among prepared extracts of chelating ability, in Figure A that the higher ability to chelating of ferrous ion were ethanolic and oil of Halawi date seed reach to 53.56% and 51.22% at concentration 1.25 mg/ml respectively then methanolic extract and aqueous extract, while Khadrawi date seed (B) the ethanolic extract appeared a higher chelating than previous extract 59.32% and lower than ethanolic extract of Zahdi date seed 60.93% at concentration 1.25mg/ml, while oil extract reach to 56.00% for Khadrawi, followed methanolic extract that appeared chelating ability reach to 48.03% then aqueous 42.97%, also ethanolic and methanolic of Zahdi date seed appeared chelating ability (C) a highest compared with previous two types reach to 60.93% at concentration 1.25% followed oil extract 52.75% then methanolic extract 52.23%, this values were less compared with EDTA-2Na reach to 92.00%, while aqueous extract appeared less ability 41.92% at concentration 1.25mg/ml, this results agree with¹² were found that aqueous extract chelating ability was less than ethanolic extract at concentration 20% and the chelating of ferrous ion return to phenolic compounds that a manner role of chelating ions that oxidation catalyst such as iron and copper¹⁶.

Conclusion

Capability to benefit from date manufacturer by product to produce natural antioxidant alternative to artificial antioxidant that highly effective side. Alcoholic extracts give the higher of phenolic and flavonoids content than aqueous extract. Alcoholic extracts posses

the higher antioxidant than aqueous extracts while the antioxidant of oil extracts higher than aqueous extracts

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under College of Agriculture, University of Basrah, Basrah, Iraq and all experiments were carried out in accordance with approved guidelines.

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Unemployment and Its Role in Increasing Crime Rates within the Iraqi Society

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Abstract

Unemployment is a complex problem whose dimensions and effects are not confined to the economic aspect solely, but also extend to the political, social, cultural and security aspects. It has great consequences, the first of which is crime and the increase of its rates. Perhaps there is a big difference between the developing communities that are still suffering from economic crises and instability in most fields of life, and suffer from chronic unemployment, which almost takes the form of the heavy legacy passed down from one generation to the next and the developed communities that are thinking of the need to exploit leisure time ideally through the creation of more future job opportunities and the importance of providing generous pensions for aged groups, not to mention the development of service sectors, especially health services and increasing the percentage of those covered by health care and health insurance services. Perhaps the difference between these and those is the attraction factor of security stability, which is the most effective tool for crime prevention and control, rather than the huge money spent by developing communities in building and arming the security

Keywords: *Unemployment, Crime Rates, Iraqi Society*

Introduction

Criminologists explain to us that criminal conduct is the result of two types of factors: the first of which is known as internal (personal) factors ¹. This means everything related to the individual criminal himself, such as biological factors like genetics, physical, mental and psychological construction, and they eventually conclude that there are people that are naturally more prepared to commit the crime compared to others without denying the possibility of committing crimes by others, who do not have the of criminal predisposing factors ². The other type of crime-producing factors in communities are (environmental) external factors, which mean the external pressures to which the individual is exposed ³, which ends up drawing him to commit the crime, and as far as the topic in question is concerned, these factors are going to be the focus of such research to the extent to which they are related to the issue of unemployment and its role in increasing the crime rate in communities in general and in the Iraqi society in particular.

2- The external environment factors are varied, and each of them has a role in the crime and who commits it. We can mention, for example, the following factors:

- Physical environment factor, which means living conditions in terms of housing, daily activities and population density.
- The political environment factor, which means the political conditions of the society in which he lives in terms of the type of government, how it deals with citizens, the amount of freedom enjoyed by the individual, the duties inflicted thereupon, and the amount of authority and control of public life.
- Cultural environment, which means community culture as if the community were tribal, liberal, civil, or Islamic.
- The social environment, which means the family institution, the educational institution, and the media foundation.
- Economic environment which means the economic conditions, unemployment rates and living standards, This is the essence of the study under consideration as far as the crime is concerned.

3- We find through study and research that crime and delinquency in general are significantly associated with the economic environment. Unemployment comes at the forefront of the economic effects that affect the individual and his conduct. you can find in an unemployed person nothing but a negative personality, pervaded by despair and frustration, lost personal balance in terms of relationship with the community in which he lives, and hence comes the risk if this person is drawn to deviation and crime.

Methodology

1- Analytical approach to identify the explicit positions of criminologists, economists and specialists in studying the phenomenon in question and linking it to the reality of Iraqi society, and to reveal the negative aspects of this phenomenon and identify the faults related thereto.

2- The objective approach in studying the phenomenon by recognizing and identifying it as a reality that imposes itself on the developing communities in general and the Iraqi society in particular, while moving away from the personal and subjective tendencies in order to reach the abstract real knowledge of the research problem.

Study Objectives

This study aims to ascertain whether there is an inevitable correlation between unemployment on the one hand and crime on the other, identifying the forms of crimes in which the correlation with unemployment is deeper and greater than others, giving them statistical significance based on the evidences and past experience that are clearly unambiguous or skeptical in Iraq at the very least.

Study Plan:

The research treatment of the subject under study takes place on two topics, the first of which addresses what unemployment is in general in two themes. The first theme introduces the definition of unemployment, and this theme comes in two sections, the first of which deals with the linguistic definition of unemployment, while the second section introduces its conventional definition. The second theme includes the types and causes of unemployment, and this theme comes in two sections, the first of which deals with the types of unemployment, while the second section introduces its causes. The

majority of applicant currently lack the qualifications that enable them to compete for vacant positions because of the incompatibility of their qualifications and experiences with the high ceiling of qualifications in the labor market, which ends with increased unemployment and the delay, if not to say failure, of many applicants to get jobs. The previously above mentioned is simply the general meaning of unemployment in its modern sense, even if the term “unemployment” contains many details and interventions, which in turn leads us to delve into the linguistic and conventional definition of the term “unemployment” as follows.

The Linguistic Definition of Unemployment:

Unemployment is derived from the infinitive form “employ”. Disguised unemployment means: The surplus number of employees in governmental bodies and departments, and the day of unemployment means: any day off, while the unemployment rate is: (Economy) the economic measurement in which the people that are unemployed, capable of working, want to work are represented compared to the already employed population in a certain community. Unemployment as the noun of “unemployed” refers to a person that has been unemployed for one month or more, who does not have a job and do not work.

Types and causes of unemployment

There are many forms of unemployment by reference to its causes. Economic studies have depicted multiple forms of unemployment, and this is what this research is going to introduce in the followings two sections.

Types of unemployment

1- Regular (cyclical) unemployment: - It means unemployment that appears in the cases in which markets suffer from recession and poor performance, despite the availability of job vacancies, but in most of the cases, the job itself is not beneficial, such as workers⁴ who quit their jobs or are dismissed from work, and fail to get another job. This type also includes young people, women who work from their homes and their work involve just simple tasks that can hardly be called jobs or work in the true sense of the work.

2- Temporary unemployment: by which people work for temporary periods such as seasons while they remain unemployed for the rest of the year, and this is often found in rural areas with regard to the work of

agriculture and livestock, as well as for the classes of students who work during the summer holiday.

3- Partial unemployment:- In which individuals work for a number of hours less than the regularly known working hours or work in part-time jobs. Therefore, there is an ⁵ abundance of labour force available compared to the actual employment rate.

4- Frictional unemployment: - it refers to the movement of workers between professions and regions along with the lack of stability in the amount of labour force, where there is no match between the labour force and job opportunities available in one region and another because of the ill- considered professional mobility due to the lack of information available to job seekers on the one hand and employers on the other hand.

Crime and Unemployment

The crime is one of the remnants of poverty and unemployment, and whatever its type, size and gravity is, crime remains a dangerous phenomenon that threatens the humanitarian community. It has a serious negative impact, either on individuals ⁶, communities or on the economy as a whole, since it is considered the scourge that kills economic and human resources.

Crimes related to Unemployment in Iraq

First: Terrorism Crimes: The positive economic factor plays an important role in creating the appropriate environment for the elimination of terrorism. On the contrary, stagnation and unemployment are a suitable environment for the maturity and spread of terrorism. It is natural that when the individual is able to fulfil his needs and ⁷ satisfy his family needs, this can ensure that he will be satisfied with the community in which he lives and feel stable and secure.

Second: Drugs Crimes: Drugs trafficking is considered one of the highways for quick and substantial financial gain. it is almost the most attractive element for the unemployed, where they find an opportunity to provide them with ⁸ enough money to meet their needs, forgetting or ignoring the great risk they are exposed to as a result of such trafficking.

Third: Organs Trafficking Crimes: There is no doubt that poverty, the need for money and the lack of job opportunities that can provide it are the reasons behind this crime. In an official report issued by the British website ?????, it was stated that unemployment

and poverty alone are the reason behind this crime, which made Iraq the hub of human organs trafficking. It is worth mentioning that the Iraqi legislator addressed the ⁹ crime of human organs trafficking by several laws dealing with different forms of human organs that can be traded, its owners can be exploited or that can be taken by force, including law no. (60) of the year 1981 which prohibits human kidneys trafficking, law no. 113 of the year 1970, which prohibits human eyes trafficking. We also refer here to the Minors' Welfare law no. (78) of the year 1980, which includes the protection of minors from any form of exploitation and the Juvenile Welfare Act no. (76) of the year 1983, providing for the protection of juveniles from all forms of exploitation. I cannot fail to mention the provisions of Article (37) of the Iraqi Constitution of the year 2005, which prohibits the trafficking of forced labour, slavery, slave trade, trafficking in women or children, and sex trade.

Conclusion

Unemployment is a negative social and economic phenomenon, from which suffer all communities of different political and economic aspects, regardless of the extent of their progress or regress in keeping pace with modernity and development, although the percentage is quite different between the problem in developing countries and in developed countries. However, the specter of this problem remains existent in both cases, and this is the crux and gravity of the problem. The analysis and study of the problem of unemployment is not limited to the importance of human resources and the fact that it occupies an important place, but is also due to the important fact that human capital is the basis of development, in addition to the danger posed by the continuous increase in the number of unemployed and the subsequent complications thereof in the social and political consequences that accompany the situation of unemployment, where unemployment represents the fertile environment conducive for the expansion of crime, extremism, violence and terrorism. The lack of income, which is synonymous with unemployment, leads to a drop in the standard of living and an increase in poverty along with the accompanying deterioration in the humanitarian situation, which are one of the most encouraging factors of delinquency and crime in the future. Unemployment has its causes, which are almost common and similar wherever it occurs, whether in developed or developing countries. The issue of unemployment in Iraq is one of the thorniest and most complicated issues, as its rates continue to rise due to

the large changes in the economic structure of Iraq and the inability of the state to retrench its increasing expenditures. Despite the importance and gravity of this large problem facing Iraq and the Iraqi people, there are no official statistics until now concerning such problem. The aggravation of unemployment and its negative impact on Iraqi society are due to a number of reasons related to the nature of Iraq and the rapid events it has experienced.

Conclusion

Perhaps there is a big difference between the developing communities that are still suffering from economic crises and instability in most fields of life, and suffer from chronic unemployment, which almost takes the form of the heavy legacy passed down from one generation to the next and the developed communities that are thinking of the need to exploit leisure time ideally through the creation of more future job opportunities and the importance of providing generous pensions for aged groups, not to mention the development of service sectors, especially health services and increasing the percentage of those covered by health care and health insurance services. Perhaps the difference between these and those is the attraction factor of security stability, which is the most effective tool for crime prevention and control, rather than the huge money spent by developing communities in building and arming the security and police services and ultimately stand unable to put an end to the growing crime rates day after another.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under Faculty of Law, University of Babylon and all experiments were carried out in accordance with approved guidelines.

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Treatment of Congenital Capillary Hemangioma: Review of 30 Cases in Nasiriyah (2013-2018)

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Abstract

The study is designed to identify the peak age of incidence of hemangioma and the most common site of involvement, presentation, different types, types of surgical procedures and the perioperative complications as well as the variation of sizes in hemangiomas. A retrospective study was done on a sample size of (30) persons. They were selected from Al_Hussein teaching hospital in Nasiriyah between (2013-2018) which included 13 males and 17 females starting from age of less than 6 months til the age of more than 3 years. The peak incidence was in those aged more than 6 months and up to three years (66%). The most common place involved being the trunk (50%), then the lower limb (16%), upper limb (16%), the the face and neck (16%). The most common presentation was increment in size in 50% of patients, recurrent ulceration in 20% and recurrent bleeding in 16% of patients. The patients in the study had three types: capillary hemangioma (66%), cavernous hemangioma (20%) and combined hemangioma (14%). The size of hemangioma varied from smaller than 5 cm (33%), 5-10 cm (33%) and larger than 10 cm (33%).

Key Words: capillary Hemangioma, surgical treatment , Nasiriyah

Introduction

A **hemangioma**, its most common vascular tumor regarded as benign tumors of infancy and it has been reported in 5–10% of the infants.⁽¹⁻³⁾, may be appear post infancy in rare conditions .this vascular tumor it contain an abundant type of endothelial cells covering the vessels wall of human .⁴The female, premature and low birth weight infants are frequently affected by such tumor .^(5,6) they usually seen during early weeks of life

and began to increasing in size abruptly with in the early three to six months after delivery.⁽⁷⁻¹⁰⁾ In good number of cases of this vascular tumor , 80% of its size is generally completed by third months.¹¹ Most of the cases, targeting its growth with stage of involution at one year of life. meanwhile, the growth can be occurred over many years and large number of tumor regression happened by five years.^(12,13) though this lesion disappeared naturally with time, few of them can precipitate and causing stigma of lax skin, small dilated vessel , or color remnants.

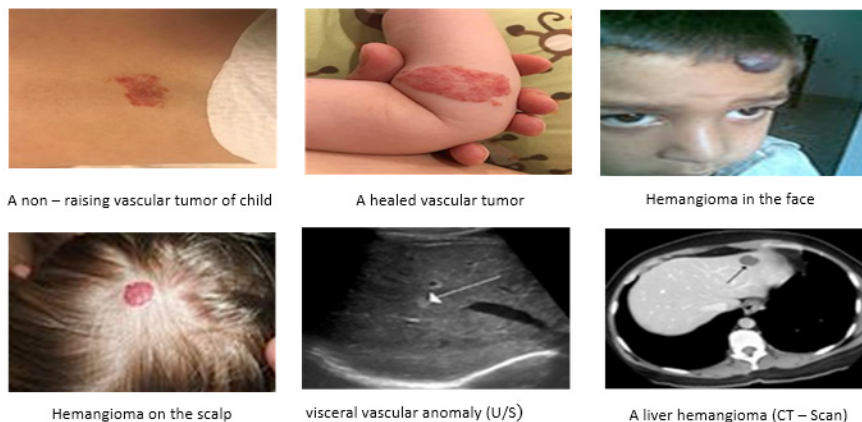


Figure (1) Types of Hemangioma

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Diagnosis:

Most of the cases of vascular tumors of infancy easily discovered from patient history and direct physical examination.⁶ In certain conditions need assisted measured like imaging (US) with Doppler, (MRI) and/or other confirming tools are needed like cytology or histopathology.¹⁴ This vascular tumor (infantile hemangioma IH) are not present at birth in most of cases or faint area, small dilated blood vessel, or dark area may be present. A well developed lesion after delivery predict other diagnosis. The type of vascular tumor with faint red strawberry color it's a Superficial type that occupied the upper dermis, while the blue and firm textured lesion which occupying the deep dermis and subcutis that indicates deep type of this vascular tumor. Mixed type of lesion contain both proliferative IH which do not substantially proliferate¹⁵ and pig endophytic IH in which obvious increment in size began later and continue for extended period.¹¹ A good history of the unique growth of a such condition its very important in the detection of the lesion. In the early weeks of after delivery this vascular abnormality proliferate very abruptly with increasing mass more than its size. After that accompanied by a decreasing growth for t up to 6-9 months, while the majority of growth about 80% is achieved by 3 months. Lastly, this lesion regressed over a period of years.¹¹ If the diagnosis is not reached from physical examination, so other added measures like imaging or histopathology is helpful.^(4,14) On Doppler ultrasound the diagnosis is achieved by showing a high flow soft-tissue mass usually without direct arteriovenous shunting for the proliferative phase. On MRI, showing the increased signal intensity and increase up take after gadolinium injections. There are fast flow vessels.^(14,15) specimen for diagnosis can be taken from the lesion by different invasive methods for microscopic evaluation.¹⁶ Under the microscope and tissue can be processed for the detection of this tumor cells, abundant well capsulated endothelial cell.¹⁷ The GLUT-1 histochemical marker also may be help full in differentiation from other vascular abnormalities.¹⁸

Results

Table (1) Frequency of age groups in patients and site of hemangioma

Variable Age group	Frequency	Percent
Smaller than 6 Months	5	16.6%
6 Months - 12 Months	10	33.3%
1 Year - 3 Years	10	33.3%
Older than 3 Years	5	16.6%
Total	30	100%

Site	Frequency	Percent
Face	2	6.66%
Neck	3	10.0%
Trunk	15	50.0%
Lower Limb	5	16.6%
Upper Limb	5	16.6%
Total	30	100 %

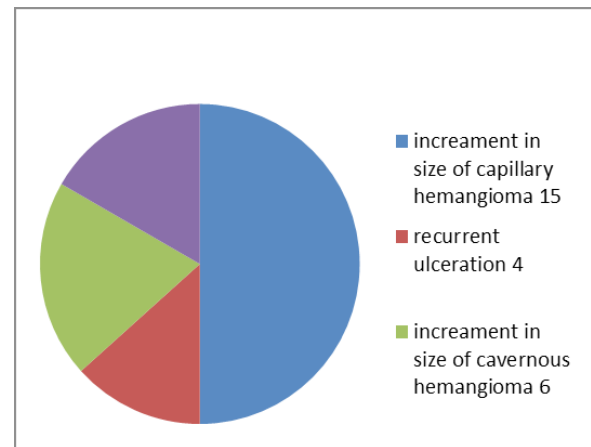


Figure (2) Presentation of hemangioma

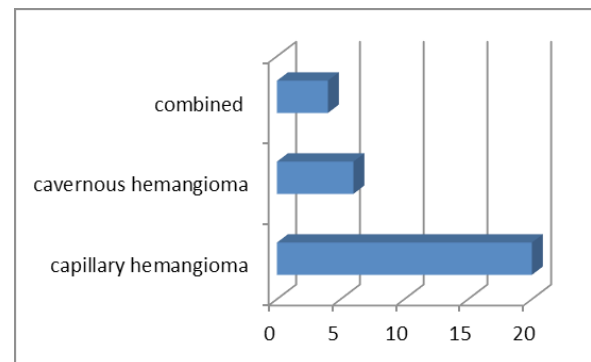


Figure (3) Types of hemangioma

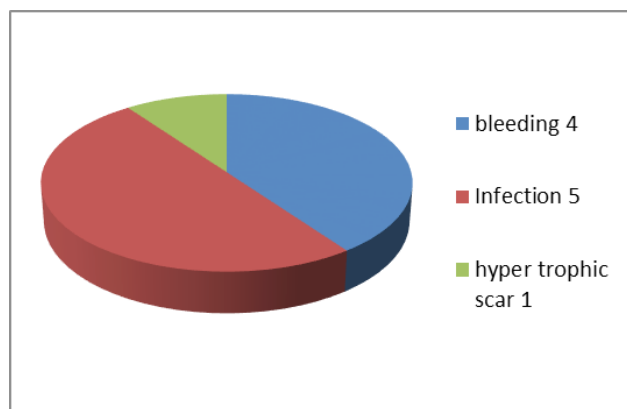


Figure (4) Perioperative complications.

Table(2), Type and size of surgical procedure

Type of Surgical procedure	Frequency	Percentage
Elliptical excision	24	80%
Linear incision	6	20%
Total	30	100%
Size of Hemangioma	Frequency	Percentage
Less than 5 cm	10	33,3%
(5-10) cm	10	33,3%
More than 10 cm	10	33,3%
Total	30	100 %

Discussion

At present work the female to male ratio was 1.3:1 unlike the study done in Goldenberg DC, et al. *Plast Reconstruct Surg.* 2016 which showed that the female-to-male ratio was 5.7:1.

In our study the most common site was the trunk then limbs followed by the face and neck unlike the study done in Goldenberg which showed that the face and limbs are the most common site .The presentation differed in our study from recurrent bleeding to increment in size to recurrent ulceration like the study done in Goldenberg DC and in Department of Pediatric Surgery, La Paz Children ´s Hospital, Spain .

in our present study, the most common type is capillary hemangioma and this is similar to the study

in Department of Pediatric Surgery, La Paz Children ´s Hospital.

The size of hemangioma ranged from less than 5 cm in one third of patients to more than 10 cm in one third of patients who underwent surgery and this is similar to the studies made by others.

Conclusion

Hemangiomas actually resolve spontaneously and only the rare and exceptional cases who needed surgical intervention were mentioned in our study. Surgical intervention was more commonly carried out in the trunk and very rarely in the face.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of dermatology / College of Medicine / University of Thi-Qar, Iraq and all experiments were carried out in accordance with approved guidelines.

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Is Glycosylated Hemoglobin A Marker of Infertility? Prospective Analytic Study

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Abstract

Infertility: Is the inability of a couple to naturally conceive, carry or deliver a healthy child after a year of unprotected intercourse⁽¹⁾. Causes: Female factors :- Problems with ovulation. Blocked fallopian tubes; this can happen as the result of pelvic inflammatory disease, endometriosis, or an ectopic pregnancy. Hormonal problems such as polycystic ovarian syndrome (pcos). In ability of the fertilized egg to implant in the uterus. Cervical hostility. Premature ovarian failure. Age; A women's fertility decline after the age of 30, both in her ability to conceive and her ability to carry pregnancy to term. Male factors: The chief factor in male infertility is sperm quality, the man may have poor motility < affecting its ability to reach ovum. Alcohol, marijuana and other drug abuse can affect sperm quality. Other possible factors include erectile dysfunction and retrograde ejaculation. Female infertility account for one third of infertility cases, male infertility for another third, combined male and female infertility for another 15%, and the remainder of cases are " un explained".

Keywords: Hemoglobin, Marker, Infertility

Introduction

Poly cystic ovary syndrome(PCOS):- Is a common endocrine disorder in women of reproductive age with primary manifestation of infertility¹. menstrual dysfunction, and clinical or biochemical hyperandrogenism (hirsutism, acne, and elevated androgens), obesity². Its other associated with hyperlipidemia and impaired glucose tolerance³. The ovaries in woman with PCOS are usually large⁽³⁾ and full of cysts, although they may not have symptoms. About 6%-10% of women have PCOS .To be diagnosed with PCOS, a women must have at least one of the clinical signs mentioned above. It is generally believed that PCOS has a genetic⁴ compenent that is influenced by environmental factors such as diet and exercise. Obesity increase the insuline resistance that often occure with women who have PCOS a hormonal imbalance⁶. Their ovaries and adrenal glands produce more androgens, specifically testosterone, and often less estrogen and progesterone than normal.

Pathophysiology: The frequency of obesity in women with anovulation and PCOS has been reported to be from 35%-60%^{6,7}, obesity is associated with three alterations that interfere with normal ovulations , and

weight loss improves all three:

- 1- Increased peripheral aromatization of androgens to estrogens.
- 2- Decreased level of sex hormone-binding globulin(SHBG), resulting in increase levels of free estradiol and testosterone.
- 3- Increased insulin level that can stimulate ovarian stromal tissue production of androgen⁵.

The ovary does not secrete increased amounts of estrogen and estradiol level are equivalent to early follicular phase concentration, circulating estrone levels are slightly elevated. The increased total estrogen is due to peripheral conversion of the increased amount of androsteredione to estrone. Both estrone and estradiol continue to be secreted in significant, although low amount. The level of sex hormone binding globulin(SHBG) are controlled by a balance of hormonal influences on its synthesis in the liver ; testosterone is inhibitory, estrogen and thyroxine are stimulating. In an ovulatory women with POCS, there is an approximately 50% reduction in circulating levels of SHBG, a response to the increased testosterone, and in patients with hyperinsulinemia due to direct insulin

effect on the liver⁷. There is increase insensitivity of the pituitary to releasing hormone stimulation, manifested by an increase in LH pulse amplitude and frequency, but mainly amplitude, this can be attributed to increase level of free estradiol because of the significant decrease in SHBG. The increase LH secretion as expressed by the LH:FSH ratio is positively correlated with the increased free estradiol^{8,9}. The lower FSH levels represents the sensitivity of the FSH negative feed back system to the elevated estrogen, both free estradiol and estrone formed peripheral conversion of androstendones. Because the FSH levels are not totally depressed, new follicular growth is continuously stimulated, but to the point of full maturation and ovulation¹⁰, follicular life span may extend several months in the form of multiple follicular cysts, 2-10mm in diameter (some can be as large as 15mm). these follicles are surround by hyperplastic theca cell, often lutenized in response to the high LH levels. As various follicles undergo atresia, the tissue derived from follicular atresia is also sustained by the steady state and now contributed to the stromal compartment of the ovary. It is not surprising that this functioning stromal tissue secrete significant amount of androstendione and testosterone, the usual production of theca cells. In response to the elevated LH, the androgen production rate is increased.

Insulin Resistance:

Is defined as a reduced glucose response to a given amount of insulin⁽¹¹⁾. There are several mechanism for the state of insulin resistance: peripheral target tissue resistance, reduced hepatic clearance, or increased pancreatic sensitivity⁽¹²⁾. The clinical presentation of patients with insulin resistance⁽¹³⁾ (whether they have impaired glucose tolerance or diabetes mellitus) depend on the ability of the pancreas to compensate for the target tissue resistance to insulin. At first, compensation is effective and the only metabolic abnormality is hyperinsulinemia. In many patients, the beta cells of the pancreas eventually fail to meet the challenges, and decline insulin levels lead to impaired glucose tolerance and type II non insulin-dependent diabetes mellitus.

Indeed, Beta cell dysfunction can be detected in women with PCOS even before the appearance of glucose intolerance.

Overall Goals of Treatment

- 1- Induction of ovulation to achieve pregnancy.

- 2- Protect the endometrium against the effects of unopposed estrogen.

- 3- Reduce the production and circulating levels of androgens.

- 4- Support life style changes to achieve normal body weight.

- 5- Avoid the effects of hyperinsulinemia on the risks of cardiovascular disease and diabetes mellitus,

- 6- Lower the risk of cardiovascular disease.

The clinical consequences of persistent anovulation

- 1- Infertility.

- 2- Menstrual bleeding problems, ranging from amenorrhea to dysfunction uterine bleeding.

- 3- Hirsutism, alopecia, and acne.

- 4- An increase risk of endometrial cancer and, perhaps, breast cancer.

- 5- An increase risk of cardiovascular disease.

- 6- An increased risk of diabetes mellitus in patients with insulin resistance.

Glycosylated haemoglobin (HbA1c)¹⁴.

Is found by covalent binding of glucose to the N-terminal Valine of the β -chain in the haemoglobin molecule throughout the life time of the erythrocyte.

In the clinical control of diabetic patients, HbA1c serves as an estimator of the time-averaged blood glucose concentration in the proceeding 3-12 weeks.

As a diagnostic tool, HbA1c may have advantage in relation to other methods, and a glycosylated proportion of 7.0% or higher has been proposed as indicative of the need for pharmacological intervention.

Subjects and Method

This is a prospective study carried out at the Maternity and Paediatrics Teaching Hospital in Al-Najaf, during the period between first January 2004 to 30th September 2004. A total of 50 patients were included in this study. They were selected from patients consult out-patient unit as first time planning for pregnancy without previous reproductive experience and patients consult infertility unit after one year of primary infertility for

the first time. 20-30 years old subjects who living with a partner were weighed in light clothes with no shoes and height has been measured ; body mass index was calculated by weight(kilograms) divided by squared height(meters). 6-months retrospective menses calendar was obtained to define of an approximated menstrual irregularity. A serum sample was frozen for later analyses of prolactin.

The measurement of HbA1c was included in the protocol from Jan 2004.

HbA1c was determine in capillary whole blood or venous blood using an immunoturbidmetric assay.

Those whom excluded from the study:

- 1- Those women had diagnosed diabetes mellitus.
- 2- Weight greater than 140 Kg.
- 3- Smoker.
- 4- Those on hormonal therapy.
- 5- Those with insulin sensitizing agents.

Results

A total of 60 patients were available for analysis. Independent t-test had been applied in statistical analysis

at level of significance P,0.05.

SPSS statistical process used V.10.

P>0.05 not significant.

P< 0.05 significant differences.

Table (1):Relationship between Body mass index of 50 subjects with their mean glycosylated haemoglobin.

Group	Number of subject	Mean value of HbA1c	SE mean	Sig. (2-tailed)
BMI<25	13	6.3538	0.6233	0.021 *
≥25	37	8.8973	0.5909	0.006

* significant at P value <0.021

50 subject were weighted in light clothes no shoes and weight(kilograms) divided by squared height(meters) with measurement of HbA1c. A high body mass index was significantly associated with high HbA1cas been shown in table (1) with P. value<0.021.

Table (2) : Relationship between regularity of the menstrual cycle and the mean value of HbA1c.

Regularity of menstrual cycle	Number of subject	Mean value of HbA1c	SE mean	P.value
Regular	22	5.8773	0.2417	0.0001
Irregular	28	9.8926	0.7900	

6-months retrospective menses calendar was obtained to define an approximated menstrual irregularity.

Irregularity of the cycle was significantly associated with high HbA1c With P.value<0.0001.

Table(3): Relationship between the ultrasound finding which related to PCOS and the mean value of HbA1c

PCOS u/s finding	No.	Mean	SE mean	Sig. (2-tailed)
Not present	29	7.7862	0.5258	0.496*
Present	21	7.2381	0.4940	0.494

* no significant association at P.value>0.05.

(Independent sample Test)

Ultrasound examination of those 50 subject reveal presence of ultrasonic finding of polycystic ovary syndrome in (21) of the subject (27 of the total with history of primary infertility not receive treatment till now).

Table (4): Relationship between S.Prolactin level and mean value of HbA1c

S.prolactin level	Number of subject	Mean value of HbA1c	SE mean	Sig. (2-tailed)
Normal	17	8.5059	0.9150	0.272 *
Abnormal	10	9.3900	1.4794	

* no significant association at P.value>0.05.

A serum sample was frozen for later analysis of prolactin for those 27 subjects (whose had history of primary infertility) show 10 of them only presented with biochemical prolactinemia while the rest 17 with normal level. There is no significant association between high prolactin level and high HbA1c with P. value of 0.272.

Discussion

The results indicated that females HbA1c may be a marker of infertility. The level of HbA1c differed significantly between the East and West centres (mean 4.83 versus 4.65 P<0.0005). All couples at the East centre were interviewed at the hospital and HbA1c was measured simultaneously from a capillary blood sample, while for the majority of samples at the west

centre(70%), a sample of various blood sample obtained for later analysis at the laboratory, this may explain the observed differences between the centres.

Possible Physiological mechanisms: Polysystic ovary syndrome(PCOS) is characterized by enlarge ovaries containing an increased number of follicles, and a hyperandrogenic hormone profile involving increased plasma concentrations of testosterone and luteinizing hormone(LH), decreased serum hormone binding globulin(SHBG) and hyperinsulinism¹⁵⁻¹⁷. The prevalence of PCOS syndrome among premenopausal women has been estimated as 5-8%, but usually PCOS diagnosed only when women seek medical advice for hirsutism, oligomenorrhea or infertility¹⁷, using ultrasound detection methods, the prevalence of an ovarian morphology typical of PCOS was shown to be approximately 20% in population samples of adult women and a considerable proportion had a hyperandrogenic hormone profile^{18,19}. These women generally have a normal menstrual and normal body mass index. PCOS has no single organic aetiology, but chronic overstimulation of ovarian steroid synthesis caused by insulin or insulin-like growth factor secondary to decrease insuline sensitivity may be a central feature of the complex hormonal dysregulation leading to this syndrome¹⁶. In this present study only a single blood sample was obtained, irrespective of the timing with respect to the menstrual cycle. A high concentration of HbA1c was associated with a high body mass index. A high concentrate of HbA1c was associated with irregularity of cycle and this differ from the result obtained by Niels Henrick I Hjollund , Tina Kold Tensen, Department of occupational Medicine, Aarhus University Hospital,Norrebrogade, a following study of first time pregnancy planners. HbA1c was not related to ultrasonic finding of PCOS, s-prolactin level. This similar to the result obtained by Department of Gynecology and Obstetrics, Aarhus University Hospital , Aarhus , Denmark,a following study of first pregnancy planners.

Conclusion

Female infertility account for one third of infertility cases, male infertility for another third, combined male and female infertility for another 15%, and the remainder of cases are “ un explained”.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Maternity and children hospital in Al- D iwaniayah, Iraq and all experiments were carried out in accordance with approved guidelines.

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Serum Salusin- α and Salusin -b levels with some Biochemical Parameters in Patients with Major Thalassemia

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ABSTRACT

Thalassemias are a heterogeneous group of genetic disorders in which the production of normal hemoglobin partially or completely is suppressed because of defective synthesis of one or more globin chain. It is sometimes called Mediterranean anemia. Many biochemical changes in the blood accompany this disease. In this research, some biochemical parameters were measured in thalassemic patients and compared with healthy control group. These parameters include serum Iron, ferritin, TIBC, transferrin, transferrin saturation percentage, Salusin- α , salusin- β , insulin, and lipid profile. The aim of this study was to Measuring the level of cytokine(salusin- α and salusin -b) lipid profile, blood sugar level and resistance to insulin in serum of thalassemia patients and Find interconnectivity between cytokine(salusin- α and salusin -b), iron, lipid profile, blood sugar level and insulin resistance. The results of the research showed that there is a significant increase ($P < 0.05$) in BMI, serum iron, ferritin, TIBC, TS%, FBG, Insulin, HOMA- β , TG, cholesterol, HDL-C, LDL-C, and salusin -b in thalassemic patients group in comparison with healthy control group. A significant decrease ($P < 0.05$) in HOMA-IR and salusin- α . There is no significant difference ($P > 0.05$) in Age, TIBC, Transferrin, and VLDL-C.

Key words : Major thalassemia, salusin alpha, salusin beta, HOMA-IR.

Introduction

The thalassemias are inherited anemias caused by mutations that affect the production of the globin chain, the protein elements of the hemoglobin. Thalassemias produce a enormous public health problems in many parts of the world²⁴. These hereditary anemia caused by reduced or absent production of one type of globin chain either α or β globin chain. These disorders range from asymptomatic to severe

anemia that can cause significant morbidity and mortality¹⁵.

Major morbidity and mortality can result from iron overload, liver dysfunction and failure, pan- endocrine failure, heart failure and fatal cardiac arrhythmias, which establish the main concerns in weakly chelated patients¹⁸. Thalassemias are classified according to which specific globin chain(s) is/are produced in a reduced amount, which may lead to an inequality in globin chains synthesis, unproductive erythropoiesis, hemolysis, and ultimately to a variable degree of anemia. The chief types of Thalassemias are the a, b, db, d, and gd. The

a and b thalassemias are the most common types, and b thalassemia is the most important and broadly spread type which causes severe anemia in the homozygous and compound heterozygous states^(27,26,9). The typical treatment of severe beta-thalassemia is at this time based on medical treatment, and a blood transfusions, iron chelation and splenectomy, permitting an increased being alive and improvement of the patients' quality of life²³.

In 2003, salusins was defined as a new class of vasoactive peptides by Shichiri et al. Salusin-alpha (Sal- α) and salusin-beta (Sal- β) are peptides composed of 28 and 20 amino acids, correspondingly. Preprosalusin is mostly excreted from vascular smooth muscle cells and endothelial cells.²⁰ Salusins are synthesized and released from the renal system, central nervous system and vascular system of human²² While salusins are expressed from coronary atherosclerotic clots, expression of Sal- α is detected at a lower ratio when associate to that of Sal- β ²⁵. In an in vivo study, it was exposed that Sal- β was synthesised by fibroblasts in the vascular smooth muscle cells of the media layer and by the media layer of aorta during coronary artery bypass graft surgeries in patients

with coronary artery disease². Salusins have differently effect on haemodynamic activities⁶. In the present study, detection of low salusin-alpha and high salusin-beta levels in major Thalassemia patients suggest the possible effect of decreased salusin-alpha and increased salusin-beta levels in rapid reactionary responses. We detected significant differences between groups regarding salusin levels on TM. This supports the idea that low levels of salusin- alpha and high levels of salusin-beta levels differ significantly in patients with Major Thalassemia to healthy people. In this study, we detected that salusin levels were increased an average of 2 hours after onset of chest pain.¹⁶.

Materials and Method

A case-control study was conducted in "Thalassemia Unit" at "AL-Zahra'a Teaching Hospital" in Najaf city-Iraq, during the period from September to December 2018. The present study included of Sixty Iraqi thalassemia major patients. Their ages ranged 1-28 years old and Thirty apparently healthy subjects were selected as control group. Their age ranges were similar to that of patients. None of these subjects was anemic or has an obvious systemic disease or any chronic diseases. The Body Mass Index was measured by dividing weight in kilograms by length of individual in square meter: $BMI = (\text{weight in kg}) / (\text{height in meters}^2)$.¹³. Fasting venous blood samples were collected from patients and control group and the serum was separated and stored at - 20 °C until they were for analysis. Serum Iron was estimated by using colorimetric method¹⁹, TIBC were estimated by using colorimetric method. The Ferritin were determined by ELISA assay (Elabscience,USA). The percentage of transferrin saturation was calculated by using the formula: $\text{Transferrin (g/L)} = \text{Serum iron } (\mu\text{mol/L}) / (3.98 \times \text{TS}\%)$ (Morgan, Dean, & Davies, 2002). Fasting investigation of Serum glucose, and lipid profile (TC, TG, LDL-C and HDL-C) levels were estimated by the colorimetric method for the quantitative in vitro diagnostic measurement using a kit. Insulin were measured determined by ELISA assay (CALBIOTCH Company,USA) Insulin resistance index (Homeostatic model assessment-insulin resistance, HOMA-IR) was estimated as follows: $HOMA\ IR = [\text{glucose (in mg/dl)} \times \text{insulin (} \mu\text{U/ml)}] / 405$ $HOMA\ \beta\ \% = 360 \times \text{insulin} / (\text{Glucose} - 63)$.⁸. Salusins (Sal - α and sal - β) were determined by ELISA assay (Elabscience,USA).

Statistical Analysis

Statistical analysis was performed using two statistical software, the Statistical Package of Social Science (SPSS ver. 21) and Graphpad Prism ver.5. Continuous variables were expressed as mean \pm standard deviation (SD). Significant differences were assessed using Paired t-test and independent t-test for variables with equal and unequal frequencies respectively. Bivariate correlations were assessed using standardized Pearson coefficients. The *p* values obtained of less than 0.05 and 0.01 were considered as statistically and highly statistically significant respectively.

Results and Discussion

The anthropometric and biochemical variables of the Thalassemia patients and healthy control group was summarized their statistical significance in Table 1. The present study demonstrated Non significant difference in age of thalassemia patients when compared to those of control group. The results of BMI revealed a significant decrease ($p < 0.05$) in groups of thalassemia patients compared with healthy group

On the other hand, found a significant increase in serum iron, ferritin, UIBC, TS%, FBG, Insulin, HOMA- β , TG, cholesterol, HDL-C, LDL-C, and salusin - β in patients with Major Thalassemia compared with healthy group but significant lower in HOMA-IR and salusin- α , ($p > 0.001$) while TIBC, Transferrin, and VLDL-C non-significant.

In Table (2) found a Correlation between Salusin α and studied variables in Major Thalassemia patients. Age, TIBC, and UIBC, have a positive correlation, and significant with *P* value ($P < 0.05$). while Salusin β , FBG and Transferrin are a negative correlation and significant.

In Table (3) found a Correlation between Salusin β and studied variables in Major Thalassemia patients Salusin α are a negative correlation and significant with *p* value ($P < 0.05$).

Homeostatic model assessment (HOMA) is a moderately simple method of estimating insulin resistance and beta-cell function by using the fasting plasma measurements of glucose and insulin¹⁷ Patients with Thalassemia major present decreased HOMA-B and elevated HOMA-IR levels compared with healthy people²¹ or displayed decreased HOMA-B and elevated HOMA-IR levels after follow-up¹⁴ Similar to previous studies, we demonstrated decreased HOMA-B in

patients without diabetes. Studies in patients with thalassemia and hereditary hemochromatosis who had chronic iron overload showed that glucose dysregulation occurred as a result of insulin resistance followed by β -cell dysfunction¹² Excessive iron causes insulin resistance and subsequently, pancreatic β -cell apoptosis and insulin deficiency⁴.

Table(1):The anthropometric and biochemical variable of major thalassemia patients and control

Parameter	Patients (n=58) Mean \pm SD	Control (n=30) Mean \pm SD	P-value
Age(Yrs)	17.28 \pm 5.758	17.97 \pm 6.990	N.S
BMI (kg/m ²)	17.67 \pm 3.73	29.11 \pm 14.46	0.000**
Ferritin(ng/ml)	3472.22 \pm 2356.84	123.70 \pm 48.05	0.000**
IRON (μ mol/L)	35.68 \pm 8.19	23.83 \pm 6.096	0.000**
TIBC (μ mol/L)	63.56 \pm 19.01	68.81 \pm 12.61	0.175 NS
UIBC	27.88 \pm 15.03	44.98 \pm 12.47	0.000**
TS%	58.71 \pm 13.34	35.52 \pm 11.78	0.000**
Transferrin(g/L)	0.16 \pm 0.05	0.17 \pm 0.03	0.175 NS
FBG(mg/dl)	123.79 \pm 26.01	86.41 \pm 10.45	0.000**
Insulin (mIU/mL)	10.20 \pm 4.79	5.27 \pm 2.17	0.000**
HOMA-IR	2.82 \pm 1.92	1.84 \pm 1.34	0.014*
HOMA- β %	66.74 \pm 10.48	89.86 \pm 13.24	0.001**
TG(mg/dL)	86.01 \pm 6.24	83.01 \pm 8.73	0.000**
Cholesterol(mg/dL)	122.07 \pm 12.05	136.53 \pm 20.09	0.000**
HDL-C(mg/dL)	24.62 \pm 2.43	47.47 \pm 4.05	0.000**
LDL-C(mg/dL)	82.38 \pm 11.76	91.91 \pm 16.23	0.002**
VLDL.C	16.88 \pm 5.08	17.62 \pm 2.96	0.464 NS
Salusin α (pg/mL)	54.11 \pm 7.87	57.59 \pm 7.41	0.048*
Salusin β (pg/mL)	48.65 \pm 6.69	44.38 \pm 7.36	0.009**

BMI: body mass index FBG: fasting blood glucose
HOMA-IR: hemostasis model assessment-insulin resistance, HOMA- β %: hemostasis model assessment-beta cell percentage. TG: triglyceride, HDL-C: High-density lipoprotein-cholesterol, LDL-C: low density lipoprotein-cholesterol. Data represented as Mean \pm SD: standard deviation, NS= nonsignificant differences at (P>0.05). *=significant differences at (P \leq 0.05), **=significant differences at (P \leq 0.01).

Salusin α is associated with renal dysfunction in patients with chronic renal failure¹¹. It was concluded that renal disorders are not rare in patients with beta-thalassemia major, iron and oxygen radicals may play a key role in the progression of chronic renal failure, the fact

that may be related to the changes in kidney excretion of different substances. Patients with Hemoglobinopathies including thalassemia would develop albuminuria and this may affect the blood concentration of albumin.⁷

Salusin is expressed not only in peripheral tissues but also in the central nervous system including neuronal cells of the hypothalamo-pituitary tract²². Intravenous administration of salusin- α or salusin- β was shown to cause a rapid decrease in arterial pressure; however, the depressor response of salusin- β was greater than that of salusin- α . Moreover, these depressor responses were concomitant with a decrease in heart rate²⁰.

Table (2): Correlation between Salusin α and studied variables in Major Thalassemia patients.

Variables	R	P-Value
BMI	0.042	0.826
age	0.351	0.057
Salusin β (pg/mL)	-0.848**	0.000
Insulin(μ IU/mL)	-0.024	0.898
HOMA-IR	-0.258	0.169
HOMA- β	0.026	0.893
Ferritin (ng/mL)	-0.303	0.104
IRON (μ mol/L)	-0.001	0.995
TIBC (μ mol/L)	0.454*	0.012
UIBC	0.458*	0.011
TS%	0.294	0.118
Transferrin (g/L)	-0.454*	0.012
HDL.C	0.158	0.405
VLDL.C	0.115	0.544
LDL.C	0.175	0.355
CHO	0.158	0.404
TG.C	0.119-	0.531
FBG	-0.386*	0.035

P- Value \leq 0.05 = significant, r : Pearson correlation. *=*significant differences at (P \leq 0.05), **=*significant differences at (P \leq 0.01).**

Salusin-beta has been shown to have effects on heart through cholinergic mechanisms and cause hypotension, bradycardia, and cardiac dysfunction without affecting systemic vascular resistance ¹⁰

Thalassemia patients developed heart complications represent significant morbidity and remain the leading cause of mortality in transfusion. Cardiac structure and function in thalassemia are mainly affected by two competing factors: iron overload and increased cardiac output (CO). The cardiac iron deposition results in a decrease of left ventricular function. The anaemia together with marrow expansion leads to volume overload and increased CO that then demands increased contractility adding additional stress to the heart (Starling’s Law). Cardiac dysfunction in thalassemia manifests with congestive cardiac failure (CCF), arrhythmias and ultimately.

Premature deaths, in some cases, because of the difficulty in accepting the chelation treatment, which was cumbersome, but also occurred even in some patients who accepted the chelation therapy well.^(5, 1)

Table (3): Correlation between Salusin β and studied variables in Major Thalassemia patients

Variables	r	P-Value
BMI	-0.079	0.679
age	-0.264	0.158
Salusin α (pg/mL)	-0.848**	0.000
Insulin(μ IU/mL)	0.037	0.845
HOMA-IR	0.280	0.138
HOMA- β	-0.111	0.558
Ferritin (ng/mL)	0.211	0.262
IRON (μ mol/L)	0.103	0.588
TIBC (μ mol/L)	-0.354	0.055
UIBC	-0.307	0.099
TS%	0.119	0.531
Transferrin (g/L)	0.354	0.055
HDL.C	-0.268	0.158
VLDL.C	-0.128	0.500
LDL.C	-0.284	0.128
CHO	-0.264	0.162
TG.C	0.142	0.454
FBG	0.313	0.092

P- Value \leq 0.05 = significant, r : Pearson correlation. *=*significant differences at (P \leq 0.05), **=*significant differences at (P \leq 0.01).**

New results for major thalassemia patients in salusins levels in the current study found that serum salusin alpha levels are significantly lower and salusin beta are significantly higher in patients with major thalassemia compared to healthy as a control group.

Conclusion

In conclusion, the current study have demonstrated that salusins, newly identified bioactive peptides with potent hemodynamic activities, Measurement of serum, Salusin α and Salusin β levels may provide a novel approach to identify patient with major Thalassemia. , our results demonstrated the decrease in serum salusin- α levels in patients with major thalassemia .further,

this study confirmed previous finding reporting that its decrease plays a role in the development and progression of heart disease and renal system . The present study suggests that salusin- α may be a novel therapeutic candidate for the treatment mainly effect the cardio vascular system and further insulin and Salusin β levels increase in serum of major Thalassemia patients.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Science, University of Kufa, Iraq and all experiments were carried out in accordance with approved guidelines.

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Isolating Liver abnormalities in CT Scan Images Using Enhancement Based Technique

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Abstract

One of the most dangerous diseases that causes death is liver cancer. As faster as detection of liver tumors and other abnormalities, as chances of survival will be increased. There are many modalities of medical scanning such as CT scan can be adopted for early detecting of the presence of any liver abnormality. In this study many CT scan liver images were adopted to investigate the robust performance of the proposed segmentation method. The proposed technique is an enhancement histogram based method employed here for segmentation purpose. The results of the presented technique showed the success of the technique in isolating and extracting the abnormal regions adequately. As well as, the implemented segmentation technique succeeded to extract the approximated whole liver regions according to the consultation of the radiologist. The processed technique was evaluated by calculating its accuracy to extract abnormal regions and it was 100%, whereas for extracting the whole liver regions the accuracy was 90%. In this study, the percent relative surface area of the abnormal regions were calculated as well.

Keywords: contrast adjusting, liver cancer, segmentation, enhancement, morphological operations.

Introduction

Liver locates at the upper right side of the human abdomen and it occupies the largest area among the various organs within the abdomen image ¹. It is well known that liver is built up of different types of cells, all types of liver cells are susceptible to many types of tumors, cancerous or noncancerous ². Computed Tomography, CT and many other modalities of medical imaging represent essential tools for fast diagnosis of the presence of any abnormal case within any member or organ of the body including the liver ³. Identifying liver on CT abdominal image is a challenging task due to the similarity of the intensity of other organs with the liver's intensity, and this makes the segmentation process more difficult ¹. According to the importance of detecting tumors and other abnormalities of liver, many researchers dedicated their efforts to process the medical images of liver in order to determine the site, area, volume and the shape of the abnormal regions as well as any other meaningful information to facilitate accurate diagnosis. One of the most principal processes,

is segmenting of the medical images to isolate or extract the abnormal regions. Several segmentation techniques were presented to handle this task, and many of these techniques gave promising findings ^(3, 4). Some researchers adopted and implemented clustering algorithms to segment medical images, while others proposed texture based methods and other researchers implemented neural network approaches and many other methods, see for examples ^(1, 3, 5-11). In this work a simple and accurate technique is presented. The proposed technique is an enhancement histogram based method employed here for segmentation purpose to isolate and extract liver abnormalities.

Enhancement Contrast based Technique

The objective of enhancement techniques of digital images is to improve the quality or the characteristics of the processed images, in such a way that, the resultant images become better than the original ones if they compared according to a specific criterion ¹². When the contents of the processed image are difficult to identify, contrast adjustment becomes essential, especially due to its ability to enhance the details in dark and bright regions ¹³. There is no general theory of image enhancement. When an image is processed for visual interpretation,

the viewer is the ultimate judge of how well a particular method works¹⁴. Enhancing an image in spatial domain depending on the image’s histogram, which is adopted in this work, is well explained in details in (14-16).

Experiments Procedure

The procedure of this work can be summarized as follows:

1. Input liver images.
2. Test many gray level ranges of the input images to be the whole intensity.
3. Select the proper range that differentiate the liver region upon other parts.
4. Utilize different morphological operations to get the liver region only.

5. Repeat steps 2 &3 to differentiate the abnormal regions upon other parts of liver.
6. Use different morphological operations to isolate the abnormal regions only
7. Calculate the surface area of the extracted liver regions as well as the abnormal regions.

Experimental Images

Many CT scan liver images were adopted to investigate the performance of the proposed technique, Figure (1) presented five of them as examples. These five images are of (992x866, 1080x731, 1280x1066, 1280x1134 and 1280x858) pixels of size from first image to the fifth one respectively. All the adopted images were acquired from the internet websites. According to the consultation of the radiologist, these images are for patients suffer from Haydatid cyst, Haydatid cyst, tumor, bloody hematoma and Hydro. cyst for the five images from the first to the fifth one respectively.



Figure (1): Input medical liver images.

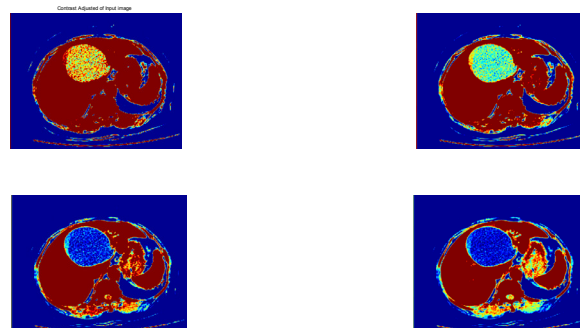
Experiments and Results

The steps of fulfilling this work are presented as follows:

Suitable Intensity Ranges

Many gray level ranges of the input images were tested to be the whole intensity of the experimental images to select the proper range that enable isolating the liver regions and the abnormal regions within the input images. These ranges are ranged from [0.1- 0.3] to [0.5-0.8]. Figure (2) shows samples of the contrast adjusted images

for the five tested images.



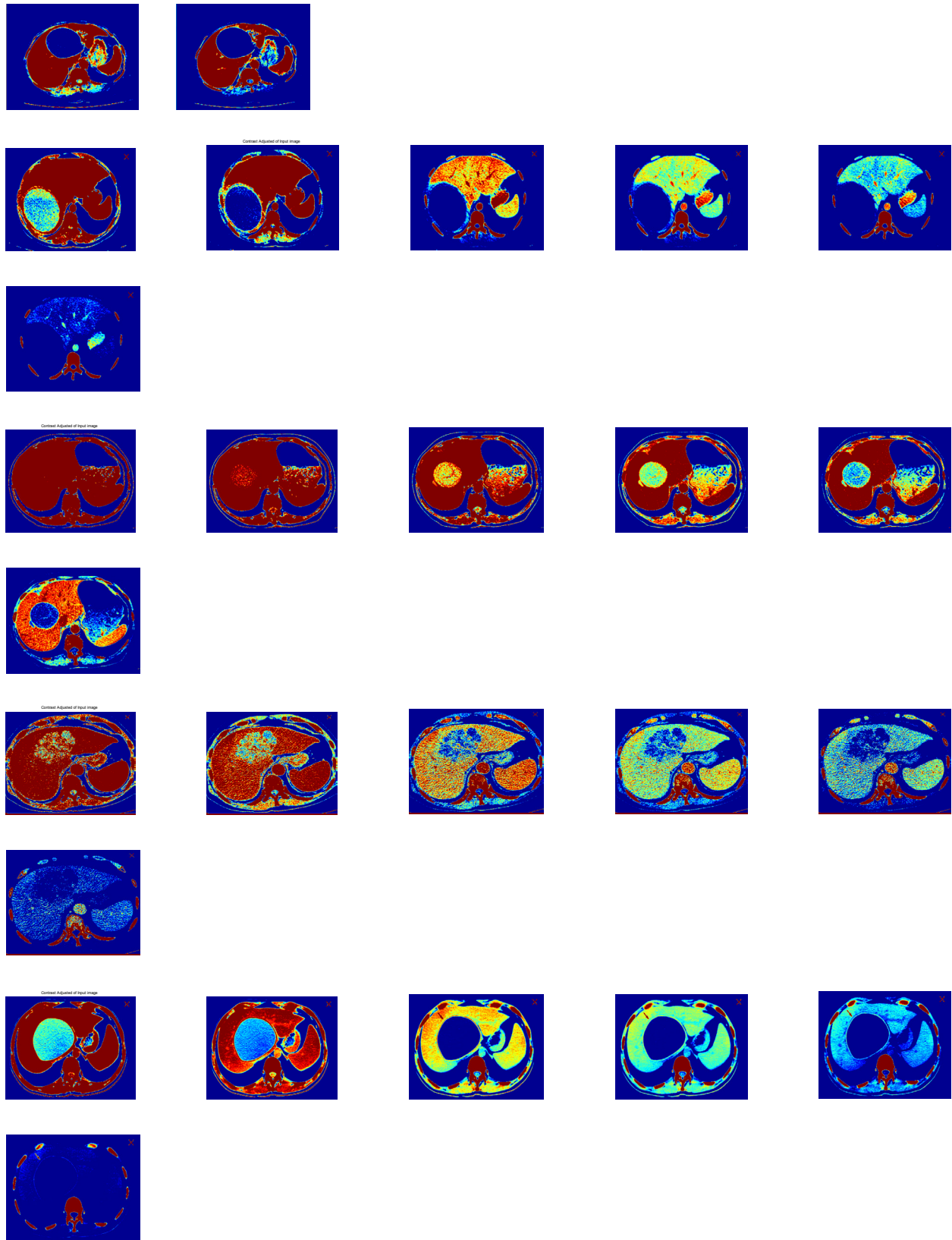


Figure (2): Contrast adjusted images for different selected gray levels for the adopted medical liver images.

In Figure (2), the contrast adjusted images for different selected gray levels for five liver images from first line to the fifth one to highlight the abnormal regions ones . To extract abnormal regions, it is found that, the ranges $[(0.2-0.5), (0.1-0.3), (0.3-0.7), (0.2-0.5)]$ for the first four images respectively, were the most proper ranges to highlight liver regions desired regions. While for the whole liver regions isolation, the ranges $[(0.3-0.6), (0.2-0.3), (0.5-0.8)]$ and $(0.2-0.4)$ for the five images respectively are the suitable ranges to highlight the

Isolating and Extracting of Liver Regions

By adopting the proper gray level rang to be the image whole range and by the aid of the morphological opening process with disk shaped structure elements, as well as implementing area selector, the liver regions could be extracted. Figure (3) showed the results of this step for four liver CT images. The selected gray level range and the radii of the structure element depend on the processed images and differ from image to another. The approximated extracted live regions are presented in second line, while the third line shows the gray images

of the liver after convoluting the B/W images of second line with the original input images.

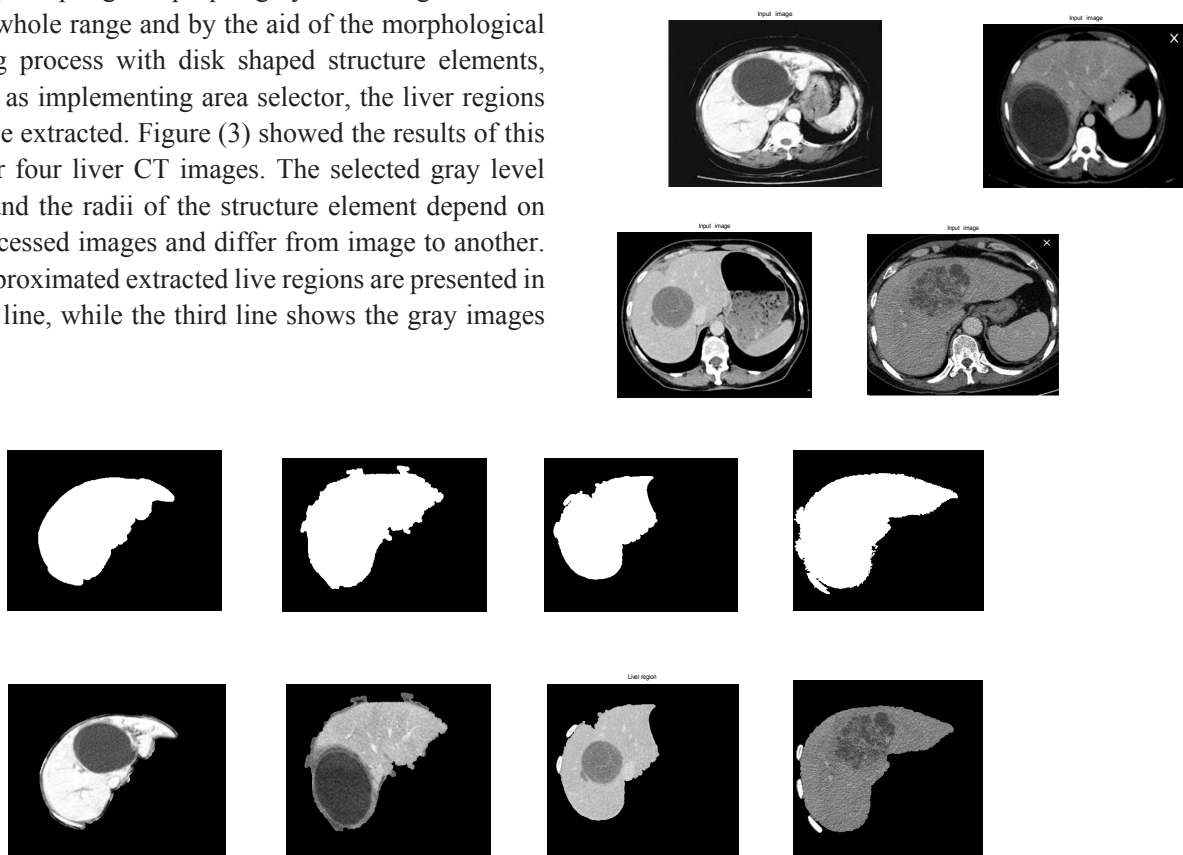


Figure (3): Results of extracting approximated final liver regions for the adopted medical liver images.

Extracting the Liver Abnormal Regions

From different gray level ranges, the suitable ones that enable isolating abnormalities upon other liver regions, were adopted to extract the abnormal regions. Opening morphological process and selecting areas function were applied to achieve the extraction process completely. The adopted radius of the structure element depends on the

processed image and it differ from image to another. Figure (4) presents the results of this step, the refined extracted abnormal regions are shown in the third line.



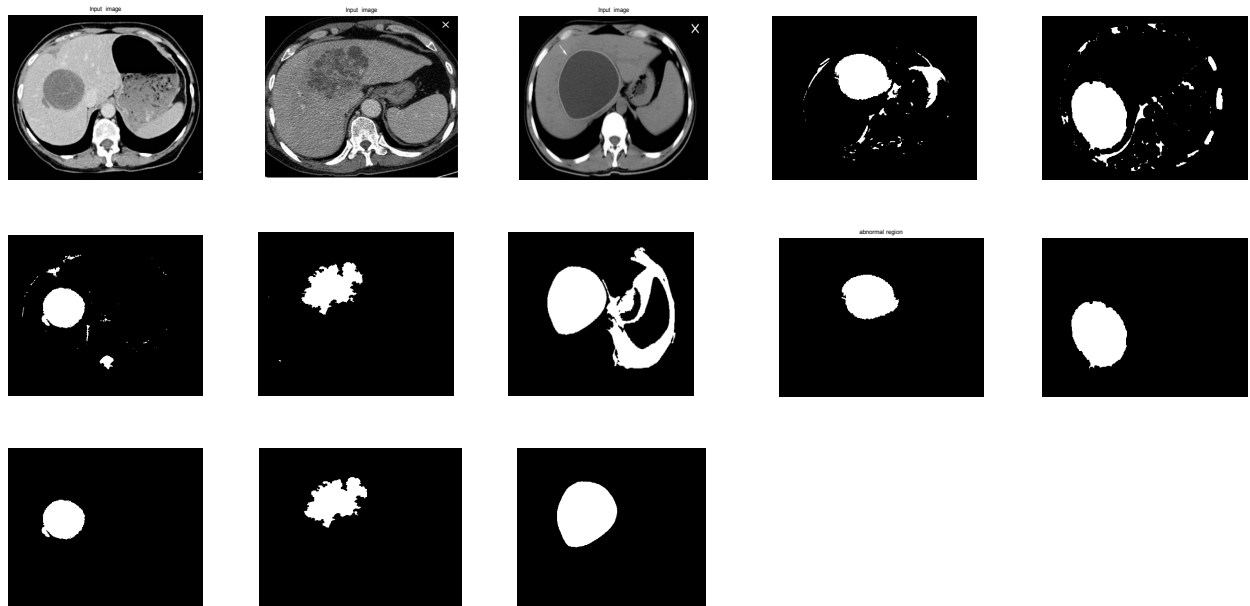


Figure (4): Results of extracting refined abnormal regions for the adopted medical liver images.

The surface area (white pixels in B/W image) of the approximated extracted liver regions and the surface area of the refined extracted abnormal regions were calculated, as well as the percent relative surface area of the extracted abnormal regions with respect to the surface area of the extracted live regions was calculated also and presented in Table (1). The proposed segmentation

technique was evaluated for its accuracy by calculating the number of succeeded cases to the total number of the processed images, and it was found that the accuracy equals 100% for extracting the abnormal regions and the accuracy equals 90% for extracting the whole liver regions without extra portions of other organs within the abdominal.

Table (1): Calculated surface area of the extracted approximated liver regions and the refined extracted abnormal regions as well as the percent relative surface area of the extracted abnormal regions.

Image	Image1	Image2	Image3	Image4	Image5
Surface area of extracted liver region (pixel)	164833	247427	332568	488607	*
Surface area of extracted abnormal regions (pixel)	49178	67002	54861	78723	110048
Percent relative surface area of extracted abnormal regions (%)	29.8400	27.0795	16.4962	16.1117	*
*Liver region of this image could not extract without extra portions of other organs.					

Conclusion

It is known that CT scan can be adopted for early detecting liver abnormalities. In this study, many CT scan liver images were adopted to investigate the robust performance of the proposed technique which is an enhancement histogram based method employed here for segmentation purpose. The results showed the success of the presented technique in isolating and extracting the abnormal regions adequately. As well as, the proposed segmentation technique succeeded to extract the approximated whole liver regions. The processed technique was evaluated by calculating its accuracy to extract abnormal regions and it was 100%, whereas for extracting the whole liver regions the accuracy was 90%. In this study, the percent relative surface area of the abnormal regions were calculated as well.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under College of Science, University of Babylon and all experiments were carried out in accordance with approved guidelines.

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Factors Affecting Self-Care Behaviors of Patients with Heart Failure

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Abstract

A Descriptive Correlational Design is carried out in Al-Najaf City/Al-Najaf Al-Ashraf Health Directorate / Al-Sadder Medical City, from October, 17th, 2018 to June, 13th, 2019, in order to assess Self-Care Behaviors of Heart Failure Patients, and to assess the factors affecting patients with heart failure. A Non-Probability (Purposive Sample) of (110) patients who had heart failure, those who visit Al-Sadder Medical City for follow up, treatment, or both. Reliability of the questionnaire is determined through a pilot study and the face validity is determined through a panel of experts. The data are collected through the utilization of the developed questionnaire after the validity and reliability are estimated, and by means of interview technique. The data are described statistically and analyzed through use of the descriptive and inferential statistical analysis approaches. The findings of the present study indicate that the overall assessment for the patients' self-care behaviors is fair. In addition, the overall assessment of patients' self-efficacy toward self-care behaviors is fair, and the overall assessment of patients' attitude toward self-care behaviors is good.

Keywords: *self-care behaviours, heart failure, factors*

Introduction

Cardiovascular disease is presently one of most prevailing cause of death within world. In the 19th century, poor diet and infection disease were the reasons of most deaths and morbidities. Nowadays, Cardiovascular disease accounts for around 30% of completely deaths in more than 35 years old. concurring to statistical of 2008 mortality, over 2200 Americans die of Cardiovascular disease daily ¹⁹. Cardiovascular diseases is the essential cause of death in different created nations. In 2000, CVD is responsible for over 1.9 million of them within European Union, about 4.35 million deaths in Europe, accountable for 43% of totally deaths in men and 55% of totally deaths in women ^(1, 13). In addition to CVD is developing to become the biggest killer in the developed countries since the early 1900 ⁷. whereas the hazard of cardiovascular mortality was once moderately low in youth, collecting evidence recommends that CVD has its roots in childhood ¹⁶. Furthermore various hazard components have been connecting to the advancement of cardiovascular disease involving: poor dietary habits, weight gain, high blood pressure, diabetic mellitus, alcohol utilization, tobacco use, & impaired physical activity levels. Of relevance, numerous of these risk

factors are linked and reversible through a healthy diet and increased physical movement. ²¹. Universally, cardiovascular diseases are the number one cause of death and they are anticipated to stay so. An evaluated 17million individuals died from cardiovascular disease in 2005, representing 30% of all worldwide deaths, of these deaths, 7.2 million were due to heart attacks and 5.7 million due to stroke. Almost 80% of these deaths happened in low- and middle-income nations. If current trends are allowed to proceed, by 2030 an evaluated 23.6 million individuals will die from cardiovascular disease (basically from heart attacks and strokes). Cardiovascular diseases include: Coronary heart disease, valvular heart diseases, hypertension, peripheral artery disease, rheumatic heart disease, congenital heart disease, and heart failure ^(9, 2). In the middle east, in hospital mortality was 5.3% among acute HF patients, increasing to 7.5% at 30 days. However, the study was based in Riyadh, the capital of Saudia Arabia. A Yemeni study indicated that in hospital mortality was 9% (Al-Shamiri, 2013). Heart failure, frequently referred to as congestive heart failure (CHF), is when the heart is incapable to pump adequately to preserve blood flow to meet the body's needs. Signs and symptoms commonly include shortness of breath, excessive tiredness, and leg swelling. The shortness of

breath is usually worse with exercise, while lying down, and may wake the person at night. A limited ability to exercise is also a common feature. Chest pain, including angina, does not typically occur due to heart failure. HF can be caused by coronary artery disease, heart attack, cardiomyopathy, high blood pressure, atrial fibrillation, valvular heart disease, and infection ²⁰.

In addition, heart failure can influence the right or left side of the heart, or both at the same time. It can be either an acute (short-term) or chronic (continuous) condition. In acute heart failure, the symptoms appear abruptly but go away reasonably rapidly. This condition frequently happens after a heart attack. It may moreover be a result of a problem with the heart valves that control the flow of blood in the heart. In chronic heart failure, however, symptoms are continuous and don't improve over time. The vast majority of heart failure cases are chronic. HF is a chronic, quickly quickening disease that currently has no cure ²⁰.

Methodology

Design of the Study:

A Descriptive correlational Design is adopted in the current study to achieve the study objectives. The study started from October, 17th, 2018 to June, 13th, 2019.

Ethical Considerations and Administrative Agreements:

This is one of the most essential principles before data collection, to preserve the participants' principles and self-esteem. The researcher gets an agreement from the Faculty of Nursing / Kufa University to conduct the study, another agreement is gotten from the Ethical Committee in Faculty of Nursing, Also, an official agreement is taken from the Ministry of Planning/ Central Council for Statistics in order to accept the study questionnaire. Another agreement is gotten from Al-Najaf Al-Ashraf Health Directorate/ Al-Sadder Medical City/ CCU Unit, Medical Emergency Department, and Medical Wards, to interviewing each subject. And lastly, subject's agreement also was gotten from the patient him/herself after the researcher clarified the purpose of the study, seeks informed consent; and offered a respect to participants confidentiality in addition to making the participation voluntary to answer the questionnaire items.

Setting of the Study

The study is conducted in Al-Najaf Al-Ashraf City/Al-Najaf Al-Ashraf Health Directorate / Al-Sadder Medical City/ CCU Unit, Medical Emergency Department, and Medical Ward.

Sample of the Study:

A Non-Probability (Purposive Sample) of (110) patients who had heart failure, those who visit Al-Sadder Medical City/ CCU Unit, Medical Emergency Department, and Medical Ward for treatment, follow up, or both.

Sample Size :

The researcher utilized the power analysis method(Cohen's method) to determine the study sample size. This method can be clarify through its factors which involve: power, effect size, and level of significance. Power is an important factor to determine an adequate sample size for descriptive correlational study. Power is the capability of the study to determine the relationships between causality variables. The less acceptable power level factor for nursing studies is 80%, and the larger the power, the bigger the sample size that is required. The effect size was determined based on three levels of effect size: large effect (0.10), moderate effect (0.30), and small effect (0.50). The significance level or alpha (α) for this study was 0.05, because 0.05 means that the accepted chance of being wrong is only 5% of the time or less after infinite frequent sampling ⁴. Hence, based on the following factors (power = 90, α = 0.05, and effect size = 0.30), the adequate sample size that was needed for this study was a minimum of (N =91). Nevertheless, to increase sample size that was wanted increase the power level of the study, and use more than 90% of power level and have become a total of (N = 110).

The Study Instrument:

An assessment tool is adopted and developed by the researcher to assess the patients' self-care behaviors, and factors affecting self-care behaviors. The complete instrument consists of four parts: demographic data, clinical data, patients' self-care behaviors, and the factors affecting patients' self-care behaviors instrument.

Validity of the Study Instrument:

The validity of the study instrument is used to determine the study instrument will measure the data that

is intended to measure. The Face Validity is determined through the use of panel of experts to investigate clarity, relevancy, and adequacy of the questionnaire to measure the interested concepts.

A draft of questionnaire is designed and presented to (15) experts, who have years of experiment more than 10 years in field of nursing and medicine (appendix A).

Also, the experts’ suggestions have been taken into consideration. The final copy of the study instrument is accomplished to be valid tool to measure the study phenomena.

Clark and Creswell,(2014) mention that the panel typically comprises of at least three experts, but a more number may be suitable if the construct is complicated.

Reliability of the Study Instrument:

Reliability is concerned with the consistency and dependability of a research instrument in order to measure a variable of interest. Determination of reliability of the questionnaire is depending upon the reliability of internal consistency / Alpha Cronbach technique.

Data Collection

The collection of data is done by application of the developed questionnaire with aid of structured interview technique with the subjects as they are individually interviewed and the researcher use Arabic version of the questionnaire, by the same questionnaire for all study subjects who are involved in the study sample. The data collection process started from January 8th , to 17th February. Each subject spends approximately (15-20) minutes to complete the interview.

Statistical Analysis

The following statistical data analysis approaches is used in order to analyze the data of the study under application of the statistical package (SPSS) ver. (24), and the Microsoft excel (2010):

1. Descriptive Data Analysis:

- a- Tables (Frequencies and Percentages).
- b- Statistical figures (Pie Charts).
- c- Statistical mean and standard deviation.
- d- Pearson’s Correlational Coefficient (r).

e- Measures of central tendency: Mean, Mean of scores (MS)And the assessment by cutoff point (0.66) due to the three points likert scales with three levels of assessment, poor (1-1.66), fair (1.67-2.33), and good (2.34-3)for assessment of the levels of the patients’ self-care behaviours.

Determine the range and some of scores for the sample size(110) with four points Likert scale, scored as 1 for(poor), 2 for(fair), and 3 for(good). assessment of the levels of the patients’ self-care

2. Inferential Data Analysis:

This approach is used to accept or reject the statistical hypothesis, which includes the following :

- a- Chi-Square test for testing the independency distribution of the observed frequencies, and for measuring the association between the studies variables according to its type.
- b- ANOVA test to find out the variance between variables
- c- Independent t-test to find out the different between variables

Results

Table (1) Overall Assessment of Patients’ Self-Efficacy Toward Self-Care Behaviors

	Rating	Frequency	Percentage
Assess self-efficacy	Fair	50	45.5
	Good	30	27.3
	Poor	30	27.3
	Total	110	100.0

n (110); M.S 1.67-2.33 (fair))

Shows that the overall assessment of patients’ self-efficacy toward self-care behaviors is fair (45.5%).

Table (2) Overall Assessment of Patients’ Attitude Toward Self-Care Behaviors

	Rating	Frequency	Percentage
Assessment patients’ attitude	Fair	18	16.4
	Good	91	82.7
	Poor	1	0.9
	Total	110	100.0

Cut off point (0.66), M.S(mean of scores), poor (mean of score 1-1.66), moderate (mean of score 1.67-2.33), high (mean of score equal or more than 2.34)

Shows that the overall assessment of patients' attitude toward self-care behaviors is good (82.7%).

Table (3) Correlation Between Patients' Self-Care Behaviors and their Self-Efficacy and Attitude Toward Self-Care Behaviors

Studied domains	Statistical parameters	Self-care behaviors	Self-efficacy	Patients' attitude
Self-care behaviors	Pearson Correlation	1	.759	.354
	P-value		0.00	0.00
	N	110	110	110
Self-efficacy	Pearson Correlation	.759	1	.416
	P-value	0.00		0.00
	N	110	110	110
Patients' attitude	Pearson Correlation	.354	.416	1
	P-value	0.00	0.00	
	N	110	110	110

** . Correlation is significant at the 0.01 level (2-tailed).

Shows that there is a positive and high significant correlation between the patient's self-care behaviors domains and the patient's self-efficacy and patients' attitude domains at p-value > 0.01 (i.e. when the patient's self-efficacy and attitude increased, the self-care behaviours also increased and vice versa).

Table (4) Relationship Between Patients' Self-Care Behaviors and their Demographic Data

Demographic Data	Chi value	Df	P. value
Age	5.988	8	0.64 (NS)
Gender	2.437	2	0.29(NS)
Educational level	16.852	10	0.07(NS)
Monthly income	11.312	4	0.02(S)
Residence	8.093	2	0.01(S)
Marital status	10.354	8	0.24(NS)
Occupation	20.086	10	0.02(S)

n (110); Non-significant at p-value more than 0.05; S, significant at p-value less than 0.05; HS, highly significant at p-value less than 0.01

Shows that there is a significant association between self-care behaviors and monthly income, residency, and occupation at p-value less than 0.05, and there is a non-significant association with the other demographical data at p-value more than 0.05.

Discussion

Table (1): The study results indicate that the overall assessment of patients' self-efficacy toward self-care behaviors is fair (45.5%). These results are in agreement with (14, 17), that patients with higher self-efficacy feel less obstructions against self-care and have hence more activities of self-care, therefore, agreeing to the evidence gotten in this study and past studies, it can be understood that self-efficacy is an important determinant of self-care behaviors in patients with cardiac disease 3. Table (2): Shows that the overall assessment of patients' attitude toward self-care behaviors is good. These results are in agreement with (14, 17) There is a positive attitude towards self-care in heart failure patients and this will make them consistent 24. Generally, positive attitudes were expected about self-care describing it as vital to controlling symptoms. Individuals who had positive evaluative and experiential attitudes toward self-care employed that tactic to manage their symptoms 12. Table (3) indicates that there is a high significant correlation between the patient's self-care behaviors domains and their self-efficacy and patient's attitude.

Conclusion

Based on the study results and discussion, the study concludes that there is a deficient in self-care behaviors of patients with heart failure. In addition, the patients self-efficacy, attitudes, occupation, residency, monthly income, and smoking are the common factors affecting their self-care behaviors.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Kufa. Faculty of Nursing, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Prevalence of Sperm Parameters for Infertile Males in Thi-Qar City

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Abstract

Objective Male infertility is a term in which the male is not capable to attain pregnancy in a female. It occurs due to a lack of semen and low-quality semen. Semen Quality is referred to as a surrogate measure of male fecundity. This study aims to assess the frequency of sperm factors in infertile men in Thi-Qar City. **Materials and Methods:** This study involved an infertile couple, seminal fluid analysis (SFA) was done to evaluate male factors. Males with normal seminal fluid parameters were excluded. Regarding male, SFA was examined according to WHO 2010. Information such as age, duration of infertility and type of infertility were taken **Results** Among the percentage of abnormal sperm parameters for infertile couples in which the largest percentage was for asthenozoospermia that represent 66.70% of all infertile males. The second sperm abnormality is 12.13% for oligoasthenozoospermia. Asthenoteratozoospermia and oligoasthenoteratozoospermia have the same percentage (4.4). Azoospermia represents 6.7% while the lower percentage for teratozoospermia. **Conclusions** largest percentage was for asthenozoospermia that represents 66.70% of all infertile males .

Keywords: Seminal fluid analysis (SFA), sperm parameters

Introduction

Infertility is a different type of medical care as it relies on both male and female. Infertility is a unique medical condition because it involves a couple, rather than a single individual. In this condition, a couple fails to conceive after 1 year of intercourse without the usage of contraception in females less than the age of 35 years; and after the duration of 6 months of intercourse without the usage of contraception in females less than the age of 35 years and older (clinical definition) ¹. This is a very disturbing medical condition as the couple cannot have children if they are suffering from infertility. This further causes depression, psychological distress, and low self-esteem in the couple ^(2,3).

Types of male infertility

Asthenozoospermia

This term is described as the total sperm motility (non-progressive and progressive), non-progressive motility is less than 40 percent and progressive motility is less than 32 percent.⁴

Oligozoospermia

A few months ago, the World Health Organization reevaluated the sperm criteria and announced a lower reference point which is less than 15M sperm/ML. (WHO 2010) ⁴

Azoospermia

This term is described as the full absence of sperms from a minimum of 2 individual samples of centrifuged semen ⁴.

Teratozoospermia

Teratozoospermia; normal sperm morphology is <4% Kruger strict criteria ⁴

Male infertility

There is a common misunderstanding that the female is responsible for infertility but, it has to be understood that male is equally responsible for this severe medical condition ⁵.

Materials and Method

The study was carried out at infertility unit in Thi Qar city patient. From February 2015 to July 2017. This study involved an infertile couple, SFA was done to evaluate malefactors. Males with normal seminal fluid parameters were excluded. Regarding male, SFA was examined according to ⁴. Information such as age, duration of infertility and type of infertility were taken

Seminal fluid analysis

The seminal fluid sample was taken in a clean,

sterile, and dry disposable Petri-dish after three to five days of sexual absence. This was done by masturbation in a quiet room near the laboratory of semen analysis. The dish was a label with the name of the male, his age, sexual intercourse absence period, and the exact time of sperms collection. The sample was liquified using an incubator at the temperature of 37 °C for half an hour. It was then mixed and analyzed by microscopic and macroscopic tests. To note the results of seminal fluid analysis, the standard form of (WHO 2010) was used (Table 1).

Table 1: Normal values of semen variables ⁴

Sperm parameters		WHO Criteria
Sperm concentration millions/mL		15x10 ⁶ spermatozoa/mL or mor
Total sperm motility (%)		>40%
Sperm Grade Activity	Progressive motility (%)	>32%
	Non Progressive motility (%)	
	Immotile sperm(%)	
Normal sperm morphology (%)		>30%*

Results

Figure 1 shows the percentage of abnormal sperm parameters for infertile couples in which the largest percentage was for asthenozoospermia that represent 66.70% of all infertile males. The second sperm abnormality is 12.13% for oligoasthenozoospermia Asthenoteratozoospermia and oligoasthenoteratozoospermia have a same percentage (4.4). Azoospermia represents 6.7% while the lower percentage for teratozoospermia.

In our study table, 2 show the effect of male infertility duration on sperm parameters. Regarding

sperm concentration there is a significant decline at 5-10years, also there is a significant decline in sperm morphology when duration more than 10 years.

Table 3 discuss the effect of male infertility type in sperm parameters whether primary or secondary. There is no significant difference between primary and secondary types for all sperm parameters (sperm concentration, motility, and morphology).

Table 4 shows the distribution into primary and secondary fertility among infertile couples, 60% of them with primary infertility and 40% with secondary infertility.

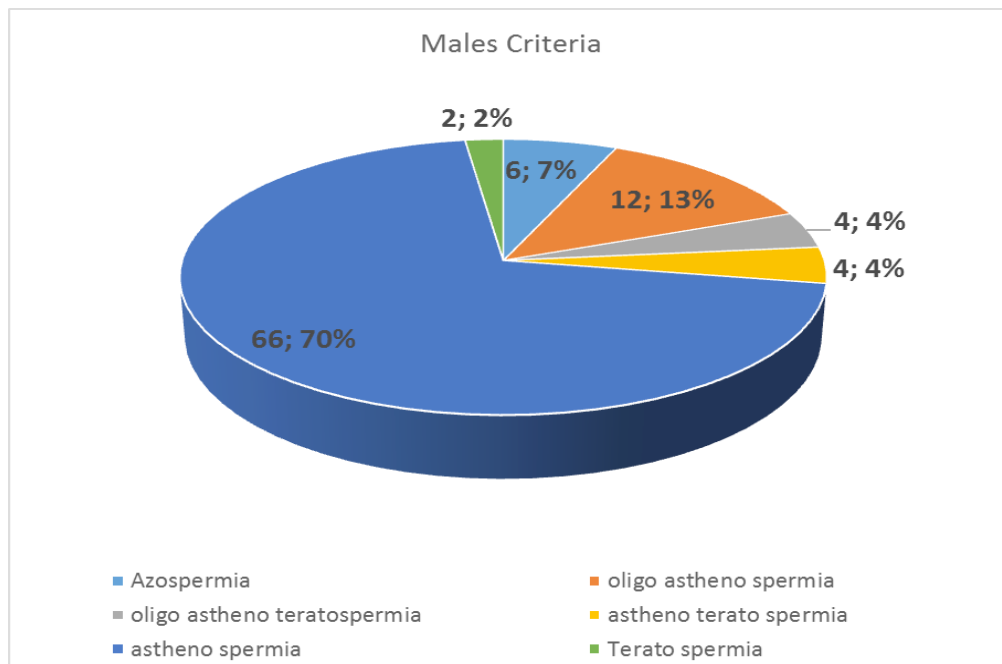


Figure 1. sperm parameters

Table2: Effect of male infertility duration on sperm parameters.

Infertility duration Parameters	1-5 years	5-10 years	≥10 years
Sperm concentration	44.417±4.10a	38.375±4.92b	46.944±5.74a
Progressive motility %	11.763±2.21a	8.081±2.58a	12.300±3.42a
Non-progressive motility %	28.383±2.69a	29.425±3.23a	32.178±4.17a
Immotile sperm	43.615±2.79b	44.813±4.38b	52.439±5.34a
sperm morphology %	52.944±3.67a	43.188±3.64b	45.468±2.47b

Means with similar letters are nonsignificant different (P>0.05).

Means with different letters are significant deferments (P≤0.05).

Table3: Effect of male infertility type in sperm parameters.

Age groups Parameters	Primary	Secondary
Sperm concentration	42.459±3.59a	43.649±4.41a
Progressive motility %	10.298±1.80a	11.254±2.69a
Non progressive motility %	28.984±2.38a	30.141±2.93a
Immotile sperm	44.633±3.11a	47.265±2.84a
sperm morphology %	44.567±2.30a	48.595±3.05a

Means with similar letters are non-significant different (P>0.05).

Means with different letters are significant deferments (P≤0.05).

Table 4: Distribution into primary and secondary fertility among infertile couples.

Infertility	Frequency	Percentage (%)
Primary	60	60%
Secondary	40	40%
Total	100	100%

Discussion

Moreover, the sperm parameters correlate negatively with increased period of infertility 7 . These findings are in agreement with the results of the present study that the male patients with duration of infertility (1-5) years were with the lowest percentage of sperm motility. The results of this study showed that primary infertility (60%) was more than secondary infertility (40%) as it is obvious from table 4. But, in men having primary infertility, genetic and chromosomal factors have a vital role in the presence of primary infertility than secondary infertility 8. A retrospective study, conducted between 1992 to 1999 highlights the occurrence of asthenozoospermia as 18.71% and for asthenozoospermia, it was 63.13%, linked with oligo- or teratozoospermia. So, 81.84 percent of the investigated samples indicated altered motility. 9 In research conducted in Nepal, 20% of the couples indicated semen abnormality. 47% indicated oligospermia while 39% indicated azoospermia. Moreover, 14% of males had asthenormia. 10. Socioeconomic, environmental, and nutritional aspects are responsible for compromising the health of the male reproductive system 11. Chemotherapy, radiation, and surgery may have an impact on spermatogenesis 12 . A research conducted in Senegal to check this abnormality, oligoasthenoteratonecrozoospermia showed the highest percentage that is 20.2 percent while azoospermia showed 14.5 percent and asthenonecrozoospermia and astheno-necrozoospermia both showed the occurrence as 10.3% 13 . However, Pontonnier indicates that oligoasthenoteratozoospermia is the chief abnormality that is usually found in the general population and particularly in varicocele 14 .

Conclusion

Largest percentage was for asthenozoospermia that represents 66.70% of all infertile males.

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Conflict of Interest: The author has no disclosures to report.

Source of Funding: Self.

Ethical Clearance: Not required.

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Histological Study of Pregnant albino Rat Treated with Nickel Oxide Nanoparticles

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Abstract

The present study was aimed to elucidate the effect of Nickel oxide nanoparticles (100 mg / kg b.wt) on some parameters in pregnant Albino rats, in both period of pregnancy (12 and 14 days). 30 albino rats were used; 20 female and the rest 10 were fertilized male rats which were used insemination only, the study including, maternal relative body weight, weight gain measurements and relative organ weights and histological study. Relative body weight of mothers showed decreases in both period of pregnancy. Body weight gain of the pregnant rat show decreases in 14 days of pregnancy in treated group as compared with control group while in 12 days of pregnancy showed increases in treated group as compared with control. Relative organ weight showed increases in (Lung, Uterus, kidney) in treated group and decreases in (Heart, Liver, Eye, Spleen, Brian) in (12) day of pregnancy. In (14) day of pregnancy showed decreases in (Heart, Liver, Eye, Brian , Kidney) and increases in (Lung, Spleen, Uterus) in treated group as compared with control group Histological study included some organ (liver, spleen, kidney, lung brain, eye and heart) for different period (12, 14) days of pregnancy.

Key words: NIO, nanoparticles, albino rats, histology.

Introduction

Nickel (Ni) is a silvery-white, hard metal. Although it forms compounds in several oxidation states, the divalent ion seems to be the most important for both organic and inorganic substances, but the trivalent form may be generated by redox reactions in the cell¹. Water-insoluble nickel compounds may dissolve in biological fluids². Particles of the same chemical entity (oxides and sulfides) have different biological activity depending on crystalline structure and surface properties^(3,4). Inhalation of all types of nickel compounds induces respiratory tract irritation, chemical pneumonia, emphysema and varying degrees of hyperplasia of pulmonary cells, and fibrosis (pneumoconiosis)⁶. Nickel may precipitate autoimmune phenomena and induce immunosuppression in vitro; the clinical importance of such effects has not been reported⁷. The histological changes noted in the lungs of this case included alveolar wall damage with fibrotic changes and oedema in the alveolar space. A statistically

significant increase in the incidence of deaths from respiratory disease was found in welders in some studies⁸. Studies in rats and mice demonstrate that chronic active inflammation in the lungs is the most prominent effect following inhalation exposure to nickel sulphate, nickel subsulphide, or nickel oxide⁹. In acute exposure, however, chronic lung inflammation was observed at the lowest concentrations of nickel sulphate and nickel subsulphide (ATSDR¹⁰). Chronic exposure for 2 yr to nickel (6 h/day, 5 day/wk) resulted in active lung inflammation in mice at 0.06 mg Ni/m³ and in rats at 0.11 mg Ni/m³ and higher.⁵

Materials and Method

Experimental Design

20 female albino rats were used in this study (in addition to 10 males in this study for mating only). Pregnant albino rats were divided into five groups (n=4), each group was subdivided into control (2) and treated groups (2). Pregnant rats were arranged into groups according to the period of treatment for 12, 14 days of pregnancy.

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Relative and Body Weight Gain

Weight of pregnant rats for both control and treated groups for 12 and 14 days of pregnancy were calculated by using electronic sensitive balance in the beginning and the end of experiment to calculate the Relative Body Weight as following:

$$\text{Relative body weight (\%)} = \frac{\text{final body weight} - \text{initial body weight}}{\text{initial body weight}} * 100$$

, while body weights gain of animals was calculated according to the following equation:

$$\text{Animal weight gain (g)} = \text{animal weight} - (\text{uterus weight} + \text{embryo weight})$$

Organs Weight: the liver, kidney, heart, brain, lung and spleen were removed, cleaned from adherent tissues, drying by filter paper and weighted immediately.

Histological Study: Tissue specimens of liver, kidney, heart brain, lung and spleen were fixed in 10% formalin. Trimming was done on the fixed tissue specimens. Tissue sections was prepared and stained by hematoxylin and eosin stain for histopathological examination by the light microscope.

Statistical Analysis

Results were shown as Mean ± Standard deviation (SE) for each group. Statistical analysis was performed by using SPSS 23. One-way analysis of variance (ANOVA) was used for multiple comparisons. The $p \leq 0.05$ was considered to be statistically significant.

Results

Body Weight Gain:

The oral administration of NIO at all treated group (100mg/kg/b.wt) periods showed significant increase ($p \leq 0.05$) in relative body weight in comparison with control group for 12 days of pregnancy, while it was decreases for 14 days of pregnancy as compared with control group (Figure -1).

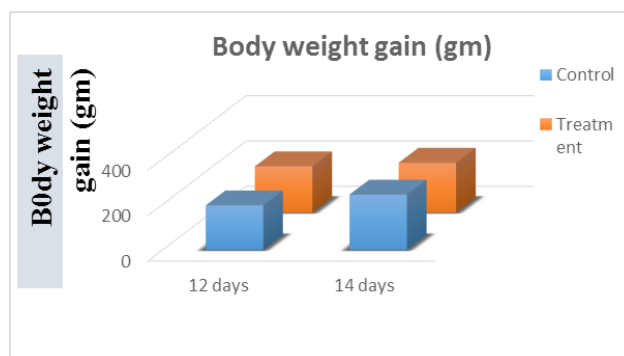


Figure (1): Effect of Nickel Oxide nanoparticles (100 mg/kg b.w.) on Body weight gain (gm) in Pregnant Albino Rats for 12 and 14 days of Pregnancy.

Relative Body Weight.

The result in the present study showed that significant ($P \leq 0.05$) decreases in the treated group of (12, 14) days with NIO (100 mg / kg b.wt) in relative weight (12, 9.26) respectively , as compared with control group (14.56,22) respectively , (Figure 2).

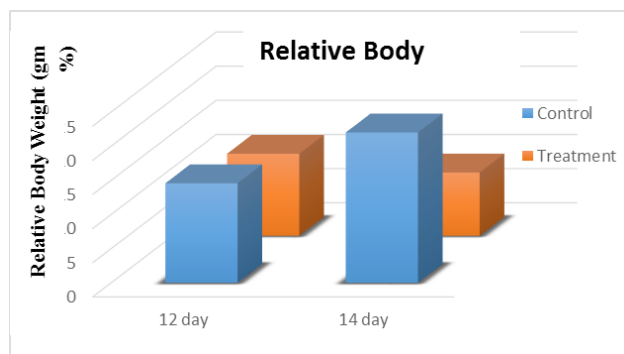


Figure (2):: Effect of Nickel Oxide on Relative Weight of Pregnant Albino Rats for 12 and 14 days of Pregnancy.

Relative Organs Weight

The result of the present study showed that the organ weight means (heart ,liver , eye, spleen , brian) decreases significantly ($P \leq 0.05$) in treated group for (12days) with NIO (100 mg / kg b.wt) (0.436±0.05 ,9.36±3.16, 0.173 ±0.064,1.703 ±0.433,1.683 ±0.077) respectively , as compared with control groups (0.473±0.049, 11.16±2.54, 0.313±0.023, 1.896±0.17, 2.74±1.124) and increases significantly ($P \leq 0.05$) in weight of (lung , uterus and kidney) in the same treat group (3.16±0.497, 12.99±13.365 , .963±.155) respectively as compared with control group (1.56±0.062, 8.83±0.361, .783±.461) respectively (Table 1).

In the other hand in treated group of (14 day) there were significantly decreases ($P \leq 0.05$) of the organs weight

(heart, liver, eye, brain and kidney) (0.376±0.064, 8.4±1.93, 0.70±0.40, 1.9±0.697, 1.28±0.23) as compared with control group (0.403±0.066, 13.93±3.53, 0.466±0.152, 2±0.264, 1.56±1.28) respectively. and increases

significantly (P≤0.05) of the organs (lung, spleen, uterus) in the same treat group (3.066±0.152, 1.566±0.635, 14.80±19.40) respectively as compared with control group (1.54±0.096, 0.466±0.152, 7.866±0.503).

Table (1): Effect of Nickel Oxide on Different Relative Organs Weight (Heart, Lung, Liver, Spleen, Eye, Uterus, Brain and Kidney) in Pregnant Albino Rats for 12 and 14 Days of Pregnancy.

Peiods Organs weight	12 day		14 day		Sig. level p≤0.05
	Control (gm) Mean±S.D	Treatmen t(gm) Mean±S.D	Control (gm) Mean±S.D	Treatment (gm) Mean±S.D	
Heart	0.473±0.049a	0.436±0.05a	0.403±0.066a	0.376±0.064a	N.s
Lung	1,56±0.062a	3.16±0.497	1.54±0.096a	3.066±0.152b	S
Liver	11.16±2.54a	9.36±3.16a	13.93±3.53a	8.4±1.93a	N.s
Spleen	1.896±0.17a	1.703±0.433	0.466±0.152a	1.566±0.635a	N.S
Eye	0.313±0.023ab	0.173±0.064	0.466±0.152a	0.70±0.40b	N.s
Uterus	8.83±0.361a	12.99±13.365a	7.866±0.503	24.80±19.40a	S
Brain	2.74±1.124a	1.683±0.077a	2 ±0.264a	1.9±0.697a	N.s
Kidney	0.783±.461a	0.963±.155a	1.56±1.28a	0.23±1.28 b	S

Histopathological Study for pregnant albino rat

12 days of pregnancy.

Light microscopy micrographs in 12 days of pregnant, the tissue of liver, kidney, brain, Spleen, Eye, Heart and Lung of experimental groups showed regular appearance as in control tissue groups (Fig. 3, 4, 5), while the lung section showed abnormality in the treated group with NIO (100 mg / kg b.wt), it showed thick alveolar septæ due to the presence of fibrinous exudate and chronic inflammatory cells as compared with control group.

14 days of pregnancy.

Light microscopy micrographs in 14 days of pregnant, the tissue of liver, kidney, brain, Spleen, Heart and Lung of experimental groups showed regular appearance as in control tissue groups, while the eye section show abnormality in the treated group with NIO (100 mg / kg b.wt), and in the section of Retina with Retinal tissue with atrophy of ganglion cell layer as compared with control group Retina with normal histological appearance during 14 days of pregnancy

(Fig.15). Also the lung showed abnormality in the treated group the tissue showed focal areas of moderate chronic inflammatory cell infiltrate of the perivascular areas. as compared with control group.

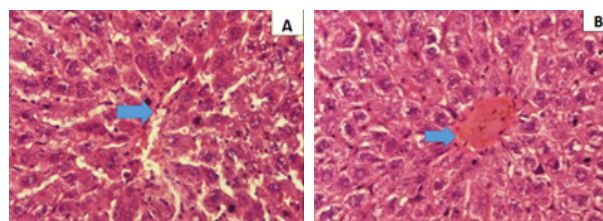


Figure (3): Cross section in the liver of pregnant rat (12 days) of pregnancy (A) control group, (B) treatment group, Liver tissue showed intact lobular architecture, hepatic plates and sinusoids (H&E x400).

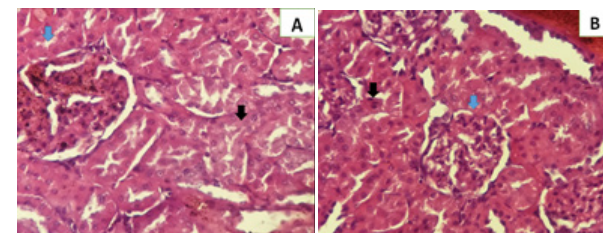


Figure (4): Cross section through pregnant rat kidney at (12 days) of pregnancy, (A) control group, (B) treatment group, Renal tissue with normal glomerulus (blue arrow) and proximal and distal convoluted tubules (black arrow). H&E

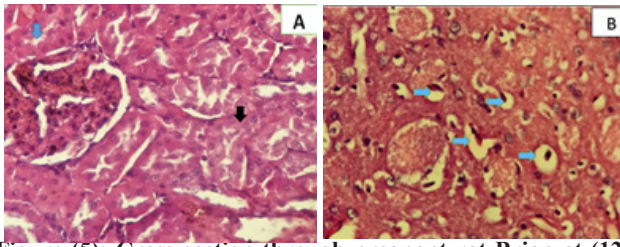


Figure (5): Cross section through pregnant rat Brain at (12 days) of pregnancy (A) control group, (B) treatment group, Brain tissue with normal histological appearance (arrows). H&E. x400.

Discussion

Relative Weight of Pregnant Albino Rats for 12, 14 days of Pregnancy.

The results showed significant ($P \leq 0.05$) decreases in the treated group of (12, 14) days with NIO (100mg / kg b.wt) in relative weight, as compared with control group the decreases of the body weight in the cumented study is correlated to the toxic effect of NIO on the female rat and decreases in diet consumption and water in take¹² The weight decrease can be correlated to decrease in diet consumption and water intake¹³ The administration of NIO could be associated with weight loss and several side effects¹⁴ . The weight parameter considered as important indicator for the progress of biological activities and its affected by external effectors. Decrease of body weight may be attributed to anabolic metabolism in body of treated animals, or as a result of anti-digestion effect, or due to the loose of appetite in treated animals as a result of nanoparticles administration³² . It could also possibly be due to increased degeneration of lipids and proteins leading to decreased organ weight. Other factors may also be responsible for the reduced maternal body weight, may be due to mucophylline-induced resorptions, decreased weight, and growth of the fetus³¹ . It is well known that body weight and organ weight coefficients are sensitive indicators of potentially toxic chemicals in general toxicity studies¹⁵ , repeated gavage administration of Ni NPs to rats caused a significant suppression in body weight gain in the male 45 mg/kg group¹². Other study which indicate the negative effect of Zinc oxide nanoparticles on animal's structure, which represent the vital efficacy of its internal organs .This suggests that exposure to metallic nanoparticles, including silver nanoparticles, could cause gastric intestinal trace GIT disturbances in animals, loss of appetite and decrease fatty tissue in organs, and eventually decrease animal's body weight¹⁶ , The effect of different ZnO-NPs concentrations was

obvious on lowering animals' weights, especially with increasing the ZnO-NPs concentration into 200 mg/kg, and duration of exposure from 7 to 14 days¹³ . Other study showed different effect of NIO on the kidney which is correlated that the kidney was the major organ of nickel accumulation, and minor renal tubular damage at the corticomedullary junction was observed in rats exposed to NIO for 13 week to a significant decrease in urine volume and urine glucose levels and an increase in relative kidney weight were also observed^(17, 27).

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under University of Babylon, College of Science, Iraq and all experiments were carried out in accordance with approved guidelines.

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Potential Risk Factors of Breast Cancer among Women Attending Teaching Hospitals in Babylon Province

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Abstract

Background: Breast cancer is the most common cancer among women worldwide and the leading cause of cancer deaths among Iraqi women.

Objective: To determine the potential risk factors associated with breast cancer.

Methodology: This was a hospital based case control study which was conducted at Merjan and Al-Hilla teaching hospitals. A sample of three hundred women participants who were selected and divided into 100 patients with established breast cancer (cases) and 200 healthy women without breast cancer who were considered as healthy control group. Data were collected by interviewing both groups using a structured questionnaire which includes information about (tobacco smoking, economic status, age of menarche, age of menopause, use of contraceptives level of education, family history of breast cancer). Medical records of patients and control group were reviewed to complete the data needed, chi square statistical test and Odds Ratios were calculated.

Results: Results of this study showed that the following factors like low economic status, late age of menopause, positive family history, use of contraceptives were significantly associated with breast cancer (Unadjusted Odds Ratios more than one, p values <0.05). Exposure to cigarette tobacco smoking, levels of education, and age of menarche did not show significant association with breast cancer in this study.

Conclusion: Breast cancer was associated positively with the presence of positive family history, Low socioeconomic status, late menopause and using contraceptive pills regularly.

Keywords: Potential risk factors, breast cancer, women, teaching hospitals, Iraq.

Introduction

Breast cancer is the most common cancer among women worldwide⁽¹⁻⁷⁾, and the leading cause of cancer death in women worldwide^{2,6} and the second leading cause of females' deaths after lung cancer². Globally, breast cancer is the commonest cancer among women, comprising 23% of the 1.1 million female cancers that are newly diagnosed each year⁴. It was estimated that 1.7 million people were diagnosed with breast cancer, accounting for around twelve percent of all new cancers.

Statistics shows between 2008 to 2012 a brisk increase in the incidence of morbidity and mortality of breast cancer among women⁸. Breast cancer was the most common cancer in 2012 with incidence of 43.4% and a mortality rate of 12.9%⁹. Incidence rates vary widely across geographic regions, with the highest rates in North America, Australia, and northern and western Europe and the lowest rates in large parts of Africa and Asia. Mortality rates do not differ as much due to better survival in developed countries, where incidence rates are also the highest³. In Iraq, breast cancer is very common type of malignancy among the population in general; responsible for about one third of the registered female cancers and almost one quarter of females' deaths from the disease^(2,4). The peak age incidence rates are

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noted among middle aged women who often present with advanced stages documenting high mortality incidence ratios¹⁰. Breast cancer is a multi-factorial disease where genetic susceptibility, environment, and other lifestyle risk factors interact. Better identification of modifiable risk factors and risk reduction of breast cancer may allow implementation of useful strategies for prevention. In Iraq, there is a continuous rise in the incidence rate which is associated with an obvious potential risk factors which may act together or in sequence to initiate or promote carcinogenesis¹. This study was conducted to determine potential risk factors associated with breast cancer.

Method

This hospital based case control study was conducted at oncology units in Merjan teaching hospital and Al-Hilla teaching hospital. A sample of Three hundred participants was conveniently selected and divided into 100 patients with confirmed breast cancer(cases) and 200 women without breast cancer who were considered as a healthy control group. Data were collected by interviewing participants (both cases and control groups) using a structured pretested questionnaire which includes information about (tobacco smoking ,economic status ,age of menarche ,age of menopause ,use of contraceptives ,level of education ,family history of breast cancer), women with primary school level and below considered as women with low educational level. Women who use oral contraceptive pills for more than two years are considered (contraceptive users). Data collection from medical records were reviewed to confirm the diagnosis. Control group was selected from women who were examined in the mammogram unit ,and from women attending primary health care centers or hospitals .

The data were obtained from patients with breast cancer who were registered in breast tumor center/ Merjan teaching hospital and Al Hilla teaching hospitals from different age group and selected according to these criteria:

- 1-Women who have cancer according to confirmed diagnosis based on pathological diagnosis.
- 2-Patients who agreed to participate in the study and give verbal consents .

Statistical Analysis

Data analysis was done by using Spss version 21 to calculate Odds Ratios(OR) and chi square , p.value< 0.05 was considered to be statistically significant.

Ethical considerations

- 1- Approval of ethical committee in Babylon university- College of Nursing was obtained.
- 2-Acceptance of ministry of health(ethical committee of Babylon Health directorate was taken) ,together with the acceptance of authorities of the teaching hospitals.
- 3-Verbal consents of all participants were obtained after explaining the objective of the study ,the privacy and confidentiality issues.

Results

Table (1) shows that the percentage of tobacco smoking habit among cases and control group were (6% and 3.5% respectively the un matched Odds Ratio was (1.78) this means that there is a weak positive relationship between smoking and breast cancer the difference did not reach significant level $p > 0.05$.

Table (1) Frequency distribution of cases and control group by cigarette smoking.

Groups	Case(n=100) Number (%)	Control(n=200) Number (%)	Chi-square	OR	P-value
cigarette smoking	6 (6 %)	7 (3.5%)	1.005	1.759	0.3161
Not cigarette smoking	94 (94%)	193 (96.5%)			
Total	100 (100)	200 (100)			

Table (2) reveals that there is a highly significant difference between cases and control groups, regarding the income level cases with not enough income (poor) they constituted (47%) while the low economic level among healthy control is (23.5%) $p < 0.001$.

Economic status	Case(n=100) Number (%)	Control(n=200) Number (%)	Chi-square	OR	P-value
Not enough	47 (47%)	47 (23.5%)	17.112	2.88	0.0000
Enough	53 (53%)	153 (76.5%)			
Total	100 (100)	200 (100)			

Table (3) shows that the age of menarche has no significant association with breast cancer $p > 0.05$.

Table (3) Frequency distribution of cases and control group by age of menarche.

Age of menarche	Case(n=100) Number (%)	Control(n=200) Number (%)	Chi-square	OR	P-value
<12 year	45 (45%)	80 (40%)	0.686	1.22	0,4076
12 year Or More	55 (55%)	120 (60%)			
Total	100 (100)	200 (100)			

Table (4) depicts that there is a significant association between late age of menopause and carcinoma of the breast $p < 0.05$, the Odds Ratio (2.48), this means that those with late menopause are three fold more liable to have breast cancer than those with menopausal period of less than (45) years of age.

Table (4) Frequency distribution of cases and control group by age of menopause.

Age of menopause	Case(n=100) Number (%)	Control(n=200) Number (%)	Chi-square	Odd Ratio	P-value
>45 year	45 (45%)	44 (22%)	3.483	2.48	0.05
45 year & Less	7 (7%)	17 (8.5%)			
*Below the age	48 (48%)	139 (69.5%)			
Total	100 (100)	200 (100)			

Table (5) explains that the positive family history of carcinoma of breast is significantly associated with the development of this disease $p < 0.05$, OR= (2.25).

Table (5) Frequency distribution of cases and control group according to the family history of breast cancer.

Family history	Case(n=100) Number (%)	Control(n=200) Number (%)	Chi-square	OR	P-value
Positive	20 (20%)	20 (10%)	5.769	2.25	0.0163
Negative	80 (80%)	180 (90%)			
Total	100 (100)	200 (100)			

Table (6) reveals that level of education has no significant relationship with breast cancer in this study $p > 0.05$, OR= (1.27).

Table (6) Frequency distribution of cases and control group by the level of education.

Level of education	Case(n=100) Number (%)	Control(n=200) Number (%)	Chi-square	OR	P-value
Not educated	32 (32%)	54 (27%)	0.815	1.27	0.3666
Educated	68 (68%)	146 (73%)			
Total	100 (100%)	200 (100%)			

Discussion

The problem of breast cancer was studied through identifying some risk factors (both modifiable and non-modifiable ones) to pay attention to the prevention actions of this high priority public health problem in our country .The findings of this study show that tobacco smoking habit was not associated significantly with breast cancer ,this finding is in agreement with a study conducted among Jordanian Women during the year 2017 ¹¹ ,but disagrees with the finding of a local study done in Baghdad province /Iraq during 2013 ¹ This disagreement may be due to the small sample size of this study or due to embarrassment of women during the interview to speak about smoking habit which is considered as social stigma among women in our society, this finding is also disagreed with the finding of other reporters such as the work done in 40 clinical centers in the United states which showed that active smoking was positively associated with an increase in the incidence

breast cancer among postmenopausal women ¹².

Regarding economic status , this study reveals that low family income status was more prevalent among cases as compared to control group ,this finding is similar to the finding of other study conducted in Missan province /Iraq during the year 2012 ¹³ , and in a study done in Eastern India ¹⁴ and disagrees with the finding of other study in jordan ¹¹ .

The current study depicts that early menarche is not association with breast carcinoma, this finding goes in lines with the finding of other studies ^(1,15,16) but disagreed with a study done in Eastern India ¹⁴ and other study conducted in Dhaka city ¹⁷.

A high proportion of cases in this study were having their age at menopause more than or equal to 45 years, compared to controls, this result is statistically significant and agree with other study conducted in India that showed higher risk was found for women who

experienced menopause after 45 years of age ^(14,8) this can be explained by the long period of exposure of cases to estrogen hormone which is blamed as a potential risk factor ⁽¹⁸⁻²⁰⁾.

There is a statistically significant association between positive family history and breast cancer, this finding is similar to the findings reported by other local and international studies ^(1, 17, 8,21-26).

This indicates the importance role of genetic factors (inheritance) in the etiology of breast cancer among Iraqi women.

The finding of this study explains that the level of education of patient has no significant relation with breast cancer, this finding agrees with the finding of other local case control study conducted in Al-khadumia district /Baghdad province ¹⁶ and disagrees with the study done in Baghdad during the year 2013 ¹ and other studies conducted outside Iraq ^(11,14,27,28).

Conclusion

The current data support that various factors like economic status, late age of menopause, family history, use of contraceptives, are significantly associated with breast cancer among women in Babylon province. Exposure to cigarette tobacco smoke, women levels of education, and age of menarche, do not show a significant association with breast cancer in this study.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Babylon University-Hammurabi College of Medicine and all experiments were carried out in accordance with approved guidelines.

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Epidemiological Aspects of Attention Deficit Hyperactivity Disorder among pupils in Al-Hilla City – Babylon Province –Iraq

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Abstract

Background: Attention Deficit Hyperactivity disorder was an important issue of mental health and welfare affecting pupils at the primary school specially in conflict affected areas including Iraq.

Objectives: To identify the prevalence and the epidemiological profile of ADHD among pupils in Al-Hilla city –Babylon province/Iraq.

Methodology: This was a cross sectional study which was conducted in 4 randomly selected groups by lottery , the pupils at the primary schools located in AL-Hilla city center, the study was conducted during the academic year 2016-2017 , 100 children were randomly selected from the first three primary school grades. A structured questionnaire was used to assess the behavior of pupils by both teachers and parents after obtaining their verbal consents. The questionnaire was designed according to the formula of diagnostic criteria of attention deficit and hyperactivity disorders used by American Academy of Pediatrics.

Results: The overall prevalence of ADHD in the study group was 14%,.The male to female ratio was 3.5:1, there was a highly significant association between this disorder and the presence of family history of this health problem $p<0.001$, parents tobacco smoking habit was significantly associated with the presence of attention deficit hyperactivity disorder among their children (the combined type) $p<0.05$, there was significant relationship between poor school achievement and this behavioral problem $p<0.05$.

In conclusion, ADHD is an important health problem among pupils in Hilla city . Intervention should be made to improve health care providers and teachers' knowledge about this problem and control the modifiable risk factors.

Keywords: Attention Deficit Hyper activity Disorder , prevalence, primary school children, Babylon province

Introduction

Attention deficit/hyperactivity disorder is defined as one of the neuropsychiatric disorder occurred among children ¹. The neurodevelopmental process of childhood-onset is mostly attacked by this disorder, leading to induce the neurodevelopmental disorder among them ². Symptoms usually take place before 7 years of age , this disorder varies in prevalence in different countries. The nature for these discrepancies

across different countries is unknown. However, the differences in terms of demographical, cultural aspects and parameters used for the diagnosis in the studied countries could partially explain this . Pervious research indicated that the prevalence for this disorder was ranged from 5.4%-8.7% in most of African countries ⁴, however, 3.2% in Nigerian community ³. This trend of variations was also found in another continent like Asia. In one of the epidemiological studies conducted in Iran mention prevalence 13%, while (2.7%) among the pupils in Saudi Arabia ⁵. Results also came from a comprehensive study that was included 21 different countries demonstrated that the children who were from Japanese and Finnish populations had the lowest scores, while the score was

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the highest among those from Jamaica and Thailand ⁶. In general, the symptoms for ADHD may be decreased when the person get older ⁷. This could be stemmed from the fact that the self-control and neural connections in the brain are seen to be more developed and less influenced during puberty ⁸. Many environmental factors and other factors like life style, mother's smoking during pregnancy or an early life of childhood, stress among pregnant, and low birth weight (<1.5kg) have been implicated with incidence of ADHD. Moreover, other medical problems such as hypoxemia, encephalitis, trauma, and brain injury could increase the incidence of ADHD ⁹. There was also a considerable evidence from a study that indicated that the incidence of ADHD was higher among first-degree family members of ADHD, suggesting that this disorder could be the most genetic psychiatric disorder ¹⁰. A study conducted in Jordan revealed that teachers perception was medium, no significant differences based on specialization and years of teaching experience, and suggests the importance of training teachers on enhancing their knowledge to identify students with attention deficit hyperactivity disorders ¹¹. A recent study conducted in Iraq shows that there is an association between computer-based video games, or mobile device use and behavioral changes like hyperactivity, attention deficit disorder among Iraqi children in Diyala province ¹². Studies showed that more difficult children are likely to be particularly vulnerable to higher levels of media exposure ^{13,14}, few studies were conducted in Iraq about the ADHD problem that affecting children and adolescent ¹⁵. ADHD children are more likely to have nocturnal enuresis, daily injuries, poor school performance and sleep problems ¹⁶. A study indicated that the drug abuse among adults was found to be linked with the cases of ADHD ¹⁷. This study was carried out to identify the prevalence and the epidemiological profile of ADHD Iraqi children at Al-Hilla city –Babylon province.

Methodology

One hundred primary school- age children were randomly selected by systematic random technique {50 males and 50 females), from four primary schools which were selected by simple random sampling from 48 elementary schools in Al Hilla city - Babylon province during the academic year 2016-2017. A random sampling was used among all students from grade 1 to 3 in the 4 elementary schools A structured questionnaire was used to assess the behavior of school children by both teachers and parents after obtaining

their verbal consents. The questionnaire was translated into Arabic language by 3 well known translators. This questionnaire was designed according to the formula of diagnostic criteria of attention deficit and hyperactivity disorders used by American Academy of Pediatrics (AAP).

The questionnaire included 18 items ; 9 of them are for information about attention deficit disorder and the other 9 are for information about hyperactivity and impulsivity disorders. Each item has 4 grades : nil – sometimes – usually – always. The way used in dealing with the data in the questionnaire is by giving score for each grade such as 1 ; 2 ; 3 ; 4 respectively and the diagnosis is made when the marks of child score for each type of the disorder is equal to or more than 22.5 marks. The child was considered as ADHD pupil when diagnosed by both teachers and parents for each type :attention deficit , hyperactive or both (combined). School children were considered as low school performing when they fail one academic year or more according to teachers and school records. Regarding tobacco smoking , smoker are those who currently smoke more than five cigarettes per day or at least one water pipe per week, while nonsmokers are those who never smoke or had quitted smoking since two years from the time of the study. Descriptive and inferential statistical analysis were applied using statistical package for social science (SPSS).Chi square test was used to assess the statistical difference between variables, $p < 0.05$ was considered as a level of statistical significance.

Results

Table (1) shows that the overall prevalence of ADHD among elementary school children in their early year is 14%,the males are highly predominant 22%. The male to female ratio is 3.5:1. Table (2) explains that this behavioral problem is more common in young age (7 years) and less among older children but this difference does not reach significant level , chi-square is 2.8251. The p -value is .243527. The result is *not* significant $p > .05$. Table (3) reveals that there is a statistically significant association between parents tobacco smoking habit and having children with ADHD problem $p < 0.05$. Table (4) depicts the very high significant statistical association between ADHD and the presence of positive family history of this behavioral problem among Iraqi children

Chi square= 34.9045 df=1 $p < 0.001$.

Table (5) shows that there is a statistically significant association between poor school achievement and development of attention deficit hyper activity disorder among the study group $p < 0.05$.

Table 1 (Distribution of ADHD among the study group by gender

Gender	Healthy NO (%)	ADHD NO (%)	Total NO (%)
Male	39 (78)	11 (22)	50 (100)
Female	47 (94)	3 (6)	50 (100)
Total	86 (86)	14 (14)	100 (100%)

* Chi square value = 5.34

* df = 1

* $p < 0.005$

Table (2) Frequency distribution of school children with ADHD by age

Age (Years)	Numbers of pupils	Number of (ADHD) pupils	Percentage
7	35	8	57
8	35	4	29
9	30	2	14
Total	100	14	100

The chi-square statistic is 2.8251. The p -value is .243527. The result is *not* significant $p > .05$.

* df = 2

Table (3) frequency distribution of the study group according to parents smoking habits.

Smoking of the parents (fathers)	ADHD NO (%)	Healthy children NO (%)	Total NO (%)
Smoking Positive	10 (71)	31 (36)	41 (41)
Smoking negative	4 (29)	55 (64)	59 (59)
Total	14 (100)	86 (100)	100 (100)

*Chi square = 6.231

* df=1

* p<0.05

Table (4) frequency distribution of family history of ADHD and normal school children.

Family history	ADHD NO (%)	Healthy NO (%)	Total NO (%)
Positive	11 (79)	9 (10.5)	20 (20)
Negative	3 (21)	77 (89.5)	80 (80)
Total	14 (100)	86 (100)	100 (100)

* Chi square= 34.9045

* df=1

* p<0.001

Table 5 - Frequency distribution of school children with ADHD and their school performance .

School performance	ADHD NO (%)	Healthy NO (%)	Total NO (%)
Low school performance	8 (57)	16 (18)	24 (24)
Normal	6 (43)	70 (82)	76 (76)
Total	14 (100)	86 (100)	100 (100)

* Chi square=9.8036

* df=1

* p<0.05

Discussion

The overall prevalence of ADHD (combined type) among school children in early years in the current study was 14%. This prevalence was less than that reported by other study conducted on Iranian children of the same age group in which the incidence was 25.8% when the parents' evaluation was considered, while it was when their teacher's evaluation was taken into account.¹⁸ The prevalence of this study is higher than that observed in pupils ranged between 6 until 12 years old in AL-Saudi Arabia (11.6%)¹⁹. and higher than the prevalence

reported in Egypt (12.6%) which was measured among children in four primary schools in AL- Mansura province²⁰. And even lesser than that reported that among primary school children in Egypt which was reported to be 6.9%²¹ ADHD is more prevalent in male children in this study with ratio 3.5:1.

This finding was in the line with previous studies²¹⁻²⁴. The study reveals that there is a significant association between having ADHD problem and positive family history, ADHD is a condition that results from the interaction among three premises, namely, genetic, environment, and developmental traits. However, the genetic promise could cover most of the cases²⁵. A relationship is identified between ADHD and parents tobacco smoking habits this finding depicts the possible role of the environmental pollution. A study reported the

role of Research indicated that mother's smoking during pregnancy or an early life of childhood had increased the incidence of ADHD for a child¹¹. In addition, a study indicated that the born girls who were exposed to nicotine in their prenatal life had higher chances to develop hyperactivity and/or impulsivity symptoms^{26,27}

Zhu and his colleagues demonstrates that the born babies came from smoker mums and non-smoker dads had higher risk of ADHD than those came from the vice-versa, highlighting the role of mother's smoking in the development of ADHD²⁸. The adverse effects of tobacco smoke could be derived from their ingredients that are accounted to be more than four hundreds molecules. Nicotine is among them that was shown to be closely related in the neurodevelopmental disorder²⁹ De Zeeuw et al³⁰ investigated the brain volumes using the imagining scan from anatomic magnetic resonance indicated that the patients with ADHD that was prenatally exposed to the smoking from their mums had smaller cerebellum volume compared to those had no smoking .This study shows a significant association between poor school achievement and having Attention Deficit Hyperactivity Disorder this may be related to poor attention, this finding goes in line with findings of other researchers who explain many reasons for poor school achievement. Good education could be one of the effective approaches that enhance the development of our children. In addition, Schools with poor educational programmers do not only influence on our child's self-esteem, but it could increase the stress of the child's parents³¹

Conclusions

the findings of this study indicated that the prevalence of ADHD is relatively high ; it is associated with low school performance , ADHD is more prevalent in boys, the prevalence is high among children with positive family history of this disorder and those whom parents are tobacco smokers therefore, considering the importance of students' mental health, the urgent needs of early diagnosis, effective prevention and management at least of high risk group, training of teachers and school health staff using a bottom line approach(District Team Problem Solving approach), Further comprehensive large scale analytic studies are suggested to deal with this neglected mental health problem. A close collaboration between schools' authorities and parents is recommendable, and the early diagnosis is crucial.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon – Hammurabi College of Medicine, Iraq and all experiments were carried out in accordance with approved guidelines.

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An Accurate Breast Cancer Detection System Based on Deep Learning CNN

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Abstract

Deep learning of multilayered computational models allowed processing to recognize the representation of data at multiple levels of abstraction. These technologies have significantly improved to identify breast cancer. Convolutional Neural Network (CNN) is a type of radiological basis for classification problems and is based on the Bayes decision-making base, which reduces the expected error in classification. In this paper, it is proposed to detect breast cancer using CNN of the mammography system to classify the mammogram to noncancerous abnormality and cancerous abnormality. The goal of Breast Cancer Detection based on CNN for speeding up diagnosis by helping a particular diagnose and classify breast cancer. A set of images of a mammogram is used to perform the pre-processing of the histogram equalization and adjust the appropriate parameters for the CNN work. Then, the whole changed images are set in CNN to classify as a training source. A CNN classifies can be produced as a model for identifying the mammogram. the BCDCNN method with the mammography classification utilizing MCCANN comparison with BCDCNN improved the classification accuracy on mammographic. Therefore, the results showed that the proposed system has a higher resolution than the other recently existing systems, and the only mass containing all was maximized from 0.84 to 0.88 and 0.70 to 0.82 accuracy.

Keywords: Breast Cancer, Convolutional Neural Network, Artificial Neural Network, Mammography Classification, Histogram Equalization.

Introduction

All over the world, the most common causes of many women deaths are breast cancer, the widespread type of cancer impacting women. In 2017, the estimates indicated that there were more than seventeen thousand five hundred women and one hundred and forty-four men with breast cancer. As an average, forty-eight of people with breast cancer were diagnosed daily. In Australia, the number of men and women affecting breast cancer has been increasing; as yet, the number of dead people because breast cancer is decreasing. The widespread type of cancer among women is breast cancer, which accounts for about 28.3% of all new cancers in women in 2017. The risk of this type of cancer at the age of 85 is 1 in 8 for women and 1 in 631 for men. If breast cancer is known to occur of younger women. In 2017, it was also estimated that 841 women aged between (twenty and thirty-nine) years were diagnosed with breast cancer. This represents 4.7% of all types of breast cancer diagnosed in Australia ¹.

According to the Breast Cancer Study, we found that 50% of NHS say they do not have the particular staff to recruit individuals with a limited nurse specializing in breast cancer². This is the most significant cause that may result a low-rate of survival of breast cancer worldwide. because of the lack of a nurse or breast cancer doctor, this will result in delayed diagnosis of breast cancer, lack of compliance with detection or optimal treatment, and unequal access to optimal treatment. Thus, detection of breast cancer has been developed to perform effectively both an anomaly and breast screening classification. This is to help and diagnose breast cancer. New proposal for image recognition system with detection of breast cancer. Image recognition utilized NN (Neural Network), a type of ANN that is designed and utilized successfully to determine visual images. This framework utilized a neural network, a kind of artificial neural network constructed and used effectively to identify visual images. This system is capable of classifying and detecting abnormalities in the image of mammograms. In general, the image of a mammogram may be categorized

as normal or cancerous abnormality (malignant), non-cancerous abnormality (benign) ³. In this paragraph, some previous researchers will be reviewed that have used various types of the neural network to depict mammograms into breast cancer as shown below:

In ⁴ (2009), Bozek et al. presented an indicator of breast cancer, such as architectural distortion but these are less important. The mass may be each non-benign. The variation between malignant and benign tumors is that tumors of benign have an oval or round shapes, whereas malignant tumors have a partially round shape of irregular outlines. Therefore, the malignant mass can seem whiter than other surrounding tissue.

In ⁵, (2011), Sharkas, Al-Sharkawy and Ragab presented discrete wavelet transformations (DWT), conversion of contour, and principal component analysis methods (PCA) to extract the feature. The system was the capability of detection and classification of abnormal and normal tissues. In addition, MC tumors were classified as malignant and benign. The rate of classification was nearly 98%.

In ⁶, (2013), Jawad Nagi presented Detection Breast Cancer (DBC) in Mammogram Images, achieved in four stages. The first phase was preprocessing and improved mammogram using global morphological techniques to reduce the image of the marker. The second phase was the process of segmentation using two techniques. Seed and growing the region and multiple OTSU threshold techniques. The third phase was the extraction of texture-based features and extracted fluorescence features. The last phase is passed by training and testing classification, and for the process of the training, the artificial neural network (ANN) was proposed.

In ⁷, 2015, W. Peng, R.V. et al. presented seeded region growing (SRG) and median filter using the 2D algorithm, improved image contrast, noise removal, deletion of radiology artifacts and elimination of chest muscle reduction from digital mammography, and ANN technology to classification the mammogram as follows: Normal Indicates a benign tumor or a malignancy. Here, 222 random images from the Breast Image Analysis Society database.

In ⁸, (2016), Jain, A, Levy D. presented Convolutional neural networks will be utilized to classify breast-segmented mammalian directly into mammography as benign or malignant, utilizing a combination of transport learning, pre-processing and increased data to overcome

limited training data. We deliver the state-of-the-art result on the DDSM data set, surpassing the performance of human, and demonstrate the viability of our model.

In ⁹, (2018), Saira Charan et al. presented neural networks to classify abnormal and normal detection of breast cancer. Convolutional neural networks (CNN) can be utilized in this detection. The dataset of mammograms-miss is utilized for this purpose system, containing 322 mammogram images of about 189 natural images and 133 abnormal breast images. A promising trial has been obtained that demonstrates the effectiveness of deep learning to detect breast cancer in mammograms and encourages the using of new methods of extracting and classifying features based on deep learning in different applications of medical imaging, essentially in the detection of breast cancer.

CONVOLUTIONAL NEURAL NETWORKS (CNN)

A Convolutional neural networks (CNN) is a special case of the neural network and a main tool of deep learning. CNN is perfect for pattern recognition for images. It includes more than convolutional layers, overwhelmingly in a subsampling layer, followed by more than connected layers just as in a Standard Neural Network (SNN) ¹⁰. The designing of CNN is derived behind the discovery of an optical mechanism, the visual cortex, into the brain. The visual cortex contains many cells in charge of light detecting in the small, overlapping subfields of the visible field, called the receiving fields. These cells act as local filters on the input area, while more complex cells contain more receptive fields. The torsion layer in CNN performs the function performed through cells into the visual cortex ¹¹.

The architecture of CNN

The primary focus of CNN is on the input basis which is comprised of images. This will give a focus on the architecture that will be set up in the best way that is required for handling data of specific type ¹². CNN consists of three types of classes. These are convolutional layers, pooling layers, and fully-connected layers. When these layers are stacked, CNN architecture has been formed. The simple architecture of CNN for classification of Breast cancer is shown in Figure (1).

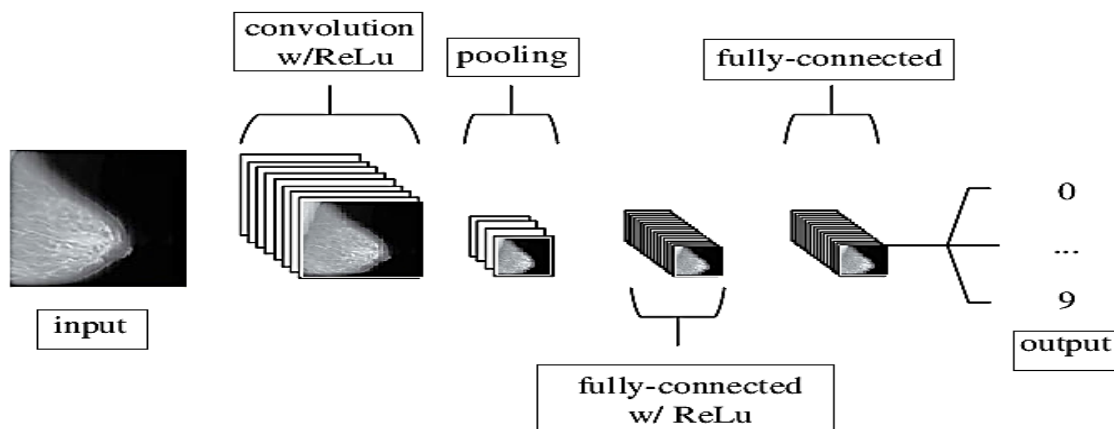


Figure (1): A simple architecture of CNN ¹² .

The basic function of CNN above will be divided into four major regions.

1. As found in other forms of artificial neural network (ANNs), the input layer can contain pixel value into image.

2. **Convolutional Layer** will be determined the yield of the neurons that are connected to the local input areas by calculating the product of scalar between its weights and the region related to the input volume. The aims of the rectified linear unit (ReLU) apply the “initial” activation function, like the sine, to the activation outputs produced through the previous layer.

3. **Pooling Layer** simply reduces the samples with the spatial dimension of the selected inputs, minimizing the number of parameters in that activation.

4. **Fully Connected Layers** can perform the same duties as the standard artificial neural network (ANNs) and try to produce the activation grades for classification. Also, it is suggested to use ReLU between these layers, for performance improving.

V. EVALUATION PERFORMANCE OF CNN

In any field of science, it is almost a necessary requirement that the performance of classifier must be evaluated to understand and measure the suitability of classifying a given problem. The classification of binary predicts all instances of data for the test data set either negative or positive. This classification or prediction results in four outcomes - true or false (positive and negative).

1. **True positive (TP):** Correct of Positive Prediction
2. **False positive (FP):** Incorrect of Positive Prediction
3. **True negative (TN):** Correct of Negative Prediction
4. **False negative (FN):** Incorrect of Negative Prediction

One of the most common measures is the confusion matrix it will be explained in the next section.

I. Confusion Matrix

The Confusion matrix is consisting of a two by two (2 x2) Table that contains four outcomes produced by a classification, these are essential performance measures, like accuracy, specificity, and sensitivity which are derived from the confusion matrix. The confusion matrix is utilized to represent the test of the result prediction model. Each of rows stands for the predicted class which means the (Output Class), and the columns stand for the true class which means the (Target Class). In Table (1), The matrix of confusion is displayed, which is described as the different values and equations associated with them. Few of these equations are closely related to performance analysis.

Table (1): A Typical Confusion matrix ¹³ .

Confusion matrix		Predicted	
		Negative	Positive
Actual	Negative	TN	FP
	Positive	FN	TP

The inputs of the confusion matrix have meaning in the context of the problem of data mining:

1. TN is the number of the prediction of true that in the case is negative,
2. FN is the number of predictions of false that a case positive,
3. TP is the number of predictions of true in which a positive instance,
4. FP is the number of predictions of false of negative instance.

The following are the Basic measures derived from the confusion matrix:

1) Accuracy

Accuracy (ACC) is determined as a number for all predictions of correct (TP + TN) divided by the total number of data sets (P + N). The best of accuracy equal to 1.0, while the worst equal 0.0. It can likewise be determined by 1 - error (ERR) as shown in equation (1).

$$ACC = \frac{TP + TN}{TP + TN + FN + FP} = \frac{TP + TN}{P + N} \quad (1)$$

2) Sensitivity (Recall or True Positive Rate)

Determined the number of predictions of true positive (TP) divided by a total number of the positives (P) this method called Sensitivity (SN) or likewise Recall or the True Positive Rate (TPR) (REC). The sensitivity equal to 1.0 is best, whereas the worst equal 0.0 as shown in equation (2).

$$SN = \frac{TP}{TP + FN} = \frac{TP}{P} \quad (2)$$

3) Specificity (True Negative Rate)

Determined the number of predictions of True

Negative (TN) divided by the total the number of negatives (N) this method called Specificity or True Negative Rate (TNR). The specificity equal to 1.0 is best, whereas the worst equal 0.0 as shown in equation (3).

$$SN = \frac{TN}{TN + FP} = \frac{TN}{N} \quad (3)$$

VI. The Proposed Method

The proposed method consists of three main stages, in the first stage is the acquisition of the image, second stage extraction features from the mammograms, selecting more optimal features, classifier to identify an appropriate classification of mammogram utilized CNN classification accuracy mainly depend on careful selection of features. In the finally step mammograms are classified, for this Convolutional neural network is used as a classifier to distinguish mammogram and classified it into malignant and normal classas shown in this Figure (2).



Figure (2). the main proposed system.

A. Dataset

The dataset used for this paper is a known Mammographic Database. Convolutional neural networks require a large amount of training data to realize height accuracy. Because of less accessibility of the dataset of enormous, testing and training were

done from the most accessible dataset on the web. In this paper were utilized 322 full images. The actual size of the images was 1024- 1024. It contained about 133 images that were abnormal and 189 of the regular category. The images of abnormal are included an inconsistency in which one breast increased density, 21 of which were included. The architectural deformity was the second types of abnormal, showing the arrangement of abnormal tissue on the breasts. This was included about 22 images. The small calcium deposits in breasts can be developed, where 24 of these images were found to contain calcification, which is irregularly shaped in the breast and can be malignant and some have not been ascertained if they are malignant. Data were randomly training by 70% and 30% were tested by CNN technology.

B.Equalize Histogram

In order to eliminate the effect of different illumination conditions, where images are taken in, the color histogram of the grayscale image is equalized, so that, the features are more distinguishable by the classifier, the overall effect of the lighting in the environment is removed.

Results

In this paragraph will illustrate the results obtained using the proposed method for a range of breast cancer images. The results of the proposed algorithm CNN are the best for detection of breast cancer.

Dataset: Mammographic Database is used in this proposed system. breast images Include both sides arranged in pairs, where each pair represents the right and left mammograms for 161 patients that mean 322 images as shown in this Figure (3).

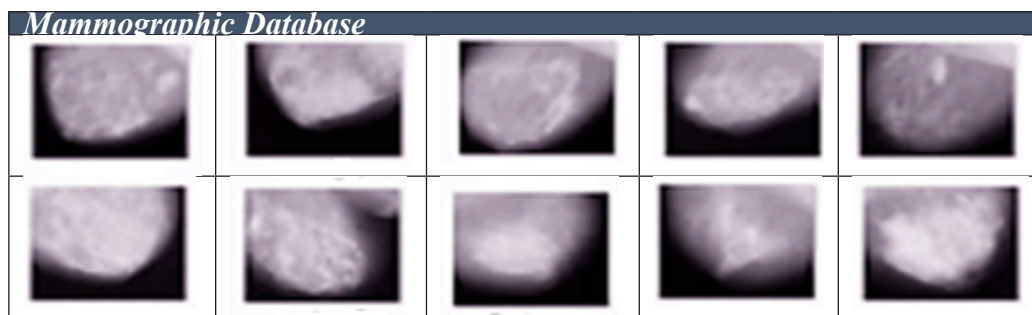
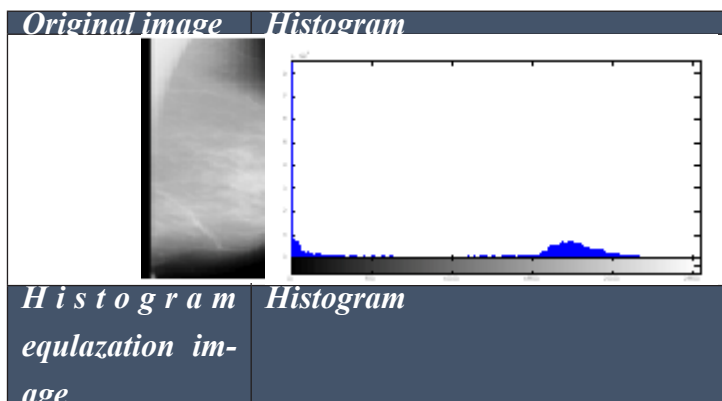


Figure (3): Mammographic Database

Histogram Equalization: Real life images are taken under different illumination conditions, which may affect the distinguishing ability of the patterns and features in the image. Thus, it is important to adjust the intensity of each pixel image through histogram equalization as shown in this Figure (4).



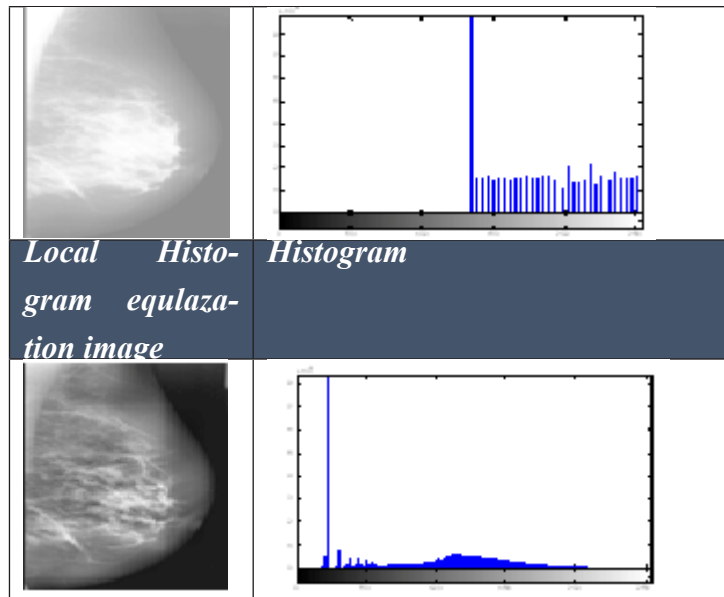


Figure (4):Histogram Equalization

• **CNN Classification:**The result of CNN detection of breast cancer divided three phases malignant, benign and normalas shown in this Figure (5) and Table (2) as shown Evaluation performance of CNN.

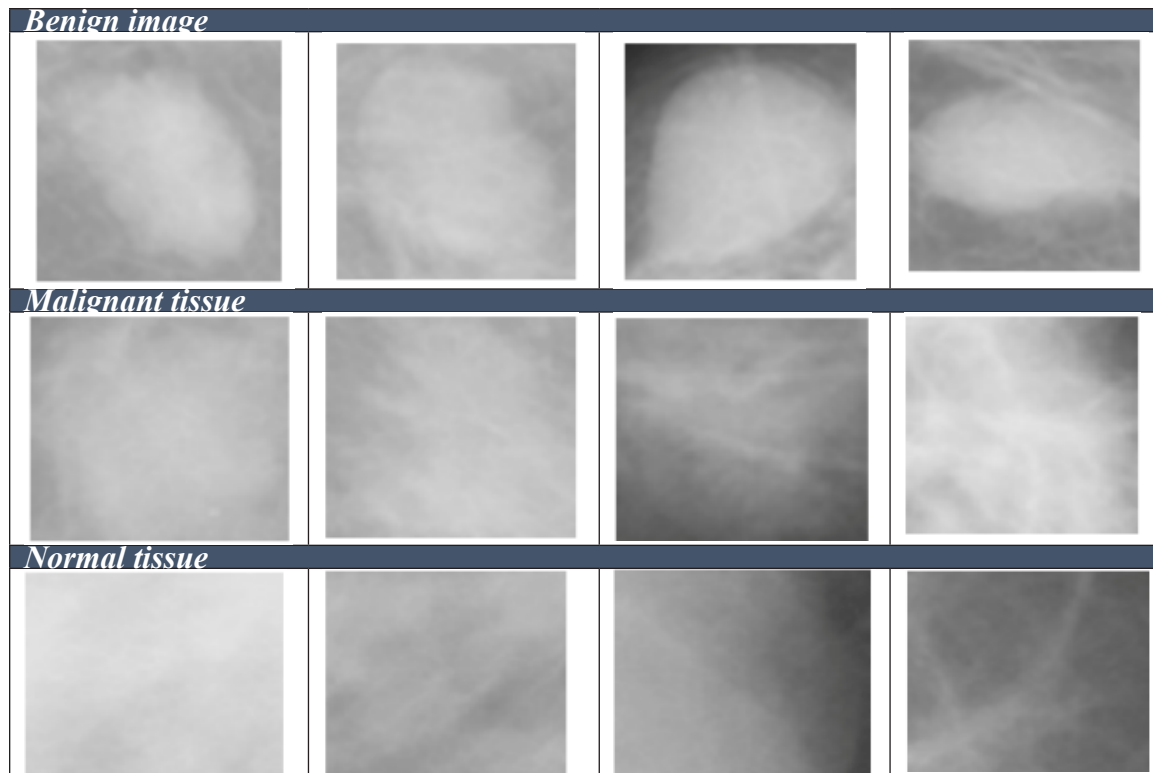


Figure (5): Breast cancer (malignant, benign and normal)

Table (2) Evaluation performance of CNN

breast cancer (malignant, benign and normal)
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Sensitivity	45.32%	63.32%	95.1%
Specificity	45.43%	63.35%	99.3%
Accuracy	48.45%	63.40%	99.4%

Conclusion

To reduce the mortality rate because of breast cancer, it is very important to identify cancer in the initial phase.

Mammography from the mini-MIAS database is used in this paper. This database consists of 322 mammograms images, of which 52 are cancerous and 270 are normal. Ten texture features from CNN were calculated along 0°, and the feature space is reduced to six features using the Classification Features method. Results show 100% accuracy for validation and test data, and total accuracy achieved using the proposed method is 99.4%.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the university of information technology and communications, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Efficacy and Safety of Cinnarizine in the Treatment of Vertigo in a Sample of Iraqi Patients in Al-Diwaniyah Province

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Abstract

Background: Vertigo is a common vestibular disorder in daily clinical practice that is frequently described as rotational sensation by patients and caused by a variety of causes that can be central or peripheral in origin. Treatment should be directed toward underlying etiology, but symptomatic relief is required to improve patients' quality of life. Cinnarizine is frequently prescribed to relieve symptoms associated with vertigo; however little is known about its efficacy in daily clinical practice in Al-Diwaniyah province.

Aim of the study: To evaluate the safety and efficacy of cinnarizine in the treatment of vertigo in patients visiting ENT unit at Al-Diwaniyah teaching hospital.

Patients and method: The present cohort study included 66 patients of vertigo who were treated medically by cinnarizine (stugeron) and followed up for treatment response evaluation. The study was carried out in Ear Nose and Throat (ENT) unit in Al-Diwaniyah Teaching Hospital, Mid-Euphrates region, Iraq. The study started on June 2018 and ended on July 2019. The main variables included in the study were age, residency, level of education, occupation, other associated ENT manifestations and chronic illnesses. The primary outcome was response to treatment classified into satisfactory and unsatisfactory.

Results: Mean age of patients with satisfactory response was significantly less than that of patients with unsatisfactory response, 45.73 ± 13.31 years versus 54.95 ± 15.67 years, respectively ($P = 0.016$). Response to treatment was not significantly associated to gender, residency, occupation and education ($P > 0.05$). Response to treatment was not significantly associated to bilateral ear wax, acute otitis media, chronic suppurative otitis media, Meniere's disease and common cold ($P > 0.05$); however, it was significantly in the absence of hearing impairment and tinnitus ($P < 0.05$). Response to treatment was not significantly associated to uremia, trauma, anemia, hypothyroidism, anxiety, hypotension, arthritis and urinary tract infection (UTI) ($P > 0.05$), but significantly better in the absence of diabetes mellitus and hypertension ($P < 0.05$).

Key words: efficacy, safety, cinnarizine, vertigo, Iraq

Introduction

The problem of vertigo is among common clinical issues that are daily seen in emergency department and primary health care centers as well as private Ear Nose and Throat (ENT) clinics ¹. It is frequently described as sensation of motion by patients and mostly as rotational sensation ². It should be differentiated from lightheadedness or near syncope ². Vertigo is often due to abnormalities affecting vestibular system and the lesion could be peripheral or central ³. Vertigo is most often the

result of peripheral lesion such as Meniere's disease and benign paroxysmal positional vertigo (BPPV) ⁴. BPPV is caused by precipitation of calcium deposits in the posterior semicircular canal leading to recurrent attacks of vertigo that often extend for a few minutes ⁵. Meniere's disease is characterized by the presence of tinnitus, aural fullness and hearing impairment in addition to vertigo ⁶. The cause of Meniere's disease is attributed to increase in the volume of endolymph inside semicircular canal ⁶. Viral infection also causes peripheral vertigo due to acute vestibular neuritis of acute labyrinthitis ⁷. Ramsay Hunt

syndrome is another cause of peripheral vertigo caused by reactivation of latent varicella zoster virus in the geniculate ganglion with subsequent vestibulocochlear neuritis⁸. This syndrome is usually associated with signs and symptoms attributed to facial nerve involvement⁸. Other less common causes of peripheral vertigo are cholesteatoma, perilymphatic fistula and otosclerosis⁹. Central causes are due to involvement of cerebellum or vestibular nuclei by ischemic or hemorrhagic stroke¹⁰, tumors of cerebellopontine angle¹¹, vestibular migraines and multiple sclerosis¹². Other causes of vertigo include certain medications¹³, anxiety and other systemic chronic illnesses¹⁴. Vertigo is a frequent problem daily faced in clinical practice and estimated to affect about 10 % of population. It is more frequent in women than in men and its incidence increases with age. It causes significant impairment of quality of life; therefore its cause must be searched and treated properly¹⁵.

Management should be directed toward identification of the cause of vertigo because once the etiology is resolved symptoms disappear¹⁶. However, a number of medications are used to suppress vestibular symptoms for a while till identification of the cause. These medications include anti-histamines, benzodiazepines and antiemetics¹⁷. Cinnarizine (stugeron) is a calcium channel blocker with antihistamine properties is frequently used in clinical practice to relieve symptoms of vertigo arising from a variety of causes¹⁸. In the current study, the efficacy and safety of cinnarizine has been evaluated in a number of Iraqi patients presented with vertigo in Al-Diwaniyah province, Mid-Euphrates region of Iraq.

Patients and Method

The present cohort study included 66 patients of vertigo who were treated medically by cinnarizine (stugeron) and followed up for treatment response evaluation. The study was carried out in Ear Nose and Throat (ENT) unit in Al-Diwaniyah Teaching Hospital, Mid-Euphrates region, Iraq. The study started on June 2018 and ended on July 2019. The main variables included in the study were age, residency, level of education, occupation, other associated ENT manifestations and chronic illnesses. The primary outcome was response to

treatment classified into satisfactory and unsatisfactory. The study was approved by institutional ethical approval committee and a verbal consent was obtained from every participant after full illustration of the study aim and procedures. Obtained data were transformed into SPSS (version 23) spread sheet. Numeric data were expressed as range, mean and standard deviation, whereas, categorical data were expressed as number and percentage. Independent sample t-test was used to evaluate mean difference between two groups; while chi-square and Fisher exact tests were used to study association between categorical variables. The level of significance was considered at $P \leq 0.05$.

Results

The demographic characteristics of patients participating in the current study were demonstrated in table 1. According to response to cinnarizine treatment patients were categorized into two groups, satisfactory response group ($n = 45$) and unsatisfactory response group ($n = 21$). Mean age of patients with satisfactory response was significantly less than that of patients with unsatisfactory response, 45.73 ± 13.31 years versus 54.95 ± 15.67 years, respectively ($P = 0.016$), table 1. There was no significant association between gender and response to treatment ($P = 0.772$). There was also no significant association between residency and response to treatment ($P = 0.547$), table 1. In addition, there was no significant association between occupation and response to treatment ($P = 0.499$), table 1. Moreover, there was no significant association between education and response to treatment ($P = 0.542$), table 1. Regarding other ENT manifestations, response to treatment was not significantly associated to bilateral ear wax, acute otitis media, chronic suppurative otitis media, Meniere's disease and common cold ($P > 0.05$); however, it was significantly in the absence of hearing impairment and tinnitus ($P < 0.05$), as shown in table 2. Regarding other associated diseases and comorbidities, response to treatment was not significantly associated to uremia, trauma, anemia, hypothyroidism, anxiety, hypotension, arthritis and urinary tract infection (UTI) ($P > 0.05$), but significantly better in the absence of diabetes mellitus and hypertension ($P < 0.05$), as shown in table 3.

Table 1: Other ENT manifestations

Characteristic	Total n = 66	Satisfactory response n = 45	Unsatisfactory response n = 21	P
Bilateral Ear wax, n (%)	5 (7.6 %)	5 (11.1 %)	0 (0.0 %)	0.169 F NS
Acute OM, n (%)	4 (6.1 %)	4 (8.9 %)	0 (0.0 %)	0.289 F NS
Chronic suppurative OM, n (%)	4 (6.1 %)	4 (8.9 %)	0 (0.0 %)	0.298 F NS
Meniere's Disease, n (%)	3 (4.5 %)	2 (4.4 %)	1 (4.8 %)	1.000 F NS
Common cold, n (%)	2 (3.0 %)	2 (4.4 %)	0 (0.0 %)	1.000 F NS
Hearing impairment, n (%)	45 (68.2 %)	27 (60.0 %)	18 (85.7 %)	0.037 C S
Tinnitus, n (%)	44 (66.7 %)	25 (55.6 %)	19 (90.5 %)	0.005 C HS

n: number of cases; OM: otitis media; C: Chi-square test; F: Fischer exact test; NS: not significant at $P \leq 0.05$; S: significant at $P \leq 0.05$; HS: NS: highly significant at $P \leq 0.01$

Table 2: Associated diseases and abnormalities

Characteristic	Total n = 66	Satisfactory response n = 45	Unsatisfactory response n = 21	P
Uremia, n (%)	1 (1.5 %)	0 (0.0 %)	1 (4.8 %)	0.318 F NS
Trauma, n (%)	3 (4.5 %)	1 (2.2 %)	2 (9.5 %)	0.236 F NS
Anemia, n (%)	10 (15.2 %)	6 (13.3 %)	4 (19.0 %)	0.714 F NS
Hypothyroidism, n (%)	1 (1.5 %)	0 (0.0 %)	1 (4.8 %)	0.318 F NS
DM, n (%)	25 (37.9 %)	13 (28.9 %)	12 (57.1 %)	0.028 C S
Anxiety, n (%)	2 (3.0 %)	2 (4.4 %)	0 (0.0 %)	1.000 F NS
Hypertension, n (%)	20 (30.3 %)	8 (17.8 %)	12 (57.1 %)	0.001 C HS
Hypotension, n (%)	4 (6.1 %)	4 (8.9 %)	0 (0.0 %)	0.298 F NS
Arthritis, n (%)	4 (6.1 %)	3 (6.7 %)	1 (4.8 %)	1.000 F NS
UTI, n (%)	3 (4.5 %)	1 (2.2 %)	2 (9.5 %)	0.236 F NS

n: number of cases; C: Chi-square test; F: Fischer exact test; NS: not significant at $P \leq 0.05$ S: significant at $P \leq 0.05$; HS: NS: highly significant at $P \leq 0.01$

Discussion

In daily clinical practice, particularly in the unit of ENT, vertigo is a common clinical problem. This problem arises from a variety of causes; however, it can be basically considered as one of two major issues. Either a peripheral cause involving the vestibular system, as is the case in most of patients or a central lesion affecting the cerebellum or vestibular system causing vertigo in addition to other localizing neurologic clinical signs⁽³⁻⁹⁾. It is, indeed, the diagnosis of the exact etiology of vertigo and removing the specific cause, the ideal way to get rid of vertigo; nevertheless, in most of cases this not amenable until a period of time during which the patients quality of life is severely affected^(16, 17). For that reason symptomatic relief is sought by almost all patients in order to improve their quality of life and get rid of that annoying symptom. Several pharmacological agents are nowadays present but the efficacy of which is still not investigated in our health institutes. We select cinnarizine because it is the most commonly prescribed agent by most physicians in Al-Diwaniyah province in order to evaluate its efficacy and safety. In the current study, cinnarizine was effective and safe with negligible side effects. Its efficacy was seen in 45 out of 66 (68.2 %) which is comparable to a number of reports of several previous authors⁽¹⁸⁻²⁰⁾. However, we found that its efficacy is low in patients with hypertension, diabetes, tinnitus and hearing impairments. Therefore, we believe, that the treatment of the exact cause is the best therapy for those patients. In addition, the search for central cause such as ischemic stroke in those patients is mandatory since cinnarizine mainly acts on peripheral vestibular apparatus. Our findings are in line with several other authors with respect to poor response in case of tinnitus and hearing loss¹⁹. Therefore, Cinnarizine is effective and safe in the treatment of majority of causes of vertigo; however, some cases need other than cinnarizine to control their symptoms especially those patients with tinnitus, hearing impairment, diabetes mellitus and hypertension.

Conclusion

Cinnarizine is effective and safe in the treatment of majority of causes of vertigo; however, some cases need other than cinnarizine to control their symptoms especially those patients with tinnitus, hearing impairment, diabetes mellitus and hypertension.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Al-Diwaniyah Teaching Hospital / Department of surgery / Al-Diwania / Iraq and all experiments were carried out in accordance with approved guidelines.

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Catalase Gene Polymorphism in Patient with Diabetes Disease Type 1 in Karbala City

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Abstract

Diabetes Mellitus (DM) is a collection of metabolic diseases categorized by hyperglycemia caused by insulin excretion deficiencies, insulin performance, or both DM are categorized into distinct kinds. Type 1 diabetes (T1D) is defined by breakdown of β -cells, generally resulting in complete insulin deficiency. Type 2 diabetes (T2D) is a consequence of peripheral tissue insulin resistance. a complete of fifty patients and fifty control subjects were collected between February to October 2018. The genotyping of catalase were attained consuming polymerase chain reaction (PCR) in addition to restriction fragment length polymorphism (RFLP). We tend to firm vigorous changes within the genotype occurrences of catalase between patients with diabetes and controls using the $P=0.038$, $OR =0.58$ (0.48-0.78).

Keywords: Diabetes, RFLP, catalase, SNPs. Polymorphisms.

Introduction

Type 1 diabetes mellitus (T1DM) is the greatest public metabolic disturbance in which together hereditary and environmental aspects were complicated ¹. It had been assumed that while kids had a hereditary predisposition to T1DM, there are expected to an environmental aspect that activates progress of T1DM. The initiates have proposed involve viral contagion, vaccines, vit D lack , and cow's milk ².

The corrosion of in elevation levels of glucose in diabetic cells products extra electron givers (NADH and FADH₂) and rises the electron transmission, thus generating superoxide, spare generation of ROS like superoxide (O₂ •₂), hydrogen peroxide (H₂O₂), and hydroxyl radical (•OH) and responsive nitrogen classes like nitric oxide oxidize aim cellular proteins, nucleic acids, or lipid layers and destruction their cellular arrangement and function ³.

Overproduction of free radicals i.e., oxidative stress may effect oxidative destruction to lipids, proteins and DNA, finally leading to several chronic diseases like diabetes, myocardial infarction, cardiovascular diseases, atherosclerosis, stroke and other degenerative diseases in humans ⁴. Moreover, hyperglycemia-induced generation of reactive oxygen species (ROS) on the

mitochondrial level is the original trigger of malicious rotation of oxidative stress in DM ⁵.

Catalase (CAT) is present in peroxisomes and occurs as a dumbbell-designed tetramer of 4 equal axillary units. CAT quickly catalyzes hydrogen peroxide breakdown into less proactive oxygen and water particles. Insufficiency of catalase has been identified to direct to T2DM improvement ⁶. Catalase gene is positioned on chromosome 11p13. Exon 2 and adjoining introns of the catalase gene were supposed to modification heated stains aimed at T2DM vulnerability ⁷. Adjustment of cysteine to cysteic acid to tyrosyl nitration of CAT and reduced activation in cases of oxidative stress ⁸. In type 1, 2 and gestational cancer (GD) and disorders such as diabetic retinopathy (DR), diabetic nephropathy (DN), ischemic heart disease (IHD) and CVD ⁹, the exon 9-262C / T polymorphism in the catalase gene was screened. In addition, this purposeful polymorphism funded T2DM's progress and its issues ¹⁰. The A / T polymorphism genotype of the CAT gene ' AT ' can elevate the hazard of T2DM in northern Indians ¹¹.

Methodology

Sampling

Fifty blood samples had gathered of patients with

primary diabetes whose visits diabetes Center /Hilla/Iraq and fifty samples as control.

DNA Extraction

Genomic DNA of complete blood cells was derived and filtered by Extraction and filtration Kit of Favergen Company (Taiwan).

Using RFLP- PCR amplification for Genotypic Identification

The directed positions of DNA were intensified using special primers was designed: collected of Bioneer, IDTDNA (USA). Primer: Frontward categorization was 5- CTGGGTATCTCCGGTCTTCA-3, and opposite categorization was 5- CCGCTTTCTAAACGGACCTT-3.

PCR was done in 20µl response measurements covering 1 µl of back and forward primers, 12.5 µl of Green Master Mix, 3 µl of Genomic DNA, and the reaction volume was finished up to 20 ul by containing with 2.5 µl of Nuclease allowed water. Intensification had been completed in a thermo-cycler customized at 94 ° C for 2 min ; 5 minutes at 94 ° C for 35 cycles, 1 at 57.8 ° C and 1 at 72 ° C; and a last five mins extension. PCR products were electrophoresed using 1% agarose gel electrophoresis at 75 V for one hour using ethidium bromide. Photographs had been obtained utilizing the context of gel documentation. Through the Promega Company Protocol, the PCR item became removed utilizing *HinfI* restriction endonuclease, the PCR-

RFLP technique achieved stable. The next ingestion of MSPI feedback was electrophoresis utilizing gel electrophoresis (Cleaver Scientific–UK) in 3% agarose gels at 75 V of one hour and 8% polyacrylmide gel electrophoresis control associated with the following: 75 V, 20 Am for 160 minutes. Gels pictured subsequently by ethidium bromide. Utilizing gel documentation system (EBOXCX–UK) photos were obtained.

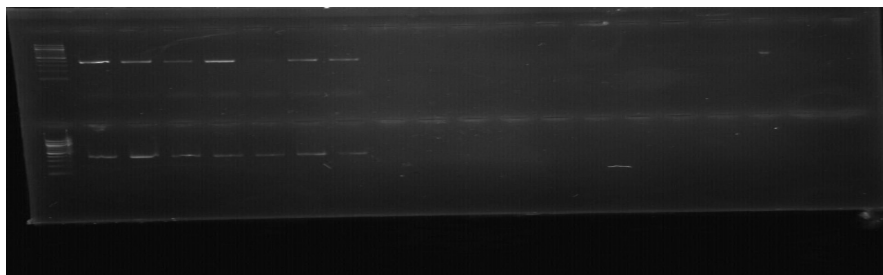
Statistical Method

The SPSS applied mathematics software system (17 ; SPSS Inc., Chicago, IL) was finished with total practical math analysis, and P- values < 0.05 were thought to be statistically important.

Results

study Genotype result

Deoxyribonucleic acid had been extracted from the blood sample Figure (1) revealed the catalase gene amplifying consumer’s agarose gel electrophoresis shot, measuring up to 369 bp portion. Issues of PCR-RFLP system catalase-related quality polymorphisms utilizing *HinfI* containment chemistry disclosed that there are three instances of genotype polymorphisms, which involve homozygous genotype (2 band, 200,175 bp), The second type was homozygous genotype (1 band 369 bp) and third example stayed heterozygous genotype (3 bands , 200,175 and 369 bp) which came about three DNA groups



Fig(1) (Agarose gel electrophoresis of Catalase) amplification produces of Diabetes and control groups.

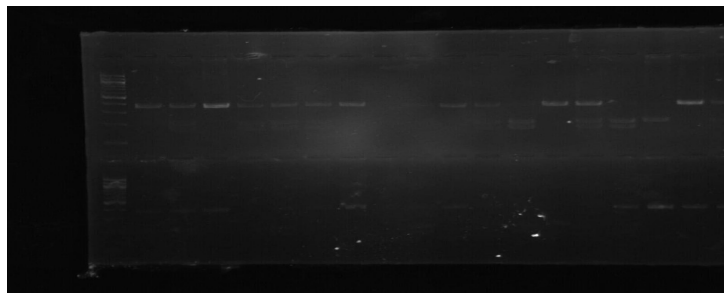


Fig 2: Agarose gel electrophoresis of Diabetes and healthy subjects allelotyping of catalase using *HinfI* enzyme by PCR-RFLP method

Table (1): genotyping distribution of Catalase gene polymorphism and there association in control and patients groups.

Genotype	control No. (%)	patients No. (%)	P-value	OR (95%) CKD
1 band ^a	13 (81.25%)	18 (52.29%)		
2 band	3 (19.75%)	9 (26.4%)	0.25	2.16 (0.48-9.60)
3 band	0 (0%)	7 (20.58%)	0.038*	0.58 (0.48-0.78)
Total	16	34		

10 20 30 40 50 60 70 80 90 100
|

reference

CTGGGTATCTCCGGTCTTCAGGCCTCCTTCGGAGAGCCCTGCTCCGAGCCCAT
 TGGGCTTCCAATCTTGGCCTGCCTAGCGCCGAGCAGCCAATCAGAAG

190305-040_I01_5_
 190305-040_K01_6_
 190305-040_M01_8_C.....
 190305-040_O01_16_C.....C.....C...
 190305-040_A03_24_A.....A.....C...
 190305-040_M03_10C_C...C...
 190305-040_A03_24C_A.....A.....C...
 190305-040_A05_25C_

110 120 130 140 150 160 170 180 190 200
|

reference

GCAGTCCTCCCAGGGGGCGGGACGAGGGGGTGGTGCTGATTGGCTGAGCCT
 GAAGTCGCCACGGACTCGGGGCAACAGGCAGATTTGCCTGCTGAGGGT

190305-040_I01_5_T.....
 190305-040_K01_6_T.....
 190305-040_M01_8_T.....

190305-040_O01_16_ ...C.....A.....C.A.....A.....C.....A.....C.....A.
 190305-040_A03_24_T.....
 190305-040_M03_10C_T.....
 190305-040_A03_24C_T.....
 190305-040_A05_25CT.....

210 220 230 240 250 260 270 280 290 300
|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|

GGAGACCCACGAGCCGAGGCCTCCTGCAGTGTTCTGCACAGCAAACCGCACGC
 TATGGCTGACAGCCGGGATCCCGCCAGCGACCAGATGCAGCACTGGA

190305-040_I01_5_C.....
 190305-040_K01_6_C.....
 190305-040_M01_8_C.....
 190305-040_O01_16_ .C.C.....A...T.....C.....T.....
 190305-040_A03_24_C.....
 190305-040_M03_10C_C.....
 190305-040_A03_24C_C.....
 190305-040_A05_25CC.....

310 320 330 340 350 360
|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|

reference

AGGAGCAGCGGGCCGCGCAGGTACTCTGTGCTCCCCGAGCGGGCCCGAAG
 GTCCGTTTAGAAAGCGG

190305-040_I01_5_
 190305-040_K01_6_
 190305-040_M01_8_
 190305-040_O01_16_
 190305-040_A03_24_
 190305-040_M03_10C_
 190305-040_A03_24C_
 190305-040_A05_25C

Figure (3): Arrangements alignment ID: catalase gene fragment for *Homo sapiens* by use Bio Edit program

Discussion

Firstly, catalase gene polymorphism was studied in Diabetes conditions and controls. The spreading witnessed in catalase gene polymorphism in control set and conditions clusters are revealed into tab (1) maximum genotype in control group remained homozygote genotype 1 band (81.2%) followed by homozygote genotype 2 band (19.1%) and mutant heterozygote genotype 3 bands (0%) and. In Diabetes disease, peak genotype in Diabetes group was homozygote genotype 1 band (52.2%) followed by homozygote genotype 2 band (26.4%) and mutant heterozygote genotype 3 bands (20.58%). Sequencing findings proven haplotypes detected in our work. Various single nucleotide polymorphism (SNP), were taken between DNA polymorphisms (1, 2 and 3 bands) and Catalase NCBI Primer3^{plus} reference. Worldwide, DM is one of the maximum non-communicable diseases in the public. As per the International Diabetes Federation (IDF), they had 366 million persons among 20-79 years of age who had diabetes¹². IDF also reported that DM in 2011 culminated in as many as 4.6 million fatalities¹³. Among kids, T1D has the greatest prevalence of various kinds of DM, with the largest occurrence recorded in Finland and Sardinia and the lowest in China and Venezuela¹⁴. Among the youngest kids, particularly among the European population, the rise is the highest. “The number of children developing this form of diabetes every year has increased rapidly all over the world, except in Central America and West Indies where the trend is decreasing (14). However, latest research regarding incidence of T1D for children in Finland highlighted two significant changes in the trends between 1980 and 2011”. The study revealed up to 2005 an annual rise, accompanied by a plateau until the later part of 2011¹⁵. A comparable plateau incidence from 2005-2007¹⁶ and Norway from 2004-2012¹⁷ has also been recorded by Sweden. “Catalase is one of the main enzyme components of cell defense counter to oxidative stress and it had been hypothesized that the polymorphism CAT decreases the antioxidant capacity and can serve as a risk element for oxidative stress associated diseases. The association among SOD1-251 A/G, CAT-21 A/T, and GPX1-198C/T antioxidant gene polymorphisms in the risk of cataract was informed between Chinese population”¹⁸. Our results showed significant differences between patients and controls, Other results showed that CAT polymorphism was linked to enhanced hazard and began playing an essential role in diabetes pathogenesis¹⁹. On the other side, little

reviews had revealed the polymorphism of the catalase gene not related to the risk of cardiovascular diseases among type 2 diabetes mellitus in Finnish population²⁰ and also among type 1 diabetes mellitus patients in Czech population²¹. Other study exhibited No association between the catalase polymorphism and DM was detected in diabetic patients of type 2 Caucasian-Brazilian. That’s the earliest research planned for our data to investigate the relation between a polymorphism of the catalase gene and diabetic problems of patients with type 2 diabetes. Though catalase has mostly been researched, little studies have been specially examined relations of catalase polymorphisms through diseases²² To conclude, our findings provision the hypothesis which the polymorphism in the catalase enzyme connected to both the progress for diabetic retinopathy, diabetic nephropathy or ischemic heart disease popular Iraqis with type 2 diabetes.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, University of Warith Al-anbiya’a and all experiments were carried out in accordance with approved guidelines.

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Depression among Patients with Renal Failure Undergoing Haemodialysis Treatment in Holy Kerbala City in Iraq

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Abstract

Renal dialysis patients face many challenges during the treatment period and are subjected to many psychological stresses, but depressive symptoms of dialysis patients are associated with higher mortality. This study aims to assess the level of depression in patients with chronic renal disease undergoing haemodialysis treatment; 60 patients with chronic renal failure receiving haemodialysis treatment were recruited from Al-Hussain hospital in one of the religious cities in Iraq. Depression was assessed using the Beck Depression Inventory. The results showed that most participants had severe and extreme levels of depression, and higher scores were representative of somatic depressive symptoms. There was no significant association between depression and patient demographic data. Depression should be assessed by nurses, and patients should be referred for treatment to decrease mortality and improve disease outcome.

Keywords: Depression, Renal failure, Haemodialysis, Beck Depression Inventory

Introduction

Haemodialysis is a long-term treatment provided to patients with end-stage chronic renal failure. Patients suffer from this treatment despite it being a life-saving and irreplaceable treatment². Renal dialysis continues throughout the life of the patient, which changes the role of the patient in his or her family and increases his or her despair, feelings of hopelessness and fear of death, which affects quality of life³. Depression is one of the most serious psychological problems for a dialysis patient and has a serious impact on the quality of life of the patient and his or her family¹⁷. Depression has negative effects on all aspects of a patient's life, affecting social, economic, and physical aspects Kimmel, (2002) including increased incidence of illness and numbers of hospital admissions, reduced desire to take medication and, more importantly, increased desire to end life (24, 18). Patients lose control because of the inability to perform their role in their family and work, which increases their despair and hopelessness⁵. Symptoms of severe depression, such as sadness, anxiety, loss of interest in any activity, lack of self-esteem, pessimism toward the future, sleep disorders and lack of appetite during the period of dialysis, are found in many dialysis

patients⁷. Renal dialysis patients face many challenges during the treatment period and are subjected to many psychological stresses, but depressive symptoms represent the most common symptom of dialysis patients and are associated with higher mortality. Dialysis treatment changes the patient's role in their family and work and increases the patient's dependence on others; patients have feelings of fatigue and feel that the disease has overcome them¹⁹ because symptoms of severe depression may be misdiagnosed. From this point of view, it becomes necessary to evaluate depression in dialysis patients to help them think logically and to relieve their psychological stresses². Many studies have been conducted to assess the psychological condition and quality of life of a dialysis patient, and the results may vary because of differences in culture and differences in the social, economic and political status of the studied countries. Chronic renal failure tends to be an epidemic and a serious disease³. In Iraq the Ministry of Health announced in 2018 that there was an increase in patients with chronic renal disease needing haemodialysis treatment of approximately 20% each year in all of Iraq; however, there has been no precise study on the prevalence of depression in dialysis patients⁶.

Methodology

Design, setting and sample

A descriptive analytic study design was carried out to assess depression in patients with renal failure undergoing haemodialysis at Al- Hussain Medical City in Holy Karbala city. An official request was submitted to a health director (Training and Developing Center). Then, permission was obtained from Al Hussain Medical City in Holy Karbala city. The study was conducted in Karbala city. Karbala is a city in central Iraq located 100 km southwest of Baghdad and has an estimated population of 1,376,000 people. It is considered a Holy city for Shi'aha Muslims and is visited by many people, especially on religious occasions. The Chronic Renal Center is the only centre in Al Hussain Medical City, It is visited by 400-500 patients annually, some of whom were treated in the haemodialysis unit. A non-probability (purposive) sample of (100) renal failure patients was chosen; 40 patients refused to participate for different reasons, including family refusal of their participation and because of feeling too tired. Only the patients who agreed to participate and verbal consent were included in the study, and the rights of the participants were respected throughout the research process; confidentiality was ensured by not sharing any information with others. Only 60 patients gave their consent to participate. These patients were selected according to the following criteria after reviewing their medical records:

- a. Iraqi patients diagnosed with chronic renal failure by a consultant.
- b. Patients treated with haemodialysis at least twice weekly for more than 6 months.
- c. Patients of both sexes
- d. Patients at least 10 years old.
- e. Patients with no history of known mental disorder.

Procedure and Questionnaire

After receiving approval from the hospital where the patients were treated, the purpose of the study was explained to the potential study participants, and the questionnaire was distributed after the patients agreed to participate in this study. Patients were interviewed for 10-15 min before they started their haemodialysis. Some patients needed help from the researcher to

explain the Beck depressive items. The questionnaire consists of two parts, as follows: The second part of the questionnaire includes the 21 items of the Beck Depression Inventory BDI-II¹², which was revised in 1996 to be more consistent with the DSM-IV criteria for depression⁹ and was translated to the Arabic version¹. The questionnaire, which is believed to have the most sensitivity and specificity in making psychiatric diagnoses of depression in end-stage renal disease patients, was used to assess the level of depression. Each item consists of 4 choices to explain the patient's feelings and measures the level of depression. The evaluation of depression levels performed according to the table below.

Total Score	Levels of Depression
1-10	These ups and downs are considered normal
11-16	Mild mood disturbance
17-20	Borderline clinical depression
21-30	Moderate depression
31-40	Severe depression
over 40	Extreme depression

A cut-off score of 14 to 16 on the Beck Depression Scale is believed to be with a psychiatric diagnosis of depression³⁹. The reliability of the present study instrument was determined using the Alpha Cronbach approach²⁰. The result reliability coefficient for the patients was $r=0.73$, and the patient's agreement to participate was assigned; a private interview technique was used to ensure confidentiality during data collection.

Data Analysis

Data were analysed through the application of appropriate statistical methods by using the statistical package of social science (SPSS) version 22 to analyse and evaluate the results of the present study. Descriptive statistics were used (means, standard deviations, frequencies and percentages) to determine the patients' characteristics and levels of depression. One-way ANOVA was used to determine any significant association between the level of depression and the patients' demographic characteristics.

Results

Analysis of the results showed that 61.7% of the participating patients were female; 40% were 41-60 years old with a mean age of 47.96 SD(13.4), primary level of education(43.3%) and were often married and housewives, and more than two thirds suffered from hypertension(83.3%), while almost half of them reported

having diabetes(46.7%). Most of the haemodialysis patients had started their treatment within the last 6 years (1-3 years duration, 55%; 4-6 years duration, 31.7%) (Table 1).

Table (1): Sociodemographic characteristics of the sample

No			Frequency	Percent
1	Age	10 to 20 years	5	8.3
		21 to 40years	16	26.7
		41 to 60years	24	40.0
		61 to 80years	15	25.0
		Total	60	100.0
		Age mean	47.96	SD= 13.4
2	Sex	Male	23	37.14
		Female	37	61.7
		Total	60	100.0
3	Education	No reading or writing	11	18.3
		Primary school	26	43.3
		Secondary school	19	31.7
		College	4	6.7
		Total	60	100.0
4	Income	Sufficient	24	40.0
		Insufficient	14	23.3
		Barely sufficient	22	36.7
		Total	60	100.0
5	HaemodialysisDuration	1 to 3 years	33	55.0
		4 to 6 years	19	31.7
		7 to 9 years	5	8.3
		10 to 12 years	3	5.0
		Total	60	100.0
6	Diabetes	Yes	28	46.7
		No	32	53.3
		Total	60	100.0
7	Hypertension	Yes	50	83.3
		No	10	16.7
		Total	60	100.0

Cont... Table (1): Sociodemographic characteristics of the sample

8	Occupation	Employee	7	11.7
		Housewives	30	50.0
		Unemployed	9	15.0
		Student	4	6.7
		Retired	10	16.7
		Total	60	100.0
9	Marital status	Married	50	83.3
		Single	8	13.3
		Divorced	1	1.7
		Widowed	1	1.7
		Total	60	100.0

Depression was found in all of our patients; 1.67% of patients were moderately depressed, 41.67% were severely depressed, and 56.66% were extremely depressed. These rates were higher than those in other studies, with a cut-off score of 14³⁹. The mean BDI was 41.2167(SD=5.45270), and the cut-off point was 1.963 (Table 2). When classifying BDI into somatic and psychological symptoms, it was observed that the mean somatic symptoms of depression score was 2.224, while the mean psychological symptoms score was 1.858. The somatic symptoms of depression were changes in sleep patterns(2.483), irritability (2.300), fatigue(2.233), changes in appetite (2.167), loss of energy (2.150), and loss of interest in sex(2.017). With regard to psychological depression symptoms, the results revealed that haemodialysis patients reported agitation, worthlessness, concentration difficulty, loss of interest, crying, self-dislike, sadness, self-criticism, pessimism, feelings of past failure, indecisiveness, loss of pleasure, feelings of guilt, feelings of punishment, and suicidal thoughts/wishes; the mean scores for these symptoms were 2.400, 2.217, 2.167, 2.083, 2.017, 1.883, 1.883, 1.850, 1.833, 1.767, 1.750, 1.717, 1.567, 1.433, and 1.300, respectively. However, there were no significant differences found between depression levels and the patients' demographic data.

Table(2): The level of depression among the sample

Items	Mean	Std. Deviation
Sadness	1.8833	.90370
Pessimism	1.8333	.76284
Feelings of past failure	1.7667	.85105
Loss of pleasure	1.7167	.76117
Feelings of guilt	1.5667	.74485
Feelings of punishment	1.4333	.74485
Self-dislike	1.8833	1.35411
Self-criticism	1.8500	.77733
Suicidal thoughts/wishes	1.3000	.74333
Crying	2.0167	.89237
Agitation	2.4000	.78546
Loss of interest	2.0833	.76561
Indecisiveness	1.7500	.85618
Worthlessness	2.2167	.66617
Loss of energy	2.1500	.79883
Change in sleep pattern (Insomnia)	2.4833	.77002
Irritability	2.3000	.72017
Loss of appetite	2.1667	.84706
Concentration difficulty	2.1667	.90510
Tiredness and fatigue	2.2333	.76727
Loss of interest in sex	2.0167	.96536
Total	41.2167	5.45270

Total mean score = 41.2167 (SD=5.45270). The cut-off point (1.963)

Discussion

This study aimed to assess the level of depression in patients with chronic kidney failure treated with haemodialysis and to determine whether depression has any association with sociodemographic factors. Depression was found in almost all of the dialysis patients. Due to our result, depression was higher in our sample than in other studies that also used the BDI, such as those conducted by ²⁹ (45%), ⁵⁷ (42.7%), ²⁶ (30%), ³¹(39.3%), ²⁷ (42%), and ³(44%). These differences may be because most of our sample was female (61.7%); the majority were married and were responsible for a family, but because of the long-term haemodialysis treatment, which leads to a disturbance in family dynamics, they failed to play their role²¹. Our result corresponds to a study by ³, which found that 80% of haemodialysis patients in Baghdad had depression associated significantly with female sex and unemployment. In addition to the poor delivery of services in hospitals, there is an especially poor proportion of haemodialysis machines in the population, which causes a great burden on women and their families, ⁶. Additionally, there is no other treatment choice, such as transplantation, due to a shortage of kidney donors, and transplantation requires more social and governmental support in Iraq (⁷, ⁴). Therefore, patients need to remain on haemodialysis treatment for a long time; these two causes may be the only explanation for the increased level of depression in haemodialysis patients in Karbala. In the present study, somatic Beck depression symptoms had a higher mean score (2.224) than psychological symptoms (1.858) such as insomnia (2.48), irritability (2.30), fatigue (2.233), loss of appetite (2.167), loss of energy (2.150) and loss of libido (2.017). The higher psychological depression symptom scores were agitation (2.40), worthlessness (2.216), concentration difficulty (2.167), anhedonia (2.083) and crying (2.017). Haemodialysis patients in Karbala expressed depression with physical symptoms more than with psychological symptoms.

Conclusion

The study found that depression is at a high level in kidney failure patients treated with dialysis, is especially prevalent in females and is expressed by somatic symptoms more than psychological symptoms in a religious city; those of medium to old age, those with low education, and unemployed females were found to be more depressed, although there was no significant association among these patient demographic factors.

Depression should be treated to decrease morality and improve disease outcome.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, University of Kerbala and all experiments were carried out in accordance with approved guidelines.

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The Use of Complementary and Alternative Medicine among Diabetic Patients in Nasiriya City

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Abstract

Diabetes is a predominant public health concern that has increased steadily worldwide . The disease causes substantial morbidity, mortality and long term complications. Herbs and natural products have been used in treatment of diabetes mellitus . Herbs and other plant products are considered more natural. They are a kind of home treatment and can be a part of home usual diet . Use of herbs is becoming popular more and more and is more appropriate for use in developing countries. The aim of this study was to examine the prevalence of use of herbal remedies among diabetic population in Nasiriya and to identify factors which might predict the likelihood of using herbal remedies. Cinnamon (Darcien) 12.3% and Black cumin(Habba soda) 11% . On univariant analysis , the factors which were found to affect the herbs use were education ,occupation , type of diabetes mellitus , duration of diabetes ,marital status and age . Using data analysis ,the significantly associated factors were occupation type of treatment and drug regularity . Health care providers should respect patients' wishes to use herbal remedies and should provide advices about treatment by herbal remedies.

Keywords: *Alternative medicine, diabetic, patients*

Introduction

Despite recent advanced in care and management, diabetes mellitus continues to be an important public health concern, causing substantial morbidity, mortality and long term complications. ¹ with increasing rates of childhood and adult obesity, diabetes is expected to become even more prevalent in coming decades, and its remains a significant risk factor for the Development of cardiovascular disease. ² The care of persons with diabetes has been influenced by a growing interest in complementary and alternative medicine (CAM).The use of alternative medicine (AM) has increased recently and attracted the attention of many researchers all over the world. (3,4)

Definition of diabetes mellitus

Diabetes is a chronic disorder in metabolism of carbohydrates , proteins and fat due to absolute or

relative deficiency of insulin secretion ,insulin action or both . ⁶ According to American Diabetes Association ,diabetes is defined as fasting plasma glucose value of at least 126 mg/dl (7mmol/l) or post glucose load of \geq 200mg /dl (11.1mmol/l)or both. ⁵

Diagnostic criteria for diabetes

The average plasma glucose level of a healthy man is 80mg/dl on fasting and up to 160 mg/dl in the postprandial state . Diabetes mellitus is characterized by recurrent or persistent hyperglycemia , and is diagnosed by demonstrating one of the following :

Fasting plasma glucose level at or above 126mg /dl (7.0 mmol/l)

Plasma glucose at or above 200mg/dl(11.1 mmol/l) two hours after a 75g oral glucose load in a glucose tolerance test.

Random plasma glucose at or above 200mg /dl (11.1 mmol/l).⁵

Tow fasting glucose measurement above 126mg/dl(7.0mmol/l)or random blood sugar level >200mg/dl (11.1mmol/l) on two occasions is considered diagnostic for diabetes mellitus. Patients with fasting plasma glucose between 110_125 mg/dl (6.1_7.0mmol/l)are considered to have impaired fasting glucose and patients with plasma glucose at or 140_200 mg/dl(7.8_11.1mmol/l) tow hours after a 75g oral glucose load are considered to have impaired glucose tolerance .⁶

Classification

Type 1 diabetes : it accounts 10% of diabetes patients, islet B- cell destruction usually leads to absolute insulin deficiency .patients are completely reliant upon exogenous insulin to prevent ketosis and other complications^(6,7) .

Type 2 diabetes : it accounts for more than 85% of cases worldwide. It is a heterogeneous type ranging from insulin resistance to insulin deficiency.

Type 2 diabetes is a multifactorial disease with both genetic and non genetic components^(6,7)

Other specific forms

Genetic defects of B cell function e.g. maturity onset diabetes of the young(MODY Syndromes)

Genetic defects in insulin action e.g. leprechaunism

Disease of the exocrine pancreas e.g. pancreatitis

Secondary to endocrinopathies ,e.g. acromegaly.

Drug or chemical induced , e.g. glucocorticoids

Infections , e.g. congenital rubella

Uncommon forms of immune_ mediated diabetes ,e.g. Stiff Man syndrome

Other genetic syndromes associated with diabetes ,e.g. Down ‘s syndrome.

Gestational diabetes : It is the diabetes which develops during pregnancy due to carbohydrates intolerance.⁶

Methodology

The overall study design

This study is descriptive cross sectional study , conducted in Nasiriya city from the period of 1st of January to the 30th of May 2010 on attendants of a diabetic center .

The study population

The participants were diabetic subjects of both gender attending diabetic center in Nasiriya city, who were aged 18 years and above.

Sampling and sample size

All diabetic patients who attending the diabetic center during the period of study were included. The total number was 885(516 females and 369 males). Data collected by direct interviewing, non-response was not reported.

The study tools

Interviewing (The questionnaire)

A structured questionnaire was used (Appendix 1), it was based on extensive literature review and it covers the following aspects :

A_ Sociodemographic data :age ,sex ,marital status ,educational status ,occupation ,monthly family income ,residence .

B_ Medical history of diabetes mellitus : including complication and control of DM depending on patients documents or reports ,types ,duration , Treatment and family history of diabetes .

C_ Information about the use of herbal or alternative medicine were acquired : use of herbal remedies in the last year , the type of herbal medicine ,duration of use ,cause of use and benefit from use .

D_ Type of treatment : Either on diet only ,oral anti diabetic drugs ,insulin alone and those on mixed treatment.

E_ Regularity of drug intake (anti diabetic drugs) : Regular or irregular .

Anthropometric measures :

A_ Height : Height was measured while the subject was standing without shoes with the heels touching the ground .

B_ Body weight : It was measured in (Kg)with the

subject wearing light clothes as possible , by portable weight balance to the nearest 0.5 kg .

C_ Body mass index (BMI) : Calculated by using Quetlet index ⁴⁰

BMI =weight in kg /height in square meter

Non obese : BMI < 25 kg /m²

Overweight : BMI 25 _29.9 kg /m²

Obese : BMI > or = 30kg/m²

Morbid obese : BMI > or = 40 kg/m²

Data collection

pilot study

The pilot study was carried out in diabetic center in Nasiriya city on 30 attendants who were included in the proper study . The aim was to asses the time required , the clarity and flow of the question and the expected response rate . In the light of this pilot study , the final proper study was prepared for .

The proper study :

The diabetic center was visited daily from 9_12 a.m. All the patients who visited the center at that time were interviewed in a quiet separate room after an informed consent was obtained. Each interview took about 15 minutes (on average 12 patient per day).

Statistical analysis

Data were analyzed using SPSS version 15 ,the data were tabulated and significant association between different variables .

Result

Table 1 shows the sociodemographic characteristics of the study population. Of the total participants,336(38.0%) were in the age group between 41-55 years , 356(40.1%) were in the age group \geq 56 years , 150(16.9%) were in the age group between 26-40 years and 43(4.9%) were in the age group 18-25 years.58.3% were females and 41.7%were males . The majority were married (77.7%). Most of participants were illiterate (51.3%), (72%)were un employed ,(65%) had intermediate monthly income, and most of them 65.5% were nonsmoker.

Table -1 sociodemographic characteristics of the study population

Character	number	Percent %
Age (years)		
18-25	43	4.9
26-40	150	16.9
41-55	336	38.1
>55	356	40.1
Sex		
Male	369	41.7
Female	516	58.3
Residence		
Urban	691	78.1
Rural	194	21.9
Marital status		
Married	688	77.7
Un married	60	6.8
Other	137	15.5

Cont... Table -1 sociodemographic characteristics of the study population

Family size		
4 \geq	124	14
5-10	498	56.3
11 \leq	263	29.7
Education		
Illiterate	454	51.3
Primary	162	18.3
Intermediate	95	10.7
Secondary	88	9.9
Basic university and above	86	9.8
Occupation		
Go. employee	153	17.3
Un employee	637	72.0
retired	95	10.7
Income		
Low	221	25.0
Moderate	575	65.0
High	89	10.0
Smoking		
Non smoker	580	65.5
Ex-smoker	198	22.4
Current smoker	107	12.1
Total	885	100.0

Table 2 presents the distribution of the study population according to diabetic and medical history. Regarding the duration of diabetes mellitus most of studied population had 1-5 years duration (48.3%), while those who had diabetes mellitus more than 5 years duration constituted (45.4%), and only 6.3% had a duration of diabetes mellitus less than one year. Most

of the patients were with type 2 diabetes (89.6%) , and only 10.4% were with type 1 diabetes . The percentage of those with diabetes complications was 58.9%. Most of the patients were on oral antidiabetic drugs which wae used in 70.8%, those who used insulin were 24.6% . The majority (89.9%) of them were on regular treatment.

Table 2. Distribution of the study population according to diabetic and medical characteristics

Character	number	Percent %
Duration of DM(year)		
<1	54	6.3
1-5	426	48.3
>5	405	45.4
Type of DM		
Type 1	92	10.4
Type 2	793	89.6

Cont... Table 2. Distribution of the study population according to diabetic and medical characteristics

Complication		
Present	521	58.9
Absent	364	41.1
Use of antidiabetic treatment		
Diet	28	3.2
Oral	627	70.8
Insulin	218	24.6
Mixed	12	1.4
*Regularity of Treatment		
Regular	796	89.9
Irregular	61	6.9
Other chronic disease		
Present	423	47.8
Absent	462	52.2
BMI		
Non obese	288	
Overweight	347	
Obese	250	
Total	885	100.0

Table 3 shows the prevalence of herbal use in the last year among the study population. 154(17.4%) of the total study population reported use of herbal remedies in the last year, 8.4% of them used herbs regularly.

Table 3 Total prevalence of use of herbal remedies

Users	Number	Percent %
Users in the last year	154	17.4
Irregular	80	9.0
Regular	74	8.4
Non users	731	82.6
Total	885	100.0

Table 4 lists the most commonly used herbs and the frequency of their use. The most commonly used type of herbal remedies was a mixed made by herbalist (16.9%), (39.6%) of the participants reported that they used more than one herbs at the same time.

Table 4 The most commonly used herbs and the frequency of their use

English name	Traditional remedy Local name	Latin name	Number	Percent %
More than one type			61	39.6
	Mixture of herbs made by herbalist		26	16.9
Cinnamon	Darcien	-	19	12.3
Black cumin	Hebba soda	Nigella sativa	17	11
Garlic	Thoum	Allium sativa	10	6.5
Aleo vera	Saiber	Aleo vera	6	3.9
Fenugreek	Halba	Trigonella foenumgracum	5	3.2
Worm wood	Sheeh	areimesia	4	2.6
Bitter apple	Hanthal	Momordica charantia	2	1.3
	Harmal	Rhazya strica	2	1.3
Kernaels of date	Nawa al tamer	-	1	0.7
Homey	Aasal	-	1	0.7

Table 5 present the factors that affect the use of herbal remedies and attitude of patients toward use of the remedies . The mostly affecting were influence of use by friend (77.3%) and (70,8%) of patients reported that they used them as a supportive mean for treatment of diabetes . (78%) reported they ere satisfied with their use of herbal remedies and (79.2%) perceived that the remedies were beneficial .

Table 5 Attitude and perception of use of herbal remedies

Character	number	Percent %
Influence of use		
By himself	16	10,4
By friend	119	77.3
By family	8	5.2
By media	11	7.1
Cause of use		
Supportive	109	70.8
Loss of confidence wit drug	0	0
Avoid complication	1	0.6
More than on cause	44	28.4
Satisfaction		
No	33	21.4
Not sure	1	0,6
Yes	120	78

Cont... Table 5 Attitude and perception of use of herbal remedies

Inform your doctor		
Yes	9	5.8
No	145	94.8
Perception of benefit		
No	32	20.8
Yes	122	79.2
Total	154	100.0

Table 6 shows the prevalence of use of herbal remedies according to age .Although the percentage of herbal use were higher among patients aged 26-40 years and 41-55 year no significant difference in use was noted according to age .

Table 6 Prevalence of use of herbal remedies according to age

Age	Users		Non _ users		Total	
	number	%	number	%	number	%
18-25	4	9.3	39	90.7	43	100.0
26-40	28	18.7	122	81.3	150	100.0
41-55	62	18.5	274	81.5	336	100.0
56≤	60	16,8	296	83.2	356	100.0
Total	154	17.4	731	82.6	885	100.0

$$df=4 \text{ p value } = 0.574 \chi^2 = 2.903 \chi^2 = 2.903$$

The traditional medicine which include herbal medicine is an accessible and affordable health care resource for many countries including Eastern Mediterranean region .³³ In general people believe that herbal therapy is more modern pharmaceutical . The popularity of the herbs or the treatment of patients with chronic diseases may be attributed to the long standing suffering of the patients or failure of the medical treatment to bring a quick and long lasting .³⁴

Conclusions

Herbal remedies are 17.4% used by diabetic patients in Nasiriya. Many factors affect the use of herbal remedies such as occupation, antidiabetic treatment regularity ,educational level ,duration of diabetes and type of diabetes. Most diabetic patients in Nasiriya had a positive attitude with the use of herbal remedies .

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Thi-qar Health Directorate/ Nasiriyah Heart Center and all experiments were carried out in accordance with approved guidelines.

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Testosterone and Progesterone Levels, Gene Expression of Androgen and Progesterone Receptors in Albino Male Rats Treated with Phenolic Flower Extract of *Hibiscus Rosa - Sinensis L*

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Abstract

Hibiscus rosa sinensis L. is one of medicinal plant and belongs to the family Malvaceae , *Hibiscus* species are used in the treatment of many disease, flowers are used to stimulate hair growth , wounds healing activity, anti-parasitic effect , Antidiabetic anti-hyperlipidemic activity. and have many pharmacological properties including anti-fertility , antipyretic, antispasmodic, antifungal, anti-inflammatory and many more. This study was conducted in the department of Biology /College of Science/University of Babylon/Iraq , to evaluate the Effect of Phenolic Extract of *Hibiscus rosa - sinensis L.* flowers on some biomarkers and gene expression in Albino male Rats .The overall number of animals used were 32 male rats aged 2-3 months. The results showed a significant decrease ($p < 0.05$) in the level of Testosterone and Progesterone in treated rats as compared with control groups for 30 and 60 days. Also the result revealed a significant decrease ($p < 0.05$) in the expression of the androgen receptors and progesterone receptor in the testicular cells treatment group with phenolic compounds of *H. rosa - sinensis* flowers at a dose of 300mg / kg /day of body weight for 60 days compared to control groups.

Keywords: Phenolic Extract, *Hibiscus rosa - sinensis L.* Testosterone, Progesterone, gene expression, androgen receptor, progesterone receptor

Introduction

Many plant extracts can be used as contraceptives by inhibiting the fertility of males and females ¹ however, those plant extracts, that have been developed into contraceptive are very few and have not been identified the methods of operation and effectiveness accurately because of the difficulty in finding out the active ingredients of the extract to be used as a herbal contraceptive² . Fertility in males is directly affected by the sex hormones produced in the testes, which are called androgens, testosterone is the main androgen of the males, which also produced by the cortex of the adrenal gland. Testosterone begins during embryonic development and last for a short period after birth and stops during the childhood and then produced very significantly at puberty. It is responsible for the growth and development of the male reproductive system, bones, muscles, enlarged throat, change of sound, hair growth and increased sexual desire ³ . Most plants

used in the regulation of fertility weaken the process of steroids synthesis by targeting the enzymes involved in this process at the level of leading cells or at the level of hypothalamus- pituitary gland- gonads, it has been shown that many botanical products targeting the Leydig cells and hindering their action ⁴.The medicinal plant extracts used in Chinese traditional medicine which containing alkaloids as one of the active compounds, caused a decrease in the level of gonadotropin hormones and testosterone which are caused edema in the interstitial tissue of mouse testis treated with these extracts ⁵. Gene expression is the process by which information from a gene is used in the synthesis of a functional gene product. These products are often proteins, but in non-protein coding genes such as transfer RNA or small nuclear RNA genes, the product is a functional RNA⁶. In genetics, gene expression is the most fundamental level at which the genotype gives rise to the phenotype. The genetic code stored in DNA is “interpreted” by

gene expression, and the properties of the expression give rise to the organism's phenotype, such phenotypes are often expressed by the synthesis of proteins that control the organism's shape, or that act as enzymes catalyzing specific metabolic pathways characterizing the organism. Regulation of gene expression is thus critical to an organism's development⁷.

Materials and Method

The flowers of *Hibiscus rosa-sinensis L.* were collected from nursery and agricultural areas in Babil province in April and May 2018. The plant was identified by Dr. Neddaa Adnan, plant herbarium/ Department of Biology/ College of Science/ University of Babylon. The flowers were collected in flowering stage after they were well cleaned and washed with water and left to dry in the air at room temperature for two weeks. After that the dried flowers were blended with a blender, until use.

Preparation of crud phenolic compounds of *Hibiscus rosa sinensis L.* flowers

The Crude phenolic compounds were extracted according to⁸ method putting 10 gm of powder flower in a flask (500 ml) and added 400 ml of acetic acid 2%. The phenolic compounds of the plant were extracted by using reflex condenser in water bath(70°C) for 8 hours. The solution was leaved to cool down after the completion of extraction. Filtrated by a separatory funnel, and added to it an equal volume of n- propanol and amount of sodium chloride until saturation. Two layers formed, the upper layer containing the phenolic compounds and neglected the lower layer, the upper part has been concentrated in a rotary evaporator then dried in oven (40°C), kept in refrigerator until use.

General phenolic Reagent

This reagent was prepared by mixing two equal quantities of aqueous solutions of 1% ferric chloride and 1% of potassiumic ferric cyanide. The extraction was derided after it was obtained by dry calcium chloride (CaCl₂) to get rid of any effect of the moisture which could affect the identification, then the compounds of *H. rosa sinensis* extract was identified by infrared spectrum by using Ft. Infrared spectroscopy³.

First experiment : Effect of *H. rosa- sinensis* flowers extract on hormones levels

This experiment include 32 male albino rats divided into two groups

1. Control (n = 16) treated orally with one ml of tap water .

2. Treated group (n = 16) treated orally with 300mg / kg /day of phenolic compounds of *Hibiscus rosa- sinensis* flowers extract .

After 30 days of treatment isolated 8 animals from each group (control and treatment) blood sample had been taken from animals for evaluated: Testosterone and progesterone hormones instruction of kits(Maglumi Testosterone CLIA/ China) .The other animals (included 8 control and 8 treatment) , was continue treatment for 30 other days , so that the treatment become 60 days . same biomarkers estimation were done like the first period (30 days) .

Second experiment : Genetic study

Control group : (n = 3) treated orally with 1 ml of tap water for 60 days

Treated group: (n = 3) treated orally with 300 mg/ kg /day phenolic compounds of *Hibiscus rosa- sinensis* flowers for 60 days .

Tissue preparation

Testis of each rat were collected immediately. Half of the sample had been frozen and stored at -80C until analysed.

Total RNA extraction and Real-Time PCR.

Total RNA was extracted from the samples according to the protocol of TRIzol™ Reagent (Thermo Scientific, USA).Complementary DNA (cDNA) was constructed by reverse transcription (Promega Corp., Madison, WI, USA) using the total RNA as a template .The primers used for rat AR,PR and glyceraldehyde 3-phosphate dehydrogenase (G3PDH) as a reference gene in RT-PCR were as follows : AR forward,5-TGTTATCTAGTCTCAACGAGC-3; AR revers,5-CATCATTTTCAGGAAAGTCC-3; PR forward, 5-CTCCTGGATGAGCCTGA TG-3; PR reverse,5-CCCGAATATAGCTTGACCTC-3,G3PDH forward,5-TCCCATCACCATCTTCCA-3 and G3PDH reverse,5-CATCACGCCACAGTTTCC-3.The PCR system consisted of 5 µl of SYBR Green qPCR mix; 0.25 µl of cDNA,0.25 Mgcl₂,2.5 Nuclease Free Water and primer pairs (0.5 µM forward and 0.5 µM revers) in a total volume of 10 µl. PCR was performed using standard protocols using the annealing temperature for 30 s at

52 °C. A final extension cycle was performed at 72 °C for 30 s. The melting curve program was 72-95 °C, with a heating rate of 0.3°C/s and continuous fluorescence measurement, the expression level of these genes was evaluated by an image software.

Results and Discussion

The effect of phenolic extract of *H.rosa sinensis* L. on Testosterone, Progesterone hormones level :-

Table 1 showed that the treatment of Albino rats with a dose of 300 mg/kg/day of body weight of phenolic compounds of *H. rosa- sinensis* flowers caused a significant decrease ($p < 0.05$) in the level of Testosterone and Progesterone in treated rats compared with control groups. The level of these hormones in both groups in comparison study between 30 days and 60 days of treatment revealed insignificant differences ($P > 0.05$) between two periods for each hormone (Figure 1,2). These results are consistent with the results of (9, 10), which revealed that the phenolic compounds of *H. rosa- sinensis* caused a decreased level of testosterone in serum of treated rats. The reason for the low testosterone level may be due to the effect of *H. rosa- sinensis* extract reducing the level of cholesterol and low density lipoproteins (LDL) in the blood (11). As the cholesterol derived from LDL is the basic compound in the process of testosterone synthesis in Leydig cells (12). The phenolic compounds of green tea reduced the level of testosterone through their effect on the enzymes required for the synthesis of hormone such as P450 α and 5 β HSD (13). Also the low level of testosterone may be due to the effect of phenolic compounds of *H. rosa sinensis* flowers on Leydig cells, some plant extracts have a negative effect on the numbers and diameters of Leydig cells and their nucleus, causing a reduction in the production of testosterone (14,15).

The low level of testosterone may be due to the effect of extract on the metabolic pathways of testosterone resulting from the presence of secondary compounds, especially flavonoids found in the *H.rosa sinensis*, Ohno *et al* (5) pointed out that the Genistein compound, a type of

flavonoids found in ginseng plant leads to the reduction of testosterone in patients of prostate cancer, this effect has been attributed to the chemical composition of this compound which is similar to the steroid hormones such as estrogen, and thus it somehow affects the process of hormonal regulation in the body and leads to lower levels of testosterone (16). The exposure to high concentrations of external estrogen hormone can cause changes in the levels of gonadotropin hormones and reproductive function (17). The ingestion of phytoestrogen by experimental animals caused a significant reduction in LH and FSH secretion and decrease the level of testosterone (18). Progesterone enhances sperm count, libido and increasing muscle mass, it also increases testosterone levels in the body and enhances its effects, being that it's a precursor of the mineralocorticoid aldosterone, and androstenedione which can be converted to testosterone, estrone and estradiol (19). In current study showed significant decrease in the level of progesterone in treated animals with phenolic extract of *H. rosa*. The treatment of male rats orally at a dose of 500 mg/kg of body weight of aqueous extract of *H. rosa sinensis* flowers caused a significant decrease in the concentration of sperms in testes and epididymis (20). Progesterone in male produced from adrenal gland, adrenal steroid biosynthesis is regulated by a negative feedback system, in which corticotrophin-releasing hormone secreted from the hypothalamus activates adrenocorticotrophic hormone release from the pituitary, and ACTH then stimulates the zona fasciculata cells to produce cortisol (21). The reduction in Progesterone and Testosterone level in serum may be due to the inhibitory effect of the phenolic compounds of *H. rosa sinensis* flowers of the hypothalamic- pituitary- testicular axis, since some studies have indicated the effect of different plant extracts on inhibiting the secretion of hormones such as alcoholic extract of *Mentha arvensis* leaves, which caused a significant reduction in the level of LH in the serum of treated male rats due to the inhibitory effect of the extract of the hypothalamic – pituitary – testicular axis (22).

Table 1. The effect of *H.rosa sinensis L.* flowers extract on male rats for 30 and 60 days.

Parameters	30 days		60 days	
	Control (mean ± SE)	Treated (mean ± SE)	Control (mean ± SE)	Treated (mean ± SE)
Testosterone (ng/ml)	a 3.22 ± 0.12	b 2.02 ± 0.27	a 3.06 ± 0.13	b 1.66 ± 0.12
Progesterone (ng/ml)	a 1.53 ± 0.11	b 0.97 ± 0.22	a 1.35 ± 0.12	b ± 0.14

-Different letters mean a significant difference (p > 0.05) between groups .

The effect of phenolic extract of *H.rosa sinensis* on androgenn receptors AR and progesterone receptor PR.

The results of this study showed a significant decrease (p< 0.05) in the expression of the androgen receptors (AR) and progesterone receptor (PR) of the testicular cells in group of rats treated with phenolic compounds of *H. rosa- sinensis* flowers (300mg / kg /day of body weight) for 60 days compared to control groups(

Figure 3,5) .The AR is a ligand- dependent transcription factor that is activated when androgens were found , anti- androgens or AR antagonists cause prevention of androgens for carrying out their biological activity via directly binding and blocking the AR receptor ligand binding domain (LBD), and by inducing repressive activity ²³ . The mechanism of anti- androgens action begin when anti- androgens bind to the binding pocket of the AR and thereby its activation ²⁴.

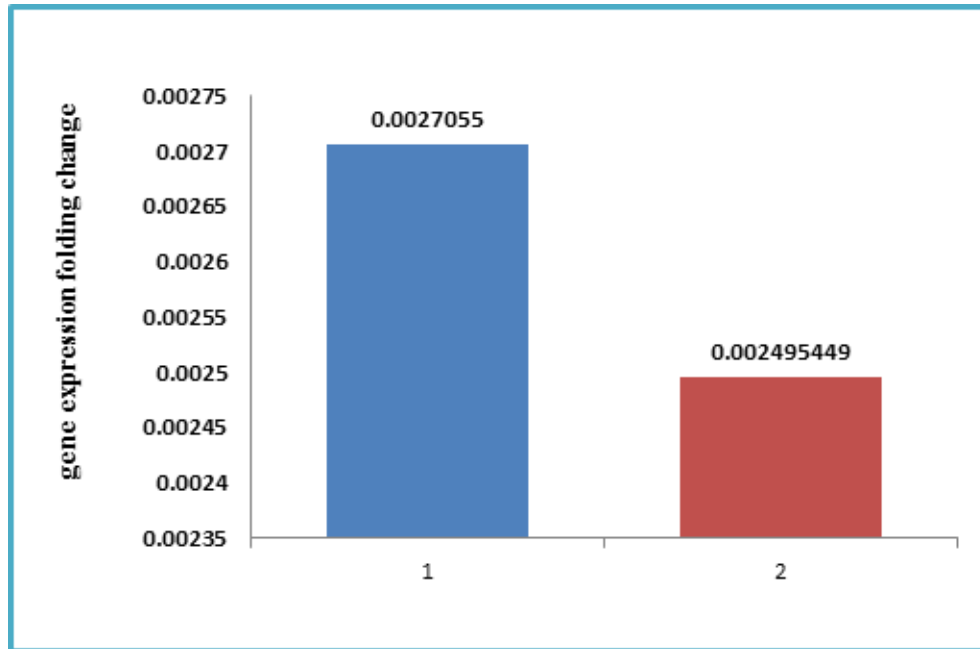


Figure 1: Folding change in gene expression of androgen receptor gene in treated and control rats groups during 60 days .

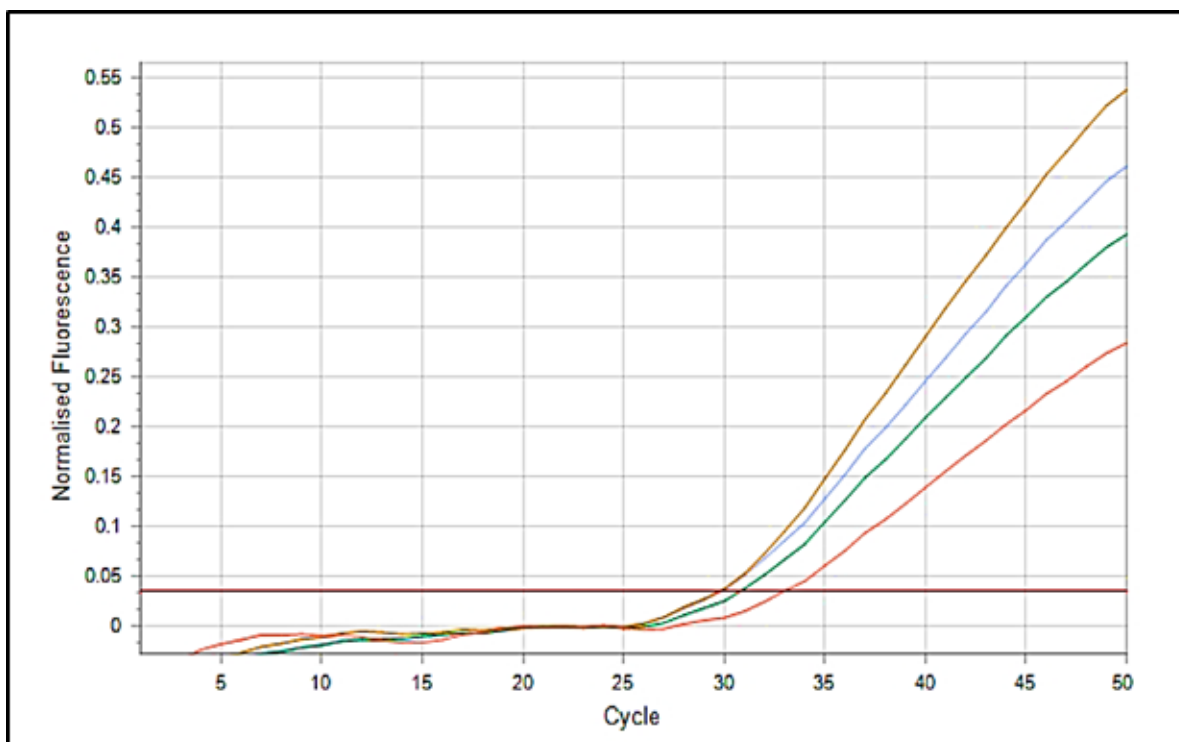


Figure 2: Real-Time PCR amplification plot of androgen receptor in testis

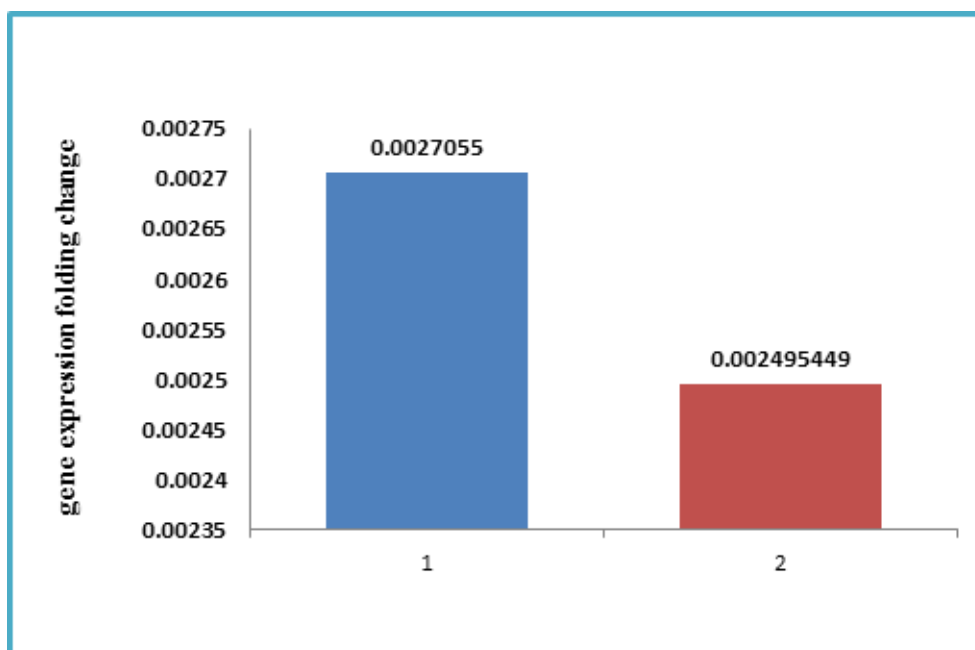


Figure 3: Folding change in gene expression progesterone receptor gene treated and control rats groups during 60 days .

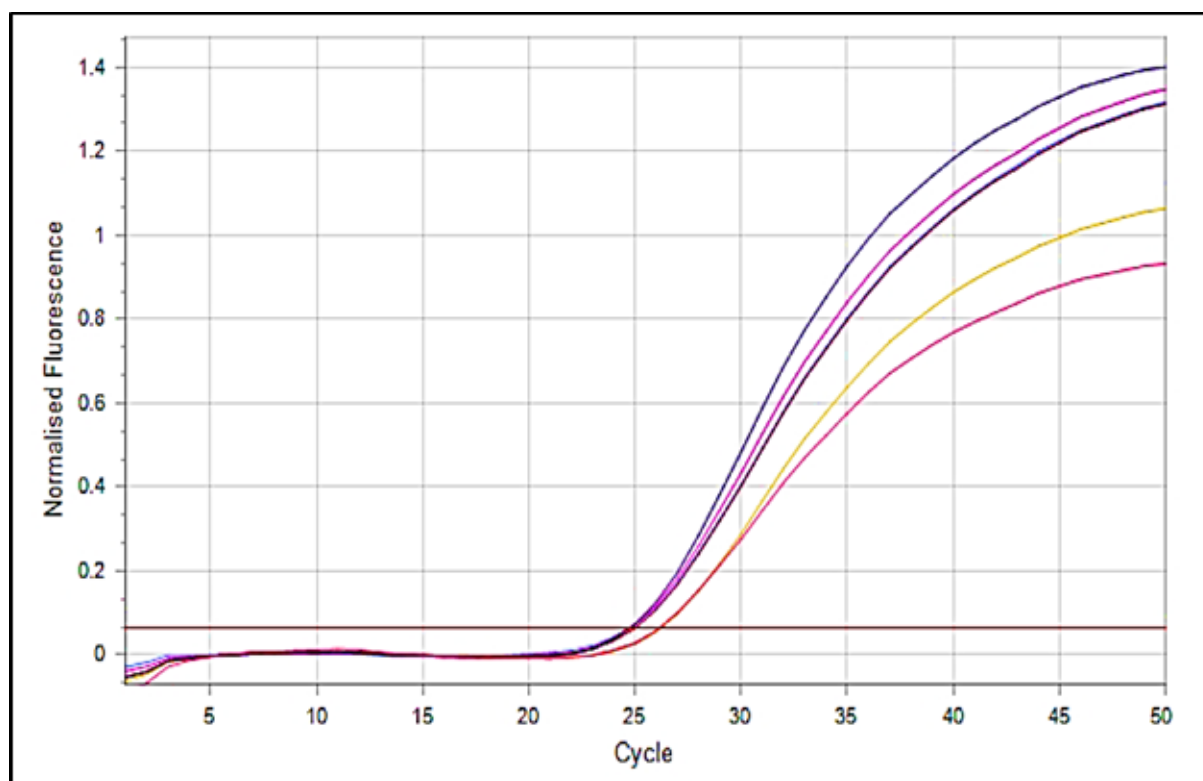


Figure 4: Real-Time PCR amplification plot of Progesterone receptor gene in testis .

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Veterinary Medicine, AL-Qasim Green university- Babylon-Iraq and all experiments were carried out in accordance with approved guidelines.

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Nutritional Status of Primary School Children in Babylon Governorate

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Abstract

Objectives: To assess the nutritional status of school children. To identify some associated factors of school children related to nutritional status. And To find out some associated factors of school children and their nutritional status.

Methodology: A cross-sectional descriptive study consisting of (1013) pupil, to assess nutritional status of primary school children in Babylon Governorate.

Result: Analysis of data reveals that there is a 47.4% of children have a normal body mass index, and 43.0% have underweight, 7.6% overweight, while 2.0% only have obesity. The study showed that 76.4% has normal blood hemoglobin, 21.2% low blood hemoglobin and 2.4% increase blood hemoglobin.

Conclusion: Just under half of children has a normal body mass index and about half of study sample have underweight this considered as a result of malnutrition of primary school children. And Observed there are high percentage of children have anemia this can be result from many factors contribute in children anemic

Keywords: Nutritional Status, Primary School, Children.

Introduction

School-age children constitute a little under one quarter of the world's population, and about three quarters of these children live in developing countries¹. School age children spend most of their time away from their parents, therefore, affected by friends as well as media further affect the formation and stabilization of their dietary practices. There is growing evidence indicate that young children from developing countries are increasingly making unhealthy food choices, especially because to lack of knowledge and wrong perception towards healthy foods². School age is the active developing phase of childhood. Primary school age is a dynamic period of physical growth as well as of mental development of the child. Research shows that health problems due to miserable nutritional status in primary school-age children are among the most common causes of low school enrolment, high absenteeism, early dropout and unsatisfactory classroom performance³. Growth and development are sometimes used interchangeably. But growth implies increase in size of organs while body development implies

differentiation and maturation of function. The former indicates quantitative growth as well the latter indicates qualitative growth. Development is influenced in the physical, emotional and social environment. In early childhood, cognitive growth and development are difficult to differentiate from neurologic and behavioral maturation. Factors affecting child development: genetic factors, physical factors, nutritional factors, emotional factors, sociocultural factors⁴. The processes of growth and maturation are related, and both influence physical performance. There are three broad phases of development: early childhood, middle childhood, and adolescence. The definitions of these phases are organized around the primary tasks of development in each stage, though the boundaries of these stages are malleable⁵. Point out that two major growth spurts happen in the brain of children in the middle and late childhood; the first happens between the age of 6 and 8 and the second between the ages of 10 and 12. State that the growth of the brain between the ages of 6 to 8 has an influence on sensory and motor areas. There is an improvement in fine- motor skills and eye- hand

coordination ⁶. Food is necessary for the proper growth and development of children. It is important for the support of oral and physical health, the enhancement of the powers of resistance and continued renewal of the substances in the cells and tissues in children ⁷. Undernutrition among children is a critical problem because its effects are long lasting and go beyond childhood. It has both short and long term consequences. For instance, undernourished as compared to non-undernourished children are physically, emotionally and intellectually less productive and suffer more from chronic illnesses and disabilities ⁸. Nutritional assessments among school children is very important as they constitute a potentially susceptible group. Growth assessment is an important tool for monitoring health and nutritional status of children, identifying deviations from normality, and also providing an indirect measurement of well-being for the entire population.

Methodology

Study Design: A cross –sectional descriptive study to assessment nutritional status of primary school children in Babylon Governorate. Randomly sample of (1013) pupil from primary schools were selected. All of these children were measured by their weight, height, body mass index, hemoglobin and blood sugar, a questionnaire was also completed which included demographic information and dietary habits for children. The questionnaire considered a means for data collection.

The content credibility of the instrument was estimated through a panel of (16) experts, the stability of the items was based on the internal consistency of the questionnaire was evaluated by calculating Alpha Cronbach' which as= 0.80.

Data Analysis

Through the used descriptive statistical (SPSS) version 24 analysis approach that includes, frequencies, percentages, mean of scores, standard deviation and graphical presentation of data; and inferential statistical data analysis approach that include correlation.

Correlation is used to identify the relationship between nutrition status of children and their demographic variables.

Result of the Study

Table (1): Socio demographic characteristics of the study sample (N=1013).

Age groups	Frequency	Percent
6-7	169	16.7
8-9	209	20.6
10-11	328	32.4
12-13	255	25.2
14-15	52	5.1
Total	1013	100.0
Gender	Frequency	Percent
Male	466	46.0
Female	547	54.0
Total	1013	100.0
Residence	Frequency	Percent
Rural	372	36.7
Urban	507	50.0
Peripheral Village	134	13.2
Total	1013	100.0
School Type	Frequency	Percent
Private	79	7.8
Government	934	92.2
Total	1013	100.0

Table (1) shows that (32.4%) of student were between (10-11) years old age, (54%) were females, (50%) were live in urban, (92.2%) were study in government schools and (7.8%) study in private schools. This table shows that (20.2%) of the student in the fourth class, (60.6%) of the student's family income were enough, (95.8%) of the student's fathers were alive and (99.1%) of the student's mothers were alive.

Table (2): Distribution of Study Sample by their Nutrition Status through Anthropometric Measurement and blood tests (Height, Weight, B.M.I. , Blood sugar level, Hemoglobin).

Students Height		Frequency	Percent
	Small	210	20.7
	Medium	524	52.0
	Large	276	27.3
	Total	1,013	100.0
Students Weight		Frequency	Percent
	Low weight	235	23.2
	Acceptable weight	499	49.5
	more than normal weight	276	27.3
	Total	1,013	100.0
Body Mass Index Level		Frequency	Percent
	Underweight	436	43.0
	Normal	480	47.4
	Overweight	77	7.6
	Obesity	20	2.0
	Total	1013	100.0
Blood Sugar Level		Frequency	Percent
	Hypoglycemia	18	1.8
	Normal	985	97.2
	Hyperglycemia	10	1.0
	Total	1013	100.0
Hemoglobin Levels		Frequency	Percent
	Low Blood Hemoglobin	215	21.2
	Normal	774	76.4
	Hyperhemoglobinemia	24	2.4

Table (2) shows that(52.0%) of study sample were medium height, (49.5%)of sample were acceptable weight, (47.4%) of the study sample were normal B.M.I, (97.2%) of the students have normal blood sugar, (76.4%) of the study sample were normal.

Table (3): The distribution of the study sample by their dietary pattern data.

Dietary pattern score		Frequency	Percent
	Meat eater	63	6.2
	Vegetarian	558	55.1
	Mediterranean-	392	38.7
	Total	1,013	100.0

The table showed that (55.1%) of the study sample have been vegetarian dietary pattern, (38.7%) was Mediterranean and (6.2%) was meat eater.

Table (4). shows the correlation between Body Mass Index and nutritional status. Body Mass Index Level * Nutritional Status

Crosstab					
Count					
		Nutritional Status			Total
		Unbalance Nutritional Status	Balanced Nutritional Status	Well Nutritional Balanced	
Body Mass Index Level	Underweight	45	227	164	436
	Normal	54	243	183	480
	Overweight	4	41	32	77
	Obesity	2	14	4	20
Total		105	525	383	1,013
Pearson's R		0.001			

This table shows there are weak positive relationship (Pearson’s R: 0.001) between body mass index and nutritional status.

Table (5) shows the correlation between blood sugar and nutritional status.

Blood Sugar Level * Nutritional Status

Crosstab					
Count					
		Nutritional Status			Total
		Balanced Nutritional Status	Well Nutritional Balanced		
Blood Sugar Level	Hypoglycemia	9	1	8	18
	Normal	95	516	374	985
	Hyperglycemia	1	8	1	10
Total		105	525	383	1,013
Pearson’s R		0.030			

This table shows there are weak positive relationship (Pearson’s R: 0.030) between blood sugar and nutritional status.

Table (6) shows the correlation between dietary pattern and nutritional status.

Dietary pattern score * Nutritional Status Cross tabulation						
Count						
		Nutritional Status			Total	
		Unbalance Nutritional Status	Balanced Nutritional Status	Well Nutritional Balanced		
Dietary pattern score	Meat eater	63	0	0	63	
	Vegetarian	33	525	0	558	
	Mediterranean-	9	0	383	392	
Total		105	525	383	1,013	
Pearson's R		0.916				

This table shows there are strong positive relationship (Pearson’s R: 0.916) between dietary pattern and nutritional status.

Discussion

Socio-Demographic Data of the Nutritional Status of the Primary School Children.

Finding of the study includes (1013) of pupils participate in this study, the most gender was female (547 at 54% female and 466 at 46% male), the most age group was between (10-11) years, this age group qualifies the student in fourth class of school this percentages consisting with hiyam and zeyneb (2016) who have been studied time of emergence of permanent teeth and impact of nutritional status among 4-15 years old children and teenagers in basrah city /iraq. Thier results depicts that consisted of 1807 children and teenaged between ages (4-15) years, 766 of the sample were boys (42.4%) and 1041 were girls (57.6%) collected from random areas of basrah city. Moreover, Abdul Razak, and others (2018) have been studied Breakfast consumption among Malaysian primary and secondary school children and relationship with body weight status, their finding indicated that the most of participants are girls (53.8%) and boys (46.2%), and more age group was (6–9)years. In current study, residence of the sample was (50.0%) urban, (36.7%) rural, (13.2%)peripheral village which disagree with Naotunna and others (2017) ¹⁴ have been studied the nutritional status among primary school children in rural Sri Lanka; a public health challenge

for a country with high child health standards. Their findings reveals that the rural schools most included in this study (701) schools from (802) total schools. Current study find most of the sample was in government schools by percentage (92.2% government schools, 7.8% private schools). This results disagree with study has been studied A comparative study of nutritional status between government and private primary school children of Mysore city(India). Their results show that 695 (44.3%) were from government school and 871 (55.6%) were from private school ¹⁵.This study show most of the sample has enough family income (60.6%enough),(32.0% not enough) and (7.4% enough and more). This findings similar Nabeela and others (2010) which studied impact of socioeconomic factors on nutritional status in primary school children. Their results indicate that 83 (51.6%) children from upper and 78 (48.4%) children from lower socio-economic class. The current study find most of mother’s and father’s children was alive (99.1% mothers alive, 0.9% mothers dead, 95.8% fathers alive, 4.2% fathers dead). This results agree with study conducted by Lilian and other in 2013 that showed (80.0%) of children alive with both parents, (15.0%) alive with mother alone and (5.0%) alive with father alone table (1). The present findings of body mass index locate that (47.4%)of the study sample were normal weight, (43.0%) were underweight,

(7.6%) were overweight and (2.0%) were obese. The results of current study agree with Katarzyna Dereń and others (2018)¹⁷ which studied the prevalence of underweight, overweight and obesity in children and adolescents from Ukraine. Their findings showed that most study sample were (boys: 75.4% normal weight, 11.5% overweight, 10.8% underweight, 2.3% obese) and (girls: 70.4% normal weight, 8.5% overweight, 19.3% underweight, 1.8% obese). Current study showed that most of study sample were (97.2%) normal blood sugar, (1.8%) hypoglycemia and (1.0)hyperglycemia. The results in this work agree with results obtained by other reports such as Marta Murillo and others (2017)¹⁸ has been studied health-related quality of life (HRQOL) and its associated factors in children with type 1 diabetes mellitus (T1DM). Their findings reveals that (97.8% no have hypoglycemia, 2.2% have hypoglycemia and 92.6% no have hyperglycemia, 7.4% have hyperglycemia). Study results depicted that the (76.4% normal blood hemoglobin), (21.2% low blood hemoglobin (anemia) and (2.4% hyperhemoglobinemia). These results are concurrent with study which has been studied anemia among primary school children in eastern Ethiopia⁹. Their results indicates that the (73.1% normal, 13.8% mild anemia, 10.8% moderate anemia, 2.3% severe anemia) table (2). Regarding dietary pattern of children in the present study were (55.1% vegetarian), (38.7% mediterranean), (6.2% meat eater). These results are disagree with study which has been clustering of dietary patterns, lifestyles, and overweight among Spanish children and adolescents¹⁹. Their findings indicate that the most dietary patterns of Spanish children were mediterranean by percentage (41.03%) table (3). In the current study it is found that weak positive relationship between body mass index and nutritional status. similarly, a study done in India which studied nutritional status and morbidity among school going children: a scenario from a rural India. Their findings showed here association of malnutrition with normal children was found statistically non-significant ($p>0.05$) Singh, (2014) table (4). In current study showed there are weak positive relationship between blood sugar and nutritional status.

Conclusion

According to the findings of this research and related to the discussion, the present study concludes that: There is a significant relationship between nutritional status and dietary pattern, whereas Pearson's R was (0.916) of primary school children in Babylon governorate. So,

theresearcherrejects the null hypothesis and accepts the alternative hypothesis which stated that there is a significant relationship between nutritional status and dietary pattern of primary school children in Babylon governorate. There is weak a significant relationship between nutritional status and age group whereas Pearson's R was (0.07).

Financial Disclosures: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Faculty of Nursing, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Prevalence Rate of Depression among Ischemic Heart Diseases Patients in Al-Diwaneya Province / Iraq

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Abstract

Background: Cardiovascular disease is on the upraise in the industrialized and unindustrialized countries, which characterize at the present time one of the chief challenges for the health systems all the world. Depressed Ischemiac Heart disease patients may have a poorer outcome than non-depressed patients ,so this study was performed with the aim of finding the link between depression and ischemic heart disease and its association with demographic factors in Iraqi patients.

Patients and Method: The study was designed to be a case- control study involving 128 case of IHD patients and 120 apparently healthy individuals serving as control group, with an age range from 20y-80y in Al-Diwaniyah Teaching Hospital in Al-Diwaniyah province/ Iraq. were examined for the presence of depressive disorder using ICD-10 diagnostic criteria and then assessing the severity of the depression in the depressed group by using Beck Depressive Inventory(BDI).

Results: The prevalence rate of depression was 48.3% in IHD patients while 22.5% in control groups .

Conclusion: Because of high rate of depression among patients with different types of heart diseases, early detection and identification of as possible ,to improve outcome .

Key words: depression, ischemic heart disease(IHD), prevalence rate

Introduction

Depression and coronary artery (CAD) are both very widespread diseases . They are changing quality of life and life expectations ¹.It is extended to be predictable that minor type of depression are found in up to 2\3 of patients in hospital after acute myocardial infarction [AMI], with major depression generally being established in about 15% of CVD patients ². The linking between the CHD and major depression disorder (MDD) was studied generally over recent periods and the prevalence of both situations has grown all over the world. Many studies over the past 2 decades show depression disorder is the most significant world health problems according to the WHO reports ³. The association between the CHD and major depression disorder (MDD) was studied extensively over recent decades and the prevalence of both conditions has risen all over the world. Every disorder remainders a main supplier to the overall burden of disease ⁴. Depression is one of principal risk factor for IHD in several studies

⁵. In China a meta-analysis study based on 27 studies the prevalence of depression was 51%in cardiovascular patients ⁶.,However the aim of this study is to identify the prevalence rate and determine the severity of depression, and its socio demographic characteristics among patients with ischemic heart disease in Al diwainya city in Iraq .

Patients and Methods

This study was designed as a case-control study, the case group being chosen from Iraqi patients whose diagnosed as Coronary Artery Diseases .A 120 patients were randomly included in this study from patients admitted to AL-Diwaniyah Teaching Hospital in cardiac care unit and cardiac catheterization center in AL-Diwaniyah province whose IHD was diagnosed/ confirmed via angiography and by specialists and 120 healthy people as control group .

Only 8 of these cases were refuse to take part in our study ..Arking days were 5 days /week ,starting from The study was started from the 20th January 2019 and

ended on the 10th June 2019. The including criteria in the study were to be all patients with ischemic heart disease of any age and sex were included, age 20 year or older with no family history of depression. And the excluded patient were those with congenital heart disease and very tired patients and refusal from patient's side to be involved in the study. Any patient with previous history of depression before heart disease and patients who have depression secondary to any organic disorder or substance abuse.

The study was approved by the Committee of Ethical Approval at Collage of Medicine / University of AL- Qadisiyah. And Verbal consent was considered when patients were selected to be part in our study.

Data was collected using a designed questionnaire having of three parts. The first part involved detailed socio-demographic and clinical information got from patients', second part questioner for diagnosis depression according to ICD -10. The third part was for assess the severity of depression according to Beck Depression Inventory (BDI) score administered during a private interview. The questionnaire, including the apparatuses, was translated from English to Arabic and back-translated from Arabic to English by two fluent specialists.

BDI test This questionnaire contains 21 multiple choice questions, each adding 0-3 points to the final score depending on the choice designated by the patient. This questionnaire was studied for validity and reliability and the endpoint points were set as following: those patients who scored a total of 0 to 9 were considered "Normal (no depression)", 10 to 19 as "mild depression", 20 to 29 as "moderate depression", and 30 and above as "severe

Results

The prevalence rate of depression among patients and control subjects is shown in table 2. Total cases of depression among control subjects were 27 out of 120 (22.5%), whereas, there were 58 patients with depression accounting for (48.3%); there was highly significant difference in the prevalence rate of depression between ACS patients and control groups, 48.3% versus 22.5%, respectively ($P < 0.001$), as shown in table 1. The prevalence rates of mild, moderate and severe depression among ACS patients were 18.3%, 20.8% and 9.2%, respectively. On the other hand, the prevalence rates of mild, moderate and severe depression among control subjects were 15.0%, 5.8% and 1.7%, respectively, table 3.

Table 1: Prevalence rate of depression among control and Acute coronary syndrome groups

Depression	Control group n = 120		ACS n = 120		χ^2	P
	N	%	n	%		
Mild	18	15.0	22	18.3	17.506	<0.001 ¥ HS
Moderate	7	5.8	25	20.8		
Severe	2	1.7	11	9.2		
Total cases of depression	27	22.5	58	48.3		
Normal	93	77.5	62	51.7		

n: number of cases; ACS: acute coronary syndrome; ¥: Chi-square test

Patients with acute coronary syndrome were categorized into three groups, stable angina, unstable angina and acute myocardial infarction (MI). The frequency distribution of patients with stable angina, unstable angina and acute myocardial infarction (MI) according to 10 years age intervals is shown in table 2. The mean age of patients with acute MI was significantly

higher than both stable and unstable angina ($P < 0.05$). There was also no significant association between gender and type of ACS ($P = 0.516$), table 3. There was, in addition, no significant association between marital status and type of ACS ($P = 0.318$), as shown in table 4.

Table 2: Distribution of patients with acute coronary syndrome according to age

Age (years)	Stable angina n = 43		Unstable angina n =31		Acute MI n = 46	
	N	%	N	%	N	%
21_30	0	0.0	2	6.5	1	2.2
31_40	3	7.0	4	12.9	3	6.5
41_50	10	23.3	4	12.9	6	13.0
51_60	11	25.6	7	22.6	8	17.4
61_70	12	27.9	8	25.8	12	26.1
71_80	4	9.3	5	16.1	10	21.7
>80	3	7.0	1	3.2	6	13.0
Mean \pm SD	58.02	6.83	55.97	5.92	62.61	5.21

n: number of cases; SD: standard deviation; MI: myocardial infarction

Table 3: Distribution of patients with acute coronary syndrome according to gender

Gender	Stable angina n = 43		Unstable angina n =31		Acute MI n = 46		χ^2	P †
	n	%	N	%	n	%		
Male	25	58.1	19	61.3	32	69.6	1.325	0.516 NS
Female	18	41.9	12	38.7	14	30.4		

n: number of cases; MI: myocardial infarction; †: Chi-square tests; NS: not significant at $P \leq 0.05$

Table 4: Distribution of patients with acute coronary syndrome according to marital status

Marital status	Stable angina n = 43		Unstable angina n =31		Acute MI n = 46		χ^2	P
	N	%	n	%	n	%		
Single	0	0.0	1	3.2	3	6.5	4.713	0.318† NS
Married	33	76.7	25	80.6	30	65.2		
Widowed	10	23.3	5	16.1	13	28.3		
Divorced	0	0.0	0	0.0	0	0.0		

n: number of cases; MI: myocardial infarction; †: Chi-square tests; NS: not significant at $P \leq 0.05$

Table 5: Distribution of patients with acute coronary syndrome according to occupation

Occupation	Stable angina n = 43		Unstable angina n =31		Acute MI n = 46		χ ²	P
	N	%	N	%	n	%		
Unemployed	6	14.0	4	12.9	9	19.6	0.588	0.745 †‡ NS
Employee	3	7.0	7	22.6	8	17.4		
Private job	8	18.6	5	16.1	7	15.2		
Military	1	2.3	0	0.0	1	2.2		
Retired	12	27.9	10	32.3	15	32.6		
Housewife	12	27.9	5	16.1	6	13.0		
Student	1	2.3	0	0.0	0	0.0		

n: number of cases; MI: myocardial infarction; †: Chi-square tests; NS: not significant at $P \leq 0.05$; ‡: comparison was made between those having job or student and those without job, retired or housewives

Discussion

Our study estimate about 128 cases of Ischemic heart disease (IHD) Diagnosed by cardiologists doctors admitted to Intensive care unit in AL Diwanayah Teaching Hospital and patients admitted to the center of cardiac catheterization in AL Diwanayah city, only 120 cases accept to sharing in our search, same number of cases taken as control group whose apparently healthy people. Our study shows response rate 93.75% and other 6.25%(5 of them refuse sharing in our search and other 3 cases were tired). It is good reaction rate for sharing . This equivalent rates of sharing with Iraqi family health survey (IFHS) 95%⁷, as well as similar to Salman study 2009 (93.6%)⁸ and equated to study conducted in Iraq in 2018 (94.1%)⁹. This high response rate because Iraqi's peoples want someone to take care for them and listening to their problems . In present study shows the mean age of IHD cases and control group were 59.25 5.97y Versus 55.92 3.78 y, respectively (P = 0.071),so there was no significant difference in the frequency distribution of mean age between control and patients groups. Moreover no statistically interactions was found in the frequency distribution of both groups according to others demographic features [gender , occupations , level of education and marital status] P 0.05.That is suggests demographic data not consider as risk factor of developing IHD. Furthermore our study's result

resembling another study conducted in Iran 2018 which found that no relationship between demographic features of IHD patients and control group¹⁰ moreover it is same result of study conducted in India¹¹.In our study from 120 cases of control were (27) cases have depression according to ICD10 diagnostic criteria of depression the prevalence rate was (22.5%), there were 58 patients of (IHD) have depression prevalence rate (48.3%) which it is highly significant difference (P 0.001). These results go with many studies one of them study conducted by Shalan *et al.* shows that prevalence rate was 45%, which was analogous to our study⁹. Other study prepared in Iran prevalence rate was (46.5%) in (IHD) patients, while controls cases (19.5%).¹⁰. Moreover our study results are analogous to other study showed in Poland, prevalence rate of depression was present in 46.3 % of IHD patient while control cases was (21.2%)¹². Additionally according to meta-analysis done in Iran found that prevalence rate of depression in IHD patients was 47%¹³. The present study result higher than results of study finished in Iraq, prevalence rate was 24% in different types of heart disease while in control group was 4%¹⁴. This difference may be due to small sample size and they take different types of heart disease; in Iraqi patients the stressful conditions are increased every day. Furthermore our result was higher than many studies, study done in Virginia in 2014 was 33%¹⁵, Iraqi mental health survey(IMHS)¹⁶, study done in Pakistan

the prevalence was 27%¹⁷ WHO educational program on depression was 33%¹⁸, study conducted in Iran on 300 patient show prevalence rate 38%¹⁹ and other study done in Germany prevalence rate was (22%)²⁰. The prevalence rate of depressed IHD patients in our study was lower than carney study (65%) and (51%) in study done in China and lower than Pena FM., *et al* results(67%)^(21,22,23). Other study on Iranian patients found prevalence rate of depression was 73.2%²⁴. The most important explanations for these dissimilarity in the results of prevalence rates among many studies were using different instrument (questionnaires) to evaluate the prevalence rate of depression²⁵. Regarding the severity of depression; the prevalence rate of mild, moderate and severe depression among IHD patients according to BID score were 22 (18.3%), 25 (20.8%) and 11 (9.2%) respectively while in control group show in mild, moderate, and severe type of depression 18 (15.0%), 7 (5.8%) and 2 (1.7%). The degree of severity of depression is statistically highly significant (P 0.001) in relation with coronary heart disease. Other study done in Iraq in 2018 by using HAMD – 17 and DSM-IV found (P = 0.003) highly significant correlation of severity of depression with Ischemic heart disease showed 14.9% for mild depression, 20% for moderate depression, 7.06% severe depression and 3.14% very severe depression⁹, while these results not go with study done in Iraq 2014 only 3% have mild depression and prevalence of moderate depression in IHD 8% while severe depression only 1%¹⁴. Patients with IHD divided in to 3 type's stable, unstable and acute myocardial infarction. The mean age in our study 59.25 5.97y and found that mean age in acute myocardial infarction 62.61 which was more than mean age in stable, unstable angina (58.02; 55.97).

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Medicine/University of Al-Qadisiyah, Iraq and all experiments were carried out in accordance with approved guidelines.

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Deposition of Ta₂O₅ Film on Commercial Pure Titanium Disk by Modified Reactive Plasma Sputtering Technique

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Abstract

Background: Now days the interest of implantology is to improve Osseo integration by find materials which accelerate bone formation at bone implant interface to provide immediate or early loading after placement of dental implant and eliminate waiting period which is un favorite and disturbs patients. Titanium is most common material for dental implant, but still need some modification for surface properties chemically and physically by using an other material such as tantalum which is gaining more attention as a new metallic biomaterial. Coating the surface of implant is an important way for development of surface properties of titanium. plasma Ta₂O₅ used for surface modification, which has several advantages such as increasing surface roughness, changing surface topography and increasing the wettability of the surface.

Aim of study: To evaluate the action of Ta₂O₅ coating by modified plasma sputtering technique of commercially pure titanium disk on surface roughness, wettability and surface chemical composition in comparison to non-coated surface.

Materials and methods: All tested group were two groups in this study which include un-coated commercial pure titanium disks and Ta₂O₅ coated commercial pure titanium. Modified reactive plasma sputtering technique was used to coat CpTi with Ta₂O₅ at 4,6,8, hr. Analysis of surface characterization by x-ray diffraction (XRD) analysis, scanning electron microscope (SEM), energy dispersive spectroscopy(EDS) were carried out on the coated surfaces of the disks, contact angle measurement was achieved by applying drop of saline on the surface of coated disks and compared to non- coated one.

Results: The result of Ta₂O₅ coated specimen at times (4,6,8) showed that 8 hr. coating time was the best time. X-ray diffraction analysis show new peak formation for CpTi coated with Ta₂O₅ disk which was not present in non- coated CpTi disk. The results showed that the rough surface was more and better distribution in CpTi coated with Ta₂O₅ disk than non- coated CpTi disk which improve by electron scanning microscope, wettability of Ta₂O₅ coated disk was more than wettability of non- coated CpTi disk.

Keywords: Ta₂O₅ film, commercial pure titanium disk, modified reactive plasma sputtering technique

Introduction

Surface improvement of dental implant become much advanced than it was earlier ¹. Titanium is material of choice for dental implant which shows a favorable combination of intrinsic properties for the fabrication of dental implants such as low modulus of elasticity, low specific weight, high strength to weight ratio, very high corrosion resistance, easy surface coating and excellent general biocompatibility ². Acceleration of the Osseo integration of Cp Ti results in reducing the non-functional

time period of the implant, increase its applicability in alveolar bone with low quality, minimize the failure rates, and cause minimum discomfort for patient. ³. Increasing roughness and change surface properties physically and chemically is one of the methods used in increasing and accelerating the Osseo integration process. Surface coating can be used for changing surface topography, increasing surface roughness and in increasing the wettability of the surface. ⁴ Chemically and physically reactive plasma discharges are widely

used to modify the surface properties of materials. ⁵ Tantalum (Ta) is stable chemical element can stably exist in the surface layers of the substrate materials. Ta is one of the promising materials in used in dental fields ⁶. The Ta components offer a low modulus of elasticity, high surface frictional characteristics, and excellent Osseo integration properties (i.e. Bioactivity and biocompatibility) ⁷ The stable Ta₂O₅ protective film can provide better bioactive property and corrosion resistance than that of TiO film. ⁸ Surface-coated implants are reported to have less failure and can support heavier and more dynamic forces. Several clinical studies have analyzed the success and failure of implants in diabetic patients. ⁹

Material and Method

Sample preparation

Disks of Titanium were prepared (5×2mm) diameter and thickness respectively which were cut from Cp Ti rod using Bench Nibbling machine (TAURUS 7000-W6 CNC, Italy). The specimens were abraded by using Si C grinding paper with different grits started from 80 grit, and continued by 120, 230, 400, 600, 800 and 1000 grit to get free scratch and flat surface. All disks were polished to obtain a mirror polished and smooth surface. After that all specimens cleaned by ultrasonic cleaner with ethanol 99.8%. was carried out.

Surface coating by Ta₂O₅

By using modify Dc glow discharge reactive plasma sputtering system, the sputtering technique was performed. Number of the total samples were 10 disk which divided as 1 un coated CpTi disk and 9 coated CpTi disk with Ta₂O₅ (3 disk for each time). Then the coated disks sub divided according to the times of coating (three times 4,6 and 8 hr.) into 3 groups. The cause of 3 disk coated in same time was to send each sample to specific test for time consuming.

The sputtering procedure started with placing the clean and polished samples on the center of base of anode electrode. evacuating process of chamber to high vacuum ($\approx 1 \times 10^{-5}$ mbar) using high vacuum system consist of rotary and turbomolecular vacuum pumps to ensure the complete removing of the heavy gases like hydrocarbons. Power supply (negatively charged voltage 3.5 kV). For sputtering process, the voltage was gradually applied using variac until the required energy achieved (applied voltage and current), The pressure was

2×10^{-2} to 7×10^{-2} mbar and this pressure was achieved by feeding the bombardment and reactive gases. The appropriate voltage and amper were adjusted precisely by regulator until intended sputtering glow (purple color, which standardized for each gas) is achieved. One of the most important modification done to convert normal plasma system to sputtering plasma system was replacement of electrode position, so the cathode placed in upper part and anode electrode placed in lower part of chamber. A Target (cathode) and anode disk of stainless steel. The cathode faced the anode with 7 cm distance between them, which provides electric field for the gas to be discharged. The electrical electrodes and the associated dc-power supply of 5kV. The bottom of the stainless steel disk cathode electrode are covered with tantalum sheet which regarded as target. The clean and polished samples were placed on the anode in the center of base which regarded as substrate. The cathode was connected to the D.C. power supply, while the grounded chamber served as anode. All the samples were cleaned by argon plasma sputtering for 15 min prior to the Ta₂O₅ coating process by applying a bios dc voltage of 100 Von the anode. For reactive plasma sputtering procedure, the following process parameters were used: argon was used as bombardment gas and oxygen as reactive gas. The process was carried out at various sputtering times (namely 4, 6 and 8 hours). The reactive gas oxygen was introduced into the evacuated chamber and the flow rate was adjusted until the pressure was stabilized at the desired pressure (1×10^{-2} mbar), then the argon gas introduced to the chamber until the sputtering pressure of 5×10^{-2} mbar achieved. After the sputtering process completed, the samples were kept until ambient temperature in the vacuum chamber was reached.

Phase Analysis by using X-Ray Diffraction

Surface analysis for Phase's distribution was performed for non-coated CpTi, CpTi coated with Ta₂O₅ it has been done by using X-ray Diffraction Facilities (SHIMADZU 6000, Japan) using Cu K α radiation. XRD analysis were performed at room temperature in the 2θ range from 30° - 80° with a 0.05° step and counting time of 5 secs per step. The indexing of the data and the diffraction peaks were identified according to the powder diffraction files. (PDF), received from ICDD (Intimations' Center for Diffraction Data).

Scanning electron microscope examination

All tested group were examined by using SEM

(JEOL-JSM-5600) for examinations of the changes occurs on the coated layer of Ta₂O₅ during the plasma sputtering technique. Samples for SEM were prepared as cross section and then mounted in double face metal tape (electrically conductive) to make the sample holder electrically conductive before entering the samples into the SEM Chamber. VEGA3 TESCAN, SEM HV: 20 KV, SEM MAG:7.50kx, VIEW FIELD:27.7

energy dispersive spectroscopy analysis

chemical structures and relative concentrations for non-coated CpTi and coated CpTi with Ta₂O₅ discs were assessed via energy dispersive spectroscopy (EDS). EDS use of the X-ray spectrum radiate a solid sample with a focused beam of electrons to obtain a localized chemical analysis. All elements from atomic number 4 (Be) to 92 (U) can be detected in principle. Qualitative analysis involves the identification of the elements in the spectrum and is fairly straightforward owing to the simplicity of X-ray spectra. Quantitative analysis determination of the concentrations of the elements. Finally, element distribution images or 'maps' can be produced.

Atomic force microscopy examination

Atomic force microscope able to detect both conductive and nonconductive surfaces on the atomic scale. The AFM relied on the scanning technique and provided a high-resolution 3D image from the surface of the sample. A sharp tip at the end of the cantilever is in contact with the surface of the development and the sample displaced with piezoelectric scanners. The force on the tip causes deflection to measure with tunneling capacitive or optical detectors such as interferometer laser in this technique, the standard pressure applied to the joint is zero (to prevent any surface deformation).

Wettability test

Non-coated CpTi and Ta₂O₅ coated CpTi (grade

2) disk 10×5 mm diameter and thickness respectively were used by dropping equal amounts of normal saline (0.25ml) from graduated container on each disk, non-coated CpTi and coated with Ta₂O₅ for (4,6,8 hr.) and measure the angle formed between titanium disc surface and drop of normal saline. The best wettability achieved for the sample was selected for the (8hr.) measurement done after 20 second from putting the drop on disk surface, and digital camera about 15 cm from disk. The images were analyzed using the program Image Tool version 5.02 for Microsoft Windows.¹⁰

Result

Surface characterization by using X-Ray Diffraction.

A: Before Heat treatment:

XRD patterns of the control CpTi specimen and Ta₂O₅ coated by modified reactive plasma sputtering after different sputtering time (namely 4, 6 and 8 hours) are demonstrated in Figure (1). and these data were indexed according to the Powder Diffraction Files (PDF) for the hexagonal α -Ti (JCPDS-ICDD file # 44-1294), Ta₂O₅ (JCPDS-ICDD file # 25-0922, 33-1391 and 33-1390), and Ta₂O₅ (JCPDS-ICDD file # 34-0977). The diffraction peaks of the uncoated CpTi were found to be corresponding to (100), (002), (101), (102), (110), (200), (112) and (201) α -Ti at 2θ values 35.00°, 38.30°, 40.05°, 52.9°, 62.8°, 70.6°, 76.25° and 77.35° respectively. The patterns of the plasma sputtered specimen for 4 and 6 hours show wide peak in the range of 2θ 20-30° which seems to be due to the formation of not fully crystallized Ta₂O₅, whereas the pattern of the specimen sputtered for 8 hours show clear and prominent Ta₂O₅ peaks indicating the formation of Ta₂O₅ corresponding to the reflections 001, 200 and 1117 at 2θ 22.90, 28.79 and 49.12. Also its very clear there are a shift in the 2θ position of the CpTi reflections towards the higher 2θ indicating the change in titanium crystal cell volume.

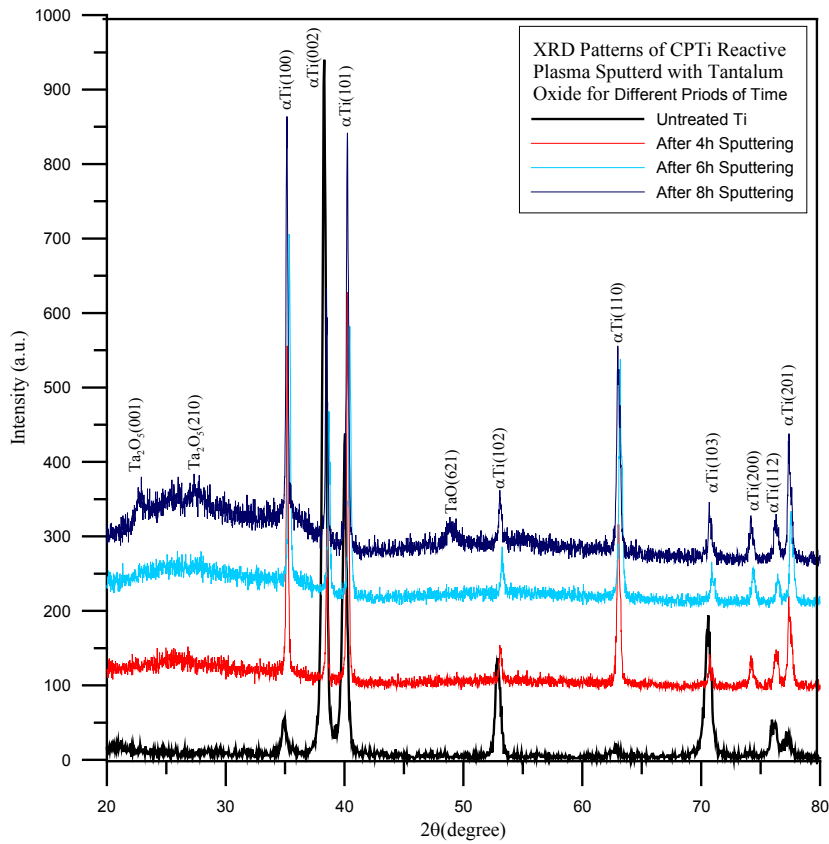


Fig (1): XRD patterns for uncoated CpTi and coated specimen with Ta2O5 at (4, 6, and 8 hr.)

B: After Heat treatment:

The CpTi specimen's coated with Ta2O5 for sputtering time 8 hours before and after heat treatment are shown in Figures (2). The pattern of the heat coated specimen show prominent new peaks indicating the formation crystalline tantalum pentoxide Ta2O5. The peaks are assigned to 001, 200, 270, 211, 3100, 092, 3111, and 3171 at 2θo 23.06, 28.79, 32.88, 37.12, 49.62, 50.98, 56.24 and 64.4 respectively. Also it's noticed that only one reflection belongs the tantalum monoxide Ta2O5 which are 621 at 2θo 52.52.

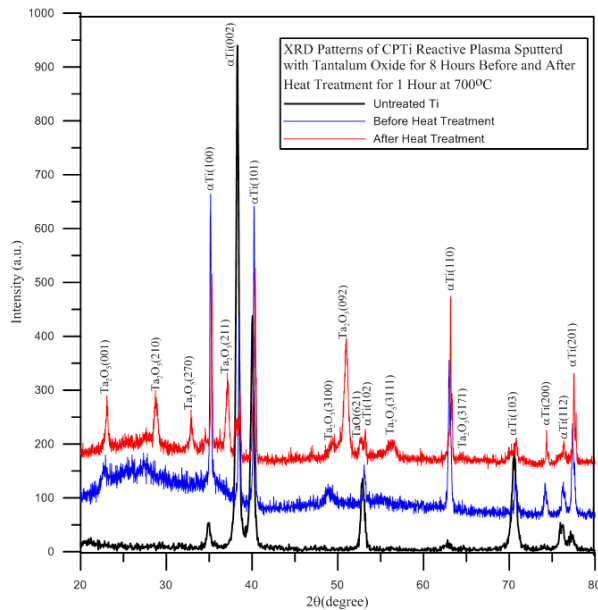


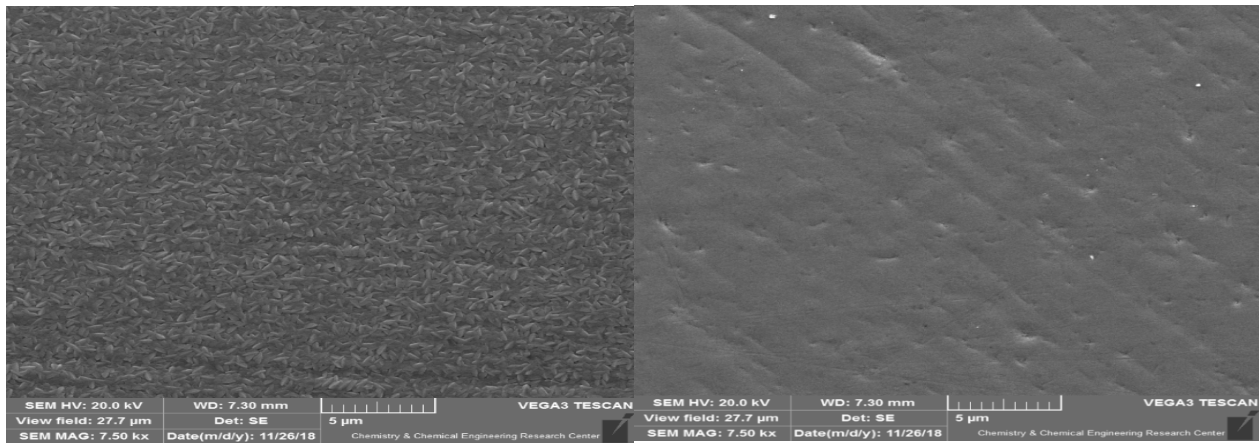
Fig (2): XRD patterns of uncoated Cp Ti and coated with Ta2O5 for 8 hours before and after heat treatment.

Surface characterization using Wettability test

From the result of wettability test, 8 hr. coated disk with Ta2O5 give more hydrophilic surface. Contact angle of fluid drop in plasma sputtering with Ta2O5 was less than non-coated disk. Un coated CpTi disk with contact angle 60°, Ta2O5 disk coated for 4hr with contact angle 65°, Ta2O5 disk coated for 6hr with contact angle 45° and Ta2O5 disk coated for 8hr with low contact angle 30°.

Surface characterization using SEM

A: Topographic

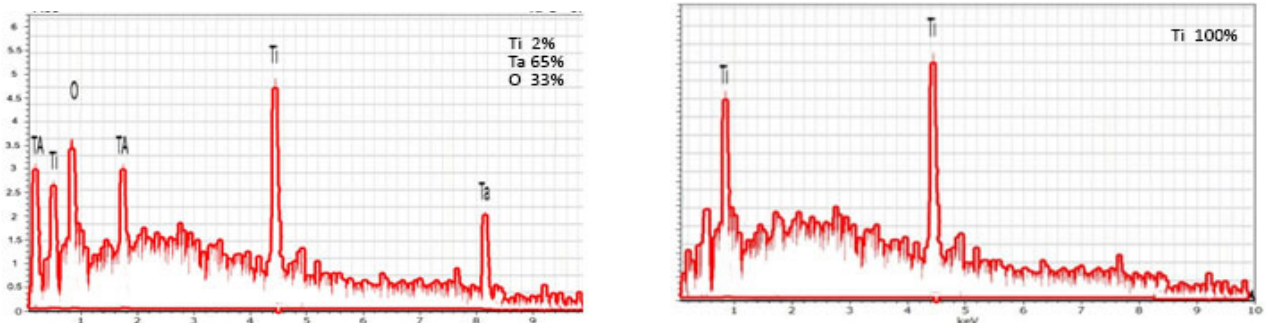


The scanning electron microscopy images of CpTi disk before coating in (figure 4a) revealed a relatively flat and smooth surface. While the surface morphology of CpTi plasma sputtering samples with Ta2O5 for 8 h showed a fully arranged nanochips and uniformly distributed in (figure 4b).

A: CpTi disk B: CpTi disk coated with Ta2O5

Fig (4): SEM.A/CpTi disk without coating B/CpTi disk coated with Ta2O5 for 8 hr.

B: chemical composition by EDS



chemical structures and elemental composition were assessed for all experimental groups which include CpTi and CpTi coated with Ta2O5. Regarding the chemical structure analysis for CpTi figure (5a) show tow titanium peaks with these value ($k\alpha$ 4.512 and $l\alpha$ 0.452) which resemble alpha phase of titanium. For second group of disk coated with Ta2O5, there were two peaks of titanium which resemble alpha phase, two tantalum

peaks and one peak of oxygen with following value ($k\alpha$ 4.512 and $l\alpha$ 0.452) ($l\alpha$ 8.146 and $m\alpha$ 1.712) ($k\alpha$ 0.525) respectively as shown in figure(5b). Elemental composition of tested group as follow in (fig a) titanium was 100%, in (fig b). percentage of titanium was 2%, tantalum was 65% and oxygen was 33%.

A: CpTi disk B: CpTi disk coated with Ta2O5

Fig (5): EDS.A/ CpTi disk without coating B/CpTi disk coated with Ta2O5 for 8 hr.

Discussion

The new trend in implant research is to increase and accelerate the osseointegration of Cp Ti which may result in decrease the non-functional time period of the implant, increase its applicability in alveolar bone with little quality, cause minimum discomfort to patient, and minimize the failure rates.¹¹ One of the methods used in increasing and accelerating the osseointegration process is to modify the surface properties of the implant¹². Chemically and physically reactive plasma is widely used to modify the surface properties of materials.¹³ In order to improve surface properties of CpTi, tantalum is a material with specific properties which is used in this research as a coat material with oxygen gas to develop Ta2O5 surface on CpTi disk by modified sputtering technique which has several advantages such as changing surface topography, increasing surface roughness, and in increasing the wettability of the surface.¹⁴ Reactive plasma coating constitutes a simple, dry technique, which does not harm the environment, of low cost and does not comprise the intrinsic properties of the biomaterial, affecting only its surface.¹⁵

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of dentistry. University of Karbala, Iraq and all experiments were carried out in accordance with approved guidelines.

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Evaluation of the Effect of Endoscopic Sinus Surgery with Medialization of Middle Turbinate

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Abstract

Background: The main goals and key points of endoscopic sinus surgery are providing a sufficient drainage and ventilation for the diseased paranasal sinus groups. **Method:** A total of 44 patients (males 22 & 22 females) were included in this study, all of them complaining of chronic rhinosinitsis with or without polyposis not responding to maximal medical treatment and were assigned for ESS. Patients were classified into three groups; Group A: ESS with bolgarization, Group B: ESS with suture medialization of middle turbinate, Group C: ESS without medialization Postoperatively, patients were followed up with subjective (nasal obstruction, nasal discharge, headache, fascial pressure and smell disturbance) and objective (endoscopic evaluation of middle meatal MM patency) parameters in 2 weeks, 1 month, 3 months, 6 months and 1 year. **Result:** There improvement in nasal obstruction was reported by patients in all the three groups. Improvement in other symptoms was significantly higher in group A as compared to other groups. MM patency was evaluated by endoscopy and showed improvement of 100% in group B.

Key words: Endoscopy, Rhinosinusitis, Bolgerization, Suturing, ESS.

Introduction

The main essential of endoscopic sinus surgery (ESS) is to open the passages of the sinuses allowing for proper drainage and ventilation to the nose. Through this technique new passages are created or existing ones are opened by removing thickened mucous, polyps and cysts, or membranes that's why endoscopic techniques are now routinely being applied to the management of many non-inflammatory sinonasal disorders.¹ Turbinate medialization techniques are often used for prevention of turbinate lateralization and middle turbinate (MT) medialization has no detectable adverse effect on olfaction.⁴ Medialization of the middle turbinate (MT) is an effective technique to prevent recurrent rhinosinusitis; but, could reduce olfactory function by interfering the odorants to reach the olfactory mucosae.⁵ Whereas, middle turbinate (MT) lateralization is a common complication of endoscopic sinus surgery (ESS) that occurs when opposing areas of denuded mucosa form a scar between them. This scar pulls the MT laterally to the lateral nasal wall and may cause obstruction of the middle meatus and the maxillary, ethmoid, or frontal sinuses, which can result in failure of the initial procedure and often necessitates revision surgery.⁴ Bolgarization

(Medialization) can also be achieved by creating a small scar band between the middle turbinate and the nasal septum. Packing in the middle meatus is necessary to keep the surfaces in contact long enough to heal together and create an adhesion (usually 5 to 7 days). The middle turbinate can also be suture fixated to the nasal septum using a dissolving suture (conchopexy). This technique can successfully secure a destabilized middle turbinate in most cases.⁶ The ethmoidal infundibulum is considered as a main draining space at the ostiomeatal complex that is bounded posteriorly by bulla ethmoidalis, anteromedially by the middle turbinate, and anterolaterally by an uncinat process, that's why it is also necessary to interfere with the middle turbinate to achieve enough ethmoidal infundibulectomy at the anteromedial aspect along with the uncinectomy^{8,9,10,11,12} when it comes to determine the recurrence incidence rate of sinusitis after middle meatal endoscopic surgery, the middle turbinate play a vital role.^{13,14,15} In most patients the middle turbinate is preserved and therefore it's vital to make it preserved during the surgery and not to destabilize. Fracturing anterior vertical insertion of middle turbinate from the skull base destabilize the MT. For posterior stability to the middle turbinate, which

is also important during surgery, could be achieved by preserving the horizontal portion of the ground lamella. However, excessive manipulation of the MT could fracture the turbinate's insertion on skull base and result in it becoming floppy. The frontal recess get narrower lateral dimension, which, ultimately, makes surgery very difficult and increases the risk of damage to the lateral wall of the olfactory fossa.

Methodology

The clinical trial was conducted in the department of otolaryngology, Head and Neck Surgery during the period from October 2015 to October 2017 at Al-Sader medical city, Al-Najaf governate. . All patients signed the informed consents, and the study conformed to the ethical principles set forth by the Declaration of Helsinki. A total of 44 patients (males 22 & 22 females) were included in this study, all of them complaining of chronic rhinosinitis with or without polyposis not responding to maximal medical treatment and were assigned for ESS.

Patients aged above 12 years and Patients complaining of chronic rhinosinitis with or without polyposis not responding to maximal medical treatment were included in this study while patients with sinonasal malignancy and middle turbinate resection and disturbed anatomy from previous surgery or trauma were excluded from the study.

The questionnaire survey methodology was used to collect the information from patients before operation for physical examination, anterior rhinoscopy, and nasal endoscopic examination and after survey all selected patients were subjected to detailed history, general examination, systemic examination and full head and neck examination and nasal endoscopic examination and divided into three respective groups, Group - A, B and C; details are given here under.

All patients were given a course of proper systemic oral antibiotic (patients with CRS) with local and systemic steroid and nasal douching for 2 weeks and then assigned for native computed tomography in axial, sagittal & coronal plane 1-2 mm thickness slices at level of the nose and paranasal sinuses was taken and the follow-up subjective (nasal obstruction, nasal discharge, headache, fascial pressure and smell disturbance) and objective (endoscopic evaluation of middle meatal MM patency) was performed after 2 weeks, 1 month, 3 months, 6 months and 1 year, respectively.

All cases were operated under general anaesthesia. The mucosa of the nasal cavity was decongested using nasal pledges with 1:80000 adrenaline and 2% xylocaine 15 – 20 minutes before surgery. After drapping, endoscopic examination with 0° rigid scope in the standard three passes to assess extent of the disease. Septoplasty was performed when necessary, removing the lateral part of concha bullosa when present. Classical steps of ESS including: unilateral or bilateral uncinectomy with MMA, anterior and posterior ethmoidectomy. sphenoidotomy and frontal recess interventions were done accordingly with the aid of microdebrider.

Patient Groups

Group A: the mucosa of medial surface of MT and the opposing septal mucosal surface were abraded with aid of sickle knife or rosen knife just posterior to the caudal end of MT (care must be taken that abrasion not extending through the whole length of MT otherwise postoperative anosmia and nasal obstruction ensure) with merocel meatal pack for 24-48 hrs to create iatrogenic synechia between MT and the septum (Fig 1).

Group B: 4-0 vicryl suture and tonsillar pillar needle were used to suture the MT to the septum. The needle passed through MT from lateral to medial through the septum to the other side and then passed in opposite direction just anterior to MT through the septum to be tied in the first side.

Group C: ESS without medicalization.

Endoscopic scoring depends on endoscopic evaluation of MM for presence of scarring or adhesion and it was graded as: 0 = 4 mm hopkin rigid 0 scope can pass freely at any point of MM. 1 = 4 mm hopkin rigid 0 scope can pass with freer used to medialize MT. 2 = 4 mm hopkin rigid scope can't pass at all.

Statistical Analysis

All collected data was then analyzed and compared on SPSS version 22.

Results

There were about three groups of patients i.e, Group A (Bolgazization group) which consisted of 13 patients, Group B (suturing group) which consisted of 9 patients, Group C (without medialization) which consisted of 22 patients. with no statistically significant differences had

been found neither in age nor gender among the three groups, ($P>0.05$). Nasal obstruction was the main chief complaint in all patients, and polyposis was the main finding in anterior rhinoscopy, with no statistically significant differences amongst the three groups neither in chief complaints nor the anterior rhinoscopy findings, ($P>0.05$) as given in Table- 1. As it shown in table 2 , there was a significant change (improvement) in nasal obstruction reported by patients in all the three groups, however, the change was significantly larger in suturing group, where the mean nasal obstruction score reduced from 5.89 at 2 weeks to reach 1.44 at the 12 month, with a mean difference of 4.45 and percentage change (improved) by of 75.5%, in bolgarization group the mean difference was (3.15) and in controls it was (3.0), by comparing the mean differences amongst the three groups it was statistically significant ($P<0.05$). In table 3 ,The changes in nasal discharge was insignificant in bolgarization group , the mean score for nasal discharge was 2.23 at 2 weeks relatively reduced at one month, three month and 6 month but return to its level at one year, ($P>0.05$). in suturing group the mean score was 2.22 reduced in the subsequent visits to reach 1.33 at the one year with a statistically significant difference of 0.89 and percentage change of 40.1% (improved), which was larger than the mean difference in control group, (-0.41) that increased at one year by 16.7% (worsening), ($P<0.05$), hence, the change (improvement) was in suturing group rather than Bolgarization and controls. . For the facial pressure, it was relatively and insignificantly reduced in bolgarization group, ($P>0.05$), but it was significant in suturing group where it reduced from 2.24 at two week to reach 1.33 at one year, with

a mean difference of 0.91 and 40.6% improvement, conversely, facial pressure get worse in controls; its score elevated from 2.5 at two weeks and to 2.81 at the one year, however it was statistically insignificant, i.e. it is the same, ($P>0.05$).

Smell was improved in both Bolgarization and suturing groups by an improvement rate of 23.7% and 50%, respectively, ($P<0.05$), compared to significant worsening in control group, ($P<0.05$). However, the larger difference and improvement rate was among suturing group , as shown in table 4.

Headache was improved significantly in both bolgarization and suturing group, ($P<0.05$) and the larger mean difference was 1.21 in suturing group with a percentage change of 52.4%, compared to 1.08 and 41.2%, respectively, in bolgarization group. While headache was relatively and insignificantly get worse in control group, ($P>0.05$) .

In figure (1)The mean MM score at two weeks was 2, 1.22 and 2.0 in bolgarization, suturing and control groups, respectively, at the one year it was improved by 57.7% in bolgarization group, reach zero (100% improved) in suturing group, also it was better in control group with improvement of 34.1, ($P<0.05$) . Middle turbinate plays an important role in ESS, extensive disease process or surgical resection may render the middle turbinate floppy and unstable with subsequent scarring and synechiae formation that result in middle turbinate lateralization and hence obstruction of OMC that impede drainage pathway and impair ventilation of the sinuses.²²

Table 1. Chief complaints and endoscopic assessment findings of patients in the studied groups

Variable		Bolgarization (n = 13)		Suturing (n = 9)		Control (n = 22)		P. value
		No.	%	No.	%	No.	%	
Chief Complaint	Nasal obstruction	12	92.3	8	88.9	20	90.9	0.69
	Headache /orbital pain	1	7.7	1	11.1	2	9.1	
Endoscopic assessment	Polyposis	12	92.3	8	88.9	17	77.3	0.37
	CRS	0	0.0	0	0.0	3	13.6	
	ACP	0	0.0	0	0.0	2	9.1	
	Other	1	7.7	1	11.1	0	0.0	

Table 2. Changes in nasal obstruction reported by patients in the studied groups at different follow up time with the mean difference and percentage change

Nasal obstruction	Bolgarization (n = 13)	Suturing (n = 9)	Control (n = 22)	P. value between groups
2wk	7.15	5.89	7.41	0.016
1m	6.15	4.78	6.59	0.005
3m	4.92	3.33	5.82	< 0.001
6m	4.31	1.78	5.14	< 0.002
12m	4.00	1.44	4.41	< 0.003
Mean difference	-3.15	-4.45	-3.00	0.008
Percentage change	44.1%	75.5%	40.5%	
P. value within group	< 0.001	< 0.001	< 0.001	

Table 3. Changes in nasal discharge reported by patients in the studied groups at different follow up time with the mean difference and percentage change

Nasal discharge	Bolgarization (n = 13)	Suturing (n = 9)	Control (n = 22)	P. value between groups
2wk	2.23	2.22	2.45	0.474
1m	2.15	2.11	2.45	0.161
3m	2.08	1.78	2.32	0.021
6m	2.15	1.78	2.77	< 0.001
12m	2.23	1.33	2.86	< 0.001
Mean difference	0.00	0.89	-0.41	0.001
Percentage change	0.0%	40.1%	16.7%	
P.value within group	1.000	0.002	0.036	

Table 4. Changes in smell disturbance reported by patients in the studied groups at different follow up time with the mean difference and percentage change

Smell disturbance	Bolgarization (n = 13)	Suturing (n = 9)	Control (n = 22)	P. value between groups
2wk	2.62	2.00	2.41	0.116
1m	2.69	2.00	2.45	0.086
3m	2.69	1.78	2.64	0.017
6m	2.31	1.22	2.91	< 0.001
12m	2.00	1.00	2.86	< 0.001
Mean difference	0.62	1.00	-0.45	< 0.001
Percentage change	23.7%	50.0%	18.7%	
P. value within Group	0.040	0.001	0.015	

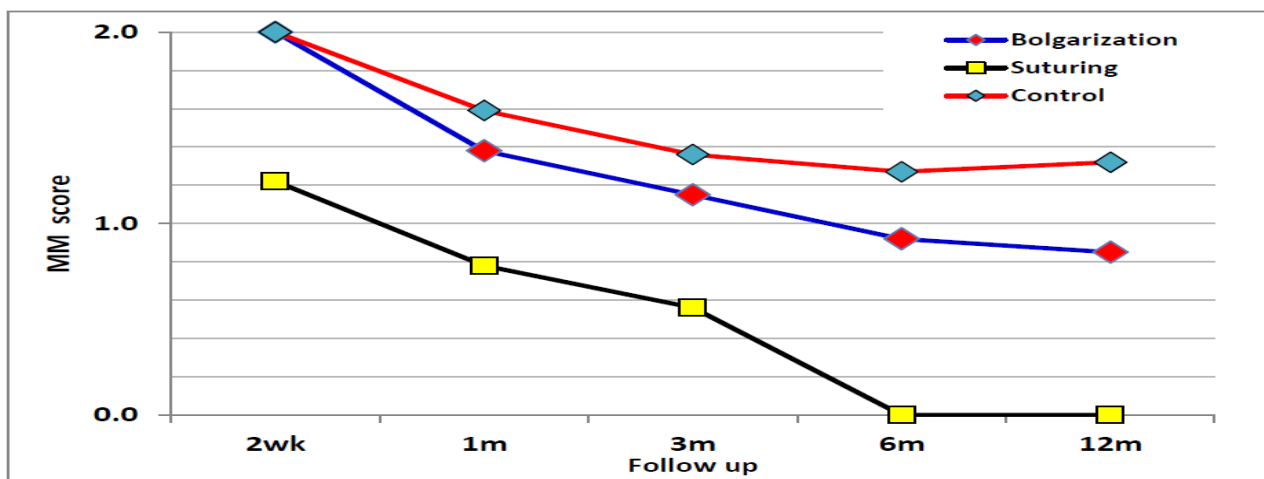


Figure 1. Comparisons between the studied groups in the changes in MM score

Conclusion

The present study was conducted to perform Medialization of middle turbinate following conventional endoscopic sinus surgery to ensure widely patent middle meatus and osteomeatal complex to facilitate drainage, ventilation, mucosal healing and follow up with better access of topical medications to the mucosa and concluded that Medialization with trans-septal suture technique is an effective method in preventing lateralization of middle turbinate and subsequent OMC obstruction. It was also clinically and statistically better than other techniques of medialization namely bolgarization. The authors in present study recommended that Middle turbinate should be medialized and stabilized in FESS to ensure widely patent MM using 0-3 or 0-2 vicryl suture to avoid laceration of MT. There is a need for further studies with a broader population of patients and with longer periods of close endoscopic and symptomatic follow-up. Moreover, other techniques

of medialization including using of Gelfilm, bovine serum albumin tissue adhesive (BioGlue), bioresorbable implant (L-lactide-co-glycolide) may also be performed to check their effectiveness.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Medicine, Kufa University, Najaf, Iraq and all experiments were carried out in accordance with approved guidelines.

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Determination Knowledge of Nurses' Concerning Measurement of Blood Pressure in Emergency Department at Al –Hussein Teaching Hospital in Al-Nasiriya City

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Abstract

A descriptive study at Al Hussein teaching Hospital in AL- Nasiriyah city to determine the knowledge of nurses' in the emergency department. The most nurses working in this department after testing their information through the questionnaire prepared in calibrations did not have sufficient information about the pressure measurement. Nurses should enter courses on blood pressure measurement

Keywords: blood pressure, emergency, AL-Nasiriya City

Introduction

Accurate blood pressure is critical to patient order, to detect blood risk, and to monitor executives. The auscultatory procedure used in the medical profession is still used in decision-making to estimate the workplace, using the first and fifth periods of the Krotovov sounds, combined with the pregnant women.. The utilization of mercury is diminishing, and choices are required. [1] They have the benefit of having the capacity to take numerous reading . Appropriate preparing of spectators, situating of the patient, then choice of suitable cuff size estimate for the most part basic. It is progressively perceived that office measurement present inadequately with blood pressure measurement in different locations, and they can be enhanced without anyone else's can readings taken with approved blood pressure apparatus at home. There is expanding proof a disappointment of blood pressure measuring to fall the night might be related with expanded hazard. In obese patients and children, the utilization of a proper cuff size is of vital significance [2]. blood pressure is a critical value for cardiovascular risk factors and gives essential data on the hemodynamic state of intensely ill or harmed patients. blood pressure continually changes and ascends with stress , pleasure and environment. White-coat hypertension' happens in patients just after a patient is sighted a health care provider specialist. potable Blood pressure measurement apparatus , utilizing a convenient device at interval and typical daytime movement and during the evening, is better at deciding cardiovascular hazard [3]. The blood

vessels pressure are estimated in millimeters of mercury (mm Hg), systolic over diastolic. The ordinary normal range of systemic blood pressure is 120/80 mm Hg. Blood pressure diminishes in the arterioles and small blood vessels, and the systolic and diastolic reading converge two reading . As blood enters the veins, blood pressure diminishes further and approaches zero as it streams into the right ventricle. As referenced beforehand, the blood pressure in the small blood vessels has incredible significance, and normal blood pressure is sufficiently high to allow filtration for nutrition of tissues but, low enough to prevent rupture The arterioles (and veins throughout expanded sympathetic stimulation)) are more often than not in a condition of slight narrowing that keeps up typical blood pressure, particularly diastolic pressure. This is called peripheral resistance; it is managed [4]. Amazingly, even a little distinction in blood pressure reading can considerably affect the pervasiveness of cardiovascular disease occurrences and prospect [5]

Objectives of the Study

- 1- To determine nurses' knowledge about measuring blood pressure accurately.
- 2- To find out association between nurses knowledge toward blood pressure measurement and level of education of nurses.

Methodology

Design of Study: A descriptive study was carried

out through the present investigation in order to achieve the objects of the present study; the study was conducted in emergency department of AL-Hussein Teaching Hospital at Al- Nasiriya City. Randomize sampling of nurses selections in emergency department and in order to assess the blood pressure measurement by questionnaire consists of:

Part 1: Nurses socio demographic characteristics include (Age, Sex, Educational level and years of experience).

Part 2: Questionnaire:

It was found as examination sequences of blood pressure in text book Macleod's Clinical Examination [5] and was revised by the researchers. also, was adjusted by the analysts. This instrument was utilized to appraisal learning of assessment knowledge of nurses with exact blood pressure measuring , incorporates 15 items covering the accompanying: Resting the client for 5 minutes preceding examination, measure BP in the two arms (brachial arteries); the greater of the two is nearest to central aortic pressure and ought to be utilized to decide treatment, In the case of patient placement or rest,

the patient's arm is easily supported around the heart, with no tight clothing shrinking at the top of the arm, and can be measured on thin clothing, while the bladder width is 12.5 cm and 30 to 35 cm long. Place the cuff at the top of the arm, with the center of the bladder on the brachial artery, palpate the brachial artery, blow the cuff up to the point where the pulse is not felt, Puff up the cuff up to 30 mmHg and hear through the diaphragm of the headset installed on the brachial artery, Empty the cuff gradually (2– 3 mmHg/s) until the point that you hear is tapping sound (stage 1 Korotkoff sounds). Record read measurements for the nearest 2 mmHg. This is the systolic pressure, continue to empty the cuff gradually until you reach the point where the sounds go, the pressure record where sounds disappear just like diastolic pressure. Official permission was obtained from the Administrative of Thi-Qar health office and from the head nurses at the study settings to done the study. A verbal assent acquired from the respondents previously their incorporation in the study . Nature and goals of the study was clarified to every individual from the members. The information when gathered with questionnaire, through a use of indirect answers as mean of information gathering.

Result

Table (1): Show distribution of nurses' age groups that were cooperative in study.

Age			
		Frequency	Percent
Age of Nurses	21-25	59	59.0
	26-30	28	28.0
	31-35	11	11.0
	36-40	2	2.0
	Total	100	100.0

This table illustrates that the majority of (59.0%) of nurses' cooperative in study were at age group (21-25).

Table (2): Show Distribution of Nurses Gender that were Cooperative in the Study.

Gender of Nurses			
		Frequency	Percent
Gender	Male	30	30.0
	Female	70	70.0
	Total	100	100.0

This table illustrates that the majority of (70.0 %) that were females that cooperative in study.

Table (3): Show Distributions of Educational level among Nurses Cooperative in Study.

Educational Level of Nurses			
		Frequency	Percent
	Secondary	32	32.0
	Institute	51	51.0
	Colleague	17	17.0
	Total	100	100.0

This table illustrates that the majority of (51%) were graduated from medical institutes.

Table (4): This Table Show Distribution of Years of Experiences of Nurses Cooperative in This Study.

Years of Experiences of Nurses			
		Frequency	Percent
	2-5 years	59	59.0
	7-11 years	28	28.0
	12-16 years	11	11.0
	17-21 years	2	2.0
	Total	100	100.0

This table illustrates that the majority of (59%) were within from (2-5 years) of experiences.

Table (5): This Table Show Cooperative in Learning Session of Nurses that were Cooperative in Study.

Cooperative in Learning Session of Nurses			
		Frequency	Percent
	Yes	94	94.0
	No	6	6.0
	Total	100	100.0

This table illustrates that the majority of (94%) were cooperative in learning sessions.

Table (6): This Table Show the Number of Learning Sessions Cooperating by Nurses.

Number of Learning Sessions Cooperating			
		Frequency	Percent
	1-5	3	3.0
	6-10	97	97.0
	Total	100	100.0

This table illustrates that the majority of (97%) of all nurses cooperative in learning sessions that were cooperative number from(6-10) learning sessions class.

Discussion

At the state when blood pressure is measure and treated by medical guidelines, even modest decreases can have a clinically critical impact [7].The present study revealed that the majority of (59.0%) of nurses cooperative in study were at age group (21-25). The study results revealed that of (70.0 %) that were females that cooperative in study. The majority of (51%) were graduated from medical institutes the study results show (59%) of nurses cooperative in the study were from (2-5 years) of experiences. the majority of (94%) were cooperative in learning sessions. majority of (97%) of all nurses cooperative in learning sessions that were cooperative number from(6-10) learning sessions class^[8].The study result illustrates that the majority of (72%) of all nurses cooperative in this study have moderate knowledge toward blood pressure measurements. The results revealed that This outcome was in accepting for the result with [9] demonstrate that 35–60% of human services experts in the Departmentd States measure circulatory strain inaccurately. Highly significant ($P<0.00$) the highly statistically significance between Average of nurses knowledge toward blood pressure measurement and level of education^[10].

Conclusions

1- The correctness of blood pressure (BP) measuring is significant.

2- Organized minor errors can mislabel BP status in many persons.

3- Persistence retraining and assessment is an crucial step toward successful blood pressure measurement accuracy.

4- Quality enhancement sessions can assist healthcare teams to apply commended guidelines in everyday practice.

5- Numerous means in the blood pressure measuring process, it is useful to consider enhancing accuracy through a progression of little execution enhancement activities or quick enhancement cycles..

6- Give more attention for those patients with white coat hypertension.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Southern Technical University and all experiments were carried out in accordance with approved guidelines.

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Thermal Effects of Laser Assisted Endodontic Treatment on The External Root Surface of Deciduous Teeth (in vitro study)

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Abstract

The aim of this study was to determine the possible temperature increase on root surface of deciduous human teeth after intra-root canal laser irradiation with different chopped modes to clarify the thermal safety of these modes. fifteen freshly extracted unrestorable deciduous molars were used. Immediately after extraction, teeth cleaned, root canal perpetrated, laser irradiation was done in mesial root using dual wavelengths 980/810 nm InGaAs diode laser (using a 200 µm fiber, 800mW output power. Room temperature were raised in the laboratory to 37C to simulate body temperature, for each tooth three chopped program were used successively: 25ms on 75ms off, 50ms on and 50ms off, and 75ms on 25ms off. Each round laser irradiated for 5 seconds then 10 seconds pause. At the very last second temperature was measured using infrared thermometer. This procedure for the three groups was repeated but with non-stop laser irradiation with no cooling intervals.

It was concluded that 30/70 ms layout can be used safely to assist root canal disinfection.

Keywords: endodontic treatment, external root surface, laser

Introduction

Successful endodontic treatment mandate elimination of bacteria in root canal system ¹. Its well known that all available irrigation solution are not optimized to eliminate all bacteria due to surface tension of liquids, which prevent these liquids to penetrate more than 100 µm in dental tissue², whereas bacteria can do much more penetration in dentin which may reach ten folds of irrigation liquids depth ³. Therefor additional disinfection protocol is needed to eliminate microbes in dentinal tubules to increase success rates of root canal treatment ⁴.

The availability of diode laser in many dental clinics, the reasonable cost, and the quite rapid development of lasers technologies make them suitable aids to root canal disinfection ⁵. Diode laser had been vigorously studied and it was concluded that using it in combination sodium hypochlorite and/ or oxygenated water would obtain a

good outcome ⁶. The effect of diode laser on microbes in dentin is either photothermal or photo-activate. The effect of the formal is relied on heat generation which in turn will kill bacteria, and the latter is required presence of special dye ⁷. Beside photothermal effect cavitations generated by laser might assist in clearing smear layer and removing debris from dentin surface ⁸. Diode lasers of wavelengths between 600 and 980 nm, had been applied to disinfect root canal system, with special interest to wavelengths above 810, due to their high absorption by water. The efficiency of laser in endodontics are relied on several factors such as: wavelength, intensity, laser mode, and proper access cavity ⁹. The beneficial effect of laser photothermal of disinfection and cavitations of smear layer, may cause collateral damage to periodontal ligament and alveolar bone if the temperature on root surface increased more than 10 C for less than 60 seconds ¹⁰. To prevent or decrease this harmful side effect, the laser parameters should be optimized to a

precise level that can perform efficient disinfection and in the same time insure periodontal ligament health. For this purpose, this study was designed to investigate the thermal changes on root surface during application of laser irradiation through root canal.

Materials and Method

This study was performed in the secondary health center of Al_Dywaniya, from January 2019 to June 2019. In this study 15 freshly extracted unrestorable deciduous molars were used. Immediately after extraction, teeth cleaned with normal saline, carries removed, proper access opening were done by high speed hand piece (W&H), root canal instrumentation of coronal 2/3 of the canal using rotary endomotor (Eighteeth, China) and rotary files (AF Fanta 0/6, China), followed by clearing root canal using normal saline then dry it with generic paper points. teeth were hold using artery forceps from the distal root to fixing them, laser irradiation was done in mesial root using dual wavelengths 980/810 nm InGaAs diode laser (Quicklase, UK), using a 200 μ m fiber, 800mW output power. Room temperature were raised in the laboratory to 37C to simulate body temperature, for each tooth three chopped program were used successively: 25ms on 75ms off, 50ms on and 50ms off, and 75ms on 25ms off. Between each cycle teeth were cooled and cleaned with normal saline and dried. Laser fiber were inserted to the end of prepared canal then irradiation started, fiber was moved during the irradiation with speed of 3mm per second to avoid hot spot, Each round laser irradiated for 5 seconds then 10 seconds pause for six times and the total time of active irradiation was 30 seconds ¹. The temperature

on mesial root surface was measured at the last second of irradiation using infrared thermometer (generic) on the middle of the mesial aspect, the result was recorded. This procedure was performed for each tooth in the same manner. The exact procedure for each tooth for the same parameters were repeated but without pause intervals, 30 seconds of laser irradiation was given in the same speed of 3 mm per second, and the temperature was measured in the same spot of above-mentioned method, to clarify the effect of non-stop laser radiation on root surface temperature.

Statistical analysis was proceeded using SigmaPlot Version 12. mean and standard deviation for each Group (1–6).

To determine temperature differences between groups we used One Way Repeated Measures Analysis of Variance. Statistical significance was defined at $p < 0.05$. To isolate the group or groups that differ from the others we used all Pairwise Multiple Comparison Procedures (Holm-Sidak method). Comparison of groups of the same parameters was done using Paired T test.

Results and Discussions

Analysis data by one-way ANOVA revealed slight increase in root temperature in all groups (table 1), The Intermitted 70/30 groups showed the higher temperature raise (5C above the initial temperature), Intermitted 50/50 showed a lesser thermal change (~3C), and the Intermitted 30/70 revealed the least temperature raise (less than 1C as average).

Table 1. Analysis data by one-way ANOVA revealed slight increase in root temperature in all groups.

Treatment Name	N	Missing	Mean	Std Dev	SEM
Intermitted 70/30	15	0	42.000	2.803	0.724
Intermitted 50/50	15	0	39.767	1.770	0.457
Intermitted 30/70	15	0	37.093	0.139	0.0358

There was a statistically significant differences between these groups (table 2), thus post hoc test was performed to isolate group or groups that differ from the others.

Table 2. Statistically significant differences between groups.

Source of Variation	DF	SS	MS	F	P
Between Subjects	14	66.885	4.778		
Between Treatments	2	181.049	90.525	29.048	<0.001
Residual	28	87.257	3.116		
Total	44	335.192			

Post hoc analysis showed that Intermitted 70/30 had statistically significantly higher mean than Intermitted 30/70 (P= <0.001), and Intermitted 50/50 (P=0.002). lower mean was recorded in Intermitted 30/70 which was statistically significantly lower than other groups (P=<0.001) as shown in table 3.

Table 3. Statistically significantly lower than other groups

Comparisons for factor:					
Comparison	Diff of Means	t	P	P<0.050	
Intermitted 70/30 vs. Intermitted 30/70	4.907	7.612	<0.001	Yes	
Intermitted 50/50 vs. Intermitted 30/70	2.673	4.147	<0.001	Yes	
Intermitted 70/30 vs. Intermitted 50/50	2.233	3.465	0.002	Yes	

Data of non-stop irradiation showed higher means in all groups, both Nonstop 70/30 and 50/50 showed high temperature (table 4), which was exceeded the upper acceptable threshold of 7-10C (8, 11), on the opposite Nonstop 30/70 group showed slight increase within safe limits. One-way ANOVA analysis revealed as expected significant differences among groups (table 5), therefore post hoc test was done using Holm-Sidak method to isolate particular differences between groups (table 6), this test showed that both Nonstop 70/30 and Nonstop 50/50 had higher mean than Nonstop 30/70 (P=<0.001), also Nonstop 70/30 was higher than Nonstop 50/50 (P=<0.001).

Table 4. Data of non-stop irradiation showed higher means in all groups.

Treatment Name	N	Missing	Mean	Std Dev	SEM
Nonstop 70/30	15	0	58.053	1.743	0.450
Nonstop 50/50	15	0	47.847	2.093	0.540
Nonstop 30/70	15	0	37.387	0.344	0.0888

Table 5. One-way ANOVA analysis revealed as expected significant differences among groups.

Source of Variation	DF	SS	MS	F	P
Between Subjects	14	32.952	2.354		
Between Treatments	2	3203.494	1601.747	618.268	<0.001
Residual	28	72.540	2.591		
Total	44	3308.986			

Table 6. Holm-Sidak method to isolate particular differences between groups.

Comparisons for factor:				
Comparison	Diff of Means	t	P	
70/30 vs. 30/70	20.667	35.164	<0.001	Yes
50/50 vs. 30/70	10.460	17.797	<0.001	Yes
70/30 vs. 50/50	10.207	17.366	<0.001	Yes

The aim of this study was to determine the possible temperature increase on root surface of deciduous human teeth after intra-root canal laser irradiation with different chopped modes to clarify the thermal safety of these modes.

It's important to mention that invitro circumstances are not always identical to vivo condition, thus the picture in real experiments may vary from this study results¹¹. In this study teeth temperature were raised to 37C by increasing room temperature to simulate the human body temperature, to avoid fast temperature loss during previous studies when using room temperature¹². Previous literatures had showed the safe threshold of root surface to be less than 10C to avoid periodontal and bone damage^(11, 13), although many authors considered 7C increases to be the safe threshold in human body due to slower cooling in comparing to vitro studies^(14, 15).

Under the condition of this study, it was observed that chopped intervals had intense influence on root surface temperature, and layout of both 70/30 and 50/50 ms on/off laser irradiated showed remarkable thermal raise which was exceed the safe threshold when it was used with non-stop mode, and in intermitted mode with cooling off intervals the raise was still within acceptable safe limits but both groups showed significantly higher temperature increase in comparing with 30/70 ms layout. It's important to mention that this study didn't examine the efficiency of laser on root canal disinfection, thus its not possible to give conclusion about the optimal laser layout, but we can conclude that 30/70ms layout can be used safely even if the laser used without cooling off periods, on the other hand its good to advice that laser layout of 70/30 and 50/50ms should use with precaution and always be used with cooling off period to avoid unintentional thermal raise which will exceed safe

threshold in less than 30 seconds.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under Al-Diwaniyah secondary dental health center, Al-Diwaniyah, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effect of Some Alcoholic Extracts in Reducing the Fat Content of the Liver Tissue in Rat

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Abstract

Objective: This research was carried out in rats in a special place of the laboratory of histopathological diseases in the period 6/9/2018 until 23/11/2018, this study to detect effect of the addition of the alcohol extract of ginger in the reduction of fat in liver tissue of rats.

Method: Eight groups and replicates for each group. The groups were homogenous in weights and were placed in 13 cages. Each group consisted of 10 rat and at 5 fares each. In the first treatment, rat were fed on regular feeding without adding and feeding rats in the second treatment sessions add to it the alcoholic extract of ginger in Turkey 150 mg / kg. The third group is the same as the normal food after adding the alcohol extract of ginger at a concentration of 300 mg / kg.

Results: The results of the study showed a high morale in the rates of reduction of fat in the liver tissue of rat fed on the alcohol extract of the ginger and improved the conversion factor of food by adding the extract of alcohol extract of each of the ginger.

Keywords: Cholesterol, liver tissue, alcohol extract of each of the ginger

Introduction

The cultivation of medicinal and aromatic plants and herbs has spread in most parts of the world and has been used for its medicinal effectiveness and quick cure for diseases which are used as whole herbs, powders, or aqueous or aquatic or oily extracts¹¹. Zingiber is a plant that is found in the hot areas. Rizhomes are used under the soil and contain volatile oils with pungent smells and pungent taste. They are also squirrels or yellowish white. They contain the ginger root nodes on resins, the most important of which are Gingerol¹¹

Methods

Preparation of the alcoholic extract of ginger

Get the ginger from the local markets and cut the raw

ginger into very small pieces. Solve 30 g of raw material in alcohol to get the ginger extract in 70 ml of ethyl alcohol at 96% concentration and place in a clean glass jar in a dark place, 4 times daily for at least two weeks. The solution is then filtered with Whatman1 filter paper²⁰. The solution is then placed in the rotary evaporator, at a temperature of 45 m for the purpose of extracting the solution. The solution was then placed in an electric oven at 45 ° C for 20 minutes to dispose of the remaining alcohol. After extracting the extract, it was weighed by a sensitive balance and stored in clean containers.

Histological study of light microscopy

For the purpose of studying the histological structure of the liver of mice, the following chemicals and colors were used⁷

Aqueous Bouin's Solution

I use this solution in the installation and have attended the accreditation⁷

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Alcoholic alcohols

Attended progressive concentrations of ethanol alcohol 30%, 50%, 70%, 80%, 90% and

95% using distilled water¹⁶

Harris Hematoxylin Stain

This is a color of basal colors that are generally used for all animal tissues, especially when using the color of the Eocene⁷

Dissection of animals

At the fifth week of the rat’s lifetime, 8 rats were taken from each treatment. The total number of mice was 16 and then the animal was explained after anesthesia based the following¹²

-Place the animal in a Dissecting Tray.

- remove the skin, and then remove the sternum Caudal appendage until the area separated with the gravitational bone Coracoid bone Cranial.

- Make a cut in the skin in the lower abdominal region.

- Elevation of the liver after cutting the suture that connects it to the transverse septum barrier separating the pericardial cavity and the abdominal cavity.

- The samples were transferred to the installed solutions Formalin.

Preparation of histological slides

I attended paraffin slices based on¹⁶

. Fixation

Place a section of samples in a 10% formalin solution in time 24 hours. **Washing**

Samples installed with a formalin solution washed 10% concentration with tap water for half hour.

Dehydration

The samples were passed with an ascending sequence of ethyl alcohol for the purpose of drawing water from the sample, starting from 70%, 80%, 90%, 95% and 100% for half an hour per concentration.

Clearing

Sample samples with Xylene for 15 minutes to make samples more transparent.

Infiltration

Before the leakage, the samples were transferred to a mixture of xylene and paraffin wax, melting 58-56m at 1: 1 for half an hour, then placed in molten paraffin wax and repeated three times for half an hour each.

Embedding and making blocks

The samples were immersed in the same type of wax used for filtration. The molten wax was poured into special molds for this purpose. The samples were then transferred to the air bubbles to remove hot bubbles around the sample and leave the mold to harden.

Trimming and Sectioning

The molds were waxed using a sharp scalpel and mounted on a wooden stand. The mold was placed on the Rotary Microtome. The models were then cut into serial sections with a thickness of seven micrometers. The sections were then placed on clean glass slides coated with a thin layer of Mayer’s aluminum and distilled water. Hot plate temperature 37 m to dry

Staining

The textile slides were colored with their own colors and the following :

Harris hematoxylin and eosin

The sections were colored with hematoxylin Harris-eosin

- Histological sections were put in the xylene and in two stages for ten minutes for each stage
- The syllables underwent a downward chain of concentration of ethyl alcohol
- Rinse the sections with Hematoxylin Harris for 15 minutes and then wash with tap water for 2 minutes. After that, wash the sections in distilled water for 2 minutes.
- The sections were painted with the eosin coating for 3-4 minutes, transferred to ethyl alcohol 70% concentration for 2 minutes.
- Dry the sections with a series of progressive

concentrations of ethyl alcohol 70-100% and for 2 minutes per concentration.

- Raise sections by using xylene in two phases and for 2 minutes for each stage.

Mounting

The plates were placed using a Dextrin Plasticizer Xylene (D. P. X). Then, covered with glass cover and no bubbles, the glass slides were transferred to a 37 ° C hot plate and left to dry.

Microscopy

Microscope Photography Microscopic slides were examined using a light microscope and various magnification powers to suit the current study requirements. The microscopic slides were selected with a digital microscope equipped with a digital camera and a standard 12-megapixel Canon camera was used to visualize prototypes.

Results and Discussion

The Liver

The results of the current study showed the effect of alcohol extract of ginger in the morphological description and tissue composition of the rat liver and compared it with the treatment of control and the following.

The histological of the liver in the rat of the control treatment

The hepatic tissue in the rat appeared to treat the control of hepatic cells, which are covered with a Glisson capsule, composed of a thin layer of connective tissue that extends from deep inner barriers. Among the hepatic cells are a number of sinusoids that are lined with two types of cells They are endothelial cells that are flat cells that are not linked to each other. Their nuclei

are compressed and dark-colored and their cytoplasm is somewhat unnoticeable, while caper cells appear in the irregular blood cell cavity, and hepatic cords, The hepatic tissue in the mice appeared to treat the control of hepatic cells, which are covered with a Glisson capsule, composed of a thin layer of connective tissue that extends from deep inner barriers. Among the hepatic cells are a number of sinusoids that are lined with two types of cells They are endothelial cells that are flat cells that are not linked to each other. Their nuclei are compressed and dark-colored and their cytoplasm is somewhat unnoticeable, while caper cells appear in the irregular blood cell cavity, and hepatic cords appear around the veins He passed Central veins, as well as the portal area of the branch of hepatic portal vein, the hepatic artery branch and the branch of bile ducts, and occasionally the lymphatic cell branch (Fig. 1, 2 and 3) in their study on chickens⁸.

Sinusoids have appeared in narrow sinuses in mice and this is consistent with what has shown through their studies on chickens and ducks.

Polygonal shape (23.4 μm), a nucleus or two spherical nuclei, and one or more central nuclei, showed a cytoplasmic granularity, because it contains a diverse group of organelles. This result is consistent with what the researchers⁸ The branch of the hepatic portal vein located in the inner courtyard is characterized by the thinness of its wall and its large cavity. It is surrounded by endothelial cells surrounded by smooth muscle fibers, while the hepatic artery branch is characterized by its wall thickness, small cavity, limp, smooth muscular fiber^(8,21) referred to large bile ducts lined with simple epithelium based on the original lamina propria and surrounded by smooth muscle fibers covered with serosa. The primary bile ducts are lined with vertical epithelial cells.

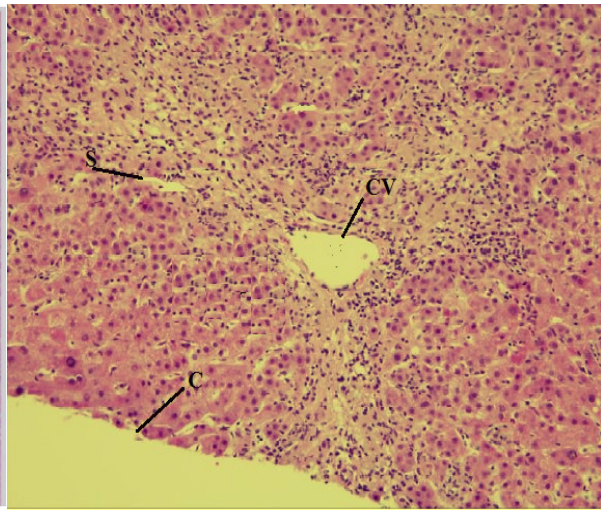
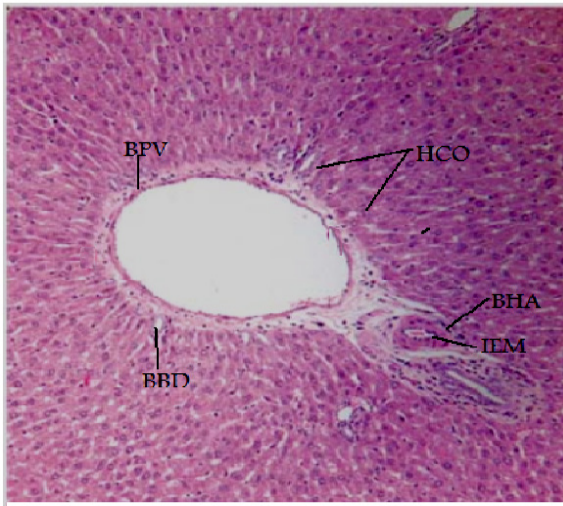


Figure 1: A transverse section of the liver of the control group in rat, showing the apillary patina, hepatic artery branch hepatic vein branch and bile duct branch (hematoxylin-eosin color) 10 X

Figure 2: A transverse section of the liver for a control group in rat showing the central vein, vein and hepatic cords (stained hematoxylin eosin) 10X.

- | | |
|--------------------------------------|------------------------|
| BPV Branch of portal vein | C Capsule |
| HCO Hepatic cords | CV Central vein |
| IEM Internal elastic membrane | S Sinusoid |
| BHA Branch of hepatic artery | |
| BBD Branch of bile duct | |

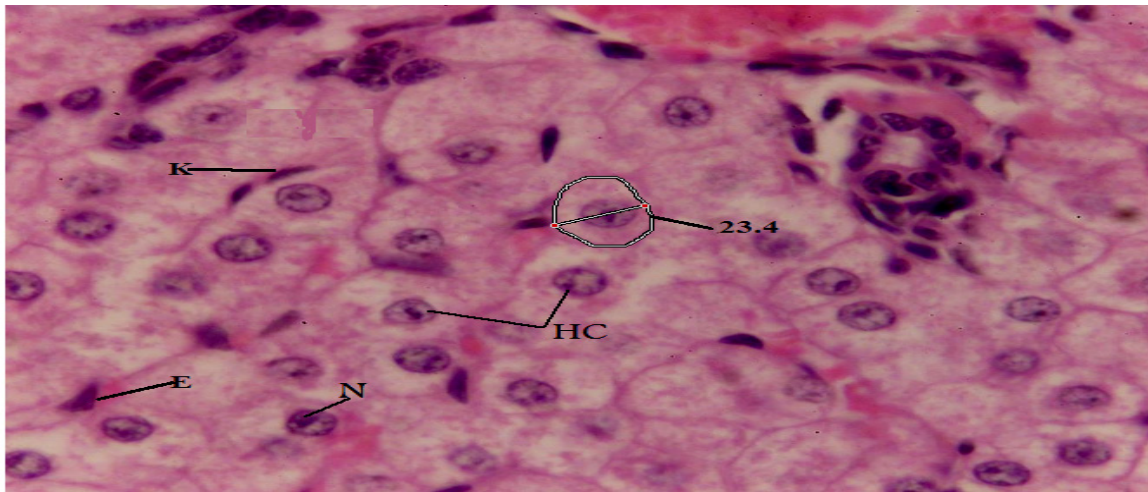


Figure (3): transverse section of the liver of the control group in mice shows hepatic cells, cells Kieffer, hepatic cells cytoplasm containment gaps (colored Hematoxylin - eosin) 40X.

- | | |
|-----------|--------------------------|
| HC | Hepatocyte |
| N | Nucleus |
| K | Kapfer cells |
| E | Endothelial cells |

The histological structure of the liver in rat treated with the alcohol extract of ginger at a concentration of 300 mg / kg:

The results of histological study showed that liver-fed rat on the standard diet plus her alcoholic extract of ginger concentration of 300 mg / kg in which distension may occur in the liver cells and the increase in the hepatic cells size as the diameter reached hepatic cell 30.4 micron and observed increasing the level of bilateral cells cores with expansion Central venous and get a blood congestion in the blood vessels and for the expansion of the bile duct branch (6 and 7 and 8 photos) compared with the control group may be due to the alcoholic extract of ginger, which may be attributed to the liberation of acid Alarkidunk located in phosphorescent fat that enters in the composition of the elk cells Friendly, leading to activation Almothinat Prostaglandins, which caused the expansion of blood vessels and the events of the expansion of the bile ducts³. As for the reduction of

the protein level of fat Lipoprotein lowland density of LDL-C, and raise the protein level of fat and high-density High-density Lipoproteins may inhibit ginger absorption of cholesterol from the intestine and increases raised as a result of increased Adrar yellow This is indicated by the researcher and his group¹³ thereby is reflected in the reduction of LDL-C and raise HDL-C, or perhaps because of the containment of ginger on the high content of vitamin C, which stimulates the secretion of insulin and works Kamadada antioxidants thus occurs on the reduction in LDL-C and raise the HDL-C and this is what he referred⁴ and the ability of Ginger rhizomes powder to cause swelling in the cells Liver compared to what is in the control treatment may be due to the possession of ginger extract compounds have a similar action to insulin hormone in its ability to alter the metabolism of carbohydrates and increase the formation of calcification by increasing the entry of glucose into the cells, causing swelling^(4,17)

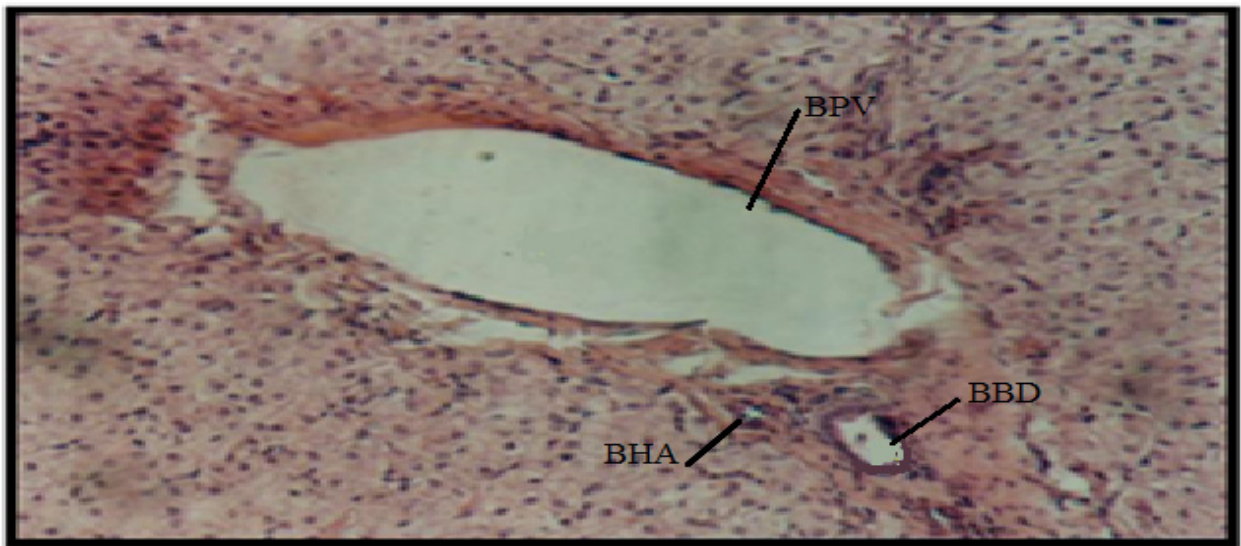


Figure 4: A transverse section of the liver of rat (treated with ginger extract 300 mg / kg), showing the hepatocellular patina, weed in the hepatic artery branch, the hepatic portal vein and the bile duct (hematoxylin- eosin) 10x.

- BPV** **Branch of portal vein**
- BHA** **Branch of hepatic artery**
- BBD** **Branch of bile duct**

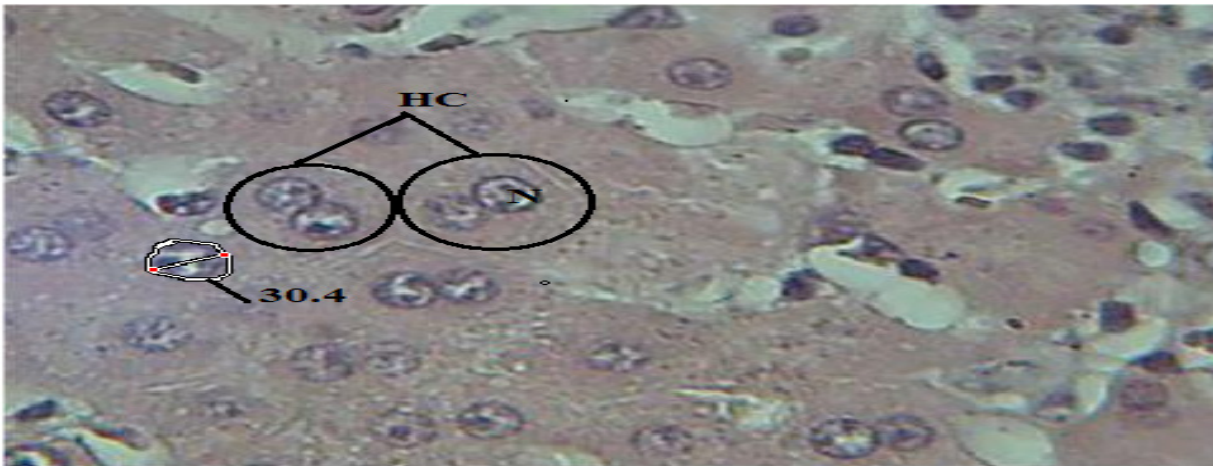


Figure 5: A cross section of the rat liver (a coefficient of ginger extract 300 mg / kg), showing double-core cells, increased hepatic cell diameter and disappearance of fat cells compared with the 40x hematoxylin-eosin control group.

N Nucleus
 HC Hepatocyte

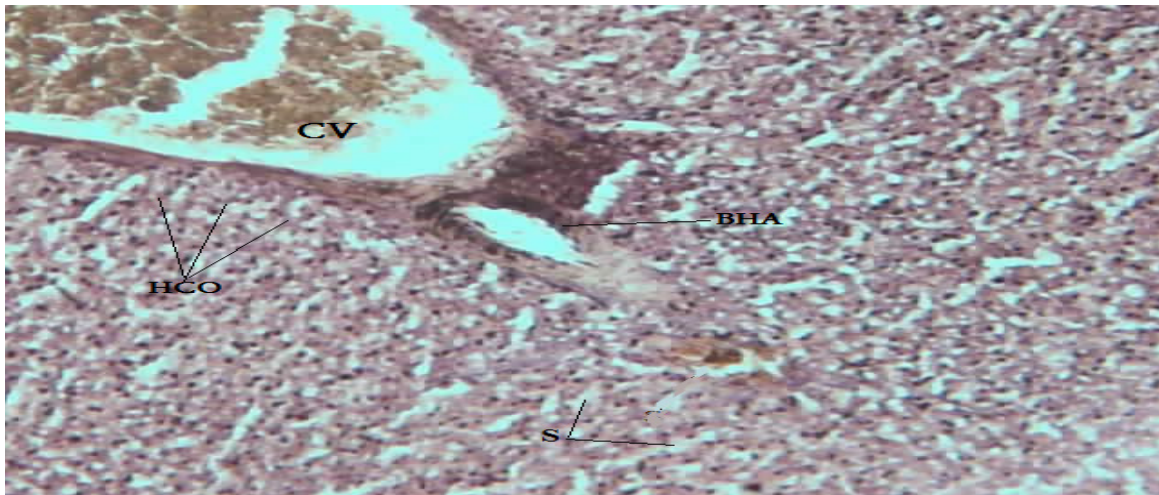


Figure 6: Transverse section of rat liver (treated with ginger extract at 300 mg / kg concentration) showing hepatic cell proliferation and liver vein congestion (hematoxylin-eosin color) .10X

CV Central vein
 S Sinusoids
 HCO Hepatic cords

All experimental protocols were approved under the *Al Mustaqbal University* college, Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Financial disclosure

There is no financial disclosure.

Conflict of interest

None to declare.

Ethical Clearance

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Knowledge, Attitude and Practice of Mothers to Neonatal Jaundice

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Abstract

Background: Neonatal severe hyperbilirubinemia represents a significant, yet preventable health problem, particularly in low- and middle-income countries (LMICs) ¹⁶. Adequate maternal knowledge, early perception, and care seeking behavior are fundamental components of effective management of NNJ ⁷. A number of studies revealed unexpected moderate knowledge and attitude scores of mothers in most knowledge domains, although the majority of them were illiterate or had low educational attainment.

Aim of the study: To assess the knowledge, attitude and practice responses of women during reproductive age toward neonatal jaundice and response correlation to demographic characteristics.

Patients and Method: In this hospital based study, in order to evaluate the knowledge background of ladies of reproductive age toward neonatal jaundice regarding causes, clinical manifestation, complications, mode of treatment and other aspects in addition to their attitude regarding conventional and traditional medical approaches and how to behave when facing the problem of neonatal jaundice, a sample of women was selected according to the duration of study.

Results: Most of women admit to know 2 symptoms of jaundice, where as small proportion of women knew only one symptom of jaundice, 80.2 % versus 15.8 %, respectively. Four women (4%) know none of symptoms of jaundice. Regarding dangerous symptoms of jaundice, most of women (88.1 %) knew a single symptom and a few of them (4 %) knew 3 symptoms. Positive attitude toward neonatal was seen in significantly high proportion of women enrolled in the study. Positive practice was correlated to older age, higher level of education and higher birth order

Conclusion: Knowledge, attitude and behavior of women about various aspects of neonatal jaundice were significantly better in older women in comparison with younger women, and highly significant better with increasing birth order, as well as it was significantly better in employee and with higher level of education.

Key words: Knowledge, Attitude and Practice, Mothers, Neonatal Jaundice.

Introduction

Neonatal jaundice is yellowish discoloration of the skin, conjunctiva and the sclera from elevated serum or plasma bilirubin in the newborn period ¹². The term jaundice is from the French word “jaune,” which means yellow ²⁴. Neonatal jaundice in most newborns is a mild and transient event. It is however imperative to identify newborns with jaundice that do not follow this pattern as failure to do so may lead to long-term sequelae ²¹. Almost all newborns will develop a total

bilirubin level above the upper limit of normal for adults and older children bilirubin of 1.5 mg/dl with less than 5% of the total bilirubin conjugated ³. Up to 60% of term infants and 80% of newborns with a gestational age of 35 weeks or more will develop jaundice, which occurs when serum bilirubin reaches and exceeds 5 mg/dl ¹⁰. Neonatal severe hyperbilirubinemia represents a significant, yet preventable health problem, particularly in low- and middle-income countries (LMICs) ¹⁶. Adequate maternal knowledge, early perception, and

care seeking behavior are fundamental components of effective management of NNJ⁷. A number of studies revealed unexpected moderate knowledge and attitude scores of mothers in most knowledge domains, although the majority of them were illiterate or had low educational attainment. This may be partly associated with successful implementation of extensive primary care network, as well as frequent broadcasting free health messages¹³. In terms of knowledge, some studies reported that participants had adequate knowledge about NNJ in the aspects of awareness, risk factors, management, and complications. Nonetheless, only little proportion of mothers had addressed breast feeding and preterm labor as risk factors for NNJ, respectively. This warrants adequate antenatal and postnatal dissemination of information on neonatal hyperbilirubinemia to the vast majority of mothers. Generally, frequency of correct responses of knowledge related to NNJ was inconsistent across studies conducted in developing world such as Ethiopia (63.5%)¹, Nigeria (57%)¹⁵, Iran (77%)², and Turkey (46%)²³. Utilization of different questionnaires, cultural diversity, and traditional beliefs could be factors that might have influenced such difference. Therefore the aim of the current study was to assess the knowledge, attitude and practice responses of women during reproductive age toward neonatal jaundice and response correlation to demographic characteristics.

Patients and Method

In this hospital based study, in order to evaluate the knowledge background of ladies of reproductive age toward neonatal jaundice regarding causes, clinical manifestation, complications, mode of treatment and other aspects in addition to their attitude regarding conventional and traditional medical approaches and how to behave when facing the problem of neonatal jaundice, a sample of women was selected according to the duration of study. The available conventional sample was collected as 2 to 3 cases per day, 3 days a week. At the end of the study we were able to collect information about 101 women. The study was carried out in the Al-Diwanyal Maternity and Child Teaching hospital during the period from October 2018 through January 2016. The following variables were included in the questionnaire form: Demographic characteristics including age, residency, education level and occupation, Mode of delivery and birth order of last child. Knowledge domain included Symptoms of jaundice, Dangerous symptoms of jaundice, Causes of neonatal jaundice, Effective treatment, Complication of severe jaundice, Best way

of diagnosis and Prevention during pregnancy. Attitude domain was evaluated through a number of questions regarding Neonatal jaundice development, traditional medicine harmful effect, worry of hospitalization, visiting physician when facing the problem of neonatal jaundice. Practice domain included direct questions with yes or no response. These questions were about Using medical herbs, Fluorescent use at home, Using sun light, Referring to physician and Referring to traditional healers. The study was approved by the institutional ethical approval committee and formal agreement was obtained from the directorate of Health in Al-Diwaniyah province, the formal representative of Iraqi Ministry of health.

Data were collected and transformed into a spread sheet of Microsoft Office Excel 2010 and then into an SPSS (statistical package for social sciences) version 23. Numeric quantitative data were expressed as mean, range and standard deviation (SD), whereas, qualitative data were expressed as number and percentage. Spearman correlation test was used to assess correlation among variables. The level of significance was considered at $P \leq 0.05$.

Results

Demographic characteristics of women enrolled in the present study were demonstrated in table 1. The frequency distribution of women according to knowledge domain is demonstrated in table 2. Most of women admit to know 2 symptoms of jaundice, where as small proportion of women knew only one symptom of jaundice, 80.2 % versus 15.8 %, respectively. Four women (4%) know none of symptoms of jaundice. Regarding dangerous symptoms of jaundice, most of women (88.1 %) knew a single symptom and a few of them (4 %) knew 3 symptoms. With respect to causes of jaundice, most women revealed knowledge of a single cause of jaundice and they accounted for 59.4 %, only 20.8 % of women knew 2 causes and 19.8 % of women were unable to recognize any cause of jaundice. Most of women (60.4 %) knew a single effective mode of therapy and 19.8 % of them knew two modes, whereas 19.8 % of them know none of effective treatment modes. The largest proportion of participating women knew nothing about complications of neonatal jaundice and they accounted for 44.6 %. Those who know 1, 2 or three complications accounted for 11.9 %, 23.8 and 19.8 %, respectively. Most of participating women had knowledge about 2 methods of diagnosis and they

accounted for 96.0 %, while 4% of them knew only a single diagnostic method. Unfortunately all participating women know nothing about how to prevent neonatal jaundice during pregnancy. Assessment of women Attitude domain toward neonatal jaundice and their frequency distribution according to response to attitude questions are shown in table 3. Regarding the first question “ I am worried about developing jaundice in my infant” 72.3 % of the response was strongly agree, 15.8 % of the response was “no idea” and 11.9 % of the response was disagree. Regarding the second question “I am worried about several blood testing of my infant because it can cause anemia” 100.0 % of the response was disagree. Regarding the third question “if jaundice develops in my infant, I shall use traditional medicine because this disease is not dangerous”, 92.1 %

of the response was disagree and 7.9 % was “no idea”. Regarding the fourth question “if jaundice develops in my infant, I won’t use traditional medicine because it may be harmful for him”, 96.0 % of the response was disagree and 4.0 % was “no idea”. Regarding the fifth question “if jaundice develops, since I am afraid of hospitalization, I won’t consult a physician”, 84.2 % of the response was disagree, 7.9% was strongly disagree, 4.0 % was “no idea” and 4.0 % was strongly agree. Regarding the sixth question “Neonatal jaundice is a serious condition”, 64.4 % of the response was strongly agree, 19.8 % was “no idea” and 15.8 % was disagree. Regarding the seventh question “early referring to the physician and getting proper treatment, neonatal jaundice is curable”, 84.2 % of the response was strongly agree, 11.9 % was “no idea” and 4.0 % was disagree.

Table 1: Frequency distribution of women according to response to knowledge domain questions

Knowledge domain response	n	%
Symptoms of jaundice		
0	4	4.0
1	16	15.8
2	81	80.2
Dangerous symptoms of jaundice		
0	8	7.9
1	89	88.1
3	4	4.0
Causes of neonatal jaundice		
0	20	19.8
1	60	59.4
2	21	20.8
Effective treatment		
0	20	19.8
1	61	60.4
2	20	19.8
Complication of severe jaundice		
0	45	44.6
1	12	11.9
2	24	23.8
3	20	19.8
Best way of diagnosis		
1	4	4.0
2	97	96.0
Prevention during pregnancy		
0	101	100.0

Table 2: Frequency distribution of women according to response to attitude domain questions

Question	Strongly agree		Agree		No idea		Disagree		Strongly disagree	
	n	%	n	%	n	%	n	%	n	%
Q1	73	72.3	0	0.0	16	15.8	12	11.9	0	0.0
Q2	0	0.0	0	0.0	0	0.0	101	100.0	0	0.0
Q3	0	0.0	0	0.0	8	7.9	93	92.1	0	0.0
Q4	0	0.0	0	0.0	4	4.0	97	96.0	0	0.0
Q5	4	4.0	0	0.0	4	4.0	85	84.2	8	7.9
Q6	65	64.4	0	0.0	20	19.8	16	15.8	0	0.0
Q7	85	84.2	0	0.0	12	11.9	4	4.0	0	0.0

The evaluation of practice domain is shown in table 4 and the frequency of women to questions related to this domain was outlined. Regarding the first question “Using medical herbs”, yes response accounted for 84.2 %, whereas, no response accounted for 15.8 %. Regarding the second question “Fluorescent use at home”, yes response accounted for 88.1 %, whereas, no response accounted for 11.1 %. Regarding the third question “Using sun light”, yes response accounted for 4.0 %, whereas, no response accounted for 96.0 %. Regarding the fourth question “Referring to physician”, yes response accounted for 96.0 %, whereas, no response accounted for 4.0 %. Regarding the fifth question “Referring to traditional healers”, yes response accounted for 0.0 %, whereas, no response accounted for 100.0 %.

Table 3: Frequency distribution of women according to response to practice domain questions

Question	Response			
	Yes		No	
	n	%	n	%
Using medical herbs	85	84.2	16	15.8
Fluorescent use at home	89	88.1	12	11.9
Using sun light	4	4.0	97	96.0
Referring to physician	97	96.0	4	4.0
Referring to traditional healers	0	0.0	101	100.0
Nothing	0	0.0	101	100.0

Discussion

In the present study, most of participating women had knowledge about 2 methods of diagnosis and they accounted for 96.0 %, while 4% of them knew only a single diagnostic method. This finding reflects fair knowledge of women in our community about method of diagnosing neonatal jaundice. However, unfortunately all participating women know nothing about how to

prevent neonatal jaundice during pregnancy. Therefore, healthcare provisional who are in touch with those women, namely governmental and private antenatal care clinics should spent more time and effort in order to explain to pregnant women the way how to avoid the problem of neonatal jaundice such as the establishment of community programs encouraging and supporting breastfeeding. In the current study, positive attitude toward neonatal was seen in significantly high

proportion of women enrolled in the study. For example worrying about development of neonatal jaundice was seen in 72.3 %, 92.1 % of the response disagree using traditional medicine, 100.0 % were unwary about multiple blood sampling to assess state of jaundice, 84.2 % of the response was disagree about avoidance of physician consultation and 64.4 % of the response was strongly agree with that neonatal jaundice should be considered seriously. This is consistent with previous studies from Nigeria ⁸ and Sri Lanka, ²⁰ and Egypt ¹³. For example, in Egypt 88.3% of participants strongly agreed to seek medical care if their babies developed NNJ. A study from Iran ¹⁹ reported similar results in perspective of the mean score; however, 63% of their study population had shown higher levels of attitudes. This difference might be attributable to the time lag between the onset of NNJ and seeking medical help, a finding corroborated by other studies ^(15, 8). This observation is an important reminder that providing education and knowledge is not sufficient itself to change maternal behavior ¹¹. The use of traditional medicine is common in underdeveloped countries and our findings are in agreement with the vast majority of literatures in this regard ^(1, 7, 5). We believe that in order to reduce such malpractices in the community, governmental effort should be directed to increase level of education of women in the community in addition to increasing the efforts offered by health workers in antenatal care clinics and institutes in addition to investing mass and social media in the correct direction of how to deal with prevention and management of neonatal jaundice. One of wrong approaches that were commonly practiced by women participating in the current study was the use of fluorescent use at home. However, one of good practices is the excellent proportion of positive response toward visiting physicians when facing problem of neonatal jaundice and avoiding traditional healers.

Conclusion

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Medicine/ University of Al-Qadissiyah/ Department of Paediatrics/ Al-Diwaniyah Province/ Iraq and all experiments were carried out in accordance with approved guidelines.

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Measurements of Horizontal condylar inclination by using Cadiax compactII in patients with TMJ clicking before and after different treatments modalities

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Abstract

Background: Temporomandibular joint can be defined as a small and complex joint in the body. The bony portions of the joint consist of glenoid fossa, mandibular condyle and articular eminence which is a part of the temporal bone. Between the two bony structures, the articular disc is found. Disc displacement characterized by alteration in the articular disc position (abnormal position) locating between the mandibular fossa and the head of the condyle. Clicking can be defined as a brief sounds that are created from the movements of mandible, associated with displacement of the disc with reduction. Remodeling of the joint or joint hypermobility can produce clicking like sounds. Horizontal condylar angle can be defined as an angle formed in the horizontal plane between the Frankfurt horizontal plane and a line connecting a point on the head of the condyle, in centric and protrusive position.

Aim of the Study: Measurement of horizontal condylar inclination in patients with clicking using Cadiax CompactII before and after the treatment.

Subjects, materials and Method: The study sample consisted of seventy eight patients with disk displacement and thirty one as control subjects. Patients with intra articular joint disorders were divided into four groups according to the Diagnostic Criteria for Temporomandibular Disorders (Group1-disk displacement with reduction. Group2-disk displacement with reduction with intermittent locking. Group3-disk displacement without reduction with limited opening. Group 4-disk displacement without reduction without limited opening).

Results: Horizontal condylar inclination, results concerning right and left sides shows highly significant differences between control and group 4, while no significant differences were seen in the studied disorder groups either for using splint or laser

Conclusions: The differences of Horizontal condylar inclination recorded by non-invasive Cadiax CompactII device may be used in the diagnosis of disc displacement without reduction without limited opening. The different modalities of treatment used do not influence the horizontal condylar inclination.

Keywords: horizontal condylar inclination, Cadiax compact II, clicking, splint, laser.

Introduction

Temporomandibular joint (TMJ) is arthroal ginglymus joint, which is formed from glenoid fossa, articular tubercle, articular disc, condyle, retro discal tissue, joints capsule and synovial membrane,^[1] consider the most commonly joint used in the human body with a bilateral concurrent capacity to move the lower jaw.

[2] Clicking is predominantly created as mandibular condyle travels above displaced disc with morphologic alterations. [3] Controversy quit remains as to whether or not anterior disc displacement in the lack of other signs and symptoms for example pain and/or mouth opening restriction should be treated.[4] Some investigators proposed that clicking may considered as usual variation, resultant from practical adaptation of TMJ

and/or aging. Other investigators involved degenerative TMJ disease as a part of relevant application process of TMJ. [5] Computed axiography allows non-invasive three-dimensional imaging of the condylar path on the basis of recorded hinge-axis movements. Axiographic recordings of the mandibular joint motion permit the diagnosis of muscular dyscoordination, hyper and hypomobility, dynamic asymmetries of movement and joint pathologies, [6] all are often assist in the identification of the causes. The present study consist of two modalities of treatment, occlusal splint and laser therapy, the most common purposes of intra oral appliance therapy are to provide joint stabilization, protect the teeth, redistribute forces, relax elevator muscles, and decrease or control the effects of bruxism. Stabilizing oral appliance that fully covers one arch and does not reposition the mandible or alter the occlusion is considered a standard part of therapy of temporomandibular joint disorders (TMDs). [7] Low level laser therapy (LLLT) is a type of therapy for musculoskeletal illness, with an anti-inflammatory, analgesic, regenerative actions, as well as limited time of treatment, easy applied with less contraindications. [8]

Subjects, materials and methods

The study sample consisted of seventy eight patients with intra articular joint disorders (Current TMJ noises, click(s) during jaw movement) and thirty one as control subjects with age range from 21-45 years old. Patients with intra articular joint disorders were divided into four groups according to the Diagnostic Criteria for Temporomandibular Disorders. [9]

1-Group1(thirty three patients with disk displacement with reduction).

2-Group2 (fifteen patients with disk displacement with reduction, with intermittent locking).

3-Group3 (fifteen patients with disk displacement without reduction, with limited opening), this group excluded from the measurements by Cadiax compact II due to limited mouth opening.

4-Group4 (fifteen patients with disk displacement without reduction, without limited opening).

The control group attending to the dental center for different diagnostic purposes which have not (TMDs) by clinical examination and patients were clinically diagnosed to have intra articular joint disorder.

Measurements of horizontal condylar inclination in control and patients with clicking using Cadiax compact II before and after the treatment; (Figure 1).

Hard occlusal splint of 2mm thickness was prepared to cover the maxillary teeth. The surface of splint was smooth and removing the posterior interferences to deliver centric relation occlusion, it was used for two months at night (eight hours) by patients and then repeated the measurements of horizontal condylar inclination by Cadiax Compact II to determine any change that occur.

Diode class IV laser of wave length 940 nm \pm 10 with the power of 4 watt using deep tissue handpiece (30mm diameter = 7.1cm² area), energy is 1200 J and energy density is 169 J/cm² for 300 second in each side.

Patients and dentist wear protective eye glasses during the session of treatment, patients were treated in four sessions (four weekly treatments). The deep tissue handpiece of laser probe was placed over the TMJ area which was identified throughout the clinical examination anterior to the ear, at the opening and closing of the mouth; (Figure 2).

Adequate level of beneficial energy in a short period of time was applied to the affected TMJs to provide active therapeutic effects. According to manufacturing recommendation, some patients may need more than one laser application or a series of treatments before significant improvement is stated.

Deep tissue handpiece is provided by disposable non-sterile protective shield used for only one patient, which was disinfected before and after any patient treatment.



Figure (1): Mounting of Cadiax Compact II.



Figure (2): Application of laser therapy to patient with temporomandibular joint clicking.

Results

Before treatment

The summary statistics regarding of the horizontal condylar inclination at 5 mm parameter in the studied groups before the treatment distributed in right and left sides, such that, mean values, standard deviation, standard

error, 95% confidence interval for the population mean; (Table 1).

Group 4 recorded the lowest mean value, followed by group 2, group 1. Control group recorded a higher mean value; (Table 1).

Table (1): The summary of statistics of horizontal condylar inclination at 5 mm parameter in the studied groups before treatment distributed in right and left sides.

Side	Groups	No.	Mean	Std. D.	Std. E.	95% C.I. for Mean	
						L.b.	U.b.
Right	Group1	33	49.27	7.76	1.35	46.52	52.02
	Group2	15	48.20	4.92	1.27	45.48	50.92
	Group4	15	42.67	9.55	2.47	37.38	47.96
	Control	31	51.16	7.39	1.33	48.45	53.87
Left	Group1	33	48.15	9.3	1.62	44.85	51.45
	Group2	15	47.27	5.57	1.44	44.18	50.35
	Group4	15	41.87	9.27	2.39	36.73	47
	Control	31	50.16	8.23	1.48	47.14	53.18

Results concerning right and left side, showed a highly significant difference ($P < 0.01$) between control and group 4. While no significant difference ($P > 0.05$) between control and other groups; (Table 2).

Table (2): Significant levels for testing all pairs of comparisons by (LSD).

Site	Groups (I)	Groups (J)	Mean Difference (I-J)	Sig.	C.S. (*)
Right	Group1	Control	-1.890	0.322	NS
	Group2	Control	-2.960	0.218	NS
	Group4	Control	-8.490	0.001	HS
Left	Group1	Control	-2.010	0.345	NS
	Group2	Control	-2.890	0.280	NS
	Group4	Control	-8.290	0.002	HS

(*) HS: Highly Sig. at $P < 0.01$; S: Sig. at $P < 0.05$; NS: Non Sig. at $P > 0.05$

After treatment

The summary statistics, as well as matched paired t-test for testing the mean values of differences of horizontal condylar inclination at 5 mm before and after treatment in different disordered groups using splint and laser therapy; (Table 3).

Results showed no significant differences between studied disordered groups ($P > 0.05$) either for using splint or laser; (Table 3).

Table (3): Summary statistics and matched paired t-test for testing differences in horizontal condylar inclination at 5 mm regarding splint and laser therapy.

Groups	Parameters	Period	No.	Mean	SD	SE	MP (t-test)	df	Sig. (*) (2-tailed)
Group1	HCI at 5mm right (Splint)	Before	10	48.40	8.550	2.700	-0.739	9	0.479 NS
		After	10	48.80	7.890	2.490			
	HCI at 5mm left (Splint)	Before	10	45.80	9.330	2.950	-1.253	9	0.242 NS
		After	10	46.50	9.100	2.880			
	HCI at 5mm right (Laser)	Before	5	44.00	9.140	4.090	-2.236	4	0.089 NS
		After	5	45.00	9.350	4.180			
	HCI at 5mm left (Laser)	Before	5	47.80	9.340	4.180	-1.372	4	0.242 NS
		After	5	48.60	8.620	3.850			
Group2	HCI at 5mm right (Splint)	Before	10	49.20	5.550	1.760	-0.287	9	0.780 NS
		After	10	49.50	4.480	1.420			
	HCI at 5mm left (Splint)	Before	10	47.80	6.140	1.940	0.439	9	0.671 NS
		After	10	47.50	5.280	1.670			
	HCI at 5mm right (Laser)	Before	5	46.20	2.770	1.240	-1.500	4	0.208 NS
		After	5	46.80	3.110	1.390			
	HCI at 5mm left (Laser)	Before	5	46.20	4.660	2.080	-0.250	4	0.815 NS
		After	5	46.40	5.900	2.640			
Group4	HCI at 5mm right (Splint)	Before	10	43.40	9.910	3.130	-0.732	9	0.483 NS
		After	10	44.00	8.590	2.720			
	HCI at 5mm left (Splint)	Before	10	42.70	9.040	2.860	-0.557	9	0.591 NS
		After	10	43.00	9.450	2.990			
	HCI at 5mm right (Laser)	Before	5	41.20	9.710	4.340	-1.633	4	0.178 NS
		After	5	42.00	8.770	3.920			
	HCI at 5mm left (Laser)	Before	5	40.20	10.57	4.730	-1.510	4	0.206 NS
		After	5	41.60	10.14	4.530			

(*) NS: Non Sig. at P>0.05; Testing based on MP (t-test)

Discussion

Horizontal condylar angle can be defined as an angle made in a horizontal plane between line joining

point on TMJ condyle in protrusive and centric location and Frankfurt-horizontal plane. [10]

Horizontal condylar inclination can be recorded by

several ways:

A-Interocclusal records. ^[11]

B-Pantographic tracings. ^[12]

C-Electronic jaw tracing devices. ^[13]

D-Radiographical methods. ^[14]

Many examiners evaluate the importance of electronic axiography in diagnosis of TMDs, due to precision and accuracy of their results. ^[15,16] Also, Obrez and Gallo, (2006) ^[17] identified the development of three-dimensional recorded systems provide more accurate data and information in the assessment of the movements of TMJ condylar head.

The findings of Cruzoe'-Rebello *et al.*, (2003) ^[18] through their clear expression of horizontal condylar inclination showed no existing difference statistically between average horizontal condylar inclination values of normal TMJs and TMJs with internal derangement. Similarly the results of this study showed no difference between average horizontal condylar inclination values of control group and patients with disc displacement with reduction (group 1 and group 2).

The present study demonstrated that mean value of horizontal condylar inclination at five mm in (both right and left) in control group, in the summary achievement of this researches this agrees with the study done by Alsawaf and Garlapo (1992), ^[19] they stated that the values of horizontal condylar inclination is between 44° and 55° which is near to the results done by Alfredo *et al.*, (2010), ^[20] they determine the mean horizontal condylar path inclination in occlusally healthy dentate subjects. Eccentric movements of five mm from reference positions were recorded using a Denar Cadiax Compact System.

In the study done by Čimić *et al.*, in 2015, ^[21] the mean value of sagittal condyle inclination 41.0° ±10.5 for right joint and 40.7° ±9.8 for the left joint. The different values in these studies may be explained by different samples in each study, considering the influence of the lower jaw function on eminence development, different patterns of chewing movements, variations in the condylar shape and condylar pathway, ^[22] condylar position in the glenoid fossa, ^[23] and chewing habits (chewing side preference). ^[24]

In a summary of all research accomplishments, current work have a specific issues that the pathway followed by condylar head in the glenoid fossa is curved, condyle moves along posterior incline of articular eminence from its superior-anterior location within glenoid fossa. The angle formed by the movement of condylar head away from horizontal reference plane mentioned as condyle guidance angle. As a result later slope of articular eminence and articular condyle surfaces effect horizontal condylar inclination. ^[25] Regarding horizontal condylar inclination right and left side, results were recorded lower mean value in group 4 than control group with a highly significant differences.

Conclusions

Horizontal condylar inclination is different in disordered groups compared to control. The differences of Horizontal condylar inclination recorded by non-invasive Cadiax CompactII device may be used in the diagnosis of disc displacement without reduction without limited opening. The different modalities of treatment used do not influence the horizontal condylar inclination.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Dentistry, University of Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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DCGAN for Handling Imbalanced Malaria Dataset based on Over-Sampling Technique and using CNN

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Abstract

Class imbalance problem as a significant research problem has been recognized in classification In recent years, where by using the number of approach to rebalancing distributions of class such as; under-sampling or over-sampling for learning datasets to improve accuracy of classification, that give good performance. Many algorithms have been developed for classification, such as Back Propagation (BP) neural networks, decision tree, Bayesian networks etc., and have been used repeatedly in many fields. In this paper, to rebalancing distributions of class for imbalanced Malaria dataset to detect infected and uninfected people by equal percentage we proposed approach Deep Convolutional Generative Adversarial Network (DCGAN) based on the O.S. technique, which are generate the synthetic samples for the minority class for imbalanced Malaria dataset and achieve a balance ratio between classes of majority and minority 100% for imbalanced Malaria dataset. As well as used Deep Learning, applied by using Convolutional Neural Network (CNN). The goal of CNN is to prove the validity of the proposed approach by firstly, will be train the imbalanced Malaria dataset and results are tested before using proposed approach. Secondly, will be training balanced Malaria dataset and results are tested after using proposed approach and comparison between them.

Keywords: DCGAN, Imbalanced Datasets, O.S., CNN.

Introduction

The data is imbalanced when the data distribution is not systematic across different classes ¹. In many applications learning occurs with the distribution of class imbalances regularly, and this situation occurs in the data when the number of examples in the minority class is much lower than number of examples in class of the majority. This means that the number of examples into the classes exceeds the number of examples in other classes ², the class which contains examples of a large number is called negative or majority class, either for the class which contains a few numbers of examples called positive or minority class. Minority class is a great impact when misclassified that will be considered as interest class ³. it is likely that the examples of minority class may be ignored or external values led to poor classification compared to the majority, the dominant class ⁴. Many problems of real-world contains several concepts with very few examples in a large group and are also described the cost of obtaining them or through their scarcity. Categories are either two classes or multi-

class. Required analyze methods to address the problem of multi-class data imbalance which focuses on many real-world problems such as medical diagnosis, fraud detection, defect detection software, network intrusion ^{5,6}. There are simple ways to overcome the problem of class imbalance in typical learning. It is usually to test the training data by taking examples of the minority too much. Another approach is cost-sensitive learning which in turn rewrites the algorithms by weighing the examples of the minority class ⁷. Techniques are used to process the imbalanced data classification such as ⁸: -

Approach of Data Level

Use unbalanced native dataset to obtain balanced dataset by using algorithms of machine learning to obtain desired results.

Approach of Algorithm Level

Use algorithms that can handle unbalanced of data.

Approach of Cost-Sensitive

Hybrid technology of the first and the second techniques are combined to achieve a decrease in the costs of poor classification and accuracy.

Data Level Approach is classified into different sets

Over-Sampling (O.S.) Technique

Over-Sampling (O.S.) technique, the data are balanced by adding examples of the minority class to the original data. Fig.1 shows how to generate synthetic samples and added them to the original data by using Synthetic Minority Over-Sampling Technique (SMOTE) algorithm⁹.

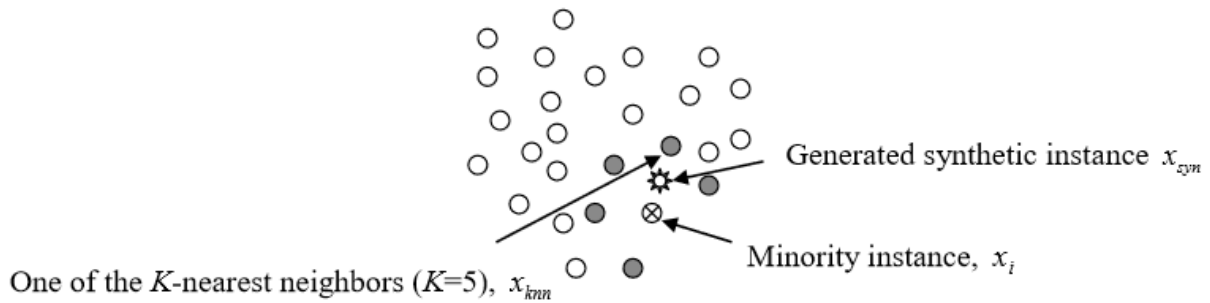


Fig.1: Synthetic Oversampling example by SMOTE algorithm [10]

Undersampling Technique

Undersampling technique, the data is balanced by removing examples from the majority class of the original data.

Hybrid Technique

Hybrid technique, the data is balanced by combining previous techniques, first O.S. technique is used and then undersampling technique is used³.

Convolutional Neural Networks (CNN)

In the computer vision problem CNN is the most widely used, which is DNNs Class that is based on Back Propagation technique and MLPs. It is different from traditional MLPs where they are used to extract the collection feature between the number of locally linked layers followed via the full number linked layer that are utilized in the classification. CNN has important characteristics, including the use of common weights and local communication, so the image of the input can learn the local features. Which consists of three layers, including the following sets:

- Convolutional layers.
- Subsampling (or Pooling) layers.

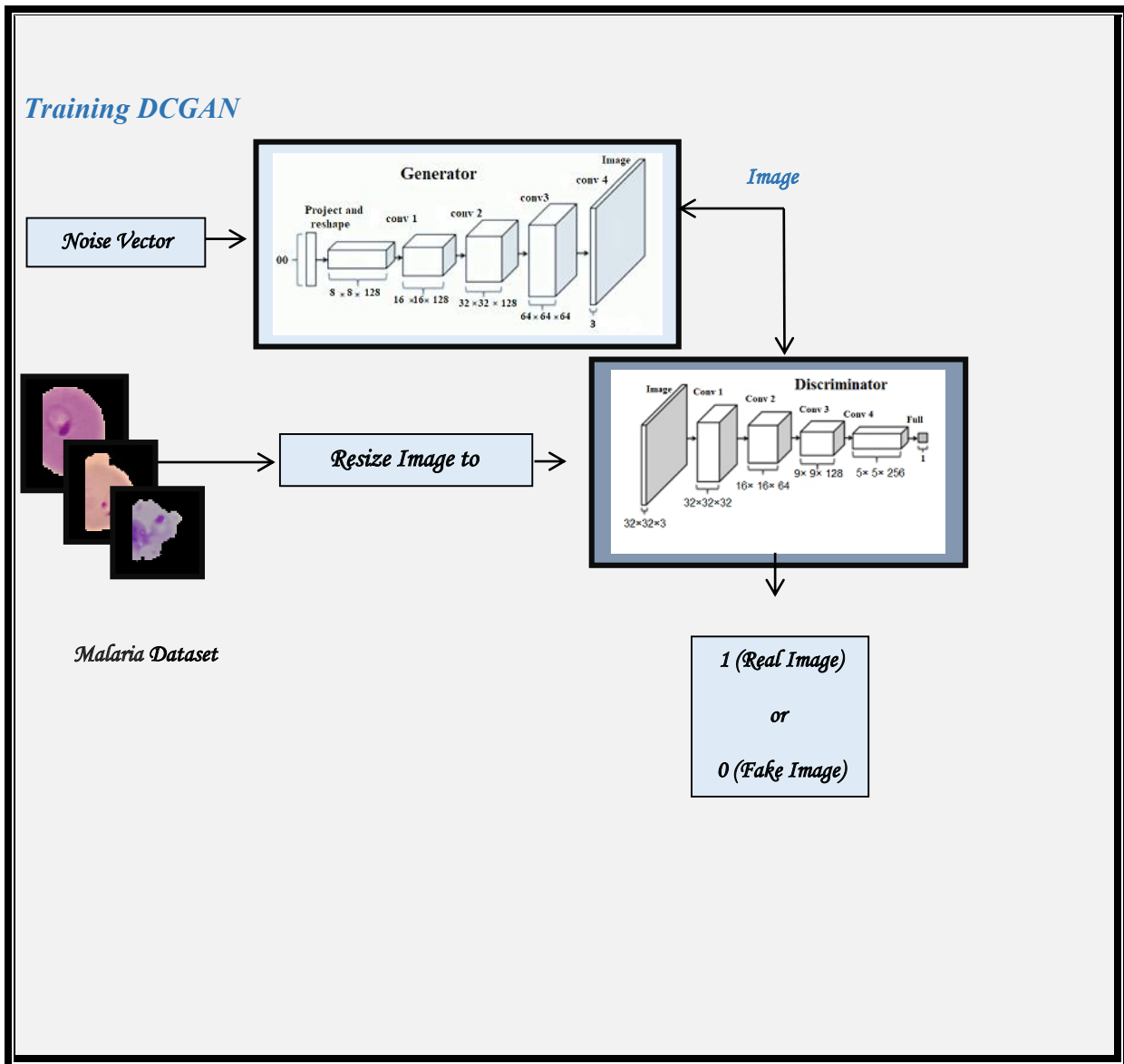
- Fully connected layers.

Related Works

Many research has been completed to solution the imbalance in O.S. datasets. Fannya and T. W. Cenggoro¹¹ are used the Class Expert Generative Adversarial Network (CE-GAN) was proposed in this research as a solution of imbalanced data classification. CE-GAN is the modification in the structure of a deep learning algorithm that does not assume that training data is imbalanced. To determine more details about a character for each class prior to the classification stage. The CE-GAN has been proven to give a good performance of imbalanced data classification. Ian J. Goodfellow et al.,¹² In order to estimate generative models through the adversarial process, a new framework has been proposed called Generative Adversarial Networks (GANs) which consist of two network models : 1.Generative model (G): which captures the data distribution where synthesis images are created. 2.Discriminative model (D): which discriminate between real images and images created from the generative model.

The Proposed Approach

Deep Convolutional Generative Adversarial Network (DCGAN)



(a)

DCGAN stands for a deep convolutional GAN. In general, most GANs rely on DCGAN architecture. Though the GAN was both deep and convolutional prior to the DCGANs. Where the DCGAN is useful of refer to this specific the style of architecture¹⁴. When a dataset consists of majority and minority classes, we will apply proposed approach of converting them from imbalanced dataset into a balanced dataset. Proposed approach is O.S. for minority class by DCGANs networks. The DCGAN network consists of the two networks:

The Discriminative Model (D): The discriminant form works like a normal binary classifier that is able to classify images into different categories. Specifies

whether the image is real or fake from a particular dataset.

The Generative Model (G): The generative model attempts to predict the features of given classes. The generator includes determining the probability of the feature given of the class. Input vector is entering into the layers used in the generating network, and the network generates fake images. Training and generating of DCGAN shows in Fig.2, where (a) is the training of DCGAN and (b) is generating of DCGAN.

Fig.2: Training and Generating of DCGAN. (a) Training (b) Generating

Experiment Setting

Dataset

Malaria dataset collection has been used from the Communications Engineering Branch is a warehouse to divide the cells from a thin image of a bloody scan of the malaria sort. In Bangladesh, falciparum-infected and 50 healthy patients are collected photographed at the Hospital of Chittagong Medical. The smartphone worked in camera obtained images of slides from each field of micro-vision. The images were illustrated manually by the expert slide reader at the Tropical Medicine Research Unit at Mahidol-Oxford in Thailand, Bangkok. Where applied the level-set based on algorithm to the detected and the segment a red blood cells. The dataset contains cell images instances of parasitized cell (Images containing malaria parasites in red blood cells) and uninfected cell (Images that do not contain malaria parasites in red blood cells).

Dataset Gathering

The Malaria dataset is dividing into two groups:

Imbalanced Malaria Dataset

The imbalance dataset consists of two-classes. And contains of (18,258) images. The dataset was divided

into two sets:

1. The training set: consists of (11,368). Where consisting of a number of parasitized cell is (1,034) images and a number of uninfected cell is (10,334) images.
2. The test set: consists of (6,890) images. Where consisting of a number of parasitized cell is (3,445) images and a number of uninfected cell is (3,445) images.

Balanced Malaria Dataset

The balance dataset consists of two-classes. And contains of (27,558) images. The dataset was divided into two sets:

1. The training set: consists of (20,668). Where consisting of same training set of imbalanced dataset that are describing in section (i), but we adding (9,300) images that are generating by proposed approach synthetic images are generated using O.S. for minority class by DCGAN.
2. The test set: using the same test set of imbalanced dataset that are describing in section (i).

A sample of Malaria dataset is show in Fig.3, where (a) is the original dataset for parasitized cell and (b) is the original dataset for uninfected cell.

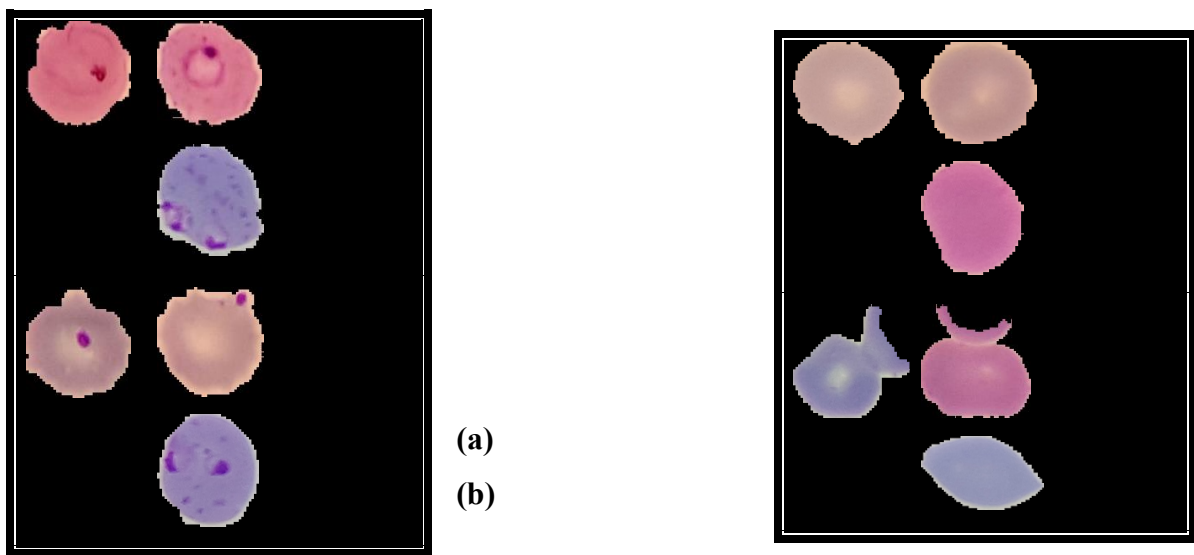


Fig.3: Sample of Malaria Dataset. (a) Parasitized cell (b) Uninfected cell

The Results of the Proposed Approach DCGAN

The result for these the proposed approach DCGAN is shown in Fig.4, where the synthetic images are generated by using O.S. for minority class by DCGAN.

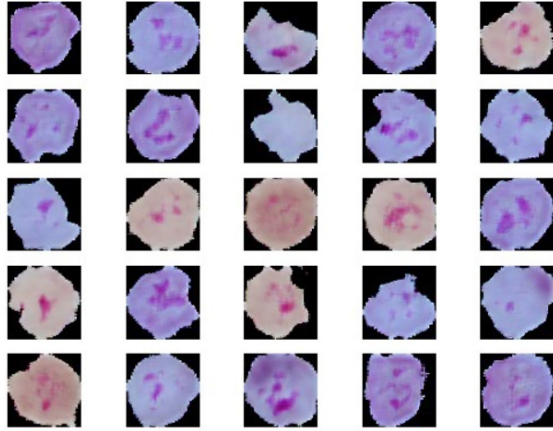


Fig.4: Malaria Images Generate by DCGAN

The Proposed Convolutional Neural Networks (CNN)

CNN is an intelligent technique to implement the imbalance dataset classification problem. The goal of CNN is to prove the validity of the proposed approach O.S. for minority class by DCGAN. By firstly, will be train the CNN on imbalanced dataset and results are tested. Secondly, will be training the CNN on balanced dataset (The results which synthetic images are generated using O.S. for minority class by DCGAN) and results are tested. Following will be explaining CNN technique. For the CNN, extraction of the features will carried out within algorithm. Design and training classifier by using CNN technique: The image will be input directly to the CNN network after resizing to new size of 64×64 and perform operations through the four convolution layers to extract final features from the network. The result attributes input to the SoftMax activation function which assigns the probability of each the individual class of matching. Table 1 explains the proposed structure of CNN Layers.

Table1. The proposed structure of the CNN, the input and the output sizes are describing in (rows*cols*#kernels). The kernel is the specified as rows*cols; stride

No. Layers Input size Output size kernel

- 1 Convolution 1 + ReLU+ Dropout (0.25) $64 \times 64 \times 32 \times 32 \times 32$ 5×5 ; 2
- 2 Convolution 2 + ReLU+ Dropout (0.25) $32 \times 32 \times 32$ $16 \times 16 \times 64$ 3×3 ; 2
- 3 Convolution 3 + ReLU+ Dropout (0.5) $16 \times 16 \times 64$ $8 \times 8 \times 128$ 3×3 ; 2
- 4 Convolution 4 + ReLU+ Dropout (0.5) $8 \times 8 \times 128$ $4 \times 4 \times 256$ 3×3 ; 2
- 5 Fully connected + ReLU + Dropout (0.5) 4096 256
- 6 Fully connected + SoftMax 256 **number of classes**

Performance Measures

To evaluate the effectiveness of learning methods performance measures are used. In general, the measure most commonly used for classification functions is accuracy or (error rate). Accuracy is the proportion of the true results (both the true positives and the true negatives) in a population[4].

Where:

- True Positive (TP): Indicates a number of positive examples predicted by the classifier positively.
- True Negative (TN): Indicates a number of negative examples that have been negatively classified by the classifier as a number of negative examples.
- False Positive (FP): Often referred to as the false alarm clock, defined as a number of negative examples that have been incorrectly classified as positive by the classifier.
- False Negative (FN): It is specified as a number of positive examples that are incorrectly assigned as negatives by the classifier.

The Table 2 shows a confusion matrix which is used in the classification problem of two class, where through this matrix is evaluated the performance of the classification¹⁰.

Table 2. Confusion matrix for performance evaluation

Prediction Actual	Negative	Positive
Negative	TN (True Negative)	FP (False Positive)
Positive	FN (False Negative)	TP (True Positive)

However, by analyzing the four input in the confusion matrix, it is not sufficient to determine the performance of the classification. Therefore, many derivatives based on the confusion matrix are used to evaluate the classification. These performance measures of the confusion matrix are:

- Sensitivity or likewise Recall or the True Positive Rate (TPR)(REC) is the denoted as:

The sensitivity indicates to able of the classifier to correctly identify the positive category. The range from 0 to 1, where score 1 is perfect.

- Specificity or likewise the True Negative Rate (TNR) is the determined as:

- Specificity indicates that the classifier can correctly identify the negative category. The perfect result is 1 and the worst measure is 0.

- Precision

Precision is a measure how many the examples that have been correctly label as a positive.

- G-mean (geometric mean)

G-mean shows another measure, which is the G-mean in which the degree of inductive bias is evaluating in terms of positive accuracy and negative accuracy.

The Result of the Performance Measures

Table3 displays performance measures (Accuracy, Sensitivity, Specificity, Precision, G-mean) the comparison between using the imbalanced dataset with CNN technique and using the balanced dataset (imbalanced dataset with results of the proposed approach that synthetic images are generated using O.S. for minority class by DCGAN) with CNN techniques.

Table 3. Lists the Results of Classification (Accuracy, Sensitivity, Specificity, Precision, G-mean) for Malaria Dataset (Imbalanced and Balanced (using proposed approach DCGAN)) using the CNN technique

Type of Dataset	Accuracy	Sensitivity	Specificity	Precision	G-mean
Imbalanced Malaria Dataset	50%	0%	100%	0%	0%
Balanced Malaria Dataset(using proposed approach DCGAN)	94.5%	90%	99%	98.9%	94.4%

Conclusions

The proposed approach DCGAN gives better results. Which will convert the imbalanced dataset into balanced dataset because it gives the number of generated images that achieve balance between classes of majority and minority. In the traning stage of DCGAN, it is a possible to obtain the variable accuracy with the slight difference

between one implementation and the another because images used of the training change each for time because selection of the images used for the training is done a randomly for each time. In the classification stage, it is the possible to obtain the variable accuracy with the slight difference between one implementation and the another because images used of the training change

each for time because selection of the images used for the training is done a randomly for each time. Using the Convolutional Neural Network give a system more power and it give the good accuracy classifier.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under Mustansiriyah University, College of Science, dept. Computer Science, Iraq and all experiments were carried out in accordance with approved guidelines.

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Seroprevalence of Toxoplasmosis Gondii Infection among Pregnant Women in Karbala Governorate 2014-2017

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Abstract

Objectives: To determine the prevalence for toxoplasmosis gondii infection among women pregnant and to find out between the relationships prevalence for toxoplasmosis gondii infection and risk factors among women pregnant and demographic data. A cross sectional study design was Carrie out of the study. A total of pregnant women are 500 attending antenatal clinic at Teaching of AL-Hussain Hospital in karbblla were selected by purposive sample for the study. The data collection process was initiated for the period of February 1st, 2018 through March 23th, 2018. The data collection are from medical recording in laboratory of hospital to identify about result of test and number of women's that attendant for laboratory and check among Testing for *Toxoplasma gondii* serology (IgM and IgG). The diagnostic test is according to stander IgG its positive have more than 0.9 and IgM is positive have more than 0.8. This is table that the show of the study results for demographic data for study sample that indicate age groups are (16-21) years are majority 33.3% within age groups. Regarded with (IgM) test are half of the study sample negative (51.8%) and (IgG) test is positive most of the study sample (95.8%).

Key Word: seroprevalence, *Toxoplasma gondii* infection, Risk factor of toxoplasma, (IgG) , (IgM)

Intruduction

Toxoplasmosis is prevalent parasitic disease that is common between humans and warm-blooded animals. This disease has a wide distribution globally and its prevalence in Iran varies in different locations ⁽¹⁾. Most patient with toxoplasma infection do not pleasure visit physicians, so their considered the risk of silent epidemics for this parasite arises. Although benign in healthy people, toxoplasmosis is a life-threatening disease in patients infected with AIDS/HIV+ as well as those taking immunosuppressant ⁽²⁾. Toxoplasmosis is one kind of this disease affecting the fetus and depending on the time at which pregnant women are infected, its clinical manifestation is different. Accordingly, infection of pregnant women is divided into three trimesters in which the risk of vertical transmission of the parasite increases over time but the disease severity decreases ⁽³⁾. Hydrocephaly, chorioretinitis, microcephaly and other CNS-related manifestations in newborns are of diagnostic importance in congenital toxoplasmosis.

The most common method for diagnosis of congenital toxoplasmosis is detection of IgG and IgM in pregnant women sera using various diagnostic tests, including enzyme-linked immunosorbent assay (ELISA) which enjoys higher validity. In addition to serodiagnostic tests such as ELISA, some types of polymerase chain reaction (PCR) methods, especially nested-PCR, are useful to find *T. gondii* parasite in the tissues of fetuses ⁽⁴⁾. Infections in humans happen after the eating of raw or uncooked meat containing tissue lumps (in the body) or by the eating of water, soil, or vegetables contaminated with oocytes released by infected cats. In most cases, the infected humans do not present medicine-based signs. However, when infection are happens in having a baby developing inside the body of women more than two, but not a lot of health problems can affect the unborn baby ⁽⁵⁾. The wide number range is due to the different (things that make it more likely that someone will get a disease), which might influence the chance of infection by *T. gondii* in a given population (e.g., eating of undercooked meat, unpasteurized milk, or educational

level. The transmitted to humans by eating of the tissue lumps (in the body) in raw or undercooked meat, as well as eating of food and water contaminated with oocysts from cat (brown, smelly waste from animals ⁽⁶⁾). Human infection with *T. gondii* is very frequent throughout the world the seroprevalence ranges from 15% in the United Kingdom to 80% in South America and certain (related to Europe) countries such as France. In developing countries, toxoplasmosis is also very frequent: in Turkey, IgG seroprevalence of *T. gondii* among (having a baby developing inside the body) women was 60% while in India it was 45%. Studies among Arab (groups of people/animals/things) have reported the seroprevalence of toxoplasmosis ranging from 22.9% in the United Arab Emirates to 47% in Jordan. Many studies focused to explore the seroprevalence of *T. gondii* among pregnant Iraqi women that reported (20%, 18.3%, and 16% respectively). A prevalence rate among patient that consumer for anti-Toxoplasma IgG (25%) and IgM (5%) was reported in the Eastern region from Iraq ⁽⁸⁾.

Material and Design of the study:

A cross sectional study design was carried out of the study. A total of pregnant women are 500 attending antenatal clinic at the Teaching AL-Hussain Hospital

karbla were selected by purposive sample for the study. **Ethical consideration:** clearance for the study was obtained from the ethical review Committee of the Faculty of nursing University of AL-Ameed Permission for data and sample collection was obtained from the AL-Hussain Teaching Hospital. **Data collection:** The data collection process was initiated for the period of February 1st, 2018 through March 23th, 2018. The data collection is from medical recording from laboratory of hospital to identify about result of test and number of women is that attendant for laboratory and check among Testing for *Toxoplasma gondii* serology (IgM and IgG). The diagnostic test is according to stander IgG its positive have more than 0.9 and IgM is positive have more than 0.8 this tests determine however pregnant have risk factor and incidence of toxoplasmosis.. **Instruments:** a questionnaire was fashioned for the purpose of the study. It is composed of three major parts included personal information sheet. Demographical data, social-demographic data and clinical data such as age, parity, period of gestation and laboratory test for women pregnant fulfillment from medical recording. **data Analysis:** In order to determine whether the objectives of the study were met or not, two statistical approaches were used for analyzing the data of the study.

Results of the Study

Table (1) Distribution of the study sample by their demographic data

Demographic data	Scale	Frequency	Percent	Cumulative Percent
Age/ years	<= 15	7	1.4	1.4
	16- 21	166	33.2	34.6
	22- 27	150	30	64.6
	28 - 33	100	20	84.6
	34 - 39	53	10.6	95.2
	40+	24	4.8	100
IgM	Negative	259	51.8	51.8
	positive	241	48.2	100
IgG	Positive	479	95.8	95.8
	Negative	21	4.2	100
Para	Non	380	76	76
	1	69	13.8	89.8
	2	33	6.6	96.4
	3	18	3.6	100

Cont... Table (1) Distribution of the study sample by their demographic data

Number of abortion	<= 2	378	75.6	75.6
	3 - 5	115	23	98.6
	6 - 8	3	0.6	99.2
	9+	4	0.8	100
Gravid	<= 2	407	81.4	81.4
	3 - 3	56	11.2	92.6
	4 - 4	25	5	97.6
	5+	12	2.4	100
Residence	Urban	77	15.4	15.4
	Suburban	316	63.2	78.6
	Rural	107	21.4	100
	Total	500	100	

This is table that the show of the study results for demographic data for study sample that indicate age groups are (16-21) years are majority 33.3% within age groups. Regarded with (IgM) test are half of the study

sample negative (51.8%) and (IgG) test is positive most of the study sample (95.8%). Concerned with para the study results indicate is Non-para (76%) and most of the study sample have number of abortion and gravid at least 2 (75.6% and 81.4%) respectively.

Table (2) Summery Statistics for the Relationship between (Igm) and Demographic Data

Demographic data	Value	df	Level of significant
Age/ years	1.949a	5	0.856
Number of Abortion	0.314a	3	0.957
Number of birth	2.828a	3	0.419
Residence	10.325a	2	0.006
Number of pregnant	2.092a	3	0.554

This table depict that the study results that there are Non-significance between some variables for demographic data such as (age, number of abortion, number of birth and number of pregnant data and (IgM). While there is high a significance between residence and (IgM) at p. value less that 0.01 is 0.006.

Table (3) Summery Statistics For The Relationship Between (IgG) and Demographic Data.

Demographic data	Chi.sq Value	df	Level of significant
Age/ years	13.554a	5	0.01 HS
Number of Abortion	1.835a	3	0.607 NS
Number of birth	6.633a	3	0.085 NS
Residence	.400a	2	0.819 NS
Number of pregnant	4.421a	3	0.219 NS

This table depict that the study results that there are Non-significance between most of variables for demographic data and (IgG) except age groups that there is high a significance with (IgG) at p. value less than 0.01.

Discussion

The study finding for study sample by their demographic data is indicate the majority for age groups are (16-21) years 33.3% within age groups. These finding is disagree with ⁽⁹⁾ that indicate their study to the prevalence increased with age from 31.0% for women aged 14 to 19 to 58.2% in cross-sectional study Toxoplasmosis among pregnant women in France: Risk factors and change of prevalence between 1995 and 2003. While other studies were supported with my study that authors are find an increase has been observed in the USA a 38.8% in *T. gondii* prevalence among 12- and 49-year-old ⁽¹⁰⁾.

Regarded with (IgM) test the study finding is half of the study sample is negative and (IgG) test is positive most of the study sample. These study finding com with study that the found the lowest *T. gondii* seronegative for (IgM) among persons residing in the western region of the United States and consistent with the high seropositivity (IgG) in previously found in western cities ⁽¹¹⁾.

Regarded with para the study results indicate is Non-para in most of the study sample and have number of abortion and gravid at least (2). Also most of the study sample is prevalence and suspected for *T. gondii* infection for women's are living in urban and suburban (table 1). These finding support with previous results are Toxoplasmosis prevalence increased with the number of pregnancies, regardless of age and have gravid. A study conducted in Brazil between 1997 and 1999 suggested that pregnant women were more vulnerable to *T. gondii* ⁽¹²⁾. Moreover another study in 1995 perinatal study showed a two-fold greater incidence of toxoplasmosis for primipara than for multipara ⁽¹³⁾. Other study performed with high risk pregnant women from central Mexico showed that 34.9% had anti-*T. gondii* IgG antibodies and living in urban setting ⁽¹⁶⁾.

Finding of study that there is Non-significance between some variables for demographic data such as (age, number of abortion, number of birth and number of pregnant data and (IgM). While there is high a significance between residence and (IgM) at p. value

less than 0.01 is 0.006 (table 2).

This finding deserves further investigation that is inconsistency with many studies by many researchers are test the association between sociodemographic, clinical, and behavioural characteristics of the studied women did not show any association with *T. gondii* infection for (IgM). Known factors associated with *T. gondii* infection in pregnant women such as drinking untreated water, contact with garden soil ⁽¹⁷⁾, age and increasing parity ⁽¹⁸⁾, consumption of cured meat and contact with cats.

We are study indicate that there is high significance between residence and (IgM) at p. value less than 0.01 is 0.006 (table 2), this finding that come with researcher ⁽¹⁹⁾ that found by his study associated with *T. gondii* infection through test for (IgM) and living in city (p = 0.004). Turkey meat consumption (p = 0.06), deer meat consumption (p = 0.08), squirrel meat consumption (p = 0.1), wild animals meat consumption (p = 0.06); and blood transfusion (p = 0.1).

These study finding that there is Non-significances between most of variables for demographic data and (IgG) test except age groups that there is high a significance with (IgG) test at p. value less than 0.01 (table 3). We are study consistent with a study that found seroprevalence of anti-Toxoplasma IgG antibodies for toxoplasmosis was 30.1%. ⁽¹³⁾. Also another researchers found Seroprevalence of IgG was positive association between IgG and age group in study Prevalence and Risk Factors of Toxoplasmosis among Pregnant Women in Fortaleza, Northeastern Brazil ⁽¹⁵⁾.

Another authors found Seroprevalence was increased with age (p=0.001) and with drinking water consumption other than bottled water (p=0.042). No significant relations were observed between anti-Toxoplasma IgG antibodies and education level, being native or migrant, abortion history, consumption of meat, vegetable and milk/milk products, personal or kitchen hygiene habits, cat owning at home of the pregnant women ⁽¹⁴⁾.

Conclusion

The conclusion most of the study participants are age between (16-22) years old within age groups. Most of the study subject haven't para. The study conclusion is depict the study subject have recurrent or multi abortion result to high prevalence of toxoplasma parasite

infection. Most of the participants are (IgG) seropositive and (IgM) seronegative, so they are high risk factors for incidence in *T. gondii* infection. There is association between some variable for demographic data such as residence and IgG.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, Iraq and all experiments were carried out in accordance with approved guidelines.

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Fasting Versus Non-Fasting in Assessing Lipid Profile and Complete Blood Picture

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Abstract

Coronary Heart Disease (CHD) is the world's leading cause of death and represents a serious global health problem. The general recommendations to operators in the prevention of CHD should include complete lipid profile testing, that is Total Cholesterol(TC), Total Triglycerides(TG), High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL) and Very Low Density Lipoprotein (VLDL). Recent recommendations have supported non-fasting lipid assessment. On the other hand, classification of dyslipidemias was derived in fasting samples, and cohort studies and clinical trials have performed fasting assessments.

The aim of this study was to evaluate fasting versus non-fasting in measuring lipid profile & complete blood picture.

A total of 80 female were divided into four groups of 20 female each. The 1st three groups were fasting for 4, 6, 14 hours respectively and the 4th group was non-fasting. Blood samples were taken from these females for biochemical & hematological investigations.

The lipid profile parameters were measured using Synchron CX4 clinical system Beckman Coulter Inc., Brea, CA. Complete Blood Picture was measured by using automated hematological analyzers BC-3000 plus (Hamburg, Germany). Statistical analysis was carried out using SPSS(Statistical Package for Social Sciences) number 22.

Biochemically, for TC, TG & VLDL, it was found that fasting 6, 14 hours gave significant differences ($P < 0.05$) when compared with non-fasting group while there were non-significant results for the mean level of HDL & LDL between groups. Regarding hematological assessment, there were non-significant differences between groups in measuring Hemoglobin, Red blood cells, White blood cells, Platelet counts.

Since non-fasting may weaken the accuracy in diagnosing some forms of hyperlipidemia, we proposed that laboratories & organizations should also offer measurement of fasting triglycerides according to clinical situations, as in the case of very high non-fasting triglyceride concentration.

Keywords: Lipid profile, Complete blood picture, Fasting, Non-fasting.

Introduction

Coronary heart disease (CHD) is a leading cause of morbidity and mortality in many countries worldwide and is estimated that it will be the single largest cause of disease burden ⁽¹⁾. A number of factors are thought to increase the likelihood of developing CHD. It can be divided into two, which are controllable and uncontrollable risk factors and hypercholesterolemia is one of controllable risk factors⁽²⁾. Recent

recommendations have favored non-fasting lipid assessment ⁽³⁾. Practical advantages to using non-fasting measurements include increasing patient convenience avoiding separate return visits for laboratory draws and improving hospital and clinic efficiency. Moreover, non-fasting triglycerides may improve cardiovascular risk prediction ⁽⁴⁾. On the other hand, classification of dyslipidemias was historically derived in fasting samples, and cohort studies and clinical trials have traditionally performed fasting assessments ^(5,6).

Because of this controversy, the aim of our study was to evaluate fasting versus non-fasting in measuring lipid profile.

Material and Method

A total of 80 healthy volunteer females , ranging in age between 22-30 years, were divided into four groups of 20 female each . The first three groups are fasting groups that had not taken any diet for last 4, 6, 14 hours respectively while in the non-fating group, blood samples were collected after 2 hours of meal. The health status of our volunteer female was confirmed by clinical examination.

For biochemical & hematological investigations, venous blood samples were taken from these females from January 2018 to June 2018. The biochemical investigation includes Total Cholesterol(TC), Total Triglycerides(TG), High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL) and Very Low Density Lipoprotein (VLDL) . They were measured using Synchron CX4 clinical system Beckman Coulter Inc., Brea, CA(standard clinical laboratory methods).The hematological investigation includes White Blood Cell (WBC), Red Blood Cell (RBC), Hemoglobin (HB) and Platelet Count (PLT), the whole blood was determined by using automated hematological analyzers BC-3000 plus (from Hamburg, Germany).

Statistical analysis was carried out using SPSS (Statistical Package for Social Sciences) number 22 with

regard to numerical features. It was described using the mean and standard deviation of the mean and was compared between the averages for the calculation of the samples under study at the level of 0.05. (7)

Results

Table 1 & Fig. 1 demonstrated that there were significant(p < 0.05) results for the mean level of TC , TG & VLDL when fasted for 6 & 14 hours while there were non-significant results between groups for the mean level of HDL & LDL.

The mean level of TC was 159.25 mg/dl, 142.25 mg/dl, 150.25 mg/dl, 172.50 mg/dl for fasting periods of 4 hours, 6 hours and 14 hours and the non-fasting respectively and mean level of TG was 72.75mg/dl, 59.0 mg/dl, 62.50mg/dl, 97.00 mg/dl for fasting hours of 4hours, 6 hours ,14 hours and the non- fasting respectively . Regarding VLDL, its mean level was 16mg/dl,14.25mg/dl,12.25mg/dl and 20.75 mg/dl for fasting periods of 4 hours, 6 hours and 14 hours and non-fasting respectively. From the above measurements, we concluded that fasting at least 6 hours gave significant differences (P< 0.05) in assessing TC,TG & VLDL.

There were non-significant differences between fasting & non-fasting in measuring HB , RBC, WBC and PCT as demonstrated in table 2 & Fig.2

Table 1: demonstrating Mean ± Standard deviation (mg/dl) of different fasting hours versus non fasting in Lipid profile assessment

			Mean	SD	SE	Sig.
TC	fasting	4	159.25 b	4.35	2.17	0.009**
		6	150.25 c	4.50	7.82	
		14	142.25 c	15.65	2.25	
	Non fasting	172.50 a	12.29	6.14		
TG	fasting	4	72.75 b	12.66	6.33	0.008**
		6	62.50 c	9.00	7.82	
		14	59.00 c	15.64	4.50	
	Non fasting	97.00 a	16.21	8.10		

Cont... Table 1: demonstrating Mean ± Standard deviation (mg/dl) of different fasting hours versus non fasting in Lipid profile assessment

HDL	fasting	4	54.25	2.50	1.25	0.32NS
		6	47.00	8.52	4.97	
		14	49.25	9.95	4.26	
	Non fasting	55.25	2.75	1.38		
LDL	fasting	4	96.75	8.42	4.21	0.47 NS
		6	93.00	12.03	6.01	
		14	91.25	4.72	2.36	
	Non fasting	100.00	6.38	3.19		
VLDL	fasting	4	16.00 B	1.41	0.71	0.01**
		6	14.25 C	1.71	0.85	
		14	12.25 C	2.06	1.03	
	Non fasting	20.75 A	5.74	2.87		

SD Standard Deviation ; SE Standard Error ; P< 0.05

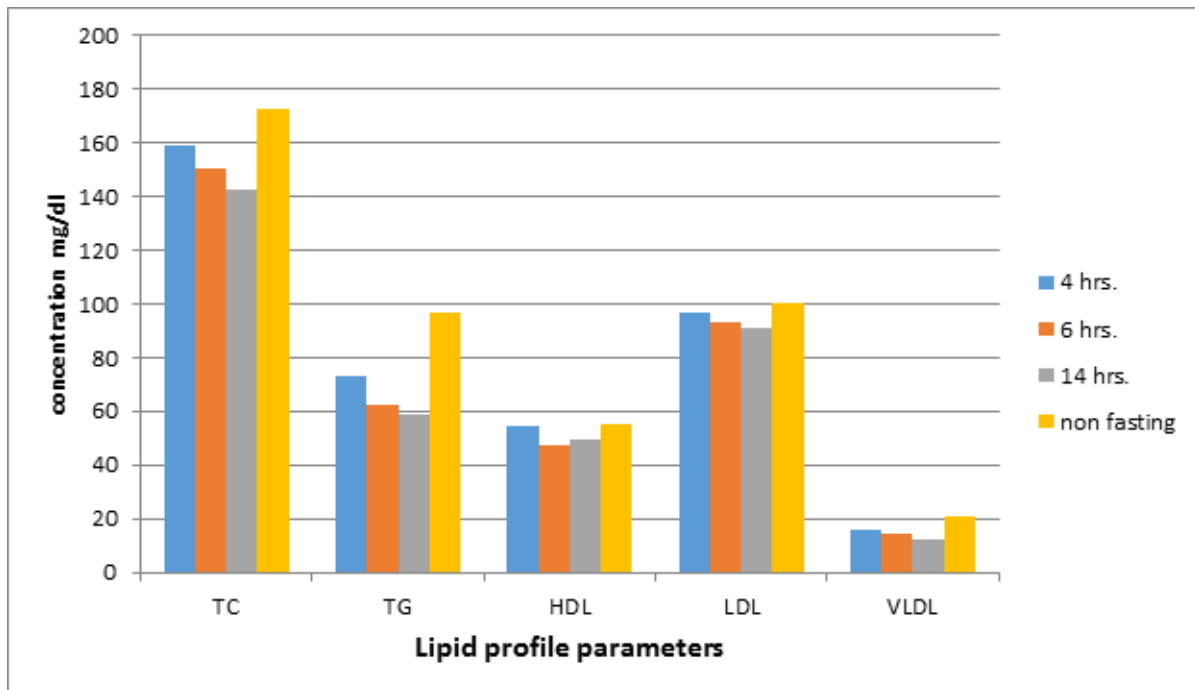


Figure 1: Lipid profile parameters under different fasting hours and non-fasting in healthy female

Table (2) demonstrating mean level of Complete Blood Picture in fasting and non-fasting groups

		HB	RBC	WBC	PLT
Fasting hrs.	4hrs.	11.98 g/dl	4.87 x10 ¹² /L	7.27 x10 ⁹ /L	295 x10 ⁹ /L
	6hrs.	12.20 g/dl	4.87 x10 ¹² /L	6.95 x10 ⁹ /L	299 x10 ⁹ /L
	14hrs	12.25 g/dl	4.78 x10 ¹² /L	7.33 x10 ⁹ /L	301 x10 ⁹ /L
Non fasting		11.25 g/dl	4.90 x10 ¹² /L	7.48 x10 ⁹ /L	295 x10 ⁹ /L

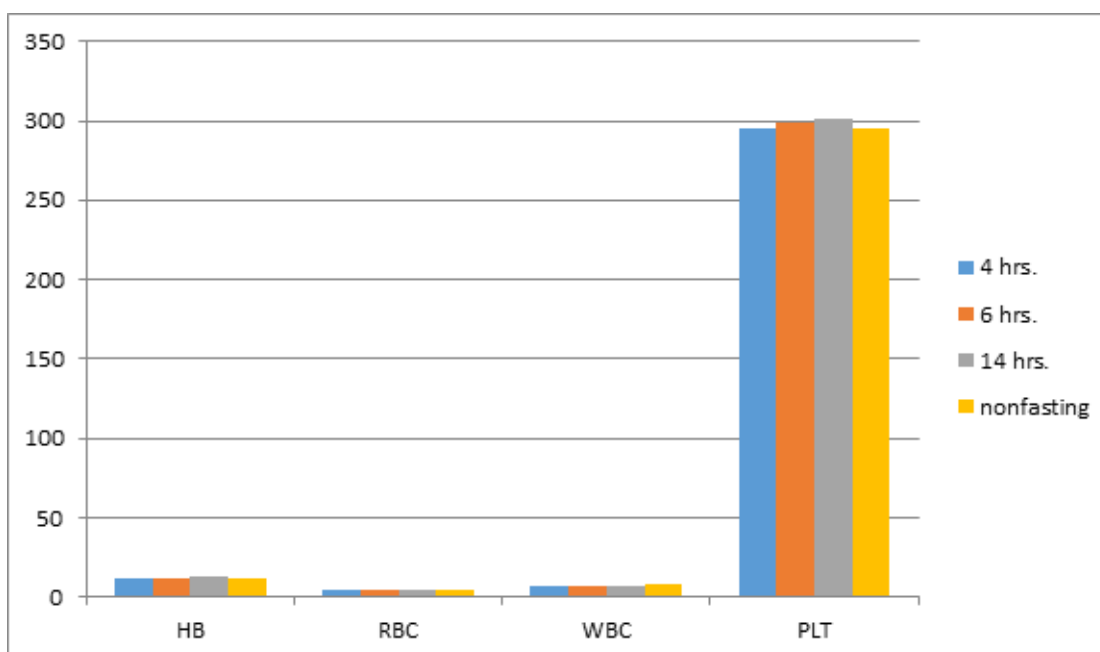


Figure 2 : Blood parameters under different fasting hours and non-fasting in healthy female

Discussion

Venipuncture is implicated in testing the lipid profile in order to predict cardiovascular risk and/or monitor responses to lipid-lowering therapy. Some guidelines continue to promulgate the conventional practice of measuring the lipid profile in the fasting state ⁽⁸⁾ . Although other societies & laboratories adapted non-fasting lipid profiles. Since 2009, non-fasting lipid testing has become the clinical standard in Denmark, based on recommendations from the Danish

Society for Clinical Biochemistry that all laboratories in Denmark use random non-fasting lipid profiles as the standard, while offering clinicians the option of re-measuring triglyceride concentrations in the fasting state if non-fasting values are 4 mmol/L (350 mg/dL) ^(9,10) . Furthermore, the UK NICE guidelines have allowed non-fasting lipid testing in the primary prevention setting since 2014 ⁽¹¹⁾ .

For cardiovascular risk assessment, evidence is lacking that fasting is superior to non-fasting when evaluating the lipid profile. However, there are advantages to using non-fasting samples over fasting ones for measuring the lipid profile^(12,13).

Comparing our biochemical and hematological results, fasting is not needed for assessing complete blood picture as there were no significant differences between fasting & non-fasting in measuring Hb, RBC, WBC, PLT. For lipid profile assessment, fasting at least 6 hours was recommended for measuring TC, TG & VLDL while it was not necessary for assessing HDL & LDL. It was concluded by Cohn et al.⁽¹⁴⁾ & Mihos et al.⁽¹⁵⁾ the reason that preferred fasting lipid profiles is the increase in triglyceride concentration seen during a fat tolerance test. On the other hand, LDL cholesterol is often calculated by the Friedewald equation, which has been thought to be affected substantially by food intake. So if this equation is employed, there may be some underestimation of LDL cholesterol when chylomicrons are present⁽¹⁶⁾. In addition to that non-fasting condition may marginally lower plasma LDL cholesterol concentrations due to liberal intake of fluids, and therefore lead to minor misclassification of cardiovascular risk, as well as to error in initiating or altering lipid-lowering medication especially to diabetic subjects^(17,18,19).

Since non-fasting may weaken the accuracy in diagnosing some forms of hyperlipidaemia, we suggested that laboratories & organizations should also offer measurement of fasting triglycerides according to clinical situations, as in the case of very high non-fasting triglyceride concentration.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under Medical Laboratory Technologies Department/ Bilad Alrafidain University College/ Baqubah/Iraq and all experiments were carried out in accordance with approved guidelines.

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Zinc Deficiency is Associated with Meprin α in Iraqi Patients with Crohn's Disease

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Abstract

Zinc deficiency in Crohn's disease (CD) is considered a frequent finding and may exacerbate CD activity. We aimed to assess the prevalence of zinc deficiency in CD patients in clinical remission, its association with meprin and to analyze a potential impact on future disease course. Proper history with blood samples were collected from (30) healthy control group, (30) Crohn's disease patients have been respond to biological therapy (infliximab IFX) (response group) and (30) CD patients with (non-response group) to biological therapy undergoing surgical intervention for the estimation of zinc concentration and meprin activity. This study demonstrate a significant decrease in both zinc and meprin levels between (non- response group) and control group ($p < 0.01$). Similarly, zinc and meprin levels were decreased significantly ($p < 0.01$) in (non- response) group as compared with re sponse group. While there were no differences between control and CD patients that have been treated with infliximab only. Meprin α is a zinc metalloproteinase, and therefore a deficiency of zinc may result in a decrease of meprin level or activity. Thus, we should maintain the balance between the meprin α that is affected by the zinc concentration then may affect the Crohn disease.

Keyword: Zinc, Crohn's disease, Infliximab, meprin α

Introduction

Crohn's disease CD is a chronic inflammatory disorder that could¹ involve any part of alimentary tract from mouth to anus. These disorders were first described by Dr. Burril Crohn's and his team in²1932. Although its aetiopathogenesis is still not clear, it has been well recognized that CD is one of the complicated disorders which result from³interaction of environmental, microbial, and genetic factors. Zinc is an essential trace element, which is absorbed in the small intestine and serves as a cofactor for numerous enzymes involved in growth, immune⁴ function, and tissue repair. Zinc is a micronutrient, which has been linked to inflammatory diseases such as IBD, zinc levels are often low in patients with chronic diarrhea or malabsorptive disorders. Similarly,

zinc deficiency (ZD) appears to compromise gastrointestinal barrier function, which can perpetuate different diseases such as celiac disease, chronic diarrhea or IBD, is common during disease and in remission, with a prevalence ranging from 15% to⁵40%. Pre-clinical data as well as human studies support that zinc deficiency may contribute to mucosal inflammation in patients with IBD. In animal models, zinc deficiency exacerbates colitis and potentiates production of pro-inflammatory cytokines, including tumor necrosis (6, 7) factor α (TNF α). Furthermore, previous work indicates that a low zinc diet in healthy volunteers results in a decrease in the Th1, cytokines, IFN- γ and IL-2, as well as diminished lytic activity of natural killer cells⁸. In addition to the impact of zinc on immune function, studies involving both animal models of colitis and Crohn's disease (CD) patients have demonstrated improvement in mucosal permeability with (8,9) zinc supplementation. zinc plays a crucial role in the development¹⁰ and function of cells mediating innate immunity has direct

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anti-inflammatory effects via zinc-finger protein, and has a positive effect on intestinal tight junctions and intestinal repair. Furthermore, zinc can act via metallothioneins (MTs). MTs are a family of small proteins with a high cysteine content at conserved positions that are rapidly up regulated in response to an inflammatory stimulus such as tumor necrosis factor (TNF).¹¹ MT function seems to be dependent upon the presence of zinc. Effects of MTs include reduction of apoptosis and antimicrobial^(13,14) activity. Zinc also is important for early and late autophagy. Autophagy is thought to suppress inflammation via degradation of¹⁵ inflammasomes and inflammasome-agonists. Zinc deficiency is common in CD, with up to one third of all patients presenting with^(16,17) low serum zinc levels, even in patients in clinical remission. ZD may exacerbate CD by increasing mucosal permeability, leading to¹⁸ neutrophil transmigration and luminal antigen permeation, such increased mucosal permeability has been shown to correlate with^(19,20)

both, CD activity and relapse probability. Despite high prevalence of ZD in IBD and its links to inflammation, so far no study investigated the role of serum zinc as a potential predictive serum marker for future disease course and its potential causative role in patients with a low or absent inflammatory disease activity. Low-normal zinc values were defined as below the 30th percentile of the normal range. Meprin expression in the intestinal tract is highest in the ileum and large intestine where host and microorganisms are in contact, and where intestinal inflammatory diseases develop. Meprins are zinc metalloproteinases that are highly expressed in the epithelial cells of the human and mouse intestine, and are found membrane bound and/or secreted into the²¹ lumen of the intestine. In addition to the abundant expression in the epithelium, meprin alpha is expressed in human intestinal lamina propria leukocytes and in mouse mesenteric lymph nodes²² both in the presence and absence of intestinal inflammation

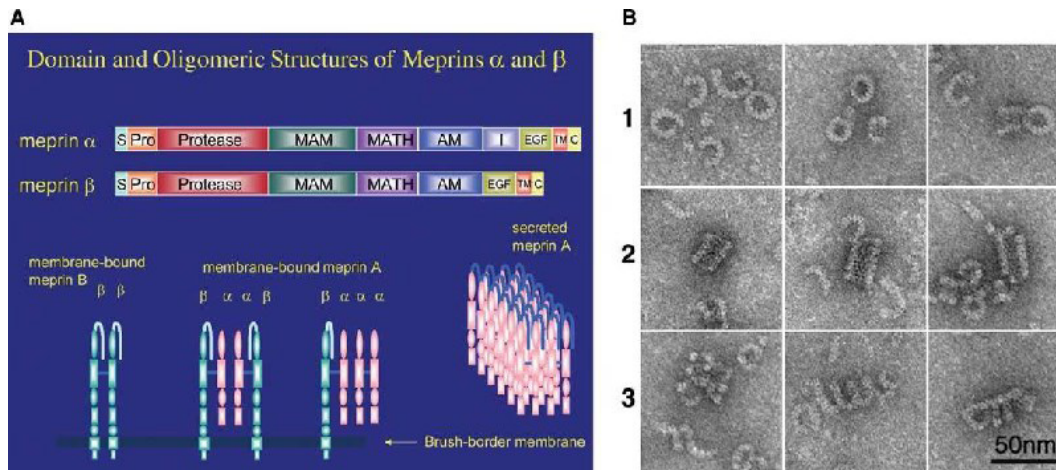


Fig. 1. (A) Domain and oligomeric structure of meprins a and b. Domains are S, signal sequence; Pro, prosequence; Protease, catalytic domain; MAM, meprin, A5 protein, protein tyrosine phosphatase I; MATH, meprin and TRAF homology; AM, after MATH; I, inserted domain; EGF, epidermal growth factor-like, TM, transmembrane-spanning; C, cytoplasmic domain. The MATH and AM domains are now designated the TRAF domain.

(B) Electron micrograph of various forms of secreted, latent homooligomeric meprin A demonstrating high molecular mass complexes. Row 1, closed rings and crescents (containing about 10 to 12 meprin a subunits); rows 2 and 3 show tubes and spirals containing up to 100 subunits.

Inflammatory bowel diseases (IBDs) are a collection of clinically heterogeneous intestinal diseases that result in damage to intestinal²⁷ epithelium and affect million people in the USA

Material and Method

Study subject:

This research has been approved by the Ethics committee, department of chemistry, college of

science, Mustansiriyah University, Bagdad, Iraq, and the Iraqi Ministry of Health approved this work as well. The blood samples were taken after informed consent of participant were recruited from Gastroenterology and Hepatology teaching hospital at Bagdad Medical city, while the healthy group were volunteers. All the patients were diagnosed by senior doctors specialist in gastroenterology field, (60) sixty unrelated Iraqi Crohn's disease patient's divided in to two groups according to response to biological therapy (infiximab) the first group (30) patients was respond to infiximab according to classical regimen (loading dose 5mg/kg at week 0,2,and 6 followed by repeated infusion of 5mg/kg every 8 weeks) and (30) patients not respond to infiximab undergoing surgical intervention as well as (30) unrelated healthy person termed as control group without any systemic disease. All the patients and control aged between 18 and 64 years. Five milliliters of venous blood was obtained from patients and control group by 5 ml disposable syringe (without tourniquet) drained into get plain tubes and left in room temperature (25C°) for 15 minutes, Then it was centrifuged at 2000 xg for 10 minutes in order to collect sera. Sera aliquots were placed in eppendorf tubes and stored at -40C° until used.

Biochemical analysis

The human Serum MEP1A(Meprin A subunit alpha) were using ELISA Kit obtained from Mybiosource using the sandwich enzyme linked immune sorbent (ELISA) assay technology method according to manufactures instruction (Cat No. MBS 765586, My bio source / USA). While Zinc Serum concentration determined by Atomic Absorption/ flame spectrophotometer(AA 680G) (SHIMADZU, Japan).

Statistical analysis²⁸

The statistical analysis system SAS program has been utilized to compare between control and two CD patients groups (response and non-response to biological therapy) in study parameters. (Analysis of variation- ANOVA) was used to compare between means (P value of 0.05 and 0.01 has been considered to be statistically significant).

Result and Discussion

Mean \pm SD value of zinc and meprin α were recorded from all subscribers as shown in table 1. Results of this study shown a significant decrease in both zinc and meprin levels between (non-response

group) and control group ($p < 0.01$). Similarly, zinc and meprin levels were decreased significantly ($p < 0.01$) in (non-response) group as compared with response group as shown in table (2). While there were no differences between control and CD patients that have been treated with infiximab only. According to the currently accepted hypothesis, both UC and CD result from a dysregulated response of the intestinal immune system to antigens of microbial origin or pathogenic bacteria in genetically predisposed individuals. MEP1A has been identified as a genetic^(23,25) susceptibility factor for IBD. It encodes meprin α , a metalloprotease highly expressed in the intestine. Meprin α is secreted into the intestinal lumen or accumulates at the apical brush border membrane of polarized epithelial cells retained by meprin β . Thus any decrease in meprin α or β expression can lead to similar defects in the host. In this study we determine the levels of serum meprin α in Iraqi patients with Crohn Disease which include two main groups (respond and non respond to biological therapy), as well as the correlation between zinc with serum meprin α in these groups. The results showed strongly significant association between meprin α and zinc.

A total of 60 patients with Crohn's disease (CD), (30) patients treated with infiximab and (30) with surgical treatment were included in the analysis. zinc deficiency was associated with an increased risk of surgeries in patients with CD. Normalization of zinc was associated with improvement in these outcomes in patients with both CD. Meprin is involved in inflammation by the release and maturation of cytokines^(26,29) and proteoglycans, it induce extracellular matrix assembly and fibrosis, and enhance cancer progression through trans-activation of²⁵ EGF receptors, which is reflected by defined cleavage specificity³⁰ and structural features unique among all proteases. Meprin α is shed by furin during the secretory pathway and secreted into extracellular space. Interestingly, this show that meprin α tends to oligomerize to huge complexes up to the mega Dalton range, which²⁶ makes it the largest extracellular protease (See Fig. 1). These fascinating ring and chain like structures can easily be visualized by transmission electron microscopy (TEM), but structure-function relationships are still ambiguous, meprin α was found to be differentially expressed in the small and large intestine, leucocytes,³¹ and several tumors. In normal dermal

skin, meprin α is higher expressed than meprin β , and are highly up-regulated in keloid tissue ³²

Our results and those of others have led to the hypothesis that meprin α play a role in the pathogenesis of IBDs. Data indicate that meprin α influence CD by affecting intestinal leukocyte dissemination to inflammatory sites in the gut, by interacting with bacteria at the epithelial surface, by degradation of compounds such as defenses that kill bacteria, or by exacerbating host tissue damage in the inflamed gut. Previous studies had demonstrated

high expression of meprin subunits in leukocytes of ²² the lamina propria of human inflammatory sites. This observation, plus the known ability of Meprin α to hydrolyze extracellular matrix proteins, led to the speculation that Meprin α play a role in the movement of macrophages to inflammatory sites. Our study has several strengths and some limitations. We provide the first study evaluating an association of serum zinc levels and meprin in CD patients.

Table 1 : Statistical analysis of meprin alpha and zinc concentration distributed among patients and control groups. 95% C.I. for

Parameter	Group	Mean \pm SD	SE	Mean		Min.	Max.
				L.b.	U.b.		
Zinc μ g/dL	A	3.910 \pm 2.551	0.473	2.939	4.881	0.489	8.63
	B	3.275 \pm 1.492	0.272	2.717	3.832	0.418	6.72
	C	1.117 \pm 1.571	0.720	0.286	0.531	1.704	5.51
Meprin ng/ml	A	83.306 \pm 16.334	3.033	77.093	89.519	53.70	114.30
	B	87.940 \pm 12.214	2.230	83.379	92.501	71.60	116.40
	C	50.058 \pm 7.622	1.391	47.212	52.904	36.90	66.61

Table 2: Multiple comparison significant (ANOVA) for parameter among the different groups.

Groups	Zinc μ g/dL	Me ng/ml
	P- Value	
A & C	0.0011 **	0.0011 **
B & C	0.0010 **	0.0012 **
A & B	NS	NS

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Science and all experiments were carried out in accordance with

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Knowledge Attitudes and Barriers of Undergraduate Medical Students Towards Research in University of Babylon

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Abstracts

Objective of the study: To evaluate the attitude and knowledge and barriers of a sample of Iraqi medical undergraduate students(in Babylon college of medicine and college of dentistry) toward research. Across sectional study was done using self-administered pretested questionnaire to measure the knowledge ,barriers and attitudes of students toward research. Two hundred eight students were responded to this study from Hammurabi medical college, and college of dentistry in the University of Babylon. Females constituted 67%. The female to male ratio was 2:1. Regarding barriers to conducting research activities the study revealed that (55.3%)of the students had efficient internet connection and 1.5% had no internet connection at home This study explained that the skill of English language writing is very low, only 5.3% of them mentioned that they had very good skill of writing in 66.5 % mentioned that they had intermediate level of writing English. Regarding speaking English language (which is the language of training for the medical students) only one in fifth of them had good skill in speaking fluent English language. Regarding the attitude 73.3% of the participants had positive attitudes and they mentioned that they are interested in conducting research during undergraduate training.

Keywords: *medical students , undergraduate, knowledge, attitude, barriers , Babylon, Iraq*

Introduction

Research is a systematic process to achieve new knowledge by the use standard methods, simply research can be defined as “a systematic collection of data that uses disciplined methods to answer questions or solve problems ^{1,2}. Health research is an integral component in developing health systems, understanding the roots and consequences of poor health, as well as anticipating and mitigating the effects of various factors on health. Promoting and fostering an environment conducive for health research is mandatory for planning, designing and implementing research and for sharing, using and translating its findings into evidence-informed health policies and cost-effective interventions ³ Health research has an impact on the prevention, diagnosis and treatment of diseases and especially on health care programs policy ^{4,5} Research is essential in all areas of health development. However, medical students frequently lack the time and training on performing research. This is especially prevalent in resource-limited settings ⁶. It is now evident that engaging students in research may lead

to increased participation in research after completion of training ⁷. However, due to the burdens of patient care, students are frequently too busy to find sufficient time for research activities ^{8,9}. Scholarly research activity programs are essential components of the modern undergraduate medical curriculum ¹⁰. Undertaking research can help develop transferable skills such as communication skills, time management, medical statistics, academic writing, systematic thinking, critical appraisal skills, information technology (IT) skills and how to practice evidence-based medicine ^{4,10}. Medical student involvement in research has been declining over the years ¹¹. Medical students’ engagement in research has been associated with the acquisition of teamwork, time management and critical thinking, gaining experience and motivation for a research career, improving critical thinking abilities and fostering positive attitudes toward science and scientific methodology ^{12,16}. Unfortunately, the future of academic medicine has come into question as recent reports point to declining numbers of clinician–scientists in both developed and developing countries ^{17–20}. In conducting research inadequate knowledge is one

of the most common reasons behind suboptimal study design or interpretation²¹⁻²³. The curriculum should be revised to address the gaps in research training. A small group learning model should be adopted to train students in research and provide supervision to group research projects. This model would improve academic learning, skills acquisition, encourage student interest in research, reduce barriers to student research and make better use of limited resources²⁴. The three main factors seen to impact on research success in the literature are: attitude to, knowledge of and barriers toward research²⁵⁻²⁸. This study was done to evaluate the knowledge, attitude to and the barriers toward research among undergraduate medical and dentistry students in Babylon university. To our best knowledge There is no published study to date that assessed the context of research training provided to undergraduate medical students in Iraq.

Methodology

This survey was conducted according to with the Helsinki declaration and national research ethical guidelines. The approval of the proposal for ethical clearance by the Research Technical and Ethical Committee at the Hammurabi College of Medicine. The purpose of the study was explained to the respondents and verbal informed consent was obtained from each one of them after explaining the objectives of the study. The questionnaire was anonymous and took about 10 minutes to complete. This was a cross-sectional study which was conducted at the University of Babylon – Hammurabi college of medicine (the first and second grade undergraduate students) and the college of dentistry (4th and 5th grade students) during the academic year 2019-2020. The research instrument was a self-administered coded questionnaire constructed from variables obtained from literature on the topic. We collected data using the self-administered, structured questionnaire within a span of 6 months. The questionnaire was adapted from the previous studies.^{29,30} The questionnaire consisted of sociodemographic, previous experience of scientific research, knowledge and attitudes toward research, and perceived barrier conducting research. The purpose of the questionnaire was to assess the knowledge and attitude of undergraduate medical student to research; motives for conducting research in the college; and barriers to student research at the university. Data was analyzed using SPSS version 21. Descriptive frequency analysis was performed for all variables in the questionnaire.

Chi-squared tests were conducted to investigate the association between variables and The statistical level of significance was a *p* value less than 0.05

Results

Table 1: shows the distribution of 206 students according to the availability of internet connection, 55.3% of the students have efficient internet connection. 1.5% have no internet what so ever. Figure (1) reveals that females number is higher with male to female ratio 2:1 Table 2: shows the distribution of 206 participates according to their skills in English language (writing, reading, and speaking), less than one third of the students mentioned that they are good in writing English language, the result is similar regarding speaking English. Table 3: explains the Distribution of students according to their attitude towards conducting research during undergraduate study, the table depicts positive attitudes toward research. Table 4 depicts the distribution of students according to exposure to encouragement to conduct research by their tutors only 70 respondents (34.5%) mentioned that the received encouragement from their tutors to participate in research activity while one fifth of them agree that tutors are easily available to supervise research. Only 8.7% of the participants believe that there are many chances are available in the college to involve in research. Regarding the obstacles table 5 shows the distribution of students according to their access to scientific journals and capacity building in research methodologies during their undergraduate study one in sixth 32 (15.8%) said that they have Easy access to scientific journals through university and 72.3% of them said that there was no enough training activities in research methodology and only 7.5% of the respondents had participated in some sort of research activities during their training courses. Table 6 shows that 85% of students believe that research is important for their future medical practice and academic study. Table 7 reveals that only 11% don't know the importance of studying the research methodology the curriculum as a goal for their future career and self-learning. More than half of the study group (57%) believe research will be a career goal for you in the future. The proportion of students who know that studying research methodology will help in engagement in self-learning about research.

Figure (2) shows that 88% of the respondents either disagree or they don't know that there are awards to encourage engage in research.

Figure (3) shows that 3% of participant know that the government support research activities in Iraq.

Table 1: distribution of 206 students according to the availability of internet connection

Internet Connection (total N=206)	N (%)
No internet	3 (1.5)
Slow connection (not always available)	89 (43.2)
High speed connection	114 (55.3)

Table 2: distribution of 206 participates according to their skills in English language (writing, reading, and speaking)

English language skills – Writing (total N=206)	N (%)
Very poor	7 (3.4)
Poor	4 (1.9)
Intermediate	137 (66.5)
Good	47 (22.8)
Very good	11 (5.3)
English language skills – Speaking (total N=206)	N (%)
Very poor	6 (2.9)
Poor	32 (15.5)
Intermediate	122 (59.2)
Good	37 (18)
Very good	9 (4.4)
English language skills – Reading (total N=206)	N (%)
Very poor	5 (2.4)
Poor	11 (5.3)
Intermediate	110 (53.4)
Good	63 (30.6)
Very good	17 (8.3)

Table 3: Distribution of students according to their attitude towards conducting research during undergraduate study.

Research involvement status (total N=206)	N (%)
Not interested in research	55 (26.7)
Interested but don't know how to involve in research	108 (52.4)
Actively looking to involve in research	43 (20.9)

Table 4: Distribution of students according to exposure to encouragement to conduct research by their tutors

Encouragement by academic staff to participate in academic research (total N=203)	N (%)
Encouraged	70 (34.5)
Not encouraged	133 (65.5)
Tutors are easily available to supervise research (Total N=204)	N (%)
Don't know	71 (34.8)
Disagree	42 (20.6)
Average	50 (24.5)
Agree	41 (20.1)
Many chances are available to involve in research (Total N=206)	N (%)
Don't know	70 (34)
Disagree	78 (37.9)
Average	40 (19.4)
Agree	18 (8.7)

Table 5: distribution of students according to the access to scientific journals and capacity building in research methodologies during their undergraduate study.

Easy access to scientific journals through university library (Total N=202)	N (%)
Don't know	40 (19.8)
Disagree	84 (41.6)
Average	46 (22.8)
Agree	32 (15.8)
There are enough training in research methods (Total N=198)	N (%)
Strongly disagree	38 (19.2)
Disagree	97 (49)
Neutral	47 (23.7)
Agree	15 (7.6)
Strongly agree	1 (0.5)
Participated in training course about medical research (Total N=200)	N (%)
Strongly disagree	
Disagree	58 (29)
Neutral	107 (53.5)
Agree	20 (10)
Strongly agree	10 (5)
	5 (2.5)

Table 6: distribution of students according to their believe that research is important for medical practice and academic study.

Research is important in medical practice (total N=201)	N (%)
Strongly disagree	7 (3.5)
Disagree	2 (1)
Neutral	21 (10.4)
Agree	69 (34.3)
Strongly agree	102 (50.7)
Research is important during academic study (Total N=202)	N (%)
Strongly disagree	9 (4.5)
Disagree	7 (3.5)
Neutral	29 (14.4)
Agree	82 (40.6)
Strongly agree	75 37.1)

Discussion

The engagement of undergraduate medical students in scientific health research had been widely advocated in the last decades in order to provide the new generations of physician with knowledge and skills of applying evidence based medicine in their career. In developing countries including Iraq, medical students are less involved in research activities owing to limited resources and other barriers. Attitude of undergraduate medical students and other students in health science, their knowledge about research and the barriers toward this educational activity are three key components that have an impact on research success. In this study there is a positive attitude toward research conducting among the study group (67.7%) of them cited that research is an important tool for undergraduate medical education , this finding goes in line with the finding of other studies ¹⁸ Positive attitude among the study group indicates very good sign to encourage them in this crucial field because negative attitudes toward research serve as an obstacle to learning associated with poor performance in research. There are many barriers mentioned by the participants which are , weak English language skills (writing, reading and speaking) , lack of resources that facilitate the process of conducting research such as high speed internet, award and encouragement in the teaching environment to enhance research work as a learning tool that stimulating critical thinking and help them to gain critical appraisal skills that help in understanding the evidence medicine practice in their future career, these findings are similar to the findings reported by other

researchers ²⁴

Conclusion

The undergraduate medical and dental students had the moderate level of knowledge and positive attitudes toward the conduct of medical research. Lack of competent English language skills (reading, writing and speaking) funding, awarding , poor internet connection and limited access to relevant medical journals and databases were the major barriers.

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Conflict of Interest: None to declare.

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Macrophage Migration Inhibitory Factor (MIF) Gene Polymorphism of Urothelial Carcinoma Patients in Iraq

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Abstract

Bladder cancer is the 2nd most frequent malignancy of the genitourinary tract and the fourth most common cancer in men. This study was designed to shed light on the association between polymorphism of macrophage migration inhibitory factor (MIF) gene at -173 locus as risk factor of bladder cancer in Iraqi population by PCR-RFLP. In a hospital-based case-control study of 70 patients with bladder cancer and 30 cancer-free controls frequency-matched by age, sex, smoking status, and alcohol use, we genotyped the MIF polymorphism and analyzed immunohistochemical stained operational bladder cancer tissue sections for MIF. We found that individuals with GC/GG genotype had a significantly decreased risk of bladder cancer (OR = 1.55, 95% CI, 0.498 to 8.85) than those with CC genotype. The frequencies of the C allele on the MIF gene were significantly increased in Urinary bladder carcinoma patients. MIF -173G>C polymorphism may play a role in the etiology of bladder cancer in Iraqi.

Keywords : MIF gene, RFLP, Urinary bladder carcinoma.

Introduction

Urothelial cell carcinoma occurs in the cells that line the inside of bladder. Bladder cancer is the ninth most frequent cancer, and it is estimated that there were 340,000 newly diagnosed bladder cancer cases and 130,000 related deaths world wide in ¹. MIF enhancement of macrophage transcription, activation and viability, coupled with its inhibitory effects on anti-tumor cell cytotoxic lymphocytes, suggests that MIF overexpression in developing malignancies may act in concert to facilitate increased tumor growth which present an important link between inflammation and cancer due to its pro-inflammatory role. Its molecular mechanisms involve, among others, the inhibition of p53 which promote tumor cell proliferation, cell survival and tumor-associated neoangiogenesis ^(2, 3). Macrophage migration inhibitory factor (MIF) functions as a pleiotropic protein, participating in inflammatory and immune responses. MIF was originally discovered as a lymphokine involved in delayed hypersensitivity and various macrophage functions, including production of proinflammatory cytokines, glucocorticoid-induced immunomodulator, and natural killer cell inhibitory factor (NKIF), regulation of toll-like receptor expression, adherence and phagocytosis of macrophages, as well as

induction of metalloproteinase. ⁴. The imbalance in the regulation of inflammation that occurs in many cancers can induce cellular damage. This stimulates interaction between immune cells and the damaged cells, which then proliferate, invade, and subsequently develop into tumors ⁵. As a functional promoter, the MIF-173 situate in the 50 flanking region of MIF gene, which is strongly associated with protein production. In 2007, Meyer-Siegler et al. ⁶ reported that the MIF allele defined by -173C SNP was associated independently with prostate cancer and independently with elevate levels of circulating MIF. The human MIF gene situated on 22q11.2 having a single nucleotide polymorphism (SNP; G to C transition) in the 50-flanking region at position -173, which has been associated with susceptibility to adult inflammation ⁷. In 2005, Ziino et al. ⁸ revealed that the MIF-173 G[C polymorphism did not contribute to prednisone poor response in vivo in childhood acute lymphoblastic leukemia. Approximately 20% of all cancers arise in association with infection and chronic inflammation and even those cancers that do not develop as a consequence of chronic inflammation, exhibit extensive inflammatory infiltrates with high levels of cytokine expression in the tumor microenvironment.

Materials and Method

Sampling and data collection

This a case-control study consisted of 70 patients with RA and 30 healthy persons (before surgery for UBC group). All subjects signed an informed consent, and clinical data of patients were collected from patient files and questionnaires. Our study was approved by the Research Ethics of the Iraqi Ministry of Health. About 2 ml of whole blood was collected from all subjects

DNA extraction and purification

Genomic DNA was extracted from whole blood collected in EDTA-tubes from all subjects (patients and control individuals) using Genomic DNA Extraction Blood DNA Mini Kit (FAVORGENE). The concentration (ng/ml) and purity (260/280 nm) of the DNA extracts were measured at 260 nm and 280 nm with a NanoDrop spectrophotometer (OPTIZEN POP – Korea).

Genotyping

The candidate SNP *MIF*₋₁₇₃ was investigated using polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) technique. The amplification reaction was done with 3 µl of 200ng/µl of genomic DNA, 12.5 µl of 1X Master Mix (Promega), 1.5 µl of 10 pmol of each specific primer pair (forward and reverse primer), and completed the volume of 20 µl PCR mixture with DNase free water. The source of the primer was Bioneer (South Korea). Primer sequences of *MIF*₋₁₇₃ were forward (5'- 5-ACTAAGAAAGACCCGAGGC-/3) and reverse (5'-GGGGCACGTTGGTGTTTA ')⁸.

The technique for PCR included a pre-denaturing temperature at 95°C for 10min, followed by 30 cycles at 95°C for 45 s; 62°C for 45 s; and 72°C for 30 min with a final extension at 72°C for 10 min. Ten µl of PCR products (366 bp in length) was digested according to Promega company protocol, which the digestion reaction mixture (36 µl) composed of 0.5 µl *Alu I*, 2 µl of buffer B, 0.2 µl BSA buffer, 7 µl of 1X Muti core buffer and 16.3 µl of DH₂O; the reaction was incubated at 37°C for 16h. Subsequently, The product was separated on a 1.5% agarose gel for 45min and power 70 volt and 20mA. Finally, The gel was viewed by RedSafe™ Nucleic Acid Staining (iNtRON) under ultraviolet light . DNA Marker;G/G:Homozygous for absence of *AluI* restriction site (268bp 98bp); C/C: Homozygous for *AluI* restriction site (206bp, 98bp,62Heterozygous for *AluI* restriction site (268bp,206bp,98bp,62bp).

Statistical analysis

Two-sided x2 test was used to evaluate the frequency distributions of select demographic variables, smoking status, alcohol use, and alleles and genotypes of MIF polymorphism between the test subjects and controls. The associations between MIF genotypes and the risk of bladder cancer were estimated by computing the crude and adjusted odds ratios (ORs) and their 95% confidence intervals (95% CIs) from logistic regression analyses.

Results and Discussion

The frequency of genotypes distribution and alleles of the groups are presented in table (3-18). The GG, GC, and CC genotype frequencies were 41.4%, 10% and 44.2%, respectively among the UBC cases and 67.5, 15, and 17.5%, respectively, respectively among healthy cases , as shown in table (3)

Table (1) Distribution of allele frequency and genotype of *MIF* in case-control study.

Genotype	Patients N(% 70(100%))	ControlN% 40(100%)		TEST X2	Odd ratio	CI 95%
GG	29(41.4%)	27(67.5%)		0		
GC	10(14.4%)	6(15%)		0.001*	1,55	0.498 to 8.85
CC	31(44.2 %)	7 (17.5%)			4,12	1.55 to 10.91
Allele Frequency						
G	68(49%)	54(67%)	1.8		2.411	1.3530 to 4.299
C	72(51%)	26(33%)				

OR: Odd Ratio.

CI: Confidence Interval.

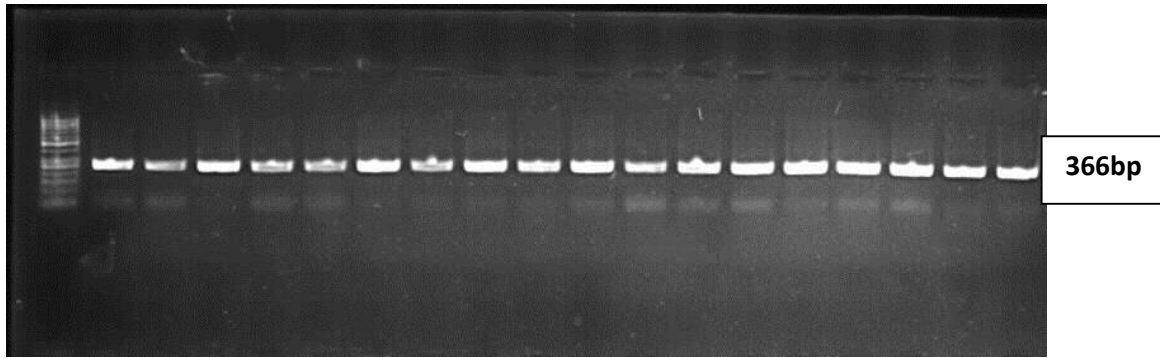


Figure (1) Electrophoresis pattern of (MIF) Amplification using PCR technique 2% agarose, 75V, 20mA, for 60 min, line 1 (50 bp) DNA marker, line 1-8 MIF genotype for patients, lane 9-12 MIF genotype for control.

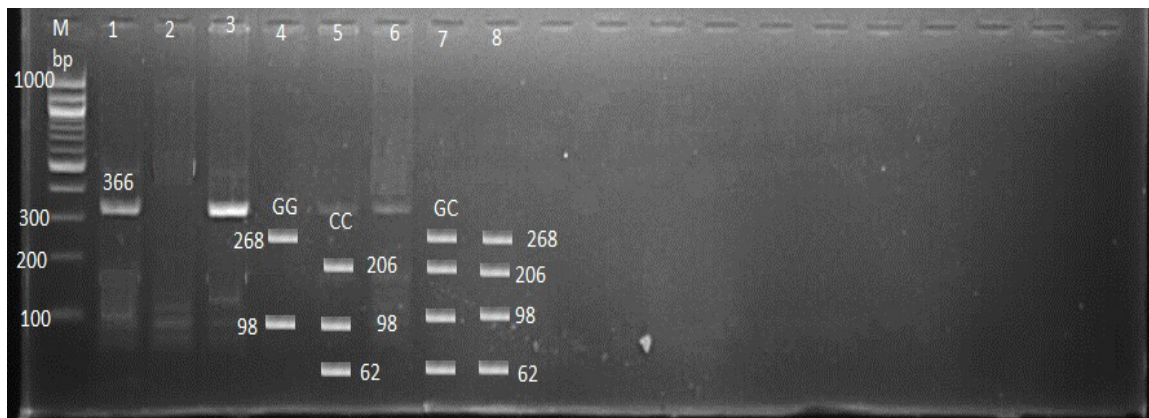


Figure (2) Gel electrophoresis of *MIF*₋₁₇₃ polymorphism (RFLP by *AluI*); M: DNA Marker (100); 4, G/G: Homozygous for absence of *AluI* restriction site (268bp, 98bp); 5 C/C: Homozygous for *AluI* restriction site (206bp, 98bp, 62bp); 6, 7, 8 G/C: Heterozygous for *AluI* restriction site (268bp, 206bp, 98bp, 62bp).

The results nearly agreed with the results reported by ¹¹ who found that individuals with GC/CC genotype had a significantly decreased risk of bladder cancer than those with GG genotype and the CC genotype frequency of *MIF* was lower among the cases. The GG, GC, and CC genotype frequencies were 63.4, 30.5, and 6.1%, respectively, among the cases and 50.7, 43.2, and 6.1%, respectively, among the controls.

The human *MIF* gene is located on chromosome 22q11.2 which contains 3 exons and 2 introns. Gene mapping has shown that the *MIF* gene displays polymorphism, including microsatellite polymorphism and single nucleotide polymorphism, at 4 sites (11,12). G/C polymorphism is located at -173, T/G polymorphism is located at +254, C/G polymorphism.

Although, how the *MIF*-173 G/C polymorphisms affect the inflammatory factor activity remains to be investigated, some studies suggested that the polymorphisms may affect the protein functions. Arikan

et al. ¹⁴ revealed that *MIF*-173C allele frequency was significantly higher in biliary atresia patients than both the chronic liver disease patients and healthy control groups. Makhija et al. ¹⁵ reported that the *MIF*-173C alleles was over expressed in acute pancreatitis patients. Their data all suggested that the polymorphisms might affect on *MIF* protein expression and activity.

Conclusion

We found that individuals with GC/GG genotype had a significantly decreased risk of bladder cancer (OR = 1.55, 95% CI, 0.498 to 8.85) than those with CC genotype. The frequencies of the C allele on the *MIF* gene were significantly increased in Urinary bladder carcinoma patients. *MIF* -173G>C polymorphism may play a role in the etiology of bladder cancer in Iraqi.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, Science For Women, University of Babylon and all experiments were carried out in accordance with approved guidelines.

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Study Impact of Hyperuricemia on the Occurrence of Atrial Fibrillation in Patients Admitted to CCU in Al-Diwaniyah Teaching Hospital

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Abstract

Background: A possible direct link between SUA and AF has barely been addressed. Several studies have reported an association between SUA and AF. An increasing body of evidence suggests that SUA may represent a marker of AF risk. The association between SUA level and AF has been demonstrated. Moreover, Nyrenes A et al. found that serum uric acid levels in men are higher than in women throughout life, although SUA levels increase after menopause, and that baseline SUA was associated with an increased risk for future AF in both sexes. In addition, the occurrence of AF increases with age, and the fact that SUA levels in women, in contrast to men, increase with age may account for the higher risk estimates seen in women.

Aim of the study: To evaluate the possible association between serum uric acid and atrial fibrillation in patients admitted to coronary care unit.

Patients and Method: In this hospital based study, in order to explore the prevalence rate of hyperuricemia in patients with atrial fibrillation, the coronary care unit in Al-Diwaniyah teaching hospital was prospectively reviewed for newly admitted patients with atrial fibrillation during the period extending from April the 15th 2019 through July the 15 the 2019.

Results: A cross sectional study enrolled 191 patients with cardiac problems. The study result revealed 53.4% of cases were males and 46.5% were females; the male to female ratio was 1: 1.14. The mean age of all patients was 51.9±4.6 years. The patients were examined and investigated for the presence of atrial fibrillation and then were divided into two groups, atrial fibrillation positive (20.5 %) and atrial fibrillation negative (77.5 %). Hyperuricemia was significantly associated with atrial fibrillation ($P < 0.001$) and the risk subjected by hyperuricemia was 3.5 in terms of odds ratio.

Conclusion: There was significant association between hyperuricemia and presence of atrial fibrillation in patients admitted to CCU indicating that hyperuricemia is a risk factor for AF development.

Key words: Atrial fibrillation, hyperuricemia, Iraq

Introduction

Atrial fibrillation is the most common type of heart arrhythmia. It is due to abnormal electrical activity within the atria of the heart causing them to fibrillate. Is characterized as a tachyarrhythmia, which means that the heart rate is often fast. This arrhythmia may be paroxysmal (less than 7 days) or persistent (more than 7 days). Due to its rhythm irregularity, blood flow

through the heart becomes turbulent and has a high chance of forming a thrombus (blood clot) which can ultimately dislodge and cause a stroke. Atrial fibrillation is the leading cardiac cause of stroke. Risk factors for atrial fibrillation include advanced age, high blood pressure, underlying heart and lung disease, congenital heart disease, and increased alcohol consumption. Symptoms vary from asymptomatic to symptoms such

as chest pain, palpitations, fast heart rate, shortness of breath, nausea, dizziness, diaphoresis (severe sweating), and generalized fatigue. Although atrial fibrillation may be a permanent disease, various treatments have been developed, and risk modifying strategies to help reduce the risk of stroke in patients that remain in atrial fibrillation exist. Treatments include anticoagulation, rate control medication, rhythm control medication, cardioversion, ablation, and other interventional cardiac procedures (1,2).

A possible direct link between SUA and AF has barely been addressed. Several studies have reported an association between SUA and AF³. An increasing body of evidence suggests that SUA may represent a marker of AF risk. The association between SUA level and AF has been demonstrated. Moreover, Nyrnes *et al*³ found that serum uric acid levels in men are higher than in women throughout life, although SUA levels increase after menopause, and that baseline SUA was associated with an increased risk for future AF in both sexes. In addition, the occurrence of AF increases with age, and the fact that SUA levels in women, in contrast to men, increase with age may account for the higher risk estimates seen in women³.

Furthermore, in a small observational study, Letsas *et al.* showed a stepwise increase of SUA levels in patients with paroxysmal AF and permanent AF compared to control subjects, while after multivariate analysis, SUA was an independent predictor of permanent⁴ (Letsas *et al.*, 2010). Also, in a retrospective observational study of hospitalized patients over 40 years an independent association between high SUA levels and AF (paroxysmal or persistent) was evident⁵. In the ARIC study, a large prospective cohort study, elevated SUA was associated with a greater risk of AF development during the follow-up⁶. In the same line, a Japanese hospital-based cohort study demonstrated an independent association between SUA and AF⁷. Another very recent study showed that SUA levels ≥ 8 mg/dl was an independent predictor of AF while SUA increased significantly between the last year and the year of the first AF detection suggesting a possible involvement in AF development. Besides, Tze-Fan Chao *et al.* showed that hyperuricemia was associated with a larger left atrial size and may be a novel risk factor for the development of AF. K. Letsas *et al.* also found an independent association between increased levels of SUA and permanent AF⁴.

The poverty of national reports and limited numbers of Iraqi studies dealing with the association of atrial fibrillation and hyperuricemia in Iraqi patients and based on the clinical daily observation in coronary care center in Al-Diwaniyah province, Mid-Euphrates region of Iraq, we planned and conducted the current study to disclose the possible association between hyperuricemia and atrial fibrillation in Iraq.

The aim of the present study was to evaluate the possible association between hyperuricemia and atrial fibrillation.

Patients and Methods

In this hospital based study, in order to explore the prevalence rate of hyperuricemia in patients with atrial fibrillation, the coronary care unit in Al-Diwaniyah teaching hospital was prospectively reviewed for newly admitted patients with atrial fibrillation during the period extending from April the 15th 2019 through July the 15th 2019. Any patient admitted to CCU during the period of the study was enrolled in the current study. Any patient who refused to participate in the current study and patients who were unfortunately unable to complete interview questionnaire were excluded from study. Following application of these exclusion criteria, the sample of included patients became 191.

The following variables were included in the questionnaire form: Age, gender, occupation, education level, residency, socioeconomic status, marital status history of smoking, history of alcoholism, history of chronic illness, the main presenting clinical features. Investigations included ECG findings, serum uric acid and thyroid function test in addition to CBC, LFT, RFT, Lipid profile, cardiac biomarkers. Echocardiographic findings were also included. The study was approved by the institutional ethical approval committee and formal agreement was obtained from the directorate of Health in Al-Diwaniyah province, the formal representative of Iraqi Ministry of health. Data were collected and transformed into a spread sheet of Microsoft Office Excel 2010 and then into an SPSS (statistical package for social sciences) version 23. Numeric quantitative data were expressed as mean, range and standard deviation (SD), whereas, qualitative data were expressed as number and percentage. Comparison of mean between any two groups was done according to independent sample t-test, while chi-square test was used to evaluate association between any two categorical variables. The

level of significance was considered at $P \leq 0.05$.

Results

A cross sectional study enrolled 191 patients with cardiac problems. The study result reveals 53.4% of sample were male and 46.5% were female, in ratio 1:1.14, with mean age for all sample 51.9 ± 4.6 years. After patients' examination by physician and ECG finding, classified patients into groups according to presence of

atrial fibrillation. Twenty point five percent of patients were had atrial fibrillation and 77.5% percent of patients had other cardiac problems rather than AF. Sixty seven out of 191 patients had hyperuricemia and 124 had no hyperuricemia. There was highly significant association between hyperuricemia and AF ($P < 0.001$) with an odds ratio of 3.15 (95 % confidence interval of 1.73 to 7.08) and an etiologic fraction of 0.42, as shown in table 1. However, there was no significant association between AF and any of other patients' characteristics, table 2.

Table 1: Association between hyperuricemia and atrial fibrillation

AF	Hyperuricemia				P †	OR	95 % CI	EF
	Positive n = 67		Negative n = 124					
	n	%	n	%				
Positive	25	37.3	18	14.5	< 0.001 HS	3.51	1.73 - 7.08	0.42
Negative	42	62.7	106	85.5				

†: Chi-square test; HS: highly significant at $P \leq 0.01$; OR: odds ratio; CI: confidence interval; EF: etiologic fraction

Table 2: Association between atrial fibrillation and other possible risk factors

Factor	P
Gender	> 0.05 NS
Age	> 0.05 NS
Hypertension	> 0.05 NS
IHD & Heart failure	> 0.05 NS
Valvular heart disease	> 0.05 NS
Mixed group	> 0.05 NS
IHD & Thyroid disease	> 0.05 NS
IHD & Kidney disease	> 0.05 NS
IHD & Diabetes mellitus	> 0.05 NS
IHD & Smoking	> 0.05 NS
IHD & CVA	> 0.05 NS

NS: Not significant at $P > 0.05$

Discussion

Atrial fibrillation newly becomes highly health problems worldwide due to largely relation to elevate diseases burden and increase death rate in general. In previous study reported AF prevalence 2.4%-3.5% in general population. Which was estimated more than 30 million of population survive with AF⁸. Patients with AF had been rise incidence of other diseases such as stroke, dementia and heart failure etc⁹. Many theories appear to explain pathophysiology and predisposing factors to AF. That had been reported a reaction of oxidative factors that cause inflammation in cell level¹⁰.

Numerous new studies expected the inflammation and oxidative processes behind the development of AF, in same way with presence of other predisposing factors like increase age of patient⁸.

The serum uric acid had been implicated to proceeding the inflammation pathways and oxidation processes in many pathological states of different diseases one of them AF. Also related to AF in accompany of others diseases such as hypertension, heart failure, hemodialysis and diabetes. Serum uric acid is the end product of purine catabolism. In our cross sectional study was revealed 43 out of 191 had AF (22.5%), which was more than reported in china studies, one of them did in Yunnan hospital reported AF prevalence in patients of age 80 years equal to 0.9% of patients treated in that hospital. Another study recorded prevalence AF 6% of 350 patients in suburban area similar risk factors. In addition a large number study in wide geographical region include more than 1000 patients reported AF prevalence in older patients equal 9%¹¹. In north of Iraq a study by reveal AF prevalence among stroke patients in ward of three hospital 17.5% of middle and older patients¹². For same study design in south of Iraq 9.8% of stroke patients that admitted to hospital associated with AF¹³.

In conclusion, there was significant association between hyperuricemia and presence of atrial fibrillation in patients admitted to CCU indicating that hyperuricemia is a risk factor for AF development.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the department of Medicine/ College of

Medicine/ University of Al-Qadisiyah / Al-Diwaniyah province/ Iraq and all experiments were carried out in accordance with approved guidelines.

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Quality of Life of Parents Having Cancer and Non-cancer Children: A Comparative Study

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Abstract

Purpose: Cancer is the second leading cause among children and the child and parents suffering from cancer also exhibit side effects of chemotherapy. The present study aimed to examine the issues with the quality of life of the parents having children with cancer as compared to those having children without cancer.

Methods: This is an investigative and descriptive study that included a sample of 300 parents along with their children with cancer; registered to the Hiwa Oncology Hospital in Sulaymaniyah City, Iraq and 300 other parents with their non-cancerous children; visited Pediatric Teaching Hospital in Sulaymaniyah City, Iraq. A questionnaire elaborated by the authors and the quality of life scale (WHOQOL-BREF) questionnaire was applied.

Results : The biggest difference between the overall quality of life of a parent with child with cancer and the parent without a child with cancer, the majority of the mothers and fathers in the control group, their quality of life fall between high to very high than the case group.

Conclusion : Thus, this study indicated the need for parental support while providing intervention to the child with cancer.

Keywords: *quality of life, parents, children, cancer*

Introduction

Cancer is one of the major issues worldwide. The number of cancer cases among children is gradually increasing.¹ Childhood cancer is the second leading cause of death among children aged 1-18 years.² In recent decades, improved technology and discovery of novel treatment increased the survival rate dramatically.³ According to the World Health Organization (WHO), the definition of quality of life is an individual's perception of his/her lives with respect to his/her goals, expectations, standards, and concerns. In addition, the

individual's physical health, psychological state, level of independence, social relationships, and the social relation to salient features of the environment are also considered.⁴ The impact of the disease and side effects of the treatments of the child affected the quality of life of the parents because the parents take care of the ill child during his/her condition.⁵ This long-term childhood disease may negatively affect the parenting and the quality of life of the parents of the child with the disease than that of both parents with a child without cancer.⁶ In the current study, we aimed to investigate the quality of life of parents with a child with cancer in Sulaymaniyah City, Iraq physically, socially, environmentally, spiritually, and level of independence as compared to parents with a child without cancer. Moreover, we also investigated how the respondents rate their quality of life and whether they were satisfied with their health. The key component of the empirical part of the study was the survey using a standardized questionnaire.⁷

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Methodology

This case-control study was carried out from September 21, 2017 to April 22, 2018 at the Hiwa Oncology and Pediatric Teaching Hospitals in Sulaymaniyah City/Iraq.

Data collection

Part one

This part included the sociodemographic data of the parents of children with cancer undergoing chemotherapy. The education, occupation, marital status, and economic status were recorded for both mothers and fathers.

Part two

In order to evaluate the quality of life of the parent, a standardized questionnaire was designed by the WHO^{7,8}. The Slovak version was used for examining the quality of life based on five domains as follows:

1. General domain: This is the last domain that examined the general health of the individual by asking them to rate their quality of life and whether they were satisfied with their health.

2. Physical domain: It mapped the extent to which the pain affects the individual's life with respect to the energy, sleep, and rest. Also, the level of independence for mobility, dependence on the medication, the activities of daily life, and work capacity were assessed.

3. Psychological domain: It investigated the degree of satisfaction of the individuals with their life. It also focused on the frequency of the occurrence of negative emotional states as despair, depression, and anxiety.

4. Social domain: It reflected the satisfaction with personal relationships, sex life, as well as the support that people receive from friends and the local community.

5. Environmental domain: This part investigated the level of quality of life with respect to environmental factors, such as the feeling of safety and quality of the environment of the individuals and accessibility of financial and information resources or health services.

Thus, these facets of the quality of life domains were used for both parents of the study sample as well as the control group.

Study design

The present study was conducted in the Hiwa Oncology Hospital, the only hospital for hematology and oncology providing care for cancer patients both adults as well as children.

The second set of the study was carried out at the Pediatric Teaching Hospital that was established in 1988 in Sulaymaniyah City/Kurdistan region of Iraq. This hospital includes emergency and medical units and provides health care for ill children, aged <15-years-old.

Sampling of the study

The sample consisted of 300 parents of children with several types of cancers in comparison with 300 control parents of children without cancer. The present cohort was selected among children with cancer in the Hiwa Oncology Hospital. Taking into account certain inclusion criteria including children undergoing chemotherapy, children diagnosed with different types of cancer and children registered in Hiwa Oncology Hospital are considered. Verbal consent was obtained from the parents of both cases and controls to confirm the voluntary participation in the study.

Data collection

The data were collected through a direct interview of the participants, including both samples parents of case and control groups, using a standardized questionnaire.

Statistical Analysis

All data were analyzed using SPSS version 23, and the level of significance was set at $P \leq 0.05$.

Results and Discussion

sociodemographic characteristics of mothers of both case and control groups. The age of the sample group in the cohort was between 31 and 42 years (69.3%), while in the control group, about 54.7% were aged between 19 and 30 years. Moreover, the age group 43-54 years constituted 12.3% of the sample group and 6.7% of the control group. Next, the education level of the mothers ranged from illiterate to college graduate, the majority was primary school graduates (45.0%), the lowest percentage of the study sample constituted of institute graduates (2%), 26% graduated from secondary school, and only 8.3% graduated from college among the control group.

In both the case and control groups, 82.3% and 67% of the mothers were housewives, respectively, and all the participants were married. Based on the consanguinity between parents, about 62.7% of the cases were relatives, whereas 75% of the control group was not related. Approximately, 67% in the case group scored the socioeconomic status as insufficient, while 83% in the control group scored the same as sufficient.

The father's sociodemographic characteristics in both groups. The majority of the participants in the case and control groups were aged between 33 and 45 years (65.7% and 58.3%, respectively). The educational qualification in case and control groups was secondary school for most of the fathers, and the majority of the participants were non-governmental employees in both groups.

Table 1 demonstrates a comparison between the mother's quality of life in case and control groups. The comparison between the mean score of general and four domains of the quality of life among the mothers in the case and control groups revealed that the mean score of the general, physical, psychological, social, and environmental domain was significantly higher among the control group ($P < 0.001$) than among the case group; however, the difference was statistically non-significant ($P = 0.047$). However, the mean score of the overall quality of life was significantly higher among the case group (87.2 ± 12.4) as compared to the control group (102.4 ± 11.3) ($P < 0.001$).

Lastly, Table 2 presents a comparison between the father's quality of life in case and control groups. The comparison between the mean score of general and four domains of the quality of life among fathers in the case and control groups revealed that the mean score of the general domain, physical, psychological, social, and environmental was significantly higher among control groups ($P < 0.001$). Hence, although the mean score was higher among controls as compared to the cases, albeit non-significantly ($P = 0.766$). However, the overall quality of life among cases (92.5 ± 15.0) was significantly higher as compared to the controls (102.4 ± 12.2) ($P < 0.001$).

To the best of our knowledge, this is the first study to investigate how cancer affects the quality of life of parents. The results showed that the children's condition affects the quality of life of the parents. All the parents had specific rules and ways of coexistence. Day-by-day,

the number of parents who have a child with cancer have in increasing, and thus, improving the health care for such children is essential. Interestingly, parents do not realize the influence of the child's condition on the whole family. The lives of the families of such children are altered dramatically. These families need to adapt to a new situation, realize the challenging condition and the imposing burden on all the family members. This research aimed to find out about the quality of parents of children with cancers with parents without cancers, namely from general, physical, psychological, social and environmental domains. Moreover, we were investigating how the respondents themselves. The result shows that most parents of children with cancers there was a minimal difference between how parents from parents of a child without cancer are satisfied with their health. The study shows that the sense that living in with child having cancer or without cancer has satisfied of mother and fathers with their health. In this study determine that the quality of life of parents of children with cancers from the physical domain will be significantly poorer than those parents had a child with cancer.

Therefore, we can state that parents with a child with cancer are less satisfied with their mobility, sleep, the sufficiency of energy and perceive a higher level of discomfort in physical area than parents of children without cancer.

The obtained result shows that there is a significant difference between the level of quality of life of parents of a child with cancer and parents of a child without cancer. Hence, we can state that the participants from parents of children with cancers perceive life as meaning full and joy-full to a smaller extent compared to parents of a child without cancer.

The results demonstrated that the quality of life of parents of children with cancers and without cancers from social domain approximately the same result found among two groups of parents and this no sign of the result. Therefore, we can state that parents of children with cancer are equally satisfied with personal relationships and supports that they receive from friends and the local community as parents of a child without cancers.

The result obtained that from the environmental domain of quality of life of parents of children without cancers scored higher than parents with parents of a

child with cancer. The difference emerging from the results is markedly significant, actually the biggest from all domains. Therefore, we can state that the level of feeling of safety and quality of the environment of parents of a child with cancer hence the accessibility of financial and information resources and health services, is much lower than of parents of children without cancer. The domain involves mainly the economic side, so its, understandable that parents of a child with cancer perceive a higher level of discomfort in this area as it needs more financial resources to satisfy all its needs and proper functioning than parents of children without cancer. According to (Lisa,2014), coping with burdensome situations appears as a significant indicator of the quality of life. She distinguishes between two terms – adaptation and coping. According to her, adaptation means coming to terms with the ordinary and increased burden (within limits of our tolerance of burden, we apply methods of solving burdensome situations to which we have predispositions and experience).

Coping represents a higher level of adaptation that is necessary for dealing with limit and extreme burden (we find ourselves at the limit of our tolerance of burden, it's a matter of solving sudden, unusual burdensome situations which often overreach our resources; we need to find, examine, test and adopt necessary coping methods first). Nakane (2006) understands coping with life burdens as a dynamic process in which it comes to transactions (mutual interactions between a person and a given situation). On one hand, there is a given person (or a family) with certain resources, possibilities, values, beliefs. On the other hand, there is a disability imposing certain requirements on a person (or a family) and influences them variously.

The results of this study are agreed with a study done by (Andrea,2015), she showed that there was the only big difference of quality of life of a family with a child with a disability and without disability in the environmental domain.

Table 1. Comparison between mother's quality of life domains in case and control groups

Mother's quality of life domains	Case	Control	P-Value of Independent t-test
	M ± SD	M ± SD	
General domain	6.17 ± 2.09	8.10 ± 1.54	< 0.001
Domain 1/Physical	23.5 ± 3.97	27.0 ± 3.51	< 0.001
Domain 2/Psychological	20.8 ± 3.84	23.3 ± 2.81	< 0.001
Domain 3/Social	9.18 ± 2.65	10.6 ± 2.75	0.047
Domain 4/Environment	26.4 ± 3.92	32.8 ± 4.88	< 0.001
Overall quality of life	87.2 ± 12.4	102.4 ± 11.3	< 0.001

Table 2. Comparison between father's quality of life domains in case and control groups

Father's quality of life domains	Case	Control	P-Value of Independent t-test
	M ± SD	M ± SD	
General domain	6.81 ± 2.09	7.78 ± 1.50	< 0.001
Domain1/Physical	25.3 ± 3.96	27.1 ± 3.58	< 0.001
Domain 2/Psychological	22.2 ± 4.08	23.9 ± 4.56	< 0.001
Domain3/Social	10.1 ± 2.86	10.1 ± 2.32	0.766
Domain4/Environment	28.0 ± 5.03	33.3 ± 4.28	< 0.001
Overall quality of life	92.5 ± 15.0	102.4 ± 12.2	< 0.001

Conclusion

There is a biggest difference between the quality of the life of parents who have a child with cancer and parents who have a child without cancer. Strikingly, in the case of parents with a child with cancer have their life more decorticated than others and need additional support. Importantly, all the social and health services in the governorate in every country need to focus on providing support to the families and designing a specific educational program for parents who have a child with cancer.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, University of Sulaimani and all experiments were carried out in accordance with approved guidelines.

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Sleep habits and Physiological Pineal Gland Calcification (A Magnified Topographical Evolution Study)

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Abstract

Physiological pineal gland calcification is a frequent finding in computed tomography brain (CT) and its volume, shape and density is variable. Melatonin is the main product of pineal gland, and its role in sleep is well documented. Two-hundred ten patients were enrolled in this cross-sectional study done at Al-Sadder Medical City-Middle Euphrates Neuroscience Center (MENC)-Najaf; between February 2016 and December 2016. Several PGC parameters include PGC density, PGC volume and PGC cross sectional area were measured. We took their demographic information and their BMI and then questions about their sleep habits was applied to patients. the study group was ($n=210$) was referred for Brain CT for different reasons, mean age (43.9 years), of them male was (118), and female was (92) they represent (56.2% and 43.8%) respectively, that had insomnia was (85, 40.5%), the mean of pineal gland calcification volume (mm³), density (Hu) and cross sectional area (mm²) was (57.5, 131 and 12.5) respectively. In this study there were a strong correlation between PGC density and age, male gender and use of diazepam and Sleep with light on at night & decreased hours of night sleep showed statistically significant correlation with PGC volume and thus on PG function.

Keyword: pineal gland, calcification, sleep habit, topographical evaluation.

Introduction

The pineal body is shaped like a pinecone, from which the name pineal is derived ¹. It has a role in controlling the/onset of puberty. The pineal body also influence the sleep-wake cycle ¹. The pineal gland (PG) measurements about 7.0 x 3.0 x 6.0 mm and is located in between the thalamic bodies ². Normal sizes is 14 mm ³.

PG action in humans are still not well understood, its neuroendocrine transducer that forms an integral part of brain. The PG mainly synthesis of melatonin (MEL) is made and secreted in/rhythmic fashion, in the darkest time of the day-night cycle. MEL synthesis and release is supervised by an endogenous/circadian system and is also inhibited by light. Recent studies show a relationship between endogenous MEL levels and the puberty onset. Finally, there was abnormal daily MEL profiles in many of psychiatric disorders and neurological diseases but the important of these was unclear ⁴.

Melatonin plays roles in various physiological functions including, inducer of spontaneous sleep, protecting cell death so it has anticancer effect⁽⁵⁻⁸⁾.

MRI was the best method for imaging of pineal gland and it is superior to CT and radiograph, although it has poor sensitivity to evaluate calcification ⁹.

Calcification of PG is a physiological intracranial calcifications that can be said that as all age-related physiologic and neurodegenerative calcifications that are unaccompanied by any evidence of disease and no pathological cause. The calcification increased with increase ¹⁰. With PGC its function will be hampered to an extent, affecting the synthesis of melatonin. If this happens we expect sleep problems. It can also effect on human sexual development and function. Some of PGC is due to increase amount of fluoride in water, other causes of PGC can include: Halides, Calcium supplements and Pesticides⁽¹⁰⁻¹²⁾. PGC lead to sleep related disturbances and daytime tiredness ¹³.

Patients and Method

Two-hundred ten patients were enrolled in this cross-sectional study which is conducted at Al-Sadder Medical City-Middle Euphrates Neuroscience Center (MENC)-Najaf, from February 2016 through December 2016. All patients were referred for non contrast brain CT scan study (spiral computed tomography scan Brilliance 64, Philips 2010) for various neurological conditions.

Inclusion criteria: any patient aged 10 years or older who already had brain CT scan and agreed to be enrolled in this study, the patient should be fully conscious and oriented to time, place and person.

Exclusion criteria: patients aged less than 10 years (as this study concerned with physiological PGC), patients with pineal gland lesions, those who are disoriented to time, place and person, those who had emergency condition, and those with hearing impairment (as this study include list of questions).

Two-hundred ten patients were participated after obtaining their or their family verbal consents and approval from local ethical committee of Medicine a middle Euphrates neuro-center.

The data about patients age ,gender, BMI, Hx of smoking, their occupations and any history of chronic physical illness was obtained.

PGC appears either as oval, round or irregular, we measure its density, volume and cross sectional area (CSA). The PGC density were measured by two methods 1st one manually by taken the density of 1.5mm area in the central of the calcification area and the 2nd method automatically by the machine, the two method show no significant difference statistically so that we depend on the manual method.

To assess the sleep pattern of each patient we applied a list of questions that were used in different sleep researches^(14,15) as the following.

1. time of going to bed

2. time of awake
3. hours of sleeping
4. night awake
5. sleep with light on
6. use of media for more than one hour before sleep
7. insomnia
8. wake with alarm
9. drink coffee or tea at night
10. working during day or night
11. Use of sleep medication

These questions were applied to all patients with details about their sleeping adequate hours and their night habits include sleeping with light on during night, uses of media before sleep more than one hour and consumption of tea or coffee.

Data were entered and analyzed using the statistical package for social sciences (SPSS) version 24, 2015, IBM, USA. Descriptive statistics were presented as mean, standard deviation, frequencies and percentages. Student's t test (independent model) was used to compare mean Pineal gland volume, density and cross sectional area across the (Yes vs. No) subgroups. Analysis of variances (ANOVA) test was used to compare the mean across the age, BMI categories and physical activity subgroups.

Results

Two-hundred ten patients were enrolled in this study. Those patients were referred for brain CT scan noncontract study for various neurological conditions and we correlated the present of PGC with different parameter and the result were as the following:

Table 1. Demographic characteristics of the studied group (N=210)

Variable		No.	%
Age (year)	10-20	18	8.6
	21 - 30	39	18.6
	31 – 40	48	22.9
	41 – 50	31	14.8
	51 – 60	35	16.7
	> 60	39	18.6
	Mean ± SD	43.9 ± 17.6	-
	Range	10 – 86	-
Gender	Male	118	56.2
	Female	92	43.8
Occupational Physical activity	Light	83	39.5
	Moderate	92	43.8
	High	35	16.7
Smoking	Yes	47	22.4
	No	163	77.6
BMI category	Underweight	8	3.8
	Normal	68	32.4
	Overweight	74	35.2
	Obese	60	28.6
	Mean ± SD	27.9 ± 7.1	-
	Range	15.6 – 46.2	-

In this table show that this study include one hundred eighteen male and ninety two female and only forty seven was smokers and only sixty eight patient within normal BMI. The patients enrolled in this study were (60) patient with hypertension and (25) patient with diabetes mellitus and (12) patient with history of different tumors and (12) with chronic physical pain the other remaining (101) had no medical history of illness.

Table 2. Distribution of sleep related parameters

Variable	No.	%	
Sleep with light on	Yes	70	33.3
	No	140	66.7
Media use before sleep	Yes	59	28.1
	No	151	71.9
Sleep Medication use	Yes	23	11.0
	No	187	89.0
Insomnia	Yes	85	40.5
	No	125	59.5
Awake with alarm	Yes	43	20.5
	No	167	79.5
Tea or coffee intake at night	Yes	48	22.9
	No	162	77.1
Day or night work	Day	197	93.8
	Night	13	6.2

This table shows that patients that sleep with light on were seventy and those use sleep medication were twenty three while those with insomnia were eighty five and those who drink tea or coffee were forty eight and only thirteen were work at night.

Table 3. Mean values of Pineal gland calcification parameters of the patients and Correlation with sleep hour (N=210)

Parameter	Mean	SD	Minimum	Maximum	Correlation coefficient (R)	P. value
PGC volume (mm3)	57.5	62.8	0.2	375.6	-0.223	0.001*
PGC density (HU)	131.0	67.1	6.3	350.0	-0.038	0.585
Cross sectional area of PGC (mm2)	12.5	10.3	0.2	48.6	-0.060	0.389
*Correlation is significant at the 0.05 level						

There was a significant inverse correlation between PGC volume and the hours of sleep (P= 0.001). While there was no significant correlation between time spend in the bed neither with PGC density nor with cross sectional area (P= 0.585 and 0.389) respectively.

Table 4. Correlation between sleep related variable and PGC volume, density and cross sectional area, of the studied group (N=210)

Variable	Mean	Pineal gland volume		P. value Mean	Pineal gland density		P. value Mean	Cross sectional area of PGC		P. value
		SD			SD			SD		
Sleep with light on	Yes	74.1	9.0	0.03*	132.5	7.3	0.89	12.2	1.2	0.55
	No	53.6	4.9		131.2	5.9		13.1	0.9	
Media use	Yes	57.3	6.9	0.67	128.1	8.1	0.63	13.1	1.2	0.80
	No	61.6	5.6		133.0	5.6		12.7	0.9	
Sleep medication use	Yes	57.4	12.7	0.82	164.1	18.4	0.013*	16.1	2.7	0.098
	No	60.7	4.8		127.6	4.6		12.4	0.7	
Insomnia	Yes	62.7	6.8	0.66	129.3	7.7	0.68	11.7	1.0	0.19
	No	58.7	5.9		133.2	5.7		13.6	1.0	
Awake with alarm	Yes	66.5	10.5	0.48	140.6	10.0	0.32	14.2	1.8	0.35
	No	58.7	4.9		129.3	5.2		12.5	0.8	
Tea or coffee intake	Yes	71.4	9.7	0.17	134.6	11.0	0.72	16.2	1.8	0.012*
	No	56.9	5.0		130.7	5.0		11.9	0.7	
day or night work	Night	61.6	4.7	0.27	131.0	4.8	0.61	12.8	0.7	0.73
	Day	40.9	13.5		141.0	18.6		13.8	2.9	

There was a significant correlation between PGC volume and sleep with light on during night ($P = 0.03$). While there was no significant correlation with other parameters, ($P > 0.05$). There was a significant correlation between PGC density and use of sleep

medication (diazepam) before night and ($P = 0.013$), while no correlation found with other parameter. There was a significant correlation between PGC cross sectional area and night intake of tea or coffee, ($P = 0.012$) while no correlation with other parameter ($P = 0.35$ and more).

Table 5. Correlation between demographic characteristics and Pineal gland calcification volume, density and cross sectional area of PGC, of the studied group (N=210)

Variable Mean		Pineal gland calc. volume		P. value Mean	Pineal gland calc. density		P. value Mean	Pineal gland calc. Cross sectional area		P. value
		SD			SD			SD		
Age (year)	≤ 20	73.0	16.7	0.65	97.4	10.9	0.038*	11.7	1.8	0.63
	21 - 30	65.6	9.0		120.9	9.1		11.5	1.5	
	31 - 40	47.8	8.7		123.9	10.0		12.8	1.5	
	41 - 50	57.0	9.9		137.5	9.6		13.5	1.9	
	51 - 60	67.3	9.7		153.7	12.8		15.4	2.2	
	> 60	61.0	14.3		143.1	12.2		11.8	1.4	
Gender	Male	62.0	5.9	0.68	139.9	6.5	0.041*	12.9	0.9	0.85
	Female	58.3	6.9		120.9	6.3		12.7	1.1	
BMI categories	Underweight	39.5	15.7	0.79	124.5	30.7	0.68	7.5	1.6	0.36
	Normal	63.9	7.4		128.5	8.3		12.6	1.3	
	Overweight	58.5	7.0		139.3	7.6		14.0	1.3	
	Obese	61.1	9.7		126.7	8.4		12.4	1.3	
Physical activity	Light	64.5	7.8	0.69	137.5	8.0	0.60	13.5	1.1	0.70
	Moderate	59.0	6.3		128.1	6.4		12.2	1.0	
	Heavy	53.9	9.7		127.3	11.2		13.0	2.1	
Smoking	Yes	66.9	8.7	0.43	141.8	10.8	0.23	12.7	1.6	0.95
	No	58.5	5.2		128.7	5.1		12.8	0.8	

This table shows that there is no significant correlation between PGC volume and cross sectional area with different selected demographic characteristics ($P = 0.43$ and $P > 0.3$) respectively. There was a significant correlation between PGC density and the age as well as male gender ($P = 0.038$ and $P = 0.041$) respectively.

Discussion

Since its first description autopsy specimens skull radiographs by Schüller in 1918¹⁵, the exact mechanisms behind the development of calcification in pineal gland are difficult to found, although there is an evidence (experimental), that calcification may be an indicator of the past secretory activity of the gland and/or of degeneration. The increased incidence of calcification in pineal gland with person's age it may suggests cerebral degenerative changes¹⁷.

This current study shows correlation between PGC (density, volume and CSA) primarily with patient's sleep pattern and secondarily with several other selected parameters. in regard to sleeping pattern this study found that there was a significant correlation between PGC density and sleep with light on ($P=0.013$), this finding was comparable with a study done by [Bogdan Lewczuk](#) (2014)¹⁸ They discuss relationship between light exposure and MEL with breast cancer risk, they found there was a significant correlation between use of light on and production of MEL which result in increased PGC density. Another study was done by Nathan PJ¹⁹ showed that plasma MEL concentration which is inhibited by light have indicated this may be related with PGC; although no direct study correlate the PGC and sleep with light on during night as they depend indirectly on the level of MEL.

Conclusion

Age showed statistically significant correlation with increase PGC density and in turn on PG function, male gender showed statistically significant correlation with increase PGC density and in turn on PG function. Use of diazepam showed statistically significant correlation with increase PGC density and in turn on PG function, sleep with light on at night and decreased hours of night sleep showed statistically significant correlation with increase PGC volume, and tea or coffee consumption at night showed statistically significant correlation with increase cross-section area of PGC. And physical activity, BMI, smoking and past medical history showed no significant correlation with other PGC parameters.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Radiology, AL-

Sadder Medical City and all experiments were carried out in accordance with approved guidelines.

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Investigation of Microbial and Mineral Contamination of Imported Meat

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Abstract

The study was carried out for the purpose of investigating the microbial and mineral pollutants in the imported red meat. This research included field work and random sampling of the markets of Diwaniya Governorate. In addition, laboratory tests were carried out on samples from the following countries: (Saudi Arabia, Turkey, Jordan, Lebanon) in the laboratories of the Department of Life Sciences. Some bacterial species were investigated in the studied meat samples. Microbial contamination The results of the study showed a high level of bacterial content and the results were the emergence of Staph bacteria. aureus in the nutritious dish. The other dishes showed no growth due to the good storage of meat. The dish in which the bacteria appeared was due to poor storage or preservatives used in the storage process. As for the chemical analysis of heavy metals using the Atomic Absorption Spectrometer technique, the concentrations were as follows: Concentration of the copper component (0.013-0.310) $\mu\text{g} / \text{g}$, while the concentration of the lead element (0.001-0.111) $\mu\text{g} / \text{G}$; for cadmium, its concentration was 0.001-0.004 $\mu\text{g} / \text{g}$ and the concentration of chromium was 0.003-0.020 $\mu\text{g} / \text{g}$. The results showed that levels of copper, lead, chromium and cadmium were higher than those allowed by the World Health Organization (WHO) and FAO in some imported meat samples.

Keywords: *Microbial, Mineral contamination, Meat*

Introduction

Meat:

Meat is one of the most important and important products in human life since ancient times. The source of animal protein is of high value for its vital amino acids necessary for the survival of life. Due to the important role that meat plays in our daily lives, meat has been preserved in different ways 1. In general, this has greatly contributed to the slaughtering of the animal in a given country and its consumption in another country 2. Therefore, it was important to control these meat for the large use of people, especially the Iraqi street, Including bacteriophages, fungi and viruses to humans, causing many diseases. Meat generally contains protein, amino acids, important minerals and vitamins, including B-Complex. The nutritional value of meat depends on the content of these important ingredients, depending on the age of the animal, the type of herd, the fat content of the meat 12 . The meat is rich in important components of the human being and is also considered to be perishable

and therefore undergoes natural changes (chemical and biological), which have a major effect on the suitability of these meat for human consumption. Meat can be preserved from these natural effects by freezing (freezing meat 8 . The method of freezing does not eliminate the microbes found in meat in general, since microbial growth generally stops at -10°C for bacteria, and for fungus it can grow on meat products clearly, leaving different spots on meat products and increasing the image Especially if the tempera-ture is higher than -11°C . This results in a noticeable change in the color and texture of the meat, since the optimal temperature for meat preservation (-18°C) 5 The microbial quality of the meat and its products is determined by the presence of the numbers and types of microorganisms in which they grow, and that the meat in general is not free of these quarters, but may increase numbers if they have some approp-riate conditions such as humidity and temperature. If the growth of these organisms is not controlled in the meat during the storage period, it may result in loss of its nutritional value and nutritional characteristics, as well as the accumulation of toxic

substances in the meat and thus lead to its unfitness for human consumption 13 . The method of storage is one of the most important ways to preserve the meat and its products in terms of quality, chemical changes and oxidation products, which include: Punching and causing undesirable changes in meat in terms of flavor, smell and color and the conversion of fatty acids to unsaturated acids and this negatively affects human health 11 . Because of the increase in the importation of meat and the dumping of commodities to the Iraqi market and because of the inability of the relevant official control bodies to impose their laws on controlling the flow of meat and the environmental conditions of the improper storage and circulation of these meat and thus lead to the possibility of negative impact on the consumer and health was conducted this study, Investigation of the microbial contamination of imported meat as well as the evaluation of the content of these meat from the mineral elements (heavy metals), which included cadmium, lead, mercury, chromium, copper) to determine their suitability to Iraqi specifications and their suitability for consumption Human.

Heavy metals

Heavy metals are non-organic elements with large atomic nuclei and are characterized by a density of more than 6.5 g / cm. They can be deposited with hydrogen sulfide in an acid solution, mainly chromium, lead, mercury, zinc, cadmium, barium, silver, nickel and copper. They pose a threat to the health of living organisms if their concentration exceeds certain small limits and are usually subject to strict rules when placed in the environment.

Metal is one of the oldest toxic substances known to humans. It was started by the use of lead since 2000 BC, where primitive industrial activities began, and the metal was produced from its raw sources or as a result of silver smelting and purification. Cadmium was first known as a mineral containing zinc carbonate in 1817 AD. There are about 80 elements of the total elements that reached 105 in the periodic table of elements were considered minerals and 30 of them were found to have the potential to cause toxic effects in humans. The environmental problems caused by minerals with environmental components began with the increase in industrial processes, which led to changes in the natural and chemical properties of natural environmental components (such as low PH value), which led to acid rain. Different human activities have been found to have

an effect on increasing the presence of minerals in the environment. The pollution of heavy elements in the soil leads to serious environmental and health problems such as the high concentration of these elements to the extent of toxicity in plants, animals and humans. On the other hand, or by this study, pollution of heavy metals is one of the forms of environmental pollution resulting from human activity of industrial or agricultural. In recent years scientists have been interested in the study of heavy elements in terms of their presence in the environment and its biological impact and its relationship to human health. Food is one of the main sources of human exposure to these elements, and therefore many studies have been concerned with the use of appropriate methods to determine the extent of contamination of food these elements and determine the minimum or critical concentration allowed Of these pollutants as mentioned in previous research by the research. The contamination of heavy elements is due to polluted fodder for beef as well as polluted water and breeding near polluted environments 9 as well as to manufacturing processes as packaging materials are another source of heavy metal contamination. Mammals, including humans, are affected by heavy metals, depending on the concentration, toxicity, chemical appearance and how the organism is exposed to it. The risk of heavy metals lies in their bioaccumulation in the body, which means that the chemical concentration of these minerals in the organism increases over time as compared to its chemical concentration in the environment 4. Examples of mineral elements that affect their toxicity to the human and directly affect lead compete directly with calcium for binding to protein uptake sites in the gastrointestinal mucosa 10 Cadmium destroys fatty acids. The increase in the level of copper causes dermatitis, cirrhosis and neurological disorders, and can cause cancer 7. Chromium is used extensively in metal plating and in other industries and enters chromium into the body by inhaling vapors containing compounds Chromium is mainly a low-permeability of the skin and causes inflammation of the respiratory tract, severe inflammation of the lungs and carcinogenicity. It is good for chromium that it is eliminated directly with urine and does not accumulate in any body member.6 found that beef and sheep contained arsenic, lead, mercury and cadmium, the highest concentration of arsenic (46.4 ± 3.41) ppm in beef, and the highest concentration of lead in beef at 2.19 ± 0.28 ppm The highest concentration of cadmium was in sheep meat (37 ± 0.06) ppm and the highest concentration of mercury in sheep meat (28.55

± 76.28) ppm.

Materials & Method

1. Collection of specimens:

Meat samples were collected from the local markets of Diwaniyah, where the samples were randomly selected from meat (Saudi Arabia, Lebanon, Turkey, Jordan) and placed in clean plastic containers and a quantity of water was placed in a container. pollution.

2. Preparation of samples for the purpose of examination Preparation of specimens:

Each sample of imported meat was weighed using a sensitive balance. Each sample was placed in a clean, sterilized independent electric mixer. 225 mL water was added to each meat sample. The samples were mixed individually using a mixer for 3 minutes. 1: 10 for each imported meat sample (Clarence et al., 2009). (1) ml of dilution (1-10) was transferred to a clean and sterilized flask containing (99) ml distilled water and then a series of dilutions was worked.

3. Cultivation of specimens Culture of specimens:

After the preparation of the samples was completed and after the required drying was done and distributed in the dishes, a quantity of sterile maconkey food was poured and then cooled. These steps were re-isolated to isolate the bacteria from the imported meat and the dishes were incubated at 37 ° C for 18-24 hour.

Preparation of culture media:
Preparation of culture media:
The ready-to-use user medium is prepared according to the manufacturer’s instructions.

4. Sterilization methods:

• **Sterilization of cultivars:**

1. **Autocleave autoclave:**

The irrigated media used at the incubator were sterilized at 121 ° C (15 ° C) at 15 ° C for 15 minutes.

2. **Dry heat sterilization Dry heating:**

Sterilize the glass in dry oven for 15 minutes at 180 ° C for 2 hours.

Results and Discussion

First: Determination of microbial content:

• **Bacterial count:**

16 samples of imported meat were taken from shops in Diwaniyah. The number of total bacterial colonies developed on the mannitol medium was calculated. These numbers represented the general mean of the bacteria found in each gram of meat samples used in the imported experiment.

The results shown in Table (1) show the total number of bacteria in the studied meat species. The growth rate of imported meat ranges between 3-10 x 52 - 3-10 x 114 bg / g. Figure (1) shows the presence of bacteria

Table (1). Total number of bacteria used to detect microbial contamination in imported meat samples in Diwaniya city

Trade mark	The middle of the plant used	Dilution	Total bacteria count
Saudi Arabia	Manitol solt agar	3-10	1 10 ⁻³
Jordan	Nutrient agar Medium	3-10	Nil
Lebanon	EMB	3-10	Nil
Turkey	Medium Manitol	3-10	Nil

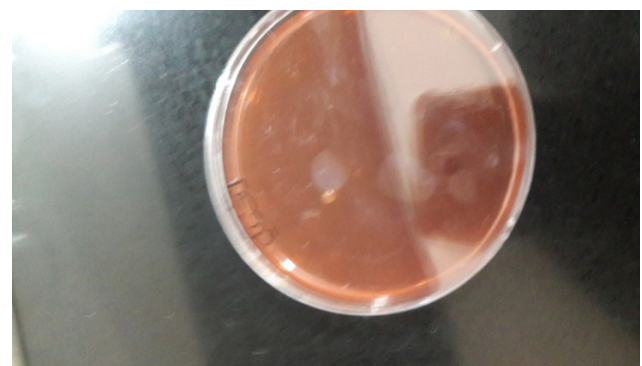


Figure (1) Growth of Staphylococcus bacteria on central Manitol Solt agar in imported meat sample

The results of the table showed a bacterial contamination with Staph. aureus bacteria in imported meat. Bacterial contamination in Saudi Arabia may be due to poor storage and may be due to the amount of preservatives used. Other dishes that have not been shown to have bacterial contamination are due to good storage of meat. We conclude from this that the cause of the contamination in the studied sample is the origin

of these meat and the health procedures followed in the production processes follow the international health conditions, the poor transport, storage and manual handling and stay away from the health conditions of storage, which may extend for long periods of the main factors of pollution as well as ways Slaughter if it is done according to Islamic law or not. The results of the total count of Staph bacteria. aureus is $1 \times 3-10$ This result came close to the results of global research 1 Staph aureus bacteria are found in the meat and penetrate within it and move from the environment surrounding all its elements to the human and this indicates the need to reduce Pollution with such microbes is one of the factors causing food poisoning in humans. According to the International Agency on Microbiological Species of

Food 3 , the positive microorganisms of the Kram dye are relatively resistant to freezing temperature and this is important in public health. The concentration of heavy metals copper, lead, cadmium and chromium in $\mu\text{g} / \text{g}$ in imported meat varied by metal and meat type. The concentration of the mineral elements in the imported meat was the highest concentration of copper (0.310) $\mu\text{g} / \text{g}$ and the lowest concentration (0.013) $\mu\text{g} / \text{g}$. For the lead element, the highest concentration was 0.111 $\mu\text{g} / \text{g}$, (0.001) $\mu\text{g} / \text{g}$ and that the concentration of the lead element was less than the normal limits allowed by the Intergovernmental Negotiating Committee and the World Health Organization and identified by a concentration of 10 $\mu\text{g} / \text{g}$

Table (2). Concentrations of heavy elements in samples of imported meat in Diwaniyah city in unit of microgram / gram

Concentration of elements ($\mu\text{g} / \text{g}$)				Trade mark
Cu	Cr	Pb	Cd	
0.061	0.000	0.111	0.002	Saudi Arabia
0.121	0.009	0.003	0.001	Lebanon
0.076	0.000	0.005	0.001	Turkey
0.078	0.000	0.003	0.002	Jordan
0.097	0.007	0.005	0.000	Jordan
0.088	0.012	0.005	0.000	Lebanon
0.110	0.000	0.007	0.001	Turkey
0.214	0.000	0.005	0.000	Saudi Arabia
0.101	0.000	0.002	0.000	Saudi Arabia
0.122	0.000	0.001	0.000	Lebanon
0.013	0.000	0.001	0.003	Jordan
0.064	0.003	0.014	0.000	Turkey
0.126	0.000	0.003	0.000	Jordan
0.024	0.000	0.001	0.000	Lebanon
0.130	0.000	0.005	0.000	Saudi Arabia
0.310	0.020	0.014	0.004	Turkey

The highest concentration of cadmium was 0.004 $\mu\text{g} / \text{g}$ and the lowest concentration was 0.001 $\mu\text{g} / \text{g}$.

The highest concentration of chromium was 0.020 $\mu\text{g} / \text{g}$ and the lowest concentration was 0.003 $\mu\text{g} / \text{g}$.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of science. University of Alqadisiyah and all experiments were carried out in accordance with approved guidelines.

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The Distribution of Hepatitis C Virus Genotypes, Viral Load and Antibody Titer among Iraqi Chronic Hepatitis Patients

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Abstract

Background: The infection by hepatitis C virus caused liver diseases such as: chronic hepatitis, liver cirrhosis and hepatocellular carcinoma. The current study aims to investigate the rate of HCV genotypes, subtypes, viral load and antibody immune response among Iraqi chronic hepatitis patients.

Methodology: During 2012-2017 period seventy-hundred and twenty two hepatitis patients were referred to Middle East Laboratory from Baghdad and other provinces asking for HCV viral load, its genotype and anti-HCV antibody determination.

Results: A cross six years records, HCV genotype 4 was the most prevalent among Iraqi chronic hepatitis patients (46.68%), then genotype 1 (37.12%). There is notable changes in HCV genotypes distribution especially during 2017, where the genotype 1 predominantly found (52.63%). Although, these genotypes were none significantly associated with gender, age, viral load or anti-HCV antibody.

Conclusion: This record indicates a recent change in the rate of HCV genotype 1 over genotype 4 infection in Iraqi chronic hepatitis patients.

Key words: HCV, genotypes, Chronic hepatitis.

Introduction

The hepatitis C virus (HCV) one of the Flaviviridae members belonging to the genus Hepacivirus (45,34). Nearly, 140 million subjects were considered as chronic HCV infected patients 36. HCV can consequently causes acute and/or chronic hepatitis, liver cirrhosis or hepatocellular carcinoma 26. The virus classified into seven genotypes (numbered 1 to 7), with multiple subtypes (e.g., subtype 1a, 1b, and so on) 51. The distribution of HCV genotypes and subtypes have been reported across the world. Genotypes 1 and 2 were reported the most common in North America, Japan, and Europe, whereas genotype 3 is mostly found in Southeast-Asia and India. Genotype 4 was the most common genotype in Middle Eastern countries, Egypt, Syria, and Saudi Arabia. Genotype 5 was most commonly reported in South Africa (26, 35, 22). HCV vaccination is so difficult because of highly genetic diversity of HCV genotypes

(20,24). In other hand, determination of an HCV genotype in patients is important for the management and treatment 49. Moreover, identification of HCV genotypes in chronic hepatitis C patients is important for more aggressive therapeutic management of certain patients. Both genotype 2 and 3 were reported to be more responsive to pegylated-interferon (PEG-IFN) and ribavirin combination therapy than those patients with genotype 1 and 4, thus require different treatment duration and dose (46, 41, 19).

In the past twenty years studies showed that viral load can be considered an indicator of response to antiviral therapy and higher viral load could be related to lower rate of response to therapy (37, 14, 21, 17, 44, 47).

This study was performed 6 years analysis of HCV viral load, genotypes, subtypes and anti-HCV antibody titer in Iraqi chronic hepatitis patients.

Materials and Method

Sample collection and setting:

A total of seventy hundred and twenty-two blood samples were collected from chronic hepatitis patients consulted by a specialist doctors referred to Middle East laboratory from Baghdad and other governorates during five years (2012-2017). Those patients were taken of all ages and both gender types, different residences and occupations.

Patients age, gender, possible cause of infection, HCV viral load, genotypes and anti-HCV antibody were determined for all patients.

Extraction of viral Nucleic acid:

After separation of serum sample, Viral RNA was extracted from each patient using specialized kit (Roche/Germany) Cat. No. 11 858 874 001.

Determination of HCV viral load:

COBAS-TaqMan- HCV testing method used to determine the HCV RNA load (Roche, German). The working master mix solution that used in the real time PCR was prepared as follows:

1- For 12 tests, 669 μ l of HCV master mix were removed and placed in a 2 ml tube.

2- Of CTM Mn^{+2} , 81 μ L were added to the 2 ml tube containing HCV master mix, the tube was cap and mixed well by inverting 10 times, the working master mix was protected from light and used within 1 hour.

3- Of working master mix, 50 μ l were pipette into each K-tube or K-tray well.

4- From each serum sample, 50 μ l added to K-tube or K-tray wells that contain working master mix.

5- Each specimen and control was gently mixed up and down three times with the micropipettor without generating bubbles.

6- The step 3 was repeated for each processed specimen and processed control until all have been transferred to K-tube and operated on COBAS Tagman 48 analyzer.

Determination of HCV genotype in chronic infected patients with HCV:

After optimizations, the dispense 6 μ l of master mix was mixed gently in the previously marked 0.2 ml test tubes and 14 μ l of extracted RNA were added to each tube and mixed carefully. The following program was run as: reverse transcription for 15 minutes at 50°C, initial denaturation at 95°C for 20 seconds, then fifty cycles of denaturation at 95°C for 15 seconds and annealing at 60°C for 60 seconds, the final step stop at 4°C.

After hybridization, the color development achieved before proceeding the interpretation of results.

Determination of anti-HCV antibody titer:

The anti-HCV was determined using electrochemiluminescence immunoassay "ECLIA" cobas e 411 analyzer. This *in vitro* diagnostic test routinely used for determination of Anti-HCV IgG antibody in serum or plasma samples.

Statistical analysis

The statistical analysis done by using GraphPad Prism7® software. Mean and standard deviation in addition to median and 25-75 confidence interval for numerical data. Frequency and percentage were calculated for categorical data. Chi-square used to estimate the possible association between studied parameters.

Results

The mean age was 37.49 \pm 13.82 years old. The male patients were 337/722 (46.68) while female was 385 (53.32). As a possible cause, 83 patients have a history of blood transfusion (11.5), followed by 58 patients whom undergone a surgery (8.03) and visiting dentist constitutes 48 patients (5.3%). The mean anti-HCV IgG is 53.01 \pm 37.16 and the mean viral load is 5 \times 10⁶ \pm 3 \times 10⁷.

In a total of 5 years genotype 4 was most frequent genotype comprising of (46.68), genotype 1 (37.12), genotype 3 was %, genotype 2 was 3.32 % and only 1 case (0.14%) was genotype 5.

Table 1: Patients characteristics and serum anti-HCV antibody, viral load and genotypes.

		Value
Age years (mean±SD)		37.49±13.82
Median (25-75 percentile)		43.74 (22-63)
Sex (%)	Male	337 (46.68)
	Female	385 (53.32)
Possible causes (%)	Blood	83 (11.5)
	Dentist	48 (6.65)
	Surgery	58 (8.03)
	Unknown	533 (73.82)
HCV Ab (mean±SD)		53.01±37.16
Median (25-75 percentile)		42.75 (30.6-60.7)
HCV viral load (copy/ml) (mean±SD)		5.E+06±3.E+07
Median (25-75 percentile)		2.E+05 (7.E+03-2.E+06)
Genotype (%)	1	268 (37.12)
	2	12 (1.66)
	3	24 (3.32)
	4	337 (46.68)
	5	1 (0.14)
	Not determined	80 (11.08)
Subtype (%)	1	151 (20.91)
	1a	86 (11.91)
	1b	31 (4.29)
	2	11 (1.52)
	2b	1 (0.14)
	3	15 (2.08)
	3a	8 (1.11)
	3b	1 (0.14)
	4	289 (40.03)
	4a	41 (5.68)
	4h	7 (0.97)
	5	1 (0.14)
	Not determined	80 (11.08)
Total		722 (100%)

Table 2: Association between HCV genotypes with years of analysis, Sex, median viral load and median antibody titer.

1		HCV genotype						P value
		2	3	4	5	Unknown		
2012 (n=140)		36	8	4	77	1	14	<0.001**
%		25.71%	5.71%	2.86%	55.00%	0.71%	10.00%	
2013 (n=201)		73	3	10	97	0	18	
%		36.32%	1.49%	4.98%	48.26%	0.00%	8.96%	
2014 (n=94)		44	0	2	35	0	13	
%		46.81%	0.00%	2.13%	37.23%	0.00%	13.83%	
2015 (n=137)		54	1	3	70	0	9	
%		39.42%	0.73%	2.19%	51.09%	0.00%	6.57%	
2016 (n=93)		31	0	3	43	0	16	
%		33.33%	0.00%	3.23%	46.24%	0.00%	17.20%	
2017 (n=57)		30	0	2	15	0	10	
%		52.63%	0.00%	3.51%	26.32%	0.00%	17.54%	
Sex type	Female (n=385)	137	4	9	194	1	40	0.129NS
	%	35.58%	1.04%	2.34%	50.39%	0.26%	10.39%	
	Male (n=337)	131	8	15	143	0	40	
	%	38.87%	2.37%	4.45%	42.43%	0.00%	11.87%	
HCV viral load	Median	7.00E+05	2.00E+05	3.00E+05	2.00E+05	2.00E+06	9.00E+05	0.096NS
	Percentile 25	7.00E+04	1.00E+04	6.00E+04	2.00E+04	2.00E+06	5.00E+05	
	Percentile 75	4.00E+06	3.00E+05	8.00E+05	2.00E+06	2.00E+06	6.00E+06	
HCV Ab	Median	38	29	41.75	51	46.33	48.9	0.435NS
	Percentile 25	27	24	26.6	34.9	46.33	32.5	
	Percentile 75	51	64	53.5	64.3	46.33	58.4	

NS=None statistical significant difference (p > 0.05).

**= High statistical significant difference (p ≤ 0.001).

Discussion

HCV infection still a major health problem in Iraq during the five years of analysis. Several records on HCV genotypes suggesting genotype 1 were predominantly distributed worldwide 42,

some of these are limited to certain geographical areas 50.It's still that no available data have described the HCV genotypes among Iraqis patients. Otherwise,many of these records lack the validity due to non-representative sample size or dealing with responsiveness to treatment.

Also, AL-Mula, et al., 2013 collected asymptomatic patients from hospitals in Najaf, Babylon, Qadisiya, Karbala and Baghdad governorates and reports the predominance of genotype 4 9 .

Al-Kubaisy, published 4 articles related to age of pregnancy 5, coinfection with HIV among hemophilia patients 7, Hepatocellular carcinoma 6, as well as history with miscarriage among pregnant females 8.

HCV genotypes distribution in the Arab gulf region reported that genotype 4 was the most common in most countries in this region, followed by genotypes 1 and 3 like, Kuwait 34 . Saudi Arabia (53,13), Egypt and is common in other MENA countries such as Jordan, Lebanon, and Syria(48, 23, 15).

In contrast to HCV genotype distribution in Iraq and other middle east countries, whereas genotype 4 the predominant one. Genotypes 1 and 3 are the most common genotypes in India, Nepal, and Pakistan, and there are large expatriate populations from these countries in the Arabian Gulf region 39 like Bahrain 28 and Dubai 2, Oman 4 it was reported that the higher rate was genotype 1 and 3. Also, different Asian populations have been reported to be infected with HCV genotype 3 like: Thailand, Malaysia, India and Pakistan 25, Mainland China(29,16). In our data, only one case have been classified to be caused by genotype 5a which is rarely reported in Punjab 3, Syria 11 , Genotypes 5 and 6 were confined to South Africa and Southeast Asia.

Of note, our data reported a highly statistically significant change of increasing distribution of genotype 1 over genotype 4 (table 2). This might be due to changing the source of infection from areas or population had have different genotype or high rate of immigrants during later years(18).

Our records didn't find an association between HCV genotype and sex distribution, this comes in agreement with studies like Alfaresi, 2011 10, Abdel-Moneim, et al., 2012 1 and

This study was the largest study in Iraq that find out that genotype 4 as a predominant genotype over last years with significant change to genotype 1 during 2017 among Iraqis chronic hepatitis patients.

Conclusion

This record indicates a recent change in the rate of HCV genotype 1 over genotype 4 infection in Iraqi

chronic hepatitis patients.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Pharmacy, Al Rasheed University College, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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In Vitro Cytotoxicity of Total Alkaloid Extract from *Peganum Harmala* L. Seeds

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Abstract

Objectives: (Investigation the cytotoxicity of total alkaloid extract of *Peganum harmala* L. seeds against tumor cell lines. **Methods:** From the seeds of *P. harmala*. total alkaloid was extracted using 80% methanol, chloro forme (at pH2 and pH10 and they chloro forme partn was driedd to gettinge the extract ofy totally alkaloidd t. The totally alkaloidss werey revealing ofd l qualitatively by Dragend0rff's, Mayer's and Hage.r's) Ireagents and estimated l quantitatively by Bromo cresol green spectro.photometry depending on the curve of atropine l calibration. (The activity of cytotoxicity was achieved by using Michigan Cancer Foundation-7 (MCF-7) breast cancer cell line and fetal hepatic cell line (WRL-68) non-tumorigenic by MTT assayi. **Resultse:** Thet t0tal content of alkal0id of *P. harmala* extract was 328.62± 2.8mg/100 g dry weight of plant. This extract drop the viability of cells in b0th cell lines, the greatest reduction happened in the concentration 400 µg/ml was 60.2± 2.8 % for MCF-7 and 66.5±2.2% for WRL-68. **Conclusion:** (The alkaloids of *P. harmala* had variable effects againtt cancery andy normale cellt linesy l depending 0n thei type of alkal0id compounds andi their concentration in the extract).

Keywords: Alkaloids, *P. harmala*, In vitro, Cytotoxicity, Breast cancer.

Introducti0n

One Of the m0st life threatening diseases l is cancer and have many health in devel0ping represented by irregular pr0liferation of cells. (The toxicity of chemotherapeutical medication typically creates a big drawback within the treatment of cancer exploitation medical care or established drugs, Plants still have monumental) potential 0ffer to produce newer medication and intrinsically area unit a reservoir of natural chemicals which will pr0ovide chemo.protective potential against l cancer ¹. (Recently varied therapies are propounded for the treatment of cancer, several of that use plant-derived product .The medicinest alwaysy playedj an imp0rtant r0le within thef world healthg). Thed healthd l medicinal l plants pr0viding av replacement space ofs l drug analysis ². l The demanda f0r planty primarily basedt l medicines, f0od supplementy, health pr0duct, prescribed drugs andy c0smetics square measure increasingi ini each l developing land devel0ped c0untries because 0f ther l growing recogniti0n l that then a naturale product aret non-t0xic, have less side effects and simply out there ³. (Secondary metabolites are developed in nature's variety

of completely l different plantd speciess, insects, fungi, algae an Andy pr0kary0tes throughout their courses 0f evoluti0n in monumental diversity). Plantr sec0ndary metabolites cani bei definied asthe l compounds that playedi a vital r0le within the interacti0n 0f thei plante withn it surr0unding, however haven't any such role in maintaining the basic life processes in plants ⁴. (The alkaloids represent a bunch of natural product that has had a significant impact throughout history on the economic, medical, political and social affairs of humans). Several of those agents have potent physiological effects on mammalian systems l moreover as different organisms, and as a consequence, some represent vital therapeutic agents ⁵. In fact, alkal0ids are among the most vital active parts in plants, and a few of those l compounds have already been with success developed into therapy medication. like campt0thecin (CPT), a famed topois0merase I (Top I) inhibit0r ⁶, and lvinblastine, that interacts with l tubulin ⁷. (Many alkaloids exhibit important biological activities, like the relieving action of ephedrine for bronchial asthma, the analgesic action of morphine, and the anticancer effects of vinblastine) ⁸. The target of our study was to analyze the cytotoxic

activity of total alkaloid extract of *Peganum harmala* L. against breast cancer cell line Michigan Cancers Foundation-71 (MCF-7) and non-tumorigenic fetal hepatic cell line (1WRL-680).

Material and Method

Plants Collection

The *Peganum harmala* seeds were collected from the cultural space in Babylon Province, Iraq, throughout March 2019. The plant seeds were washed with tap water to get rid of dirt and so with distilled water (DW), and dried below shade for several days at room temperature. The seeds were ground and kept in air-light container to forestall the humidity impact and so hold on at room temperature till additional use.

Extraction of total alkaloid

Total alkaloids were extracted in keeping with Harborne⁹. Briefly, 120g of plant dry powder was extracted with 80% methanol for 124 hours continuously by Soxhlet apparatus 250 ml volume. The extract was filtered by Whatman No. 11 filter paper and then, the filtrate was concentrated by rotary evaporator below vacuum at 45°C until the solution reached to 10 ml. Subsequently, the concentrated extract was transferred to a separating funnel and 12 ml of 1N HCl was added step by step to regulate the pH value up to two, at that time the extract was washed with ten ml of chloroform three times. Then, the pH value of the extracts was adjusted to ten using 1N NH₄OH, and partitioned with ten ml of chloroform three times. The chloroform portion was dried to get the overall alkaloid extract. The dried extract was weighed, and preserved in a clean container at four °C for further investigation.

Detection of qualitative alkaloids

Some qualitative tests were performed to detect the presence of alkaloids in plant extracts by using Mayer's, Dragendorff's and Hager's reagents. (Mayer's reagent used to screen all types of alkaloids, prepared by dissolving 113.5 g of Mercuric chloride and 15 g of KI in 1000 ml DW). The tests were done by adding 1-2 ml of the reagent to 15 ml of plant extract. The formation of white

or creamy precipitate indicated the test was positive¹⁰. Also, Dragendorff's reagent was used to investigate alkaloids in plant extract. (The reagent

was prepared by dissolving 20 g of Bismuth Nitrate in 140 ml DW and 116 g of Sodium Iodide in 40 ml DW, then the two solutions were mixed together). The tests were performed by adding 1-2 ml of Dragendorff's reagent to 15 ml of the plant extract, the formation of a prominent orange color indicated the test was positive¹¹. Hager's test, Hager's reagent is a saturated solution of Picric acid, was done by adding a few drops of the reagent to the plant extract and appeared a yellow color precipitate that indicated the presence of alkaloids¹².

Estimations of total alkaloid content

The total alkaloid content was calculated by Bromocresol Green (BCG) spectrophotometry technique^(13, 14). (The BCG reagent was prepared by heating 169.8 mg of bromocresol green with 13 ml of 12N NaOH and 5 ml D.W. till fully dissolved and so, the solution was diluted to 1000 ml with DW). Phosphate buffer solution (pH 4.17) was prepared by adjusting the pH of 2M sodium phosphate (171.6 g Na₂HPO₄ in 1 DW) to 14.7 with 0.12 M citric acid (142.02 g citric acid in 1 DW).

BCG assay: A 10 mg of the plant extract was dissolved in 2N HCl and then filtered. This solution (1 ml) was transferred to a separating funnel and washed with 10 ml chloroform (3 times). (The pH of the extract was adjusted to neutral with 0.11 N NaOH. Then 15 ml of BCG solution and 15 ml of phosphate buffer were added to the extract). The mixture was shaken and the complex was extracted with 0.1, 0.2, 0.3 and 0.4 ml chloroform by vigorous shaking, the extract was then collected in a 110 ml volumetric flask and diluted with chloroform. The absorbance of the complex in chloroform was measured at 1470 nm against a blank prepared as above but without alkaloid (plant extract)¹⁴. The total alkaloids were calculated depending on the calibration curve of atropine.

The standard curve was constructed using (0.4, 0.8, 1.2, 1.6 and 2 ml) of atropine standard solution (1 mg/10 ml) and each of them was transferred to different separating funnels as the previous method. The absorbance of the complex in chloroform was measured at 470 nm against a blank prepared as above but without atropine¹³.

Cytotoxic activity

To determine the cytotoxic activity against two kinds of cell lines including breast cancer cell line MCF-7 and non-mutagenicity fetal hepatocyte WRL-68 using 13-[14, 15 – dimethylthiazoly]-12, 15-diphenyltetrazolium bromide (MTT dye). (Briefly, 1100 µl cell suspension was added into 96-well flat-bottomed microculture plate wells, separated plate for each cell line in triplicate, and treated them with 100 µl partially purified plant extract), incubated for 24 h, centrifuged to remove the dead cells. Aliquot of 100 µl of 12 mg/ml MTT dye was added to each well and the incubation was continued for a further 4 h, then 50 µl of solubilization solution of D.MSO was added into each well. After complete solubilization of the dye, the absorbance of each well was read at 620 nm with an ELISA reader. The mean absorbance for each group of replicates was calculated. The percentage viability of cells exposed to various treatments was calculated as follows¹⁵:

The control was the non-treated cultures in all experiments that contained cells in the medium only. (This assay was held at the Centre for Natural Product Research and Drug Discovery, Department of Pharmacology, Faculty of Medicine, University of Malaya / Kuala Lumpur, Malaysia).

Statistical Analysis

(Statistical analysis of the data was performed by using SPSS 14.0 version using one-way analysis of variance (ANOVA) according to the method described by Levesque¹⁶ (numerical) data were expressed as mean ± SD. $P < 0.05$ were considered to be statistically significant).

Results and Discussion

The qualitative analysis of *Peganum harmala* seed extract appears the presence of alkaloids by changing the color in each reagent (Table 1). The quantitative content of alkaloid compounds in the *P. harmala* seeds extract was 328.62 ± 2.8 mg/100 g DW. The results of cell viability assay based on the MTT assay using MCF-7 and WRL-68 cell lines which treated with total alkaloid extract of *Peganum harmala* seeds appeared the percentage of cytotoxicity increased with increasing concentration of alkaloids (Table 2). Also, it had a cytotoxicity effect on both cancer and normal cell. The highest reduction of viability was observed at the highest concentration (400

µg/ml) of *Peganum harmala* alkaloid extract was 60.2 ± 2.8 % for MCF-7 and 66.5 ± 2.2 % for WRL-68.

Table 11: Qualitative detection of *P. harmala* alkaloid extract using different reagents

Reagent	Result	Resulted color
Mayer's reagent	+	Creamy precipitate
Dragendorff's reagent	+	Orange color
Hager's test	+	Yellow color

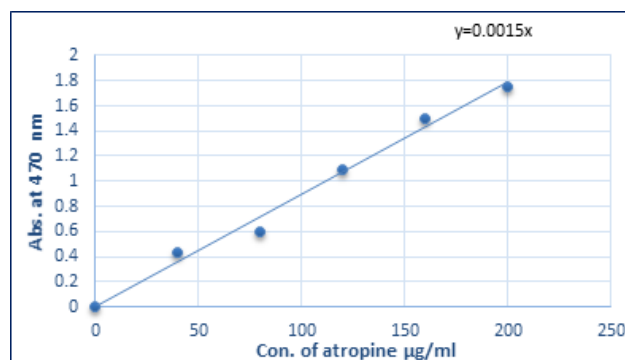


Figure 1: Calibration curve of the atropine using BCG methods at 470 nm

Table 2: Cytotoxic activity of the total alkaloids of *P. harmala L.* against the breast cancer cell line MCF7 and normal cell line WRL-68.

Alkaloid extract con. µg/ml	% Viability of WRL ± SD	% Viability of MC7 ± iSD	IC50 of MC7 µg/ml
1400	66.5 ± 12.2	60.2 ± 12.8	5.191e+006
1200	85.16 ± 1.50	78.90 ± 1.30	
100	88.50 ± 2.00	85.14 ± 4.00	
50	93.12 ± 0.70	96.05 ± 2.90	

(The alkaloids are the most active principles present in the seeds of *P. harmala*. Extraction of total alkaloids from the seeds of *Peganum harmala* plant has achieved a high yield, but still a low yield) compared to bibliographic data reported by Bukhari *et al.*¹⁷. That it could be explained by the use of a different

extraction technique and solvents. The range of alkaloid concentration necessary to elicit the anticancer effects is wide^(6, 7) and not all alkaloids can react with IBCG dye¹⁴. Therefore, due to the lack of a general method to estimate all types of alkaloids¹⁸, the method described in this study can be used for the determination of a special group of alkaloids^(13, 19, 20). The IBCG can react with a certain class of alkaloids and some alkaloids do not react with this reagent^(14, 21).

P. harmalay has been used in traditional medicine, but remains a poisonous plant for humans and animals. So, the alkaloid extract of *P. harmalay* seeds had anticancer activity to reduce the growth of cancer cell, also it had inhibited effect on normal cell. This plant is a rich source of β -carboline alkaloids, which constitute the majority of alkaloids of *Peganum harmalay*¹⁷. (The compounds that inhibit cancer initiation are traditionally termed (blocking agents), these bioactive components present in plants can prevent carcinogenesis by blocking metabolic activation, increasing detoxification, or providing alternative targets for electrophilic metabolites²². (They may act by preventing the interaction between chemical carcinogens or endogenous free radicals and DNA, thereby reducing the level of damage and resulting mutations which contribute not only to cancer initiation but also progressive genomic instability and overall neoplastic transformation). Protection may be achieved as a consequence of decreased cellular uptake and metabolic activation of pro-carcinogens and/or enhanced detoxification of reactive electrophiles and free radical scavenging, as well as induction of repair pathways⁽²³⁻²⁵⁾. (This activity of inhibition may be due to the nature of the compounds found in each crude extract and their interaction with the metabolic nature of each type of cancer cell or may be due to the effectiveness of some enzymes that act as antioxidants especially in cancer cells^(26, 27)).

Conclusion

Plant alkaloids had variable effects against cancer and normal cell lines depending on the type of alkaloid compounds and their concentration in the extract. Also, these alkaloids need further purification and tested against different cell lines to determine their effectiveness.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology and all experiments were carried out in accordance with approved guidelines.

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Psychological Factor Affecting on Performance Thinking among the Pupils: Mentally or Spiritually Concerned with the Aspects in Students' Acquisition

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Abstract

The study adopted the experimental approach as a methodology for conducting research, The experimental design was adopted with partial adjustment to adjust the research variables, before applying the experiment, the researcher compared the two groups for the purpose of obtaining accurate and objective results in the following variables (The chronological age calculated in months, half-year grades, parental achievement) the researcher prepared the implementation requirements of plans, objectives and tests for the two research groups, after completing the experiment, the researcher applied the research tools to the two research groups . After correcting the students' answers, each student received data for the experimental group and the control, the data were statistically processed by the TEST for two independent samples and showed, and the experimental group studied according to the fruit tree strategy was superior to the control group that was studied in the normal way in the variable scholastic achievement.

Keywords: *Psychological Factors, Performance, fruitful tree strategy, achievement.*

Introduction

The problem of learning grammar in Arabic is one of the most complex educational problems whereas the grammatical subjects alienate the students and make them tired and hard to learn intractable for students and teachers alike ⁴. Therefore, the researcher believes that there are several factors may be interconnected and the difficulty of the pupils, which leads to the weakness of the level of students in the rule grammar in Arabic and these factors lie in the difficulty of grammatical rules , the abundance of rules , their ramifications, and the curriculum and methods used in teaching and the competencies of teachers, the researcher herself felt this weakness through the field work in teaching, it was noted that students memorize grammatical rules without application or without much benefit, and the factors of difficulty are:

The first factor : it is the difficulty of grammatical rules of the complexities developed by the authors in advance, and because of their enactments and divisions based on extrapolation and balancing (Zaer and Sama, 2013, p. 61)., the reasons that are related to the nature of the material grammatical rules, and their ramifications

and the abundance of details and the exclusive teaching in the formal aspects of building the structure of the word or the most recent and non-realization of the principle of functionalism in their teaching (Zayer and Sama, 2016, p. 59). The second factor is the curriculum with the highest percentage of students' weakness in grammar in terms of confusion in the composition and the imbalance in the content and inability to deliver material and bring it to the minds of learners and this was not the result of the current circumstances, but it has been since ancient times like other books of the curriculum did not perform the function that was developed ⁸, and The third factor is the methods of the used teaching. The researcher believes that the methods of teaching the rules used by the teacher do not attract the attention of the students to the lesson and that it became a problem of educational problems which the teachers praised by referring to the weakness of their students on the one hand and their symptoms on the other. The need to search for methods and methods appropriate to the age of students and the stage of study in which they are. The fourth factor: The researcher considers the weakness of some teachers' competencies in presenting the lesson inside the classroom. Therefore, the secondary education sector working paper (1980) pointed out that there is a weakness in the teacher

preparation programs in the required scientific direction.¹¹ so the researcher decided to use a new strategy in the teaching of Arabic grammar in the hope of success and alleviate some problems in teaching this article. The current research attempts to answer the following question: What is the effect of the Fruit Tree Strategy on the achievement of the grammar of the Arabic language among the pupils in the fifth grade of primary school ? The education is the starting point of supporting the creativity, the innate lines that shape the preparation and accept the creative trends, but confirmed and reflected the education received by the child since childhood, and education is a multilateral system and relations, do not know the introversion of self, but is seen as an integrated device working in the framework of the kinetic relationship with the rest of the devices in the social and civil context¹⁴ and the education cannot achieve its goals in society except by means of communication through which the application of scientific educational systems, namely language, it is the basic means used by man since ancient times in the process of understanding with the other, and was able in light of the transfer of ideas and experiences of life, to be a way to build his own life and build his community⁹ Therefore, the language is the instrument of human civilization and the basis, the first civil invention to which man extended its existence; it is the instrument of divine messages and earthly doctrines². Language is a key element in controlling the behavior of an individual, It is part of the entity cannot dispense with it, it uses it as water and air, And if not aware of its potential, importance and complexity, then language is an important issue in the life of mankind, It is not only a means of understanding, but also an affirmation of their existence, a symbol of their unity and of their unity,

Methodology

It includes a presentation of the procedures followed to achieve the objectives of this research in terms of

adopting the appropriate method, the appropriate design, the research community, the method of selection of the sample and the methods of parity of the two groups and a presentation of the research requirements, tools and how to apply them.

The Experimental Design:

While the goal of the research was to identify the effect of the fruit tree strategy as an independent variable in the achievement of students as a dependent variable, the researcher adopted experimental design with partial control in two equal groups (experimental study according to fruit tree strategy

The research community and its sample

The current research dealt with the female pupils of the fifth grade primary school represented in schools (primary) Governmental Day schools at the Directorate General of Education of holy Karbala province of For the academic year (2018 - 2019), which is not less than two divisions in the fifth grade primary school , while the sample research that will be conducted in the experiment has chosen to research is (Al-Janin primary school) in the city of Karbala deliberately to implement the research procedures, and found that it includes two divisions (A - B), the researcher selected the division (A) to be the experimental group and the division (B) to be the control group according to random drawing method. The experimental group consisted of (32) students who study according to the fruitful tree strategy and (B) Traditional. (3) students were excluded from the experimental group (2) of the control group. The reason for excluding repeat students is that they have previous experience in subjects to be taught during the experiment. It may affect the dependent variable (achievement in Arabic grammar), the accuracy of the results, and are statistically excluded .

Table (1) Distribution of experimental and control research groups before and after exclusion

Groups	Division	No. of students before exclusion	No. of failures	No of students after exclusion
Experimental	A	32	1	31
Control	B	32	2	30
Total		64	3	61

Equivalence of the two research groups:

The researcher did before embarking on actual teaching by making the students of the two groups statistically equal in a number of variables that may affect the safety of the experiment and the accuracy of its results are as follows:

The students' chronological age calculated in months, parents' academic achievement and the academic achievement of mothers, grades of students in the first semester of the academic year 2018/2019 in the Arabic grammar.

Adjusting Exotic Variables:

In spite of the equivalence measures carried out by the researcher between the two research groups, The researcher tried to limit the place to avoid the effect of some variables extraneous in the secret experience, and then in its results, here are some of these variables and how to adjust them, either experimental extinction did not get a breakout situation for the group students the current research for the duration of the experiment, and the current research experience did not experience any incident that hinders its progress so it was possible to avoid the impact of this factor.

The research requirements :

The research requirements are basic and according to which the research procedure is carried out, which is as follows:

- Identification of educational material :

The teaching material that the researcher is teaching was given to the students of the two research groups during the period of the experiment (the second semester) of the academic year (2018-2019). The six subjects of grammar in the Arabic language book included the part to be taught for the fifth students.

The Behavioral Goals :

The researcher formulated 68 goals in the light of the general objectives and the content of the subject to be taught during the period of the experiment. The researcher presented the list of behavioral objectives to a group of experts and language specialists and their teaching methods, and in the educational sciences to take their views and suggestions regarding the soundness of the formulation of the objectives and the extent to

which they represent the subjects of the study content covered by the experiment.

- Preparation of teaching plans :

The researcher prepared a set of teaching plans for the experimental and control groups in light of the subjects of the book to be taught to the students. The number of teaching plans (6) plans for the experimental group according to the fruit tree strategy and the same for the control group according to the usual method.

-The research tools :

The current research requirements, there is a standard tool to measure the achievement of pupils in the fifth grade primary in the Arabic grammar for the experimental and control groups. Therefore, the researcher prepared a collection test consisting of (30) paragraphs.

- The honesty of the test : The results showed that the virtual honesty obtained the percentage of agreement (80%) by the arbitrators and specialists, and the truthfulness of the content has shown the results That all the test paragraphs are statistically significant.

- The Test stability :

The researcher used the Pearson correlation coefficient to extract the coefficient of correlation between the individual and marital vertebrates for the test. It was corrected by Spearman-Brown equation. To calculate stability in this method, the researcher adopted the sample of the survey sample which reached 100 answer sheets. On the other hand, stability was achieved using Pearson correlation coefficient (0.86) and corrected by Spearman-Brown equation (0.93).

- Application of the achievement test :

A week before the experiment ended, the researcher told the students of the two research groups that there was a test for them in the six subjects she had studied. The researcher supervised the course with the Arabic language teacher and explained how to answer the test paragraphs before the students began to answer.

- The Statistical means :

The researcher used the end-tailed T-Test for two independent samples:

The researcher used the end-tit test for two

independent samples in the parity between the experimental and control groups in the following variables: (the age of the students, the grades of Arabic grammar in the half year of the current year, and the final achievement test).

The hypothesis of the research: «There is no statistically significant difference at the level of (0.05) between the average achievement of students of the experimental group who study Arabic grammar using the cluster strategy, and the average score of students of the control group who study the same subject in the usual way.» To examine the hypothesis of the research, the statistical averages and the standard deviations of the scores of the two groups of students were extracted in the post-achievement test in Arabic grammar, and the results of the T-Test were extracted to reveal the significance of the differences between the averages. (0, 05) between the experimental and control groups on the post-achievement test in Arabic grammar and by reference to the arithmetic averages, it is noted that these differences are in favor of the experimental group. In this way, we reject the null hypothesis and accept the alternative hypothesis, which means that the fruit tree strategy positively affects the educational attainment of female students.

Conclusion

The experimental design was adopted with partial adjustment to adjust the research variables, before applying the experiment, the researcher compared the two groups for the purpose of obtaining accurate and objective results in the following variables (The chronological age calculated in months, half-year grades, parental achievement) the researcher prepared the implementation requirements of plans, objectives and tests for the two research groups, after completing the experiment, the researcher applied the research tools to the two research groups . After correcting the students' answers, each student received data for the experimental group and the control, the data were statistically processed by the TEST for two independent samples and showed, the experimental group studied according to the fruit tree strategy was superior to the control group that was studied in the normal way in the variable scholastic achievement.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the college of Basic Education and all experiments were carried out in accordance with approved guidelines.

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Determination of the Critical Care Nurses Knowledge Toward Enteral Tube Feeding in AL-Hilla Teaching Hospitals (Interventional study)

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Abstract

Background: Patients with serious illness who admitted to the critical care unit almost have a complex nutritional needs commonly require intensive nutritional care as part of the metabolic reply to disease and injuries. The knowledge of nurses and their practices toward enteral nutrition act effectively on the clinical outcome of the patients.

Aim: To evaluate the effectiveness of enteral tube feeding protocol sessions upon nurses knowledge.

Methodology: Quasi-experimental study conducted in the critical care units in AL – Hilla Teaching Hospitals, from the period (Sep.2018 to Aug .2019). Non-probability (purposive) sample were assigned to achieve the objectives of the study, (60) nurses divided to control and trail group, special questionnaire prepared to collect the data which divided on to three parts. The validity of the questionnaire obtained by review of (11) experts in the different filed, correlation used as statistical method to calculate the reliability of the study questionnaire which recorded as (r=0.76), which is statically acceptable.

Result: The presented that most of the study sample were male, between (22-26) years old, 14(56.0) and 19(95.5) were married most of them were bachelor degree holders.

Conclusion: Implementation of an educational program to the nurses' who caring to patients schultated to tube feeding record significant improvement in the nurses' level of knowledge.

Key word: *Determination, Critical Care, Nurses, Knowledge, Enteral Tube Feeding.*

Introduction

Enteral tube feeding is a proper therapeutic strategy which used in the management of special complicated cases ,advance device such as pumps may be used in spite of the traditional nasogastric tube which made the intestinal feeding easy ,annual increasing in the number of the patients who need to require such type of feeding exceed more than (20 to 25%) in the UK ,so the responsibility of the health care providers to develop their knowledge and skills in order to enhance their ability to manage this type of tube nutrition Over recent years the enteral feeding (EF) techniques have developed by using technology it become safe, comfortable and efficient practice to provide nutritional support, its become as a key --component in the management of patients with complex conditions.¹

Aspiration of recognizable gastro intestinal contents, auscultation of insufflated air, measurement of PH of gastrointestinal secretions, and observing for coughing and choking, inability to speak, or appearance of air bubbles from the end of the tube when it is hold under water level. All these methods was recommended as bedside test to check the placement of the enteral tube. ²

The care giver should assess the presence of gastric residuals by aspirating stomach contents through the feeding tube. If it's more than (100 ml) can be discarded, and the feeding dose should be postponed. For next scheduled time if the residuals are more than 100 ml in this situation feeding stopped and the physician notified feeding stopped³

A safe method of handling and storage of formula for tube feeding Patient's. The points to be kept in mind, as the hands must be washed thoroughly before handling the formula thus lessening the chances of food contamination. Regarding to temperature extremes when storing unopened formula should be avoided. The expiry date on formula containers should be checked and use of out dated formula must be avoided, the equipment and kitchen area must be checked before mixing or handling formula. Tube feeding equipment must be rinsed before and after each use, and a new formula should not be added to formula already hanging in the bag and the formula should hang for no more than 6-8 hours if continuous drip method is used and compared the adequacy of care provided in tube feeding procedure by different group of nursing personnel in CMC hospital. ⁴

If the administration of medications by oral route difficult the health care providers should think about enteral or other alternative routes such as para-enteral. The common problem of nasogastric administration is drug-food interruption which leads to patient discomfort or blockage of tube sometimes.⁵ This challenge makes the issue of improving the health care providers knowledge and practices related to gastric feeding is important, plus the multidisciplinary participation of other people such as pharmacist or dietitian is important to maintain patient safety. ⁶

Objectives: To determine the effectiveness of enteral tube feeding protocol sessions upon critical care nurses knowledge.

Result

Table (1): distribution of the study sample related to their demographic characteristics

Variable	trial (n = 25)		Control (n = 29)		C.S.
	Frequency	Percent	Frequency	Percent	
Age (Years)					
22-26	22	88.0	18	62.1	.854 (NS)
27-31	3	12.0	8	27.6	
32-36	0	0.0	3	10.3	
Gender					
Male					.656 (NS)
Female		80.0	22	75.9	
20		20.0	7	24.1	
5					
Marital Status					
Married	14	56.0	19	65.5	.201 (NS)
Single	11	44.0	10	34.5	
Educational qualification					
Secondary nursing school	0	0.0	2	6.9	.779 (NS)
Diploma	7	28.0	10	34.5	
Bachelor's degree	18	72.0	17	58.6	
Residency					
Urban	14	56.0	18	62.1	.327 (NS)
Rural	11	44.0	11	37.9	

C.S. = Contingency Coefficient; n = Number

The result in table (1) presented that most of the study sample were male, between (22-26) years old, 14(56.0) and 19(95.5) were married most of them were bachelor degree holders.

Table (2): distribution of the study sample related to their employment characteristics

Variable	Trail (n = 25)		Control (n = 29)		C.S
	Frequency	Percent	Frequency	Percent	
Experience in the critical care unit					.336 (NS)
1	21	84.0	14	48.3	
2-4	2	8.0	9	31.0	
> 4	2	8.0	6	20.7	
Work Shift					.819 (NS)
Morning	10	40.0	20	69.0	
Evening	15	60.0	9	31.0	

Table (3). Descriptive Statistics for the Values of the nurses’ knowledge about feeding and medications via nasogastric tube over Time

Feeding & Medications via NG tube	Mean	Std. Deviation
Trail Pretest	21.84	1.43411
Trail Posttest I	25.36	1.70098
Trail Posttest II	26.32	2.28910
Control Pretest	21.00	1.73205
Control Posttest I	21.00	1.73205
Control Posttest II	20.96	1.74198

Discussion

Table (1) the most of nurses in the trail group age 22-26-years 22 (88.0%), For the control group, most age 22-26-years 18(62.1%).Most of nurses in the trail group are males 20(80 %) and for the control group, most are males 22(75.9%) .More than a half in the trail group are married 14(56.0%) and for the control group, most are married 19(65.5%) .Most of nurses in the trail group hold a bachelor’s degree . More than a half of nurses in the trail group and control group reported that they have

been living in urban areas.

This result agrees with the study ⁷ which find out the nurses who participate in the study were between age group (22-28) years, married, (97%) bachelor degree holder, between (1to 5) years of experience in the critical care, while their gender was female.

The most of the nurses who participate in the present study were male because of workload in the unit and the policy of the hospitals prefer male nurses to involving all

shifts morning and evening, while female nurses cannot assign in because of social norms in our society.

Table (2) the most of nurses in the trail group have one year of experience in the critical care, 21(84 %). Of the control group, have less than one year of experience in the critical care 14(48.3%). Most of nurses in the trail group work in the evening work shift 15(60%). For the control group, most work in the morning shift 20(69). The most of nurses who work in the critical care unit usually work in complex, stressful environment with complicated cases who need urgent intervention for this reason the morning shift nurses cannot involve in three educational sessions because of the workload related to admission and discharge of patient in addition to administrative arrangement, while evening shift work long shift time nearly(18hrs). Which let them to involve in the educational sessions which take above (50min) for each session.

The most of the nurses did not attend any training courses related to tube feeding. Thus, low quality of care provided to the patients, find that the most of the nurses had no knowledge deficit due to lack if the service. This finding goes along with the study which training programs related to this issue, that an orientation program or training is helpful for the nurse to find their places in the particular working area and to be able to adjust to assigned work function.⁸

Table (3 and 4) reveals that the most of answer of nursing regarding to amount and method of feeding, nurses' knowledge about feeding and medications by nasogastric tube are with mean scores with low R.S. and their assessment is low, other regarding to delivering feeding and prepare formula are of moderate-mean scores with low R.S., and the last answer regarding managing blockage tube to administering medication is high-mean scores with high R.S in the pretest time. In the posttest time, eight items are of high mean scores with high R.S. and their assessment is high with statistically significant differences in two items, and other seven items are of moderate-mean scores with high R.S with statistically significant differences for five of them. The values of the nurses' knowledge about feeding and medications via noticeably NG tube increase by time compared to the control group (Pretest = 7.72, 7.51; Posttest II = 9.48, 7.48; Posttest II = 9.48, 7.48) respectively. Higher score means better knowledge.

Previous studies showed that the majority nurses had of the deficient knowledge related to proper drugs administration technique through feeding tubes. 70% use to crushed an enteric-coated tablet and 66.2% have crushed a sustained-release tablet⁹ the healthcare institutions need to develop strategies to enable practicing nurses to improve their knowledge and skills in medication preparation and administration through feeding tubes in hospital settings.

Related to wrong drug administration which include: ignore to assess the correct placement of the tube rated as (67.6%); the number of nurses who administering medications together (65.6%); not flushing the tube prior to medication administration were (62.5%); and not flushing the tube between medications were (86.5%). Previous study shows that when 74% of nurses had employed wrong medication administration methods to deliver medicines through feeding tubes, may reduce the effects of drugs and lead to unsuccessful treatment. Special caution must be highlighted for assessing the placement of the tube lip prior to drug administration.¹⁰

Mixing medications with the feeding formula is problematic. The scope can increase and may progress to tube obstructions. The tube obstruction was significantly higher (36.5%) than that reported in other causes (ranging from 2% to 12.5%) and it may be refer to the use of solid form medications.¹¹

A statistical significant relationship found ($p= 0.006$) between tube obstruction and incorrect reconstitution of drugs, and it may be attributable to a lack of adequate knowledge related to pharmaceutical formulations. This finding may also be explained by the deficiency in the training process for nurses, specifically regarding administration medicines, which may not include information related to pharmaceutical technology. Furthermore, the size of the tube mainly, 12F (74.2%), used in adults' patients should be between 6F to 12F.¹² are more likely to become blocked, so special precautions should be taken to prevent tube obstructions, which includes stopping enteral feeding before a drug is administered; flushing the tube before and after each feeding or every four to six hours during continuous feeding pattern, and before and after each drug administration. For patients with renal or cardiac disorder flushing volume should degrees to meet fluid restoration issue.¹³

To improve patients, care and maintain quality of care educational sessions is necessary to update and improve the health care providers knowledge and practice to promote patient's health and safety.

Conclusion

The trail group members who participate in the enteral feeding educational sessions recorded high scores related to their knowledge, the educational sessions act effectively upon the nurse's knowledge.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing-University of Babylon. Iraq and all experiments were carried out in accordance with approved guidelines.

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Molecular Detection of Pathogenic *Entamoeba histolytica* based on Amoebapore C Gene in Fecal Samples of Camels from Babylon Province, Iraq

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Abstract

The attention in the current study was paid to the identification of pathogenic *Entamoebahistolytica* (PEH) using molecular techniques targeted the amoebapore C (AP-C) gene in fecal samples of camels from Babylon province, Iraq. Fifty, 50 camels, fecal samples were collected and analyzed in a laboratory using a real-time polymerase chain reaction (RT-PCR) method to detect the amplification of the AP-C gene. The results demonstrated that 28 (56%) out of 50 samples were positive for the presence of the AP-C gene. The findings showed high efficiency rate (99.7%) of the current used technique in detecting the gene in the fecal samples of camels. The present work provides interesting data about the current presence of the pathogenic *Entamoebahistolytica* in the feces of the tested camels from Babylon Province, Iraq.

Keywords: Amoebapore C, camels, feces, pathogenic *Entamoebahistolytica*, RT-qPCR.

Introduction

E. histolytica trophozoites have some unique pathogenic abilities, and on-contact eukaryotic-cell lysing (OCECL) is considered as an important activity provided via the presence of amoebapores (Aps). Three pore-forming peptides of the AP family are included of which AP-A, AP-B, and AP-C⁹. The mechanistic approaches regarding the action of the APs are recognized by inducing OCECL via the insertion of APs into the bacterial or eukaryotic cell (EC) membranes and subsequent formation of effective lysing pores. For evaluation and confirmation purposes, it has been found that adding purified APs to ECs induced apoptosis after the occurrence of cell necrosis¹. Moreover, low trophozoitic lysing activities were detected after antisense-induced inhibition of the AP-A expression was performed. In addition, trophozoite induced liver abscesses in hamster models were recognized to be occurred in participation with low expression levels of the APs but in less virulence activities^(2,8,5). Furthermore, no expression of the AP-A gene was detected after insertion of specific transcription-silencing plasmids into the trophozoites of the *E. histolytica* trophozoites was done (6). These techniques, antisense inhibition or transcriptional silencing, provide valuable paths to determine the pathogenicity levels of *E. histolytica*.

The attention in the current study was paid to the identification of pathogenic *Entamoebahistolytica* (PEH) using molecular techniques targeted the amoebapore C (AP-C) gene in fecal samples of camels from Babylon province, Iraq.

Materials and Method

Sampling

Fifty, 50 camels, fecal samples were collected from various regions of Babylon province, Iraq. The sampling followed aseptic procedures. The samples were transported to a Lab using plastic zip logs placed in an ice box.

Extraction of genomic DNA

The extraction of the genomic DNA (gDNA) was done using Stool DNA extraction Kit (Bioneer, Korea) with considering the protocol of the kit as a guide for performing the DNA extraction. Then, the gDNA was scanned, using a NanoDrop, for its quality and quantity. The DNA was stored in a deep freezer (20°C) waiting for the next molecular identification steps.

Real-time PCR

The RT-qPCR technique was initiated to detect the

amplification, as virulence indicators of the *E.histolytica*, of the AP-C gene using specific primers and a probe, table 1, which were NCBI-GenBank- and primer3 plus-based designed and registered in the NCBI GenBank under the ID No.: X76903.1. Then, the primers were ordered from Bioneer Company, Korea.

Table 1: the AP-C primers and the probe

	Sequence (5'-3')		Amplicon
Primer	F	CCTGTTTGTACATCACTTGTGG	113bp
	R	TCAACAAGACCATCTGCTTTAGC	
Probe	FAM- TGATTTAGTCCTTGGTGGAGCAGTTG -BHQ1		

The reaction components of the RT-qPCR amplification included the use of AccuPower® DualStar™ qPCR PreMix kit (Bioneer, Korea) and preparation of the master mix depending on the company instructions was performed using 20µl of a total volume for the reaction that contained 2µl gDNA, 1µl (10pmol) for each direction of the AP-C primer, 2.5µl (20pmol) of the probe, and the total volume was reached using 13.5µl of nuclease-free water. The RT-qPCR technique was generated using MiniOpticon Real-Time PCR system under the thermocycler conditions of one-cycled initial denaturation under 95°C for 5min and 45-cycled denaturation and annealing/extension under 95°C and 60°C, respectively, for 30s and 1min, respectively.

Results

The results demonstrated that 28 (56%) out of 50 samples were positive for the presence of the AP-C gene. The CT values were ranged from 22.26 to 34.89, figure 1.

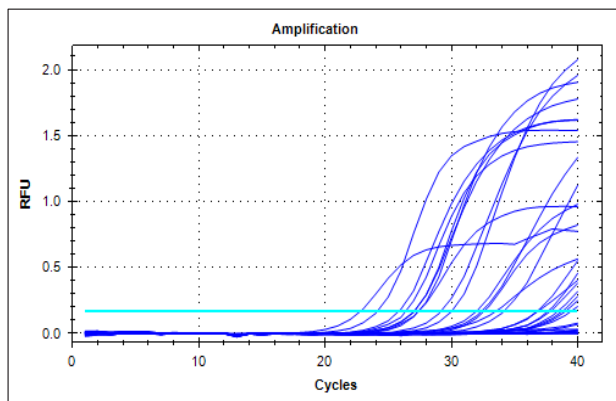


Figure 1: The amplification plot of the RT-PCR that demonstrates the AP-C gene positive amplification in Entamoeba histolytica. No amplification is shown under the threshold line.

The TaqMan probe (FAM) used in the present work showed high efficiency rate (99.7%) of the current used technique in detecting the gene in the fecal samples of camels. This efficiency was recognized using a standard curve involving DNA serial dilution of the positive samples, figure 2.

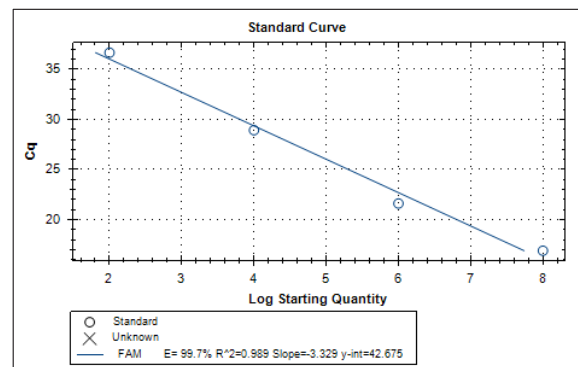


Figure 2: Standard curve of RT-PCR that shows high efficiency (99.7%) of the TaqMan probe for the serial dilution of the DNA positive samples.

Discussion

APs are well-known proteins recognized for their activities in the formation of eukaryotic cell membrane pores via establishing themselves in those membranes and generating oligomers of ionic-channel peptide-peptide interactions resulting in a lysis process of the host cells. These actions are similar to that from the natural killers (NKs) granulysin proteins and the cytotoxic lymphocyte granules (7, 1,4).

The results showed the amplification of the AP-C gene using the RT-PCR method employed in the current study, and this indicates that the *E.histolytica* positive samples were all pathogenic that induce host cell membrane lysis due to the presence of the AP-C gene product. The finding agrees with¹⁰ who detected

that full pathogenicity of *E.histolytica* is maintained by the expression of the AP genes suggesting important role of the APs in the host-cell damages upon contact by trophozoites. The critical needs for *E.histolytica* to induce a severe disease are fulfilled by the expression of the AP genes leading to promote host-cell destruction via the activities of the AP proteins inserted the membranes of those host cells. Studies have recognized this importance in the virulence of *E.histolytica* as those APs are normally present in granules located in the trophozoite cytoplasmic and projected outside those granules and the membrane upon initiating a contact with host-cell membrane.

Conclusion

In conclusion, the present work provides interesting data about the current presence of the pathogenic *Entamoebahistolytica* in the feces of the tested camels from Babylon Province, Iraq.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Collage of Veterinary Medicine, University of Al-Qasim Green and all experiments were carried out in accordance with approved guidelines.

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The Role of Hyperglycemia and Coexisting Hypertension in The Development of Diabetic Nephropathy in Type II Diabetes Mellitus

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Abstract

Background: diabetic nephropathy (D.N) is an important cause of morbidity and mortality and now the most common cause of end stage renal failure ESRF worldwide but especially in developed countries.

Objectives: the aim of the study is to know the role of hyperglycemia and co-existing hypertension HTN in the development of D.N. among patients with type II Diabetes Mellitus(DM).

Patients and Method: one hundred and twenty one diabetic patients were enrolled in a prospective observational study. Sixty six patients were females and fifty five were males. Besides full history and physical examination data were collected according to a format. At the end, these data were collected and analyzed statistically.

Results: the average age was (54± 2.1) year, female to male ratio 66 to 55 (1.2:1) the number of patients with hyperglycemia was 90. Average random blood sugar R.B.S was 259± 1.6 mg/dL. number of patients with hypertension was 71, the average of systolic blood pressure BP was 158± 6.1mmHg and diastolic was 10.2±1.1, the average duration of D.M. was (10.5± 4.2) year, the average of glycosylated hemoglobin HbA1c was 9.8± 2.1. the number of patients with D.N was 77.

Conclusion: the data showed that hyperglycemia and co-existing of hypertension were major risk factors in the development of D.N. among patient with type II D.M.

Keywords: Diabetic Nephropathy, Type II Diabetes Mellitus, Hyperglycemia, Co-Existing Hypertension.

Introduction

Diabetes Mellitus D.M is defined as fasting blood sugar (F.B.S) at or more than 126 mg/dL or a random blood sugar (R.B.S) at or more than 200 mg/dL. Plus signs and symptoms of DM plus glycosuria and recently by estimation of glycosylated hemoglobin (HbA1c) ¹. Diabetes Mellitus is a heterogeneous disorder or syndrome because overtime it results in damage or dysfunction of multiple organ-system including the kidney causing diabetic nephropathy ².

Diabetic nephropathy DN is pathologically defined as changes occurring in the kidney as result of DM ^(3,4) with thickening of basement membrane of glomeruli, widening of the slit membrane of the podocytes, an increased number of mesangial cells, and matrix

which invade the glomerular capillaries and eventually produces nodular deposits called kimmelstiel-wilson nodules ^(5,6).

Chemically high blood sugar leads to formation of advanced glycation end products and cytokines which are implicated in the mechanism of development of D.N ^(7,8)

Clinically D.N. is characterized by excretion of abnormal amount of albumin in the urine, Plus at the end stage renal failure other signs and symptoms like; tiredness, edema, frequency of urination, pallor, puffiness of the eyes and ankles, anorexia, nausea, and vomiting etc...

Diabetic nephropathy can be monitored by testing urine regularly for urinary albumin, urinary creatinine and serum creatinine (S.Cr). the amount of the protein in the urine reflects the degree of damage to the any still functioning glomeruli. The value of S.cr can be used to estimate the glomerular filtration rate(GFR).

The most common cause of (ESRF) specially in the developed countries is D.N., that affect approximately one quarter of adults with D.M in united states (9,10) and also associated with an increased risk of death in general population particularly from cardiovascular disease(9,10,11).

Diabetes Mellitus with co-existing hypertension HTN induce pathophysiological change in the kidney including inappropriate activation of the renin-angiotension-aldosterone system, inflammation, increased sympathetic nervous system activation, increased oxidation stress and other mechanisms which eventually share in the damage of the kidney ¹².

Women with D.M have a higher incidence of HTN than men (12,13,14). The earliest evidence of D.N is a microalbuminurea which means the presence of small quantities of albumin in the urine (30-300)mg per 24hours, this stage is called inceptient nephropathy because the patient looks clinically healthy and biochemially the kidney function expressed by glomerular filtration rate GFR is preserved. The disease then progressed with increased excretion of albumin to more than 300mg/24h (macroalbuminemia) , and ultimately progressed to renal impairment and failure. this stage is called overt nephropathy, in which the patient feels ill and unwell, looks pale with puffiness of the face and ankles, dry, itchy skin and frequency of urination.

Regular examination of albumin is a good monitoring test to discover the disease progress. The use of dipsticks is a useful but insensitive way for quantitative albumin measurement, the efficient way is by radioimmunoassay method (15-16-17).

The progress of D.N can be delayed, stopped, or even reversed if early discovered by; strict glycemic control , aggressive blood pressure control (below 130/80 mmHg) with the use of angiotension converting enzyme inhibitors (ACEI) or angiotension receptor blockers (ARBs), quit smoking, life style modification, control of obesity, the use of statins and aspirin etc.... (18,19).

Patients and Method

The study involved 121 patients (66females and 55males) who were proved to have type II D.M in the diabetic clinic of Al-Hussein medical city Teaching hospital – kerbala holly city from first October 2017 to first April 2019. 5mL of Blood and urine samples were collected from patients during their visit to the diabetic clinic. Data were collected according to the forma which included; Age, Sex, duration of D.M, RBS HTN, HbA1c, S. creatinine, B. urea, urine albumin and creatinie, ACR (albumin creatinine ratio). urinary albumin in mg/dL measured by turbidmetric end point method by I-chroma instrument. Urinary creatinine measured by spectrophotometer in mg/dL. ACR is the ratio of urine albumin in mg/dL to urine creatinine in gms.

HbA1c was measured by clover A1c system, any values more than 6.5% was considered high, any value of RBS equal or more than 200mg/dL was considered high i.e diabetic range.

Values of ACR 0-29 mg/g were considered normal. values of 30-300mg/g were considered as microalbuminurea, and values above 300mg/gm were considered as macroalbuminuria. At the end data results were entered in to SPSS statistical software, p-values less than 0.05 was considered significant and less than 0.01 was highly significant.

Results

The total no. of patient was 121 (66females and 55 males) and the ratio of female to male was 1.2:1, the age ranged between 30-80 years with an average of 54±2.1. age and sex distribution was shown in table1.

The no. of patients with hyperglycemia i.e. R.B.S at or more than 200mg/dL of the both sexes was 86. The no. of patients with microalbuminurea ACR 30-300 mg/g in the total samples was 41, the no. of patients with macroalbuminurea ACR more than 300mg/g in both sexes was 36. This means that the total no. of D.N patients was 77 (63.63% of the total sample) which is the prevalence of D.N in the total sample. Details seen in table 2, The no. of females with D.N was 41, for male it was 36, both sexes were distributed according to age groups, details seen in table 3.

Persistent hyperglycemia represented by raised HbA1c the relation between ACR and HbA1c was seen in table 4. The relation of pre-existing HTN and its effect on ACR was shown in table 5, the relation

between chronicity of D.M and the development of D.N is shown in table 6 this table shows that in the first five years after diagnoses of D.M one patient would have D.N microalbuminurea but when more than 20 years has passed since diagnoses of D.M 19 patints would have D.N out of 20 (95%).

Discussion

Women are more liable to develop D.M and HTN than men this is probably due to the increase in their waist circumference and body mass index (BMI) compared with men (13,20). In addition the no. of patients with D.M increases with age(see table1) which shows the female to male preponderance 1.2:1 . Although not classically: in this study hyperglycemia plays a great role in the development of D.N because it induces pathophysiological changes in the glomeruli e.g by inducing activation protein-kinase C and other product mentioned earlier which induce mesangial expansion and glomerular basement membrane thickening etc....

The usual story is that patients with DM usually started as normoalbuminuric whether controlled or uncontroled. By the passage of time(chronicity) especially if remained uncontrolled, some of them will pass to the stage of microalbuminuria.If action would not be taken to control ,stop or reverse the risk factors ,they would pass to the stage of macroalbuminuria and finally,to the end stage renal disease(ESRD)... Table 2). Practically at the time of diagnosis about 1 in 8 (12.5%) of people have microalbuminurea and 1 in 50 (2%) have macroalbuminurea²² , while in this study for comparison

only one patient out of 21 had microalbuminuria at the time of diagnosis(table6),and after 10 years of having DM ,8 patients out of 26(30.7%) had microalbuminuria and 6 out of 26(23.1) had macroalbuminuria. Sixteen to twenty years after diagnosis,10 patients out of30(33%) had microalbuminuria and 18 out of 30(60%) had macroalbuminuria, table 6.

If DM is poorly controlled for a long period of time,this would be reflected by increased HbA1C,and this would be a risk factor to develop DN .There is good correlation between the level of HbA1C and DN represented byACR, table 4.

Hypertension(HTN) is also an important risk factor if it co-exists with DM.....table...(5). The association of HTN and DM increases the pathophyeiological changes in the kidney which eventually share in the damage of the kidney tissue(22-23-24).

In 2008(67%)of American adults aged 20years&over with DM had BP greater than 140/90mmhg and hence type 2 DM and high BP increase the risk of developing diabetes related diseases such as kidney disease(or DN)..

In short female sex increasing age, increasing duration of D.M (chronicity) with persistent hyperglycemia and co-existing HTN are the major risk. Factors which play a great role in the deterioration and damage resulting into ERSD. In addition we have not to forget the role of other factors which contribute or assist in the damage of the kidney such as smoking, obesity, hyperlipidemia, genetic factors and race (26- 27-28-29-30-31).

Table 1: Age and Sex distribution of the study sample n= 121

Age group in years	Sex		Total	Percentage
	Female	Male		
30-39	5	4	9	7.4
40-49	21	16	37	90.1
50-59	17	18	35	
60-69	21	16	37	
70-80	2	1	3	2.5
Total	66	55	121	100%

Table 2: The relation between hyperglycemia (according to elevated R.B.S) and ACR in mg/gm p-value>0.01

Value of ACR		No.of normglycemics	No.of hyperglycemics	Total	
0-29		4	40	44	
D.N	30-300	1	38	39	77=63.63%
	More than 300	0	38	38	
Total		5	116	121	

Table 3: Age and Sex distribution in patients with D.N represented by ACR (30 mg/gm and over).

Age group in years	Sex		Total
	Female	Male	
30-39	2	1	3
40-49	10	8	18
50-59	11	12	23
60-69	16	14	30
70-80	2	1	3
Total	41	36	77

Table 4: The relation between persistent hyperglycemia represented by HbA1C and ACR in mg/gm. p-value>0.001

ACR	Average HbA1C
0-29	7.28
30-300	8.88
More than 300	11.38

Table 5: The relation between pre – existing HTN and ACR in mg\gm. p-value>0.01.

Value of ACR	No. of patients with pre – existing HTN	Percentage of PTS with HTN to the total no. of the sample
0-29	18	14.87
30-300	25	20.66
More than 300	28	23.14
Total	71	58.67

Table 6: The relation between chronicity of D.M (duration in years) and ACR in mg\gm. No. of patients with DN 77 (27+50). p-value>0.005.

Duration of DM.	ACR			Total
	0-29	30-300 Microalbuminuria	Above 300 Macro albuminuria	
0-5	20	1	0	21
6-10	12	8	6	26
11-15	9	5	10	24
16-20	2	10	18	30
More than 20	1	3	16	20
Total	44	27	50	121

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Alsafwa University College, Karbala, Iraq and all experiments were carried out in accordance with approved guidelines.

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Risk Factors for Congenital Anomalies in Neonatal Intensive Care Unit in Baghdad City

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Abstract

Study Aim: to assess the possible risk factors of congenital anomalies and its patterns in Baghdad city.

Methodology: a cross sectional design carried out in NICU at two main governmental pediatric hospitals in Baghdad city. Sixteen newborns medically diagnosed with congenital anomalies were involved at time of data collection. The instrument of the study concerned with newborns and their mothers' data related to the possible risk factors that may lead to congenital anomalies. The data were analyzed by using SPSS program.

Results: the result of the study revealed that (60%) of neonate were boys, and (48.3%) was preterm. For systematic body anomalies (30%) documented for gastrointestinal system, (26.7%) cardiovascular and (23.3%) central nervous system. The result also showed (66.7%) of mother > 34 years, (61.7%) with BMI ≥ 30 , (56.6%) with hypertension, (63.3%) anaemic, (60%) self medication, (80%) have positive family history, (58.3%) lived near mobile station, (56.6%) consanguinity, (70%) did not take folic acid, (65%) with low socioeconomic status.

Conclusion: most common anomalies were gastrointestinal, cardiovascular, and central nervous system. Elder mothers, increased BMI, chronic diseases, consanguinity, positive family history, and low socioeconomic status were related to increased incidence of congenital anomalies.

Recommendation: increased health awareness about the antenatal check up, concern about neonatal exam for early diagnosis, and folic acid supplements during pregnancy period.

Key words: risk factors, congenital anomalies, NICU

Introduction

Congenital anomalies are important health issue worldwide ⁽¹⁾, it is considers one of leading causes for morbidity and mortality among infants in both developed and developing countries ^(2 & 3 & 4), approximately 12.3%-32% of infants' mortality caused by secondary complications of congenital anomalies ⁽⁴⁾, in 2014 a study by WHO mentioned that 20% of premature deaths result from such anomalies ⁽¹⁾.

Globally many studies reported an increased incidence of congenital anomalies ⁽²⁾; but it is differing all over the world ⁽⁴⁾, in Islamic population the incidence was high 10-45% usually due to consanguinity marriage. In Iraq at Mosel city according to study in 2012 the mortality rate of congenital anomalies during perinatal period was 79.25% ⁽⁴⁾.

Multifactors contributing in developing this health problem ^(1, 2 & 3), most of them were unknown ⁽¹⁾, because 80% of anomalies were caused by different environmental factors and 15-20% from genetic factors ⁽⁴⁾.

Congenital anomalies prediction and prevention is a serious challenge for health care specialties ^(2 & 3), the

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early diagnosis can contribute in reducing its incidence, possible complications, and adequate planning for suitable health services (1, 2, & 3). The aim of the present study was assessing the potential risk factors and pattern of congenital anomalies in Baghdad city to reduce its burden

Method and Materials

Method

Research design: a cross sectional design was used, the study was conducted during the period first of November 2014- first of May 2015.

Setting: the study carried out in NICU at two main governmental pediatric hospitals in Baghdad city: children Welfare Pediatric Hospital and Child Center Hospital, which were newborns with congenital anomalies referral from different hospitals usually for these two hospitals.

Instrument of the study and procedure: A non probability (purposive) sample of 60 neonates with their mothers were included at time of data collection, they were selected based on neonatologist diagnosis as any functional or structural abnormalities during the first 30 days of neonates life. The consent form has been taken from neonates` guardians before data collection.

The instrument of the study was a constructed questionnaire developed by the researchers after a comprehensive literature review and researches related to the field of the study. The instrument consists of newborn and their mothers` data included their gestational age, age, sex, weight, and types of malformation system. Mother age, parity, abortion, history of previous delivery with congenital anomalies in the family, smoking history, consanguinity, socioeconomic status, mother`s health during pregnancy, medication history, medical and surgical history.

Statistical Analysis: The data were analyzed by statistical package for social science (SPSS) version 23 was used for data analysis. The descriptive statistical measures of frequency, percentage, mean, and standard deviation were used.

Results

Table (1) Sociodemographic characteristic of newborn with congenital anomalies

Sociodemographic characteristic	F N=60	percentages 100 %
1. Age		
• 1-15 day	28	46.7
• 16-30 day	32	53.3
2. Gender		
• Boy	36	60
• Girl	24	40
3. Weight		
• Less 2.5 Kg	20	33.3
• 2.5-3 Kg	30	50
• 3.5-4 Kg	10	16.7
4. Feeding type		
• Normal	4	6.6
• Artificial	52	86.8
• Mixed	4	6.6
5. Gestational age		
• Preterm	29	48.3
• Full-term	25	41.7
• Post-term	6	10
6. Mode of delivery		
• Normal delivery	20	33.4
• Cesarean section	40	66.6

This table shows that (53.3%) of neonates were at age (16-30) days, (60%) were boys, (50%) within weight (2, 5-3 Kg), (86.8%) have artificial feeding, (48.3%) was preterm according to G.A., and (66.6%) were born with cesarean section mode.

In this figure the most common types of CAs were (30%) digestive system, (26.7%) circulatory and (23.3) central nervous system.

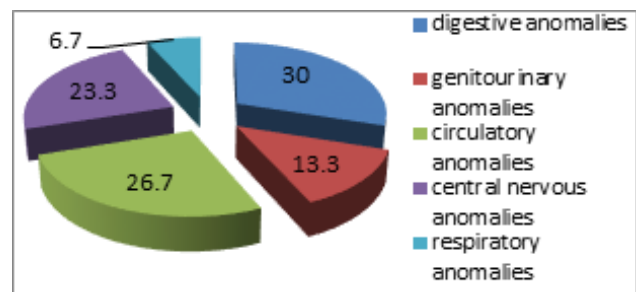


Figure (1) distribution of congenital anomalies according to body system

Table (2) incidence of congenital anomalies according to sub type of the body system

Congenital anomalies	F	%
1. Digestive system	18	100
• Imperforated anus	6	33.3
• Intussusception	4	22.2
• Cleft lip	6	33.3
• Cleft lip and cleft palate	2	11.2
2. Central nervous system	14	100
• Hydrocephaly	4	28.5
• Spina bifida	10	71.5
3. Genitourinary system	8	100
• Ambiguous genitalia	4	50
• Obstruction uropathy	4	50
4. Cardiovascular system	16	100
• A cyanotic	10	62.5
• Cyanotic	6	37.5
5. Respiratory system		
• Diaphragmatic hernia	4	100

This table shows that high percentages of congenital anomalies related to body system: for digestive system was imperforated anus and cleft palate (33.3%) for both of them, central nervous system was spina bifida (71.5%), genitourinary was ambiguous and obstetric uropathy (50%) for both, cardiovascular was a cyanotic disorders (62.5%), and diaphragmatic hernia (100%).

Table (3) possible risks factors for congenital anomalies

Risk factors	Yes		No	
	F	%	F	%
Age of mother	40	66.7		
• > 34 years	20	33.3		
• < 19 years				
BMI ≥30	37	61.7	23	38.3
Have chronic disease	12	20	48	80
Diabetes	21	36	39	65
Hypertension	34	56.6	26	43.3
psychological stress	26	43.3	34	56.6
physical violence	12	20	48	80
Have sexual violence	6	10	54	90
Smoking	18	30	42	70
Oligohydramnios	18	30	42	70
Preeclampsia	33	55	27	45
Anemia	38	63.3	22	36.7
Self-medications	36	60	24	40
Family history of CAs	48	80	12	20
Exposure to radiation	12	20	48	80
Living near mobile stations	35	58.3	25	41.7
Consanguinity	34	56.6	26	43.3
Infectious diseases	36	60	24	40
Previous child with CAs	20	33.3	40	66.7
History of abortion	35	58.3	25	41.7
Have recommended folic acid	18	30	42	70
Socioeconomic status				
• Low	39	65		
• Moderate	16	26.7		
• High	5	8.3		

This table shows that (66.7%) of mother > 34 years, (61.7%) with BMI ≥30, (80%) no chronic diseases, (56.6%) with hypertension, (63.3%) anaemic, (60%) self medication, (80%) have family history with CAs, (58.3%) lived near mobile station, (56.6%) consanguinity, (60%) have infectious diseases during

pregnancy, (58.3%) previous abortion, (70%) did not take folic acid, (65%) with low socioeconomic status.

Discussion

The results of the present study showed that most of newborns (60%) were boys. This may due to most of

congenital anomalies found in boys for unknown causes. This result supported by previous studies carried out in Egypt, Ethiopia, Iran, and Pakistan which mentioned that anomalies in boys were more than girls^(5, 6, & 10). In Mosel city from 2009-2010 found that the prevalence of CAs was (0.69%) and the ratio of boys to girls was approximate 1:1.09, and their mean of GA was 36 weeks⁽⁴⁾.

The result also showed (33.3%) of neonates borne less than 2.5 Kg, (48.3%) of them were premature neonates, and (66.6%) delivered by cesarean section mode. Usually abnormal fetal development affects on their normal weight gain and duration of gestational age, therefore the outcomes is abnormal. A study about CAs in Iran documented that (30.9%) were LBW, and (27.3%) were prematurely⁽¹⁰⁾. Another study about risk factors of CAs in Punjab revealed that (58.5%) of neonates born with low birth weight, and (30.8%) borne prematurely⁽²⁾. In Egypt study about risk factors of CAs reported LBW and prematurity were more documented with neonates delivered with CAs⁽⁵⁾. The incidence of CAs in India was increased with mother age, prematurity, and LBW⁽¹¹⁾.

Most common types of CAs in the present study were (30%) for digestive system, (26.7%) circulatory and (23.3) central nervous system. While the subtypes of systematic congenital anomalies as follow: for digestive system was imperforated anus and cleft palate (33.3%) for both of them, central nervous system was spina bifida (71.5%), genitourinary was ambiguous and obstructed uropathy (50%) for both, cardiovascular was a cyanotic disorders (62.5%), and diaphragmatic hernia (100%).

While a study in Mosel showed the abnormalities of central nervous system were the highest percentages⁽⁴⁾. In Egypt the incidence of digestive system anomalies was (38.0%), musculoskeletal system (32.9%), and circulatory system (11.0%)⁽⁵⁾. In Addis Ababa also showed the incidence of nervous system anomalies was (40.3%), orofacial clefts (23.3%), musculoskeletal anomalies (23.3%), and cardiovascular anomalies (8%)⁽⁸⁾. While in India the most common of CAs was cardiovascular, musculoskeletal and genitourinary anomalies⁽¹¹⁾. A study concerning CAs reported gastrointestinal tract anomalies were the most common anomalies followed by genitourinary and cardiovascular anomalies⁽¹³⁾. A retrospective study from 2010-2015 reported that CNS malformations were the most common anomalies (52%), followed by genitourinary (20%), and

musculoskeletal (9.33%). anencephaly was the most common anomalies of CNS (25.33%), hydrocephalus (12%), meningomyelocele (13.33%)⁽²⁾. A similar study showed CNS anomalies were (31.88%) and the most common types were anencephaly, meningocele & hydrocephalus, while genitourinary anomalies was (40.58%) and cardiovascular system (8.70%)⁽⁷⁾.

Concerning the possible risk factors of congenital anomalies, the present finding reported (66.7%) of mother > 34 years, (61.7%) with BMI \geq 30, (80%) no chronic diseases, (56.6%) with hypertension, (63.3%) anaemic, (60%) self medication, (80%) have family history with CAs, (58.3%) lived near mobile station, (56.6%) consanguinity, (60%) have infectious diseases during pregnancy, (58.3%) previous abortion, (70%) did not take folic acid, and (65%) with low socioeconomic status.

Many previous studies showed mother age has related with CAs prevalence that may due to decreasing normal body function during age developed and effects of chronic diseases especially (hypertension, diabetes mellitus, and anemia) on blood circulation and maternal general fetus health. Low socioeconomic status also affects on mothers' health and fetus growth, by in adequate nutrition supplements and poor obstetric follow up. In addition mothers' low educational level affects negatively on their health awareness toward nutrition.

Many studies about risk factors of CAs showed association between increasing mother age and incidence of CAs^(12, 13, 14, 16, & 17). In 2019 a study about the prevalence of CAs in Ethiopia reported (3.6%) of mothers have previous delivery with CAs, (2.4%) have positive history of CAs, and most of them reported low iron folate intake during pregnancy⁽⁸⁾. The authors added in their study mothers' illnesses, infection, and malnutrition showed significant relation with CAs⁽⁸⁾. A study about CAs also documented (3.6%) of parents showed sibling positive history of CAs, and (14.5%) of mothers have chronic illnesses⁽¹⁰⁾.

In a systematic review with 22 studies concerning the risk factors of CAs found an association between incidence of neonates' anomalies and mothers' smoking, increased BMI, and chronic illnesses⁽⁹⁾. In studies about maternal obesity and congenital anomalies revealed increasing BMI showed a significant relation with frequency of CAs^(16 & 17).

In Pakistan 2014 a study related to the prevalence of CAs documented elder mothers and living in rural area showed increased CAs percentages ⁽¹²⁾. Another study in Pakistan also showed the incidence of CAs was (3%), mothers' age more than 34 years and consanguinity showed double risk with CAs ^(2 & 15).

In Egypt 2013 a study about risk factors of birth defects revealed family positive history, consanguinity, residency, radiation exposure, and medication used, and chronic diseases showed significant relation with CAs prevalence ⁽³⁾. A study about epidemiological risk factors of CAs 2016 reported mothers' age, educational level, iron folic intake, smoking, history of CAs, and abortion increased prevalence of CAs ⁽¹³⁾. In Egypt also 2019 a study about risk factors of CAs revealed consanguinity, mothers' malnutrition, increases BMI, positive family history were the most common risk factors for CAs ⁽⁵⁾.

A study about risk factors of CAs 2015 documented elder mothers, low socioeconomic status, low educational level, residency, consanguinity, smoking, self medication, low vitamins and folic acid during pregnancy, and chronic diseases were increasing the factors for CAs ⁽⁷⁾. WHO reported increasing incidence of CAs associated with lower socioeconomic status due to inadequate nutrition, hygiene, educational level, poor obstetrical history check-up and folic acid supplements ⁽⁷⁾. In Mosel city a study about risk factors of CAs reported mothers' medication used, chronic diseases, infections, radiation, psychosocial stressors, and premature delivery documented as significant risk factors ⁽⁴⁾, in addition to low socioeconomic status and educational level, mothers' in adequate iron folic acid intake ⁽⁴⁾ with older mother, consanguinity the incidence of CAs increased ⁽⁴⁾.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Pediatric Nursing Department, College of Nursing, University of Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Genetic Polymorphisms of Catalase Enzyme with Hypertension Patients in Babylon Governorate

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Abstract

Oxidative stresses are affected in an inequality among the creation of reactive oxygen species (ROS) and a biological system's capability to voluntarily purify responsive intermediates or simply healing the causing destruction. Catalase was an antioxidant enzyme that acting a most important role in monitoring hydrogen peroxide focus at human cells. H₂O₂ is dissolved in H₂O and O₂ by CAT, Protecting the oxidative stress cells. It has proposed which helpful polymorphism moves the enzyme action within the gene coding catalase enzyme, thereby reducing safety against oxidative stress. Between February and October 2018 a total of thirty-five patients and fifteen control subjects were gathered. The genotyping of catalase were achieved consuming polymerase chain reaction (PCR) in addition to restriction fragment length polymorphism (RFLP). we tend to determine no significant difference within the genotype frequencies of catalase among patients with hypertension and controls using the $P=0.06$, OR =7.36 (0.77-69.5)).

Keywords: Hypertension, RFLP, catalase, SNPs. Polymorphisms

Introduction

Essential hypertension (HTN) was a popular multifactorial disturbance which includes complex hereditary, vasoconstrictive, environmental and other danger causes¹. Several family trials have acknowledged the genetic nature of vital hypertension: equivalent to 30% of the changeability of blood pressure has been assessed for genetically specified and the genetic susceptibility of an individual to hypertensive illness sequence of 15 to 35%². The major neurohumoral mechanics included in universal blood pressure ruling and hypertensive barriers have been well known and involve aldosterone renin-angiotensin system, the sympathoadrenal system, the kallikrein-kinin system³ and others. Moreover, various enzymes like catalase disturbing the metabolism of resident tissue defending or destructive factors⁴. Various enzymes had been designated for participating to blood pressure deregulation. "Responsive classes of oxygen may trigger oxidative hassles that have been shown to play a important role in the pathogenesis of many diseases such as cancer, hyperlipidemia, diabetes mellitus, metabolic disorders, atherosclerosis, cardiovascular diseases (hypertension, ischemic heart

disease, chronic heart failure) and neurodegenerative diseases⁵". Typically antioxidant enzyme genes are susceptible to polymorphism and may lead to gene expression modification and reduce enzyme activity⁶. It is shown that various metabolic disorders are associated with the functions of altered antioxidant enzymes⁷. Due to its largest turnover level, catalase (CAT) is one of the strong antioxidant enzymes and exists in almost all aerobic respiratory organisms⁸. Catalase (CAT) is an intracellular antioxidant enzyme that prevents cells against ROS damage by converting hydrogen peroxide into water and oxygen to avoid cell damage⁹. People with decreased CAT activity have been highly risky of oxidative stress-related diseases like atherosclerosis and diabetes¹⁰. Dyslipidaemia¹⁸ and neurodegenerative disease, Furthermore, the administration of CAT has been shown to avoid bone loss induced by ovariectomy¹¹. Recently, CAT gene polymorphisms have been associated with hypertension¹². However, to our knowledge, Despite CAT's allegedly significant role in bone metabolic and vascular stability and activity, its genetic impacts on hypertension have not yet been researched. This research therefore explored the genetic impact of CAT on the danger of hypertension for the

first time.

Methodology

Sampling

Thirty Five Samples of blood were gathered patient with primary Hypertension whom visit hypertension Center / Hilla/Iraq and fifteen samples as control.

DNA Extraction

Genomic DNA from entire blood cells has been obtained and purified using the Favergen Company (Taiwan) extraction and purification kit.

Genotypical identification by amplification of RFLP-PCR

Specific primers were used to amplify the targeted DNA sites: took of Bioneer, IDTDNA(USA). Primer: Sequence straight on was 5-CTGGGTATCTCCGGTCTTCA -3, Then the opposite pair was 5- CCGCTTTCTAAACGGACCTT-3.

PCR was performed in 20µl response sizes comprising 1 µl of inverse and frontward primers, 12.5 µl of Mix of Green Master , 3 µl of Genomic DNA and a response quantity of up to 20 µl including Nuclease-free water 2.5 µl had been finished. Intensification was completed in a customized thermo-cycler at 94 ° C for two mins; at 94 ° C for 35 cycles Every 5 mints, at 57.8 ° C for one moment and by 72 ° C for one minute; and a last 5 minute extension. Using ethidium bromide, PCR medicines used 1% agarose gel electrophoresis at 75 V for 1 hour. Photographs were taken using the

gel documentation structure. The PCR item was sliced using endonuclease restraint of HinfI, with the Promega Company Protocol the PCR-RFLP technique was achieved steadily.

After digestion, electrophoresis utilizing gel electrophoresis (Cleaver Scientific–UK) was linked to MSPI reaction in 3 percent agarose gels at 75 V for 1 hour and 8 percent polyacrylmide gel electrophoresis control: 75 V, 20 Am for 160 minutes after the ethidium bromide gels were pictured. The gel documentation system (EBOXCX–U.K.) used to take photographs.

Statistical Method

SPSS applied mathematics software scheme (17; SPSS Inc., Chicago, IL) was finished with all the practical math analysis, P-values < 0.05 statistically significant were regarded.

Results

Genotyping study

deoxyribonucleic acid had removed as of the sample blood Figure (1) showed the electrophoresis agarose gel shot of catalase gene amplification product measuring up to 369 bp portion. The effects of PCR-RFLP's catalase-related quality polymorphisms using HinfI containment chemistry revealed that there were three instances of genotype polymorphisms, involving homozygous genotype (2 bands, 200,175 bp), homozygous genotype (1 band, 369 bp) and heterozygous genotype (3 bands, 200,175 and 369 bp) that originated from about three DNA groups.

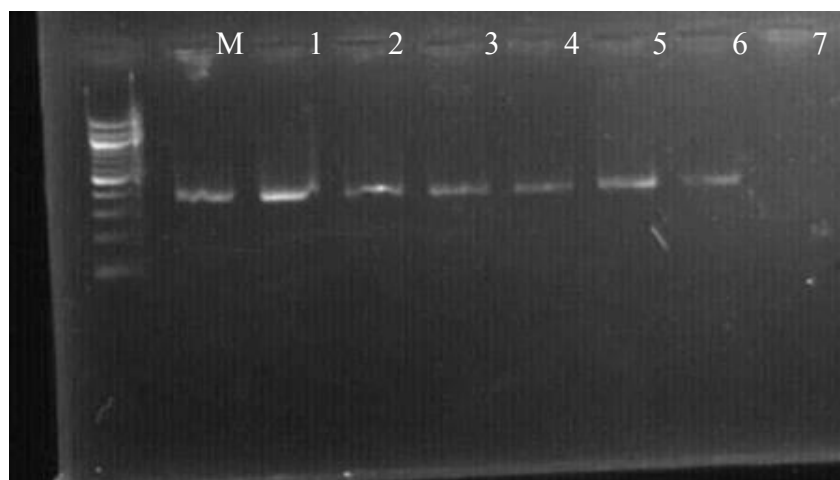


Fig 1. Agarose gel Catalase electrophoresis (Hypertension and control group) amplification products.

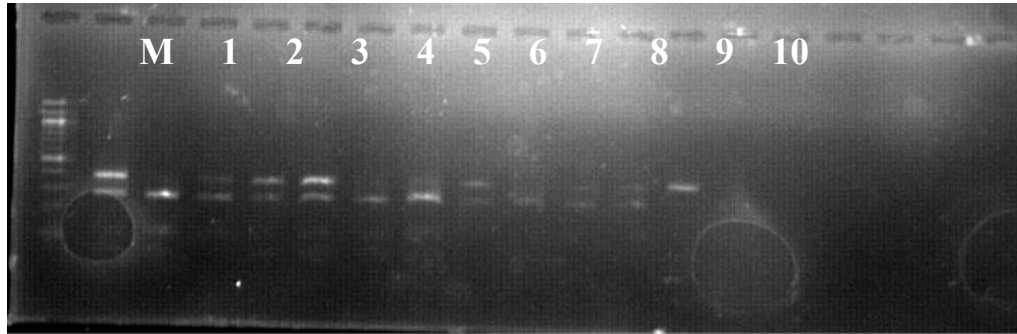


Fig. (2): Agarose gel electrophoresis of Hypertension and healthy subjects allelotyping of catalase using *HinfI* enzyme by PCR-RFLP method

Table (1): genotyping distribution of Catalase gene polymorphism and there association in control and patients groups .

Genotype	Control No. (%)	patients No. (%)	P-value	OR (95%) CKD
1 band a	9 (60%)	11 (31.4%)		
2 band	5 (33.3%)	15 (42.8%)	0.16	2.45 (0.64-9.39)
3 band	1(6.66%)	9 (25.7%)	0.06	7.36 (0.77-69.58)
Total	15	35		

P ≤ 0.05; OR=(95%CI); ^a reference



reference

CTGGGTATCTCCGGTCTTCAGGCCTCCTTCGGAGAGCCCTGCTCCGAGCCCAT
TGGGCTTCCAATCTTGGCCTGCCTAGCGCCGAGCAGCCAATCAGAAG

- 190305-040_C03_36_
- 190305-040_E03_79_G..GA.....A.....C...
- 190305-040_G03_80_G.....AA.C...C...
- 190305-040_I03_82_G..GA.....A.....C...
- 190305-040_K03_83_A.G..C...
- 190305-040_M03_10C_C..C...
- 190305-040_A03_24C_A.....A.....C...
- 190305-040_A05_25C_

110 120 130 140 150 160 170 180 190 200

...|...|...|...|...|...|...|...|...|...|...|...|...|...|...|...|

reference

GCAGTCCTCCCGAGGGGGCGGGACGAGGGGGTGGTGCTGATTGGCTGAGCCT
GAAGTCGCCACGGACTCGGGGCAACAGGCAGATTTGCCTGCTGAGGGT

190305-040_C03_36_|

190305-040_E03_79_|**T**.....|

190305-040_G03_80_|**T**.....|

190305-040_I03_82_|**T**.....|

190305-040_K03_83_ ..**A**.....|**T**.....|

190305-040_M03_10C_|**T**.....|

190305-040_A03_24C_|**T**.....|

190305-040_A05_25C|**T**.....|

210 220 230 240 250 260 270 280 290 300

...|...|...|...|...|...|...|...|...|...|...|...|...|...|...|

reference

GGAGACCCACGAGCCGAGGCCTCCTGCAGTGTCTGCACAGCAAACCGCACGC
TATGGCTGACAGCCGGGATCCCGCCAGCGACCAGATGCAGCACTGGA

190305-040_C03_36_|**C**.....|

190305-040_E03_79_|**C**.....|

190305-040_G03_80_|**C**.....|

190305-040_I03_82_|**C**.....|

190305-040_K03_83_|**C**.....|

190305-040_M03_10C_|**C**.....|

190305-040_A03_24C_|**C**.....|

190305-040_A05_25C|**C**.....|

310 320 330 340 350 360

...|...|...|...|...|...|

10 20 30 40 50 60 70 80 90 100

...|...|...|...|...|...|...|...|...|...|...|...|...|...|...|


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REFERENCE  GYLRSSGLLRRALLRAHWASNLGLPSAEQPIRRQSSRRGGGTRGWC-
LAEP EVATDSGQQADLPAEGGDPRAEASC SVLH SKPHAMADSRDPASDQM QHWK
SAMPLE     .....T.....-.....V.....P.....

          110    120
          ....|....|....|....|..
REFERENCE  EQRAAQVHSVLP ERARRSV-KA
SAMPLE     .....-..
    
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Fig (3) Protein Sequences alignment: results for *Homo sapiens* catalase gene fragment version 7.2.5 of the Bio Edit program

Discussion

The catalase gene polymorphism was studied of hypertension and checks. The distribution found in catalase gene polymorphism in control group and group of instances is shown in Table (1): homozygote genotype was the largest genotype in control group 1 band (60%) followed by homozygote genotype 2 band (33%) and mutant heterozygote genotype 3 bands (6.66%) and, in hypertension disease Homozygous genotype 2 band (42.8%) and homozygous genotype 1 band (31.4%) false genotype 3 bands (20.7%) were the largest genotype. Followed by the results of sequencing, confirmation of the haplotypes found in our job. A lot of single nucleotide polymorphism (SNP) has been taken among DNA polymorphisms (1-, 2- and 3-band) and Catalase NCBI Primer3 and more reference.

Our group’s genetic studies have effectively resulted in no important connection between patients and control, while other trials have effectively resulted in the identification and correlation of particular polymorphisms connected with regulation of blood pressure ¹³. There have been numerous genetic markers to be acknowledged on the basis of volunteers cardiovascular system dysfunctions and hypertensive patient kidneys, as well as the already recognized HTN physiology pathway. There are several significant constraints in the attempt to detect genes connected with vital HTN: the big amount of genes that can control blood pressure, the combined impact of their expression, the potential genetic polymorphisms of each gene, the patient’s phenotypic heterogeneity, as well as various environmental variables that influence blood pressure ¹⁴.

“An association between CAT and hypertension is compatible with a research in China demonstrating the association of homozygous people with CAT-844 AA and high blood pressure ¹⁵”. “However, in this Chinese population, the CAT-844 G allele is more common (68.4%) than the two groups recorded here (41.1% for African Americans and 36.2% for Caucasians). This can be result of variations in population or selection bias in the Chinese sample that involved only hypertensive topics. The CAT-262 SNP has not earlier been examined for blood pressure values, although the CAT-262 T allele is linked with the catalase gene’s greater expression level ¹⁶”.

The CAT enzyme is capable of controlling oxidative stress by hydrogen peroxide degradation ¹⁷. In the promoter region of the CAT gene, polymorphism may decrease gene expression, eventually decreasing enzymatic activity and increasing oxidative stress ¹⁸.

To sum up, these findings indicate that CAT gene polymorphisms are unlikely to related with hypertension vulnerability. This research is, to our understanding, the first report showing that CAT polymorphisms and haplotypes are not correlated with hypertension.

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Ethical Clearance: All experimental protocols were approved under the Adult Nursing Department, College of Nursing, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Comparison Study of Major Thalassemia, Thalassemia Intermedia of Iraqi Patients and Control Groups for Effectiveness of Liver Enzymes

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Abstract

Beta-thalassemia is an autosomal recessive disease caused by absence or reduction in the synthesis of the β -globin chain, which is one of three special scientific types, thalassemia grand, secondary and medium. In Iraq, the β -thalassemia is a real problem due to the lack of medicines and equipment during the exclusive periods of wars and insecurity. The aim of this study is to evaluate some liver enzymes among Iraqi thalassemia and β -thalassemia patients and the volunteer group. The study included 100 patients (57 females and 43 males) who were divided into two groups (53 with major thalassemia and 47 with moderate thalassemia), with an average age \pm SD (14.28). The study also included 30 healthy individuals (16 males and 14 females) with average age of 15.25 years as a control group. The groups were matched by gender and age and had the same geographical and socio-economic status. The colorimetric methods were used to estimate the values of serum transaminases (GOT, GPT), bilirubin and alkaline phosphatase (ALP). There were no statistically significant differences between primary thalassemia and the control group regarding, mean age, sex, WBC count and serum serotonin, while there was statistically significant differences between thalassemia (grand) and thalassemia (mean) compared to control groups ($P=0.001$) in regard to (GPT), (GOT), bilirubin and (ALP) values.

Keywords: *β -thalassemia major, β -thalassemia intermedia, Serum ferritin, GOT, GPT, Alkaline phosphatase, Serum bilirubin.*

Introduction

Thalassemia is a genetic disease that takes place in blood cells, is a major health problem all over the world where the value of hemoglobin (the main component of the red blood cells and oxygen transporter) is below normal ¹. Thalassemia results from a genetic defect affecting the hemoglobin production process, and this genetic defect is transmitted from parents to their children. Thalassemia depends upon the severity and type of the disease, as some children exhibit symptoms since birth, while others develop symptoms during the first two years of life. Symptoms may not be shown in people with the disorder i.e (those who have a single gene disorder) ². More than 200 different mutations (defects) can be caused to the β -globin gene, which is present on chromosome 11. The majority of the mutations that cause β -thalassemia are bitmap mutations i.e changing one letter of the genetic code. Various β -chain dysfunction mutations can happen in different ways ³. Molecular DNA tests to detect mutations in patients

allow prediction of disease severity. With the aid of those molecular methods, the disease can be identified in the fetus during the earlier periods of pregnancy (Prenatal diagnosis) ⁴.

Beta thalassemia happens as a result of a deficiency or defect in two beta type series ⁵, which consists of hemoglobin and divided into a) thalassemia minor, results from a defect in a single chain and the patient is asymptomatic, but shows a simple anemia during routine blood tests ⁶, and intermediate thalassemia, which is an intermediate condition between minor and major types, where patients may live a normal life, but need occasional blood transfusion in times of illness and pregnancy ⁷. In thalassemia major type, patients suffer from severe anemia, bone marrow and hypertrophic swelling and need regular blood transfusions to live normally, and the symptoms do not occur at child's birth, but appear during the first two years of the child's life ⁸.

The liver performs a focal task in iron homeostasis. However, iron discharged from transfused red cells, an upgraded rate of gastrointestinal iron assimilation has been proposed. This overabundant iron is initially limited to the hepatic Kupffer cells, and when transfusion necessities produce iron over-burden, overflow to hepatic parenchyma cells quickly occurs, with the risk of recent cirrhosis and fibrosis. In β -thalassemia patients, without co-factors, the limit of hepatic iron for the development of fibrosis is about 16 mg/g of dry weight liver⁹. During clinical investigations, it is recommended to find a link between appearance of iron-incident hepatotoxicity and hepatic iron fixation¹⁰.

Materials and Method

Blood samples were collected from 100 thalassemia patients (57 females and 43 males) who attended the thalassemia center in Al-Karama hospital/Baghdad city during the period from January to December 2018. The patients were divided into two groups (53 with major thalassemia and 47 with moderate thalassemia), with an average age \pm SD (14.28). The study also included 30 healthy volunteer individuals (16 males and 14 females) with average age of 15.25 years as a control group.

Sample collection

Venous blood samples (5 ml) were taken from all the study groups by means of disposable syringes. Two ml of this blood was transferred to EDTA tube for estimation of hematological parameters, while the rest of blood was transferred to poly ethylene plane

tube, to obtain serum after allowing blood to clot, then centrifuged at 3000 RPM for 5 minutes and frozen at (-6 °C) in anew disposable tubes until analysis of other parameters.

Serum ferritin was determined using the ELFA technique (enzyme linked fluorescent assay) .Vida's ferritin (FER) is an automated quantitative test for use on Vidas technique. Transaminases (GOT and GPT), serum bilirubin and Alkaline Phosphatase (ALP) were estimated by using colorimetric methods.

Statistical analysis

Data were analyzed using statistical package for social science (SPSS). Percentage prevalence rates were calculated with their respective 95% confidence intervals. Differences between proportions were evaluated using T- tests, and significance were achieved at $p < 0.05$.

Results and Discussion

The study was performed on 53 patients having thalassemia major and 47 Thalassemia intermediate in Al-Karama hospital in Baghdad city.

Table (1) shows the demographic and laboratory characteristics of thalassemia major and thalassemia intermedia patients. There were no significant differences between BTM and BTI patients regarding age, sex, W.B.C and PCV. The mean value of ferritin was (3215, 27) mg / dl in BTM and BTI which also showed non-significant difference ($p > 0.05$).

Table (1): Demographic and laboratory characteristics of thalassemia patients (thalassemia major & thalassemia intermedia) (values other than sex are reported as mean \pm SD)

	BTM (n =53)	BTI (n = 47)	P - value
Age (year)	12.32 \pm 7.42	16.58 \pm 13.75	NS *
Sex (M / F)	28 / 25	29 / 18	NS *
W.B.C count (cell/c.mm)	7.93 \pm 3.55	7.21 \pm 2.83	NS *
P.C.V (%)	29.39 \pm 4.59	28.82 \pm 3.81	NS*
Ferritin (mg/dl)	3215 \pm 1693	2720 \pm 1425	NS*

NS*: Not significant

Table (2) shows a very high GOT and GPT level increases in both BTM and BTI in comparison with the control group ($P > 0.001$). While there was no significant difference between patients in both BTM and BTI levels regarding ALP and total serum bilirubin, although there was a significant increase in their levels in thalassemia patients compared to the control group ($P > 0.001$)

Table (2) : Mean \pm SD values of different parameters in BTM, BTI patients and the control group (GOT, GPT, ALP, bilirubin and ferritin)

	BTM n = 53	BTI n = 47	Controls n=30	P-value ANOVA	I vs II	I vs III	II vs III
GOT	44.707 \pm 24.09	41.53 \pm 16.68	20.70 \pm 8.80	$P < 0.00$	0.00*	0.001*	0.01
GPT	54.83 \pm 20.12	50.31 \pm 11.21	15.08 \pm 3.34	$P < 0.05$	0.000*	0.00*	0.001
ALP	157.53 \pm 90.31	146.37 \pm 88.21	75.09 \pm 25.3	$P < 0.00$	0.93	0.00*	0.00*
Bilirubin	24.31 \pm 11.31	29.61 \pm 15.31	9.11 \pm 3.12	$P < 0.00$	0.09	0.00*	0.001*
Ferritin	3215 \pm 1693	2720 \pm 1425	113.54 \pm 93.23	$P < 0.05$	0.086	0.001*	0.001*

There was no significant difference in relation to age, gender, WBC count, PCV value and serum ferritin between BTM and BTI patients as shown in Table (1), although the level of stock iron amount was significantly higher ($P > 0.001$) in both BTM and BTI compared to the control group. The test of ferritin is useful for monitoring treatment in patients who have not yet experienced marked increase in the amount of stored iron. increased iron observed in β -thalassemia patients may be due to chronic blood transfusion and hypercalcemia. Similar results were seen in some studies ¹¹. Iron overload in β -thalassemia can lead to iron intestinal uptake and an increase in the abnormal molecular form of iron. elevated iron may play a main role in the oxidation of cell membranes and the formation of epithelial cell antigens, which can play one of the major pathways in removing the red blood cells.

There was a significant increase in GOT, GPT, ALP, Bilirubin and ferritin levels in both BTM and BTI compared to the control group, and these results were consistent with other studies ^{12,13}. The results also showed a significant increase in ALP and bilirubin levels among patients with BTM and BTI and the control group. The level of ALP in obstructive jaundice is expected to increase more than hepatic jaundice resulting from hepatitis C infection. There was no significant variation between BTM and BTI ¹⁶.

Iron-induced liver diseases are usually aggravated by viral infections. Despite iron chelation treatment, the hepatic siderosis, portal cirrhosis and even fibrosis may develop ¹³⁻¹⁵. The high serum ALT levels must alert the clinician about the possibility of hepatitis resulting from multiple blood transfusions. Liver diseases caused by hepatitis, cirrhosis, biliary stenosis, gall bladder inflammation, biliary duct infection and hepatic liver tumors can result in liver enzyme and alkaline phosphatase elevations ¹⁴.

Thalassemia patients suffer from a high bilirubin amount in the blood because of the increased destruction of the red blood cells. This is the major cause of hyperbilirubinemia resulting in the damage of other hepatic cells due to the side effects of iron overload ¹⁵.

Conclusion

Prevention of thalassemia lies in prenatal screening through a medical examination. However, out-of-court marriage and the marriage of minors were the reasons why these tests were ignored and therefore the rate of infection in Iraq has increased in recent years. Liver disease is a notable cause of death in patients with beta-thalassemia (major and moderate). Liver disease in thalassemia patients can be observed as hepatotoxicity, hepatitis B and C. Hepatic cirrhosis due to iron overload, which is the result of excessive blood transfusions, rupture of red blood cells and excessive

iron retention of the gastrointestinal tract due to non-intractable erythropoietin.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Collage of Medical and Health Technique, Middle Technique University/ Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Prevalence of Stress and Coping Behaviors among Medical Students at University of AL-Qadisiyah

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Abstract

Background: Studying medicine, particularly, creates considerable deal of stress. Therefore, the aim of current study was to evaluate prevalence of stress and coping behaviors among medical students. **Methods:** Descriptive cross-sectional questionnaire-based study conducted at AL-Qadisiyah Medical School from October to December 2018. The target population was 4th- and 5th-years medical students. Data were collected using Arabic versions of three self-reported questionnaires and analyzed using SPSS statistical software. **Results:** Participation rate was 70% and participants aged 19 to 26 years. Also, the most common stressors were “academic-related stressors” and the most frequently used coping behavior was “problem-solving behavior”. **Conclusion:** The academic and clinical settings at AL-Qadisiyah Medical School were perceived stressful.

Keywords: Stress, stressors, medical students, coping behaviors, problem-solving.

Introduction

Stress can be defined as whatever thing that interrupts humans’ physical and psychological health. In addition, it takes place when the individual becomes unable to deal with the pressures and requirements made on them [1]. Studying at higher education institutes generates a great deal of stress for students and study of medicine, particularly, creates further stress as medical education has its own stressors [2]. The latter can be categorised into [3]: “academic-related stressors, interpersonal and intrapersonal-related stressors, teaching and learning-related stressors, social-related stressors, drive and desire-related stressors and group activities-related stressors”. Also, the top rated stressors are examinations, impact of time and heavy course work. Moreover, curriculum changes may exert differential perception of stress among medical students with more satisfaction toward innovative curricula as opposed to traditional ones [4,5]. Despite that, stress might be beneficial “favourable” as it stimulates students’ learning, yet

it might be “unfavourable” as it negatively affects students’ social lives, their academic performance and achievement of course objectives [6]. Nonetheless, unresolved stress is associated with a wide range of affective, physical and intellectual health problems such as nervousness, depression, inconfidence, impairment of critical thinking and decision-making, personality disorders, alcohol and drugs abuse/ dependence and suicide attempts [7,8]. These problems might reduce numbers of students attending medical schools with consequent shortage of medical workforce [9]. However, early diagnosis of stress, accurate identification of its causes and successful management would help prevent its consequences at all levels of medical education [3]. Unless stressors are identified and eliminated, effective coping with them remains the golden alternative strategy [9,10]. In this regard, four famous coping behaviours have been recognised [11]; “problem-solving, avoidance, optimistic and transference”. Adoption of one or more of these coping behaviors may help medical students achieve their academic goals and live pleasant social lives. However, coping abilities of students might be influenced by their age, gender, living circumstances, place of training, academic grades, their socio-cultural background, the way they had chosen study of medicine

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and educational level of people they deal with [12,13]. Investigating the sources and levels of stress as well as coping behaviours among medical students was the focus of a number of international studies [3,14-17]. However, no previous study had explored this issue in the context of Iraqi medical education. Therefore, current study was aimed to explore the extent of stress among Iraqi medical students, identify potential stressors and recognise coping behaviours adopted by students in dealing with the identified stressors at AL-Qadisiyah Medical School (QMS).

Methods

Study design

A descriptive cross-sectional questionnaire-based study conducted at AL-Qadisiyah Medical School (QMS) from October 2018 to December 2018. The target population was 4th-, and 5th-, year medical student as they were expected to have considerable clinical training compared with students in earlier years of study. In addition, to avoid the effects of examinations on students' perceptions of stress in the medical school, we started collection of information approximately one month following the start of 2018/2019 academic year. Therefore, the extent of stress measured in current study represented natural perceptions of medical students. The latter were informed that their participation is voluntary, anonymous, and confidential as well as will not affect their academic progress. The questionnaires were distributed to students by face-to-face contact at the end of classroom lectures. Verbal informed consents were obtained from all participants prior to the study. Filled questionnaires were collected on the same day.

Data collection tools

Data were collected using the Arabic versions of three self-reported questionnaires. The first one was a questionnaire for demographic data (Table 1). The second questionnaire was the Medical Student Stress Questionnaire (MSSQ) [18]; the entire questionnaire was translated from English to Arabic then back translated from Arabic to English by team of professionals. It consists of 40 items sub-grouped into six domains. These are "Academic-Related Stressors (ARS; 13 items), "Interpersonal and intrapersonal-Related Stressors (IRS; 7 items), Teaching and learning-Related Stressors (TRS; 7 items), Social-Related Stressors (SRS; 6 items), Drive and desire-Related Stressors (DRS; 3 items) and Group Activities-Related Stressors (GARS; 4 items)". Each

item is scored on a 5-point Likert scale from 0 to 4 for "causing no stress at all", causing mild stress", causing moderate stress", causing high stress" and causing severe stress", respectively. MSSQ was proved to be reliable and valid scale for measurement of extent of stress and intensity of the different stressors [18]. In terms of its mean items scores, developers of the MSSQ stated that a score of 0.00 to 1.00 indicates mild stress, a score of 1.01 to 2.00 indicates moderate stress, a score of 2.01 to 3.00 indicates high stress while a score of 3.01 to 4.00 indicates severe stress [18]. The other questionnaire was the Coping Behavior Inventory (CBI) [9]. It has 19 items categorised into four categories of coping behaviours; "avoidance behavior" (6 items), "problem-solving behavior" (6 items), "optimistic behavior" (4 items) and "transference behavior" (3 items). Each item is scored on a 5-point Likert scale from 0 for "not used coping behavior" to 4 for "mostly used coping behavior". CBI was proved to have both good reliability and construct validity. The Arabic versions of the three questionnaires were piloted before conducting the actual study and the results of the pilot study showed that the Arabic versions of the two questionnaires can be completed without a problem and no adjustments of questions were needed.

Data analysis

Data from current study were entered into Microsoft Excel spreadsheets and processed using computer-based software, the Statistical Package for Social Sciences (SPSS; version 24.0). Descriptive statistics were applied to present percentages and socio demographic data. Data from entire inventories and scores for categorized domains and each item were expressed as Mean \pm Standard Deviation (SD).

Results and Discussion

Results of current study also showed that 76.85% of participants had an intrinsic motivation to study medical sciences, whereas 17.73% decided to study medicine for vocational reasons (extrinsic motivation) (Table 1). In addition, 56.15% of our participants had relatives working in medicine. However, only 43.84% of them had previous experience of looking after sick people. Furthermore, participants' fathers seemed to have higher educational levels than mothers and the vast majority of our participants (86.69%) were living with their families, despite that, 13.79% of them were facing financial difficulties.

A previous study [14] reported participation rate of 72% with 62% of participants were females. Also, [15] reported a response rate of 89.7% with mean(SD) age of participants of 21.4(2.34) years. However, another study [16] reported that 59% of respondents were males and 41% were females with mean(SD) age of 20.31(1.74) years.

One possible explanation for the high participation rate reported in current study was that the researchers informed students that their participation is voluntary, confidential and anonymous. Also, data collection well before final exams would help avoid any potential exam-generated stress that could affect students' natural perceptions. Moreover, the high number of female participants reflected gender distribution within the target population.

Data showed that our participants were young adults; therefore, their immature performance, unreliability, emotional liability and being inexperienced would create a great deal of stress for them during academic as well as clinical studies [19].

Medical students who participated in current study had some demographic criteria that would protect them from stress and its potential complications (Table 1). Despite that, previous studies revealed that the only predictor of stress among medical students was year of study [14].

Level of stress

Medical students at QMS expressed an overall moderate level of stress as the global mean(SD) items score for MSSQ was 1.80(0.54). In addition, this level of stress was similarly expressed by participants in the two years of study with no gender-wise differences (Table 2).

Previous studies reported moderate to high levels of stress among medical students which was higher than among the public as well as higher than among students doing other courses [14,15,20].

Reasons behind this stressful atmosphere at QMS may include curriculum overload, exam anxiety and authoritarian inexperienced [21].

Types of stressors

In terms of stressors, the most common stressors perceived by medical students at QMS were "Academic-

related stressors", "Teaching and learning-related stressors", "Social-related stressors", "Group activities-related stressors", "Interpersonal and intrapersonal-related stressors" and "Drive and desire-related stressors", respectively. In addition, these findings were mostly not affected by year of study (Table 2).

Our findings were in agreement with those reported by [14,15] who showed that the most common stressors for medical students were related to academic issues such as heavy course work, inadequate time for revision and inability to meet the needs of a challenging and demanding clinical environment.

One reason behind our findings could be the traditional curriculum implemented at QMS and the unprogrammed clinical training [22]. However, stressors related to student-student relationships created lower levels of stress as majority of students at QMS were local students and living with their families (Table 2).

Coping behaviors

Results of current study revealed that there was an overall average, without gender-related differences, use of coping behaviors among participants at QMS (Table 3).

On the other hand, coping behaviors employed by participants were "problem-solving behaviors", "optimistic coping behaviors", "transference behaviors", "avoidance behaviors", respectively; this finding was not affected by year of study or student's gender (Table 3).

A previous study [14] showed that medical students used active coping behaviors rather than avoidance behavior. Another study also reported frequent use of "problem-solving" behavior among undergraduate medical students [15].

Adoption of coping behaviors by medical students is greatly influenced by cultural norms and values [13].

Problem-solving behavior is the most effective coping strategy and it is usually adopted by senior medical students [23] who are experienced and skillful in contrast to "avoidance behavior" that is frequently adopted by junior medical students who are unconfident and have inadequate knowledge and skills [24].

"Transference behavior" is adopted when stress results from looking after patients as students depend on

their teachers when conflicts happen [25].

Furthermore, “optimistic behavior” is usually adopted by students who choose medicine for job security, therefore, they need to be self-assured, realistic and having constructive attitudes when dealing with stressful circumstances [26].

Conclusions

The academic and clinical settings at QMS were perceived stressful and remedial interventions are highly indicated to lessen this stress. In addition, implementation of novel medical curriculum, establishment of students’ support system and educating students about time-, self- and stress-management are highly recommended.

Table (1) Mean(SD) items scores for MSSQ and its subscales for participants

Scale (No. of items)	4th year			5th year			Overall N= 203
	Females N= 61	Males N= 46	Total N= 107	Females N= 64	Males N= 32	Total N= 96	
Total MSSQ (40)	1.83 (0.56)	1.87 (0.58)	1.85 (0.57)	1.63 (0.53)	1.86 (1.86)	1.74 (0.51)	1.80 (0.54)
*ARS (13)	2.38 (0.68)	2.33 (0.63)	1.48 (0.65)	2.17 (0.67)	2.25 (0.59)	2.20 (0.64)	2.29 (0.65)
*IRS (7)	1.27 (0.75)	1.37 (0.88)	2.36 (0.81)	1.11 (0.69)	2.09 (0.77)	1.24 (0.75)	1.28 (0.78)
*TRS (7)	1.74 (0.69)	2.01 (0.82)	1.86 (0.76)	1.72 (0.73)	2.01 (0.83)	1.83 (0.78)	1.84 (0.77)
*SRS (6)	1.72 (0.63)	1.64 (0.74)	1.69 (0.67)	1.54 (0.68)	2.02 (0.70)	1.48 (0.63)	1.59 (0.68)
*DRS (3)	1.13 (0.82)	1.33 (0.92)	1.22 (0.86)	1.26 (0.83)	1.30 (0.94)	1.28 (0.86)	1.25 (0.86)
*GRS (4)	1.65 (0.85)	1.56 (0.76)	1.57 (0.90)	1.41 (0.84)	1.53 (0.76)	1.45 (0.81)	1.52 (0.86)

*: Subscales within MSSQ (see Methods section).

Table (2) Mean(SD) items scores for CBI and its subscales for participants

Scale (No. of items)	4th year			5th year			Overall N= 203
	Males N= 46	Females N= 61	Total N= 107	Males N= 32	Females N= 64	Total N= 96	
Total CBI (19)	1.88 (0.50)	1.84 (0.49)	1.86 (0.49)	1.77 (0.43)	1.75 (0.37)	1.78 (0.40)	1.82 (0.45)
*C1 (6)	1.35 (0.82)	1.29 (0.72)	1.29 (0.74)	1.08 (0.73)	1.22 (0.61)	1.23 (0.69)	1.26 (0.71)
*C2 (6)	2.36 (0.74)	2.32 (0.78)	2.34 (0.76)	2.34 (0.69)	2.13 (0.66)	2.20 (0.68)	2.28 (0.73)
*C3 (4)	1.98 (0.72)	2.11 (0.73)	2.05 (0.73)	1.92 (0.58)	2.13 (0.60)	1.92 (0.67)	1.99 (0.70)
*C4 (3)	1.82 (1.02)	1.79 (0.96)	1.79 (0.98)	1.75 (0.87)	1.79 (0.84)	1.78 (0.85)	1.79 (0.92)

* : Subscales within CBI (see Methods section).

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Medicine, Iraq and all experiments were carried out in accordance with approved guidelines.

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Assessment of Self-Esteem among Patients with Major Depressive Disorder in Sulaimani City

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Abstract

Background: Major depressive disorder has been associated with greater morbidity and mortality. Many researchers have been sought complex association between depressions with self-esteem. The levels of severity of such factors can play role in the causes, recovery and predictor of depression.

Objectives: The main objective of this study is to assess the levels of self-esteem.

Methods: A quantitative descriptive design, conducted at psychiatric clinic in Ali Kamal medical consultation center in Sulaimani City. A non-probability, convenient sampling was recruited of 150 patients with major depressive disorder attending the psychiatric clinic. The data were collected from December, 21st, 2017 to April 1st, 2018 by the researcher of current study through the utilization of structured Face-to-Face interview guided by the questionnaire.

Result: The result shows that the patients with major depressive disorder experience low self-esteem.

Conclusions: The study conclude that high self-esteem value on its own the strongest significant factor may represents emotional source and possibly used to handle or cope with depressed mood by the patients.

Keywords: *Self-esteem, Depression*

Introduction

Research findings indicated an association between self-esteem with major depressive disorder⁵. It can be the contributory factors to depression²⁹. Depression has become one of the most common mental disorders with high prevalence throughout a lifetime⁴. It affects approximately 3.6% of the global population in 2013². In the view of¹⁴ self-esteem can both lead to and result from clinical depression. Self-esteem has been regarded as an essential component of mental health. It is the personal judgment of worthiness that expressed in attitude the person hold toward himself³⁰. Higher self-esteem tends to report more positive affective states, grater wellness and more life satisfaction²⁷. Low self-esteem has been frequent finding in depression and suicide behavior¹. Recent empirical studies using longitudinal data and cross-lagged regression models have consistently supported the idea that self-esteem negatively predicts depression¹⁹.

When low self-esteem is formed it affects all aspects of an individual's life³. It contributes to the development of a poor or negative self-image²⁹ and its partial mediator of the relationship between hopelessness and depression²⁷. Understanding self-esteem is important for interventions and prevention of depression¹.

The contemporary models of depression emphasized the role of low self-esteem in the etiology of depressive disorder^(9, 17).²⁴ devised two models, the vulnerability and scar models in their metal-analysis longitudinal study, found a total of 53 studies published in the year, 1984, 2000, 2010. The study indicated that low self-esteem had role in causes of depression. In addition, other studies suggested that self-esteem fluctuation is a factor in the etiology and maintenance of depression. Low self-esteem is more prevalent among depressed people and can predict a depression onset¹⁴. However, a major problem exists in examining the relationship between self-esteem and depression, self-esteem may be part of definition of an illness and in no way a causal²⁷. The findings by¹², revealed that low self-esteem on

its own dose not predict future episodes. Nonetheless it may do so interaction with other factors such as stress, hopelessness.

Greif is the painful psychological and physiological response to loss. Although it is most commonly associated with death of loved one, grief occurs when there is any significant loss, including loss of self-esteem; identity, dignity or sense of worth ⁶. Greif an accompanied by guilt about sustained loss of self-esteem and ambivalence about living is an indication that suicide risk increased and help is needed for such people. Low self-esteem primarily is common among major depression disorder ².

The current study designed to identify self-esteem among patients with major depressive disorder, identifying the level of severity of this factor is expected to have particular important for nursing interventions and prevention of major depressive disorder.

Method

A quantitative-descriptive design was used to assess self-esteem levels among patients with major depressive

disorder. The study was carried out from December, 10th, 2017 to October, 1st, 2018. This study carried out at Psychiatric clinic in Ali Kamal medical Consultation Center which is affiliated to the Teaching Hospital in Sulaimani City. A non-probability, convenient sampling of 150 patients previously diagnosed with major depressive disorder were recruited from consecutively attended the psychiatric department during the period of data collection.

A questionnaire was developed to measure the variables underlying the present study, using the Rosenberg self-esteem scale. Validity of the questionnaire was determined through a panel of 20 experts and reliability was determined through the computation of Cronbach's Alpha. The result of reliability was (0.843) for the self-esteem scale. The data were collected from December 21st, 2017 to April 1st 2018. Statistical package for social science (SPSS) version 22 is used for data analysis.

Results

Table 1: Distribution the socio-demographic characteristics of the sample

Sociodemographic	Characteristics	Frequency	Percentage
Age	18-27 year	31	%20.7
	28-37 year	51	%34.0
	38-47 year	40	%26.7
	48-57 year	21	%14.0
	58 Year or more	7	%4.6
	Mean ± 37.5 11.03		
Gender	Male	99	%66
	Female	51	%34
Marital status	Single	33	%22
	Married	87	%58
	Divorced	24	%16
	Widowed	6	%4
Educational level	Illiterate	36	%24
	Primary school	39	%26
	Intermediate school	24	%16
	Secondary school	21	%14
	Institute or university	30	%20
Occupation	Employed	51	%34
	Unemployed	99	%66
Total	150	%100	

Table (1) shows that the mean of age is (37.5 ± 11.3). Most of them male (66%) and married (58%). According to their educational level, the high percentage of the sample (26%) has primary school, and 24% of them illiterate, while 20% of them graduated from college or institute. Approximately two third (66%) of the study sample are not employed.

Table 2 Distribution of the sample according to their psychiatric history characteristics

Psychiatric history	Clinical characteristics	Frequency	Percentage
Duration of illness	1-5 years	87	%58
	6-10 years	36	%24
	11-15 years	12	%8
	16-20 years	6	%4
	21-25 years	9	%6
Number of hospitalization	Non	111	%74
	1 time	15	%10
	2 times	12	%8
	3 times	6	%4
	4 times and more	6	%4
Suicidal attempt	No	102	%68
	Yes	48	%32
Number of Suicidal attempt	No attempt	102	%68
	1 attempt	9	%6
	2 attempt	9	%6
	3 attempt	12	%8
	4 attempt and more	18	%12
Total		150	%100

Table (2) shows that the mean of duration of illness is (6.14) years, ± 6.3. The majority of the study sample (74%) has no admission to mental hospital. The table shows that two third of the sample (68%) have no suicidal attempt while (32%) of them have suicidal attempt and (12%) of them attempted more than four attempts, then (8%) of them attempted three attempts, also the same percentage (6%) of them attempted one or two attempts.

Table 3 the significant difference between calculated mean and theoretical mean in self-esteem measure, using -test

Variable	Sample	Calculative mean	standard deviation	theoretical mean	value	Level of significance
Self-esteem	150	14.380	4.097	15	1.853	Nonsignificant

Table (3) appears that statistically non-significant difference was found between calculated mean (14.380) and theoretical mean (x=15), (-test = 1.853, ± 4.097) at >0.05 level in self-esteem scale.

Table 4 Distribution of the sample according to the self-esteem levels

Statistical Indicator	Level of self-esteem			Total
	Low level (0-14)	Medium level (15-24)	High level (25-30)	
Frequency	78	69	3	150
Percentage	%52	%46	%2	%100

Table (4) shows the distribution of the patients according to self-esteem scale index. The table indicates that the highest percentage (52%) of the total patients were low level of self-esteem and the mean score ranged from (0-14), and the lowest percentage (2%) of the total patients were high level of self-esteem and the mean score ranged from (25-30).

Table 5 the significant difference of self-esteem in regard to patient's gender factor among sample

Variable	Group	Number	Mean score	Standard Deviation	value	Level of significant
Self-esteem	Males	99	14.45	3.81	0.310	Nonsignificant
	Females	51	14.23	4.62		

The table (5) appears that there was statistically non-significant difference mean score of self-esteem, in compare to patients gender because p- value was greater than common alpha 0.05 for the study variable (- test = 0.310). The table reveals that gender factor is not impact factor affecting the self-esteem in major depressive disorder among study patients.

Table 6 the significance differences of mean score of self-esteem in regard to suicide attempt factor among patients

Variables	Suicide attempt	Number	Mean score	Standard Deviation	value	Level of significant
Self-esteem	No	102	15.47	3.90	5.142	0.001
	Yes	48	12.06	3.52		

Table (6) shows that there were statistically highly significant differences mean score of self-esteem (-test =5.142 at <0.001) in regard to patients attempted suicide. Table 7 reveals that the suicidal attempt is highly an impact factor affecting self-esteem in major depressive disorder.

Discussion

The result shows that the mean and standard deviation of age were 37.511.3. This result is slightly

consistent with the result of ³⁰ who found that one third of 150 depressive outpatients of convenient sampling their age ranged from 24-34 years old, in Pakistan. Also ⁸ found that more than one third of depressive outpatients age 28-37 years old in Sulaimani city. ¹¹ confirmed the results of this study and mentioned that the average of age of onset for major depression has been consider the middle thirties. Although the most frequent age of onset for depression may range 25 to 44 years old age group, people in younger age group have an ever increasing risk

of developing depression²⁹. Some data indicate that the onset of depression at an early adolescents age²⁷ or at age 55years or more¹.

In this study the results revealed that the predominance gender were males (66%). This results are almost similar with the findings of¹ who found that males (57%) more than females (43%) of depressive outpatients in Kashmir/ India, also³⁰ found that the predominance males gender more than females among outpatients in Pakistan. On the other hand this results are inconsistent with²⁷ in Malaysia, ¹⁸ in Brazil, who found that the predominance gender were females among depressed patients. Literatures noted that gender roles continue to linger and contribute to high rates of depression among women^(7, 10). The findings of this study is that male-female ratio could be explained as females psychiatric patients were less frequently brought to psychiatric governmental clinics due to the feeling of shame and public stigma and self-stigma²⁸. More than half (58%) of the sample, their marital status married, and (22%) single. This result goes with the results of¹⁵ and ¹⁶ found that approximately more than half of study depressed patients were married. The finding of the present study may be explained by the late onset or recovery from acute onset among the sample of this study and fortunately such patients tend to have fewer difficulties in maintaining their daily life and exhibiting social roles and social integration²⁸.

About half of the studied depressed patients were low educational level, and two thirds of them were unemployed. This result similar to the findings of²² who founds that more than one third of depressed patient with low educational level, while they found that more than half of their sample were employed which are inconsistent to the results of this study.

The main characteristics of depressed patients show that their duration of illness was 1-5 years (58%). This results is consistent with findings of¹, ²¹ and ¹⁶. The finding of the present study predicts that the study patient's condition may have reached a chronic limit or in remission.²⁵ confirm the result of this study and stated that acute episodes of major depression last a limited amount of time.

Most of the study sample is not admitted to psychiatric hospital (74%) they treated in outpatient's psychiatric clinics. These results are in agreement of the findings of¹ in India, found that most study depressed

subjects were treated in homes. Today the emphasis in psychiatric care treatment is on outpatients or community-based interventions that address the treatment needs of psychiatric clients striving to maintain a position within the community.

The current study showed that one third of the depressed participants were attempted suicide and 18% of them have more than four attempts. The findings of²⁰, ¹⁵ and ¹³ confirmed the results of this study and mentioned that depression is one of the factors confirm risk for suicide ideation, attempts and death.

The results showed that the depressed participants observed (calculated) mean score of self-esteem (14.580 4.676) were non-significantly difference with theoretical mean score (15 4.676) of Rosenberg self-esteem scale ($p>0.05$). The distribution of studied sample revealed 52% low self-esteem level, 46% moderate self-esteem only 2% with high self-esteem. This finding is similar to the finding by³⁰ study in Pakistan. Who found that the main logistic regression results indicate that depressed patients had lower self-esteem than non-depressed population Also,²⁹ study in Malaysia found that depressed mood and low self-esteem occur with disproportionately high prevalence among adults, And also in adolescents²⁷.

Recently emerging studies suggest that low self-esteem contributes to the development of depression²⁶. In contrary,¹⁴ reported that there is a reciprocal relationship between self-esteem and depression, yet the causal direction of this association is not establish and noted that self-esteem can both lead to and result from clinical depression and suggested that the self-esteem fluctuation is a factor in a etiology and maintenance of depression.²⁹ determined that self-esteem emerged as the strongest predictor of depression, in contrast²³ revealed that low self-esteem and its own does not predict future depressive episodes, nonetheless, it may do so interaction with other factors.

This finding of the current study point out that low self-esteem is a state dependent on depressed mood and acts as a vulnerability factor for the development of major depression among study patients.

In this study, the findings showed that the gender is not significant factors effecting self-esteem levels ($p>0.05$). These findings are inconsistent with²⁹ found that self-esteem score significantly affected by gender. Suicidal attempts is highly significant factors effecting

patients self-esteem levels ($p < 0.001$). This findings are consistent with the findings of previous studies¹⁵ noted that lowest self-esteem increase the risk of suicide attempts in depressed patients.

Conclusion

Most of patients were male, unemployed, living in urban areas, practicing religious activities and their mean of age 37.5 years and most of them were less admitting to hospital although the long duration of illness ranged from 1-25 years. The patients experience low self-esteem level. The self-esteem levels are affected by suicide attempts. Patient gender is not significant factor.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing/University of Sulaimani, Iraq and all experiments were carried out in accordance with approved guidelines.

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Evaluation of an Education Program for Elementary School Teachers Regarding Post-Traumatic Stress Disorder among Pupils in Mosul City

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Abstract

Background: The ability of teachers to recognize and respond appropriately to the emotional and social needs of their pupils plays a key role in promoting pupils' mental health. In the absence of teachers' supportive roles, some susceptible pupils may experience unrecognized sadness, despair, and/or anger. As a result pupils can get low academic performance, and loss of control over their lives. Therefore, teachers must be involved in specific education programs and training sessions about common childhood mental health disorders, especially post-traumatic stress disorder. In addition, ensuring that the majority of teachers have benefited from such programs is an important aspect.

Objectives: The study objective is to construct and evaluate an education program for elementary school teachers about post-traumatic stress disorder among pupils.

Materials and Method: A Quasi-experimental design was carried out through the present study with application of pre and post-tests approach. The study sample consisted of (60) teachers participated voluntarily in the study. Teachers were randomly selected from (60) elementary schools inside Mosul (Mosul is the second largest city in Iraq). The study subjects were divided into two equal groups of (30) teachers, study group which was exposed to the education program, while the control group was not exposed to the education program. Data were analyzed by using SPSS version-25.

Results: The results reveal that there are statistically significant differences in teachers' knowledge regarding all (PTSD) related knowledge domains in comparison between pre and post tests for study group compared with control group.

Conclusion: The study concludes that there is a considerable acquisition in teachers' knowledge regarding post-traumatic stress disorder following program implementation.

Recommendations: The study recommends to construct and apply such mental health education programs in most Iraqi governorates elementary schools.

Keywords: *Evaluation, Education Program, Post-traumatic Stress Disorder.*

Introduction

Mental health education programs can provide instructions and advices for teachers to support the pupils

with mental health disorder at schools. The risk of mental health disorders can be reduced significantly by routine attention, psychological awareness, support, as well as referral for pupils with psychological distress symptoms to mental health professionals. Pupils, especially those at schools located in regions which were exposed armed conflict and wars events, are more vulnerable to get emotional disturbing symptoms¹. To motivate teachers' supportive roles, they should be given proper

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and adequate training, and opportunities for continuing mental health education. To achieve that, constructing an education program about post-traumatic stress disorder is necessary to help teachers improving and developing their knowledge and practices to insure mental well-being for pupils ^(1, 2). Post-traumatic stress disorder (PTSD) is a severe mental disorder which develop in response to an unexpected emotional or physical trauma that could not be controlled ³. With PTSD, a person feels distress long after the event is over ⁴. Since classroom teachers spend several continuous hours a day with their pupils, they are often in an excellent position to detect early physical, psychological and behavioral changes in pupils at school. Teachers may observe differences in the usual pattern for a particular pupil ^(4, 5). Education of teachers about the impacts of such traumatic events provides an opportunity for direct treatment of issues affecting the children and his or her environment. Education can help teachers acquire specific knowledge and practices for effective and appropriate interaction with pupils, and for successful management of challenging situations ⁶. Experts believe that the course of mental illness may be less severe if early detection and effective intervention are implemented. In addition, teachers education is particularly effective in relieving children from the burden of traumatic events and their related emotions, as well as in mitigating the consequences and symptoms of the trauma ⁷.

Objectives

The study aimed to construct and evaluate an education program for elementary school teachers about post-traumatic disorder among pupils in Mosul city.

Methodology

A quasi-experimental design was applied to attain the objectives of this study for the period from (1st December 2018 to 30th August 2019). After reviewing reports of mental health disorders in Nineveh directorate of health and consulting many mental health professionals there, it was obvious that post-traumatic stress disorder had high prevalence rates among elementary school pupils

in Mosul city, so, the researchers selected this disorder to construct an education program regarding it and apply it on the elementary school teachers. Therefore, the researchers constructed PTSD related lectures and a special questionnaire after reviewing many PTSD related literatures. The questionnaire was composed of two main parts: **Part-I:** Teachers' socio-demographical data such as (age, gender, marital status, years of employment, and educational level)., **Part-II:** This part is concerned with multiple choice questions (MCQs) to evaluate the teachers' post-traumatic stress related knowledge which included six domains as follow: **Domain-1:** Eight (MCQs) about concepts of childhood mental health., **Domain-2:** Eight (MCQs) about the psychological trauma., **Domain-3:** Eight (MCQs) about the impacts of psychological trauma., **Domain-4:** Eight (MCQs) about Post-traumatic Stress Disorder and its symptoms., **Domain-5:** Eight (MCQs) about DSM-5 Criteria for PTSD., **Domain-6:** Eight (MCQs) about protection factors and prevention. The program lectures and questionnaire were exposed to (15) experts for validation. The questionnaire reliability was measured through a technique of test-retest after application that on ten teachers out of the study sample, the reliability was ($r= 0.83$). The study sample consisted of (60) teachers who participated voluntarily in the study. Teachers were randomly selected from (60) elementary schools inside Mosul city after dividing the city into two sides (Right side and left side of Tigris River), then selected (30) schools from each side and one teacher was selected from each school in a probable manner. The sample was divided randomly into two equal groups of (30) teachers, one group was exposed to the education program; **study group**, while the second was not exposed to the education program; **control group**. The education program was consisted of five major sessions, it has been implemented on (30) teachers of study group only through six classroom sessions. All sessions were conducted in a special hall in Nineveh directorate of education- department of preparation and training which located in left side of Mosul city. The educational program was started in 13th April till 30th April, 2019.

Results

Table(1): Distribution of Socio-demographical Characteristics of the Study Subjects and Homogeneity between Study and Control Groups:

Characteristics	Groups	Study (n = 30)		Control (n=30)		Total (n=60)		Homo-geneity
		F	%	F	%	F	%	t
Age	30-40 years	17	56.7	15	50.0	32	53.4	-.167
	41-50 years	7	23.3	10	33.3	17	28.3	
	51-60 years	6	20.0	5	16.7	11	18.3	
	Mean (SD)	42.23 (7.66)		42.57 (7.79)		42.40 (7.66)		
Gender	Group	F	%	F	%	F	%	χ^2
	Male	14	46.7	17	56.7	31	51.7	.601
	Female	16	53.3	13	43.3	29	48.3	
Marital Status	Single	5	16.7	4	13.3	9	15.0	.137
	Married	19	63.3	20	66.7	39	65.0	
	Widowed	4	13.3	4	13.3	8	13.3	
	Divorced	2	6.7	2	6.7	4	6.7	
Years of Employment	1-5 years	4	13.3	3	10.0	7	11.7	1.190
	6-10 years	6	20.0	6	20.0	12	20.0	
	11-15 years	11	36.7	10	33.3	21	35.0	
	16-20 years	1	3.3	3	10.0	4	6.7	
	≤ 21 years	8	26.7	8	26.7	16	26.7	
Educational levels	Preparative	8	26.7	10	33.3	18	30.0	Z = -.482
	Institute	12	40.1	11	36.6	23	38.3	
	University	10	33.3	9	30.0	19	31.7	

N: Number, F: Frequency, %: Percent, t: t-test, χ^2 : Chi-square, z: Mann-Whitney U Statistics.

This table illustrates that the total number of teachers who participated in the study were (60) teachers. Their age ranged between (30-60) years old. The overall mean age for the participants is 42.40 (SD=7.66). The table also shows that the highest percentage of the sample (53.4%) was at the age group of (30-40) years old, while the lowest percentage of them (18.3%) was at the age group

of (51-60) years old. Concerning other demographical variables; the table shows that about (51.7%) of the sample were male. On the other hand, the majority of teachers (65%) were married. Regarding teacher's work experience, the table indicates that (35%; n=21) of the sample were having years of employment ranged between (11-15) years. Finally, the table demonstrates

that the highest percentage (38.3%) of sample were possess a diploma degree and approximately (31.7%) were having bachelor’s degree.

Table(2): Distribution of Baseline(pre-test) Among Post-Traumatic Stress Disorder Related Knowledge domains and Homogeneity Between Study and Control groups:

	Groups	Study (n =30)		Control (n=30)		Total (n=60)		t
	Domains	M	SD	M	SD	M	SD	
PTSD Related Knowledge	Domain One	3.53	1.43	3.47	1.33	3.57	1.267	.187
	Domain Two	2.97	1.32	3.30	1.05	2.97	1.221	-1.077
	Domain Three	3.00	1.20	3.30	1.14	3.03	1.057	-.987
	Domain Four	2.87	1.45	2.80	1.42	2.93	1.233	.179
	Domain Five	3.17	1.39	3.17	1.41	3.12	1.223	.000
	Domain Six	3.37	1.15	2.90	.923	3.38	1.027	1.725
	Total Knowledge	18.90	4.83	19.10	3.18	19.00	4.058	-.189

M: Mean, SD: Standard deviation, t: t-test, Maximum PTSD domains knowledge Score= 8; Minimum PTSD domains knowledge Score= 0; Maximum PTSD total knowledge Score=48; Minimum PTSD total knowledge Score= 0, All group differences $p > 0.05$.

This table indicates that there were no statistically significant differences in baseline (pre-test) among post-traumatic stress disorder related knowledge domains between study and control groups.

Table(3): Descriptive Statistics and Results of Mixed ANOVA Measuring Change in Post-Traumatic Stress Disorder Related Knowledge over Time across Study Groups:

PTSD Related Knowledge	Groups	M (SD)			Multivariate F
		Time-1	Time-2	Time-3	
Domain One	Study	3.53 (1.43)	4.67 (1.64)	4.40 (1.40)	F (2, 57) = 9.682, $p < .001$, $\eta^2 = .254$
	Control	3.47 (1.33)	3.93 (1.11)	3.83 (1.08)	
Domain Two	Study	2.97 (1.32)	4.27 (1.43)	3.90 (1.42)	F (2, 57) = 6.375, $p = .003$, $\eta^2 = .183$
	Control	3.30 (1.05)	3.20 (1.34)	2.90 (1.29)	
Domain Three	Study	3.00 (1.20)	5.80 (1.56)	5.50 (0.93)	F (2, 57) = 9.698, $p < 0.001$, $\eta^2 = .554$
	Control	3.30 (1.14)	3.50 (1.30)	3.40 (1.10)	

Cont... Table(3): Descriptive Statistics and Results of Mixed ANOVA Measuring Change in Post-Traumatic Stress Disorder Related Knowledge over Time across Study Groups:

Domain Four	Study	2.87 (1.45)	5.17 (1.55)	5.37 (1.15)	F (2, 57) = 17.433, p < 0.001, η ² = .380
	Control	2.80 (1.42)	3.00 (1.01)	2.80 (0.96)	
Domain Five	Study	3.17 (1.39)	5.23 (1.87)	5.27 (1.72)	F (2, 57) = 13.736, p < 0.001, η ² = .325
	Control	3.17 (1.41)	3.13 (0.81)	3.27 (1.17)	
Domain Six	Study	3.37 (1.15)	4.97 (1.75)	4.63 (1.67)	F (2, 57) = 11.006, p < 0.001, η ² = .279
	Control	2.90 (.923)	3.27 (1.17)	3.23 (1.30)	
Total Knowledge	Study	18.9 (4.83)	30.1 (3.60)	29.0 (3.95)	F (2, 57) = 67.654, p < 0.001, η ² = .704
	Control	19.1 (3.18)	20.0 (3.03)	19.4 (3.15)	

Study group (n = 30); Control group (n = 30); M: mean, SD: standard deviation, minimum domain score = 0, maximum domain score =8, minimum total PTSD knowledge score = 0, maximum total PTSD knowledge score = 48, p < 0.000 indicated in bold, η²: Eta Squared.

This table shows the results for Mixed design analysis of variance (ANOVA). For this analysis, there was one between subjects’ factor (group with two levels; [study (intervention) and control (non-intervention)]) and one within subject factor (time of testing with three levels: Time-1, Time-2, Time-3). All effects reported as significant at P < 0.05. This test showed that the changes among knowledge mean scores were a result of time, not of condition (group) or interaction between time of test and types of groups.

Table (4): Post-hoc Test Using Bonferroni Corrections Procedure:

PTSD Related Knowledge	Groups	Post hoc Using Bonferroni		
		T1 vs. T2	T1 vs. T3	T2 vs. T3
Domain One	Study	.000	.000	.037
	Control	.485	.796	1.000
Domain Two	Study	.000	.003	.446
	Control	1.000	1.000	.708
Domain Three	Study	.000	.000	.791
	Control	.437	.705	1.000
Domain Four	Study	.000	.000	1.000
	Control	1.000	1.000	1.000
Domain Five	Study	.000	.000	1.000
	Control	1.000	1.000	1.000
Domain Six	Study	.000	.000	.544
	Control	1.000	1.000	1.000
Total Knowledge	Study	.000	.000	.105
	Control	.630	1.000	.644

Study group (n = 30), Control group (n = 30), p < 0.05 indicated in bold.

On the basis of these results, the post-hoc procedure by using Bonferroni corrections test was conducted to

determine where the differences among the changed knowledge exactly lies. The test revealed that the scores of knowledge were significantly different among study group over times ($p < 0.05$). Concerning control group, the post-hoc test revealed fluctuation of the knowledge mean score over times. However, no exact improvement or stable continuous significant change in score over time was observed.

Discussion

The most challenges that the researchers faced, were that there were no any related literature and previous studies about such health education program regarding post-traumatic stress disorder among pupils. The study findings revealed that the participants' age is ranged between (30-60) years old. **Table-1** showed that the [mean (\pm SD)] of teachers' age for study (experimental) group was [42.23 (\pm 7.66)] and for control group was [42.57 (\pm 7.79)]. This table also demonstrated that the highest percentage of the study group gender was females(53.3%), while the highest percentage of the control group gender was males (56.7%). **Table-1** also illustrated that the majority of the study and control group subjects were married, they accounted (63.3%, 66.7%) respectively. **Table-1** identified that (35%; n=21) of the study subjects(study and control groups) were having years of employment ranged between (11-15) years.

Table-1 also illustrated that about (38.3% ; n=23) of sample were possess an institute degree certificate and approximately (31.7%; n=19) were having university degree certificate. Finally, **Table-1** revealed that there were no statistically significant differences between study and control groups' demographical characteristics; [$p > 0.05$ for t , χ^2 , and Z]. This means that all teachers were homogenous and they relatively had the same socio-demographical characteristics.

A pretest was carried out for both study and control groups prior to implementation the education program and after that all sessions had been given for the study group only. The results of pretest indicated that there were no statistically significant differences between study and control groups ($p > 0.05$) in the scores of the teachers' knowledge towards all (PTSD) domains at baseline. This means that teachers had the same knowledge about (PTSD) at pretest (**Table-2**). This table also revealed that the mean of total knowledge scores of the participants in study and control groups was

(18.90, 19.00) respectively. That means that teachers' knowledge level was low at pretest.

One week after completion of the education program, a posttest-1 was administrated for both groups. The results of posttest-1 indicated that there were significant differences among all (PTSD) related knowledge domains (**Table-3; 4**). This means that teachers had got a significant improvement in their knowledge regarding post-traumatic stress disorder (PTSD). And then after (3) months of program finishing, a posttest-2 was performed for both groups to investigate the effectiveness of the education program. A comparison of all test scores was carried out (**Table-3; 4**).

The post-hoc results revealed that the score of knowledge were significantly different among study group over times ($p < 0.05$). This indicates that there was a good acquisition in teachers' knowledge regarding post-traumatic stress disorder, while for control group, the post-hoc result revealed there is no exact improvement in teachers' scores over time was observed (**Table-4**).

The findings of this study were relatively compatible with the results of a previous study done by ⁸. He was studied the effectiveness of an education program on primary school teachers' knowledge towards Attention deficit-hyperactivity disorder among pupils at primary schools in AL- Najaf city. In his mentioned study, Al-kraawi proved that there is a considerable lack in teachers' knowledge towards such common childhood mental health disorder among pupils. His study also illustrated that the education program was effective.

Conclusions

The study concluded that there is a significant lack of teachers' knowledge towards post-traumatic stress disorder before implementation of the educational program at pre-program test. The study also concluded that there was a large and obvious effect for the education program on teachers throughout a good acquisition of knowledge after conducting the education program.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Faculty of Nursing, University of Babylon, Iraq and all experiments were carried out in

accordance with approved guidelines.

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Histological Changes in Liver Tissue Resulting from Hydatid Cyst Infection: Comparison between Sheep and Cattle in Iraq

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Abstract

Hydatidosis is one of the most common parasitic zoonosis diseases not only in Iraq but throughout the world. Liver infected with hydatid cysts were randomly collected from 15 sheep and 18 cows of different ages and sexes during the period extended from September 2018 to December 2018. This study was aimed to provide insight on the histological changes of liver associated with *E. granulosus* and to compare the changes of liver tissue between sheep and cattle. Samples were collected from private (individual) butchers' places at Diyala province in Iraq. Livers had been transferred to Zoology Laboratory in Department of Biology in College of Education for Pure Sciences in Diyala University. Specimens from infected livers were immediately taken and fixed in 10 % formalin. Then the routine histological sections were done. The results showed that there were many histological changes resulting from infection with hydatid cysts infection including infiltration of inflammatory cells, necrosis, degeneration of liver tissue, fibrosis, fibrosis around portal veins, congestion of portal vein, increase in bile duct numbers, maladjustment of hepatic cords. A comparison between the histological changes of sheep and cattle showed the same histological changes, with a difference in the severity of these changes as they were more severe and developed in the livers of cattle than in sheep.

Key words: hydatid cyst, histological changes, cattle, sheep

Introduction

Hydatidosis is one of the most common parasitic zoonosis diseases not only in Iraq but throughout the world. The disease considers as a major threat to public health in many regions of the world, especially in developing countries, as well as large economic losses resulting from the infection of livestock ⁵. Despite the variety rates of infection in different countries, the incidence of this disease in both human beings and economic animals constitute a significant importance and may be a potential factor for new infection ¹⁰.

The disease caused by the larval stage of the small tapeworm *Echinococcus granulosus* (family *Taeniidae*). This parasite lives as a small intestinal cestode of dogs and occasionally other carnivores while their larval form lives in domestic animals and accidentally in man ¹¹. As the symptoms of this disease has been slowly developing, the disease is only detected after the infection has been exacerbated. The primary location of this cyst is the liver and lung but it could have located in other organs like

kidneys, bone marrow, spleen, heart and brain etc. ¹³.

Most of domestic animals represents as the main source of food for human in Iraqi populations and they have been used as a source both milk and meat. Liver is a vital organ as it characterized by multiple functions categorized broadly as synthetic, catabolic, detoxifying, secretory and excretory ⁴. Most of domestic animals represents as the main source of food for human in Iraqi populations and they have been used as a source both milk and meat. Liver is a vital organ as it characterized by its multiple functions including synthetic, catabolic, detoxifying, secretory and excretory in addition to use it as food ⁹. As other organs, the liver may have affected by a variety of pathogens causes resulting in huge economic losses either directly through throw it ¹⁴ or indirectly by effect on animal production ^(9, 14). The examination of histology changes provides highlights into interactions between pathogens and their host that it ¹⁶. This study was aimed to provide insight on the histological changes of liver associated with *E. granulosus* and to compare

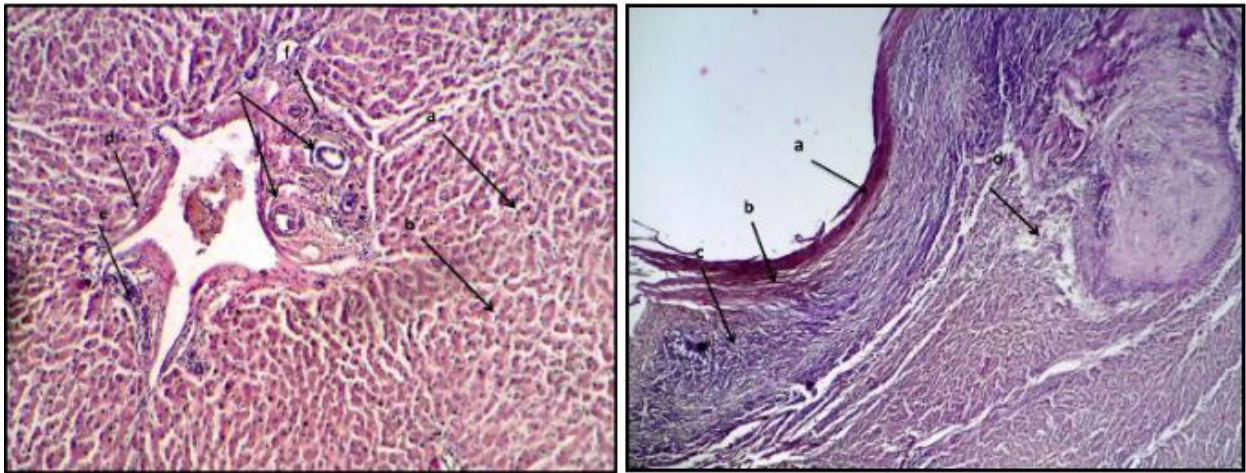
the changes of liver tissue between sheep and cattle.

Materials and Method

Liver infected with hydatid cysts were randomly collected from 15 sheep and 18 cattle of different ages and sexes during the period extended from September 2018 to December 2018. Samples were collected from private (individual) butchers' places at Diyala province in Iraq. Livers had been transferred to Zoology Laboratory in Department of Biology in College of

Education for Pure Sciences in Diyala University and careful visual examination and identification of hydatid cysts was carried out. Specimens from infected livers were immediately taken and fixed in 10 % formalin. After fixation, the specimens were cut into about 1cm pieces, trimmed, washed, dehydrated in graduated concentrations of ethyl alcohol, then cleared in xylol and embedded in paraffin. Then the samples were sectioned at 4-6 microns and stained with hematoxylin and eosin stain for general histological examination.

Results



Th

The histological examination in the present study obtained that there are many hydatid cysts embedded in liver tissue in 7 of examined livers of sheep and 5 of examined livers of cows resulting in histological changes in infected livers of both cattle and sheep. Both these animals have the same changes with deference in severity. The changes included as shows in Figures, the germinal layer of the cyst surrounded with fibrosis and infiltration of lymphocyte cells and other inflammation cells and there is a necrosis in the tissue (Figure1), in addition of necrosis and infiltration of inflammatory cells around the bile ducts and blood sinusoids, there is propagation in bile duct numbers and expansion of blood sinusoids(Figure2)

Fig.1: Sheep liver: a. germinal layer of the hydatid cyst, b. fibrosis, c. infiltration of lymphocytes , d. necrosis (4x)

Fig.2 sheep liver: a. and b. necrosis, c. propagation in bile duct numbers, d. expansion of blood sinusoids, e and f, infiltration of lymphocytes(10x)

In Figure 3 and 4 there is clearly occurrence of fibrosis and maladjustment of hepatic cords as well as heavy infiltration of inflammation cells, in addition to necrosis in both figures.

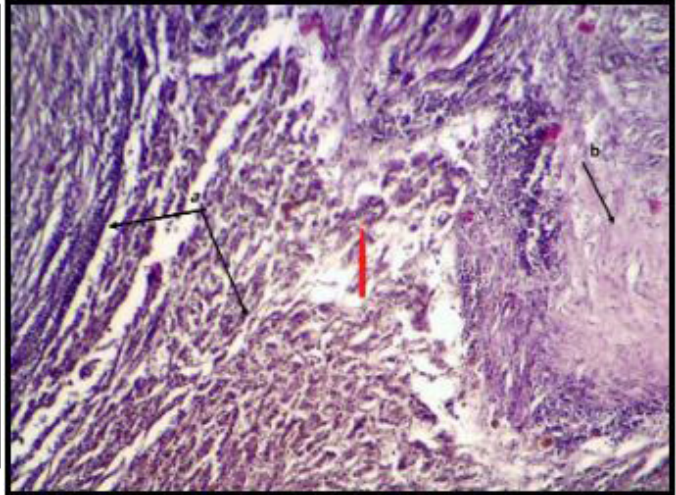
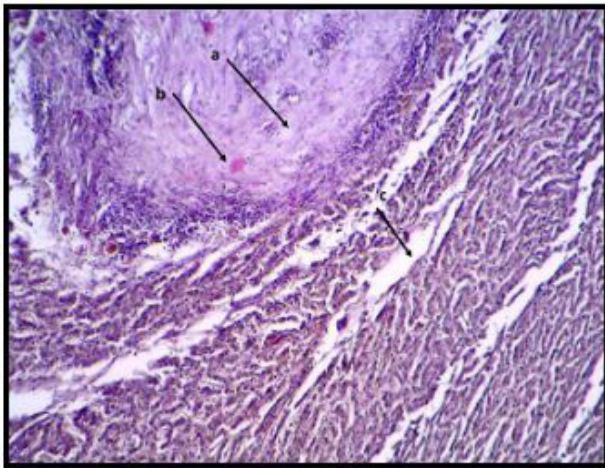
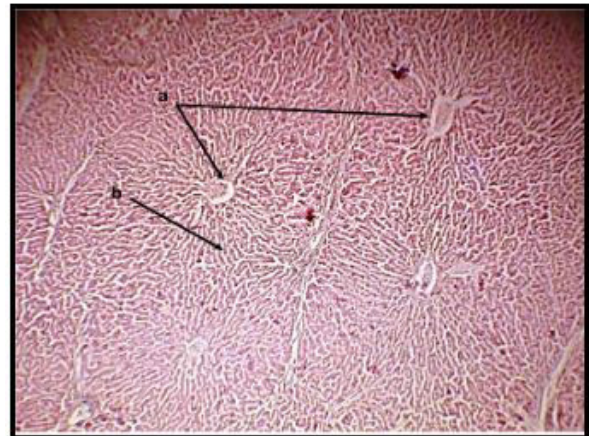
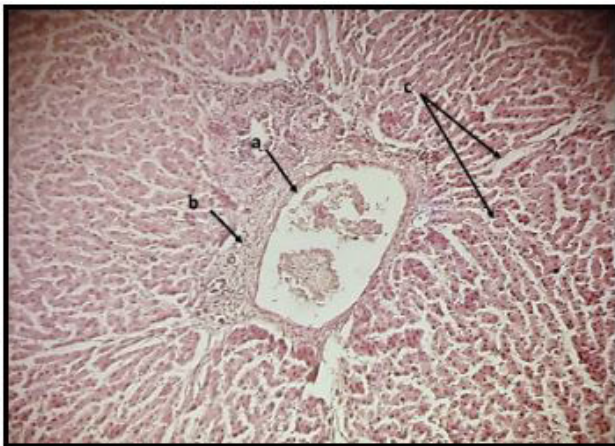


Fig3:sheep liver: a. maladjustment of hepatic cords, b. fibrosis of the connective fibers (10x)

Fig4:sheep liver a. fibrosis, b. spot of hemorrhage , c. maladjustment of hepatic cords(10x)



Congestion and expansion of portal vein and infiltration of lymphocyte around portal vein in addition to expansion of blood sinusoids as shows in Figure 5. The central veins expended and there is a congestion in these veins with increase of connective tissue around the portal and central veins (Figure 6).

Fig5: cow liver a Congestion and expansion of portal vein, b. infiltration of lymphocyte around portal vein, c. expansion of blood sinusoids.(10x)

Fig. 6: cow liver: The expansion and congestion in central veins, b. increase of connective tissue around the portal and central veins.(4x)

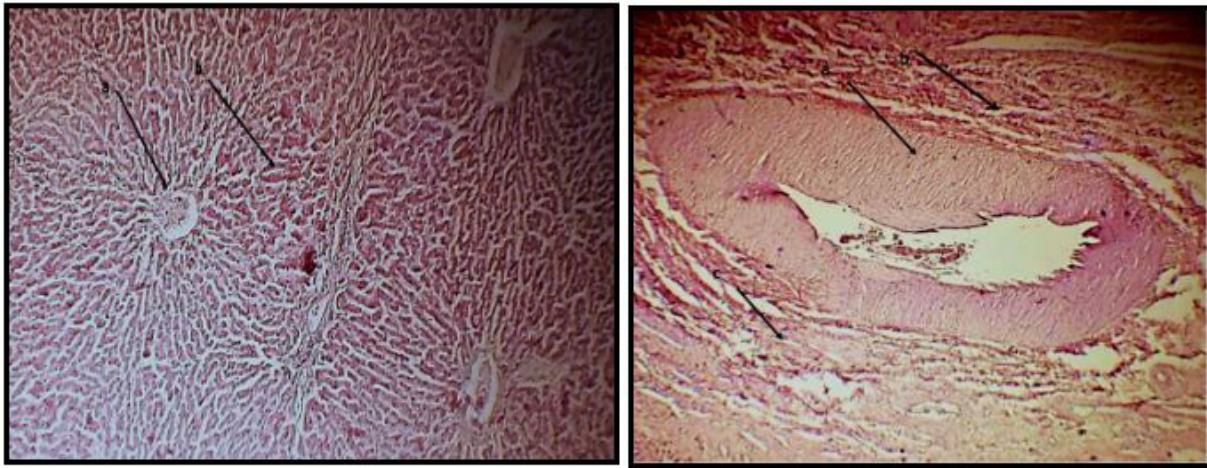


Figure 7: liver: a. expansion and congestion of portal vein, b. infiltration of lymphocyte cells(10x)

Figure 8: liver: a. expansion of portal vein and increase of thickness wall of portal vein, b. lymphocytes, c. fibrosis around portal vein (10x)

Histological changes included also, Necrosis, fibrosis, infiltration of inflammatory cell, cirrhosis in Figure(9). Necrosis, fibrosis, inflammatory cell in portal area, maladjustment of hepatic cords

Both Figures(11) and (12) obtained fibrosis around portal veins and infiltration of inflammatory cells and congestion of portal vein and necrosis, it can be seen the increase in bile duct numbers and the layer of hydatid cyst surrounded with fibrosis in Figure(12). A comparison between the histological changes of sheep and cattle showed the same histological changes, with a difference in the severity of these changes as they were more severe and developed in the livers of cattle than in sheep.

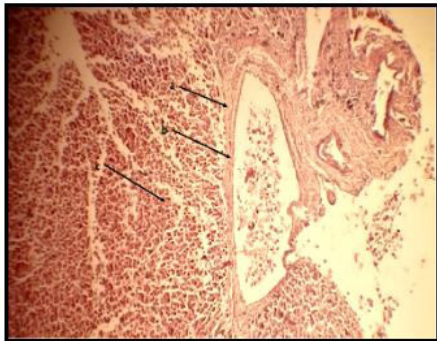


Figure 9: cow liver: a. fibrosis, b. expansion in portal vein, c. infiltration of inflammatory cell (10x) **Figure10:cow liver: a. fibrosis, b. inflammatory cell around portal area, c. maladjustment of hepatic cords (10x)**

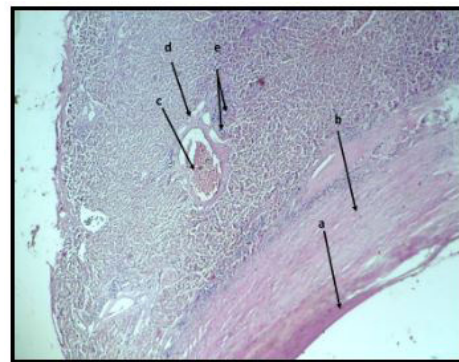


Figure11:cow liver: a. necrosis, b infiltration of inflammatory cells, c. congestion , d fibrosis(10x) **Figure12:cow liver: a. hydatid cyst wall, b. fibrosis, c. congestion ,d. fibrosis around portal vein, e. bile ducts (4x)**

Discussion

Hydatid cysts may arise anywhere in the intermediate host body (animals and human) but it mostly arise in

liver as hepatic capillary network forms the first capillary filter for circulating hexacanth embryos¹, they slowly develop to the hydatid cyst in this organ¹⁸. So, the disease remains asymptomatic in intermediate animal hosts until they reach to suitable volume to initiate the symptoms⁸. Although, there are many histological changes resulting from hydatid cysts infection. The present results of this study obtained that they are many changes in liver tissue and these changes including: infiltration of inflammatory cells, necrosis, degeneration of liver tissue, fibrosis, fibrosis around portal veins, congestion of portal vein, increase in bile duct numbers, maladjustment of hepatic cords, These results agree with many previous studies (2,4,12) as they reported that the hydatid cysts infection resulting in many histological changes in any infected organ.

The enlarged cysts pressed on the hepatocytes and congested the portal veins in addition to maladjustment of hepatic cords caused as a result of the pressure resulting from these cysts and this agree with⁶ who recorded that the experimentally infected mice have histopathological changes including hepatocytes and congested the portal veins in addition to maladjustment of hepatic cords resulting from the pressure of enlarged cysts. The same authors obtained that the reactions, such as lymphocytes infiltration and fibrosis capsules were occurred for the final cleanup of the residual debris of cysts⁶. These results as well as to the results that recorded by³ concur with the present study that revealed that fibrosis was occurred heavily in cattle liver tissue compare with sheep liver tissue as the age of slaughtered animals (the mean cattle age was one year while the mean sheep age was five months). The difference in age between cattle and sheep gives the time for the development and growing of the cysts in the cows according to the fact that this process is slowly. The fibrous tissue developed as a host's reaction to the parasite inflammatory effect, initiated in the early development stages of the cyst and the intensity of this reaction effect on the cystic development, if there is a heavily reaction it will lead to degeneration or death of the parasite while a moderate reaction allows the development of a viable cyst¹⁵. The present study compared between the liver's histological changes in both of sheep and cattle infected with hydatid cyst. In both, the reaction of the host to the presence of hydatid cyst referred to very clear chronic inflammatory reaction characterized by fibrosis associated with lymphocytic reaction and congestion, centrally with areas of necrosis and this agree with³

There was infiltration of lymphocytes recorded in the present study in both of sheep and cattle liver this due to inflammatory reaction of host –parasite interaction as¹⁷ study suggest the impact of the host's susceptibility on the composition of T lymphocytes which are locally activated in response to hydatid infection of the liver.

Increase in the number of bile ducts and thicken in their wall and expand their cavity occur in the liver in present study. This agree with⁷ who obtained that a large hydatid cyst caused compression on the bile duct bifurcation with proximal bile duct dilatation. In the hepatic parenchyma a slight hemorrhage and mild hepatocellular degeneration occurred in the present study and were in accordance with the findings of an earlier worker,¹⁸. These changes may due to the pressure of hydatid cyst that that cause in destruction of hepatocells.

This study concludes that the hydatid cyst infection result in many histopathological changes in both of cattle and sheep with difference in severity tend to cattle.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Baghdad University, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Effect of Special Exercises by Using Training Methods to Assist in the Development of Some Motor Abilities and Handstand Skill of Still Rings for Young People

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Abstract

Artistic gymnastics is considered as one of the plays that developed, in which the performance reaches to the top, we exactly dedicate to the still rings device that its exercises characterized by strength, stability, pronation and tucks flyaway of handstand, so an athlete needs to strength, speed, endurance, fitness, balance and flexibility. This study aims at preparing some special exercises using assistance tools to improve some motor and skills abilities on the Still Rings device. This study hypothesized that there is no significant differences between pre and post-tests of the experimental and control groups in the motor abilities and handstand skills of still rings device for the good of experimental group. The researchers used descriptive method with two groups. After homogenizing and equaling the sample of the research, the researchers applied special exercises on the experimental group that made up of (24) training modules. The researchers concluded that the special exercises with assistance tools have a great role in improving the motor and skillful abilities of the experimental group. The use of these assistance tools in improving the performance of some skills which assist in saving time and effort of the trainer and the player.

Keywords: *Handstand Skill, Still Rings and Motor Abilities.*

Introduction

The role of sports training lies in applying its principles, rules and scientific bases in building the essential training curriculum in each game and sports effectiveness, including the gymnastics game, which has the specificity of special physical requirements and high performance art in addition to that of its practitioners must be young people comparing with players in some other sports. Gymnastics works to form and build body and gain good strength and enjoy high fitness, although, it is a single game but it offers an infinite opportunity in creating the ability to invent and success through performing motors which leads to the development of the ability of consistency, continuity and compatibility

among players. The still rings device is considered as a lovely device, because it has lots of features as well as the extent of invention in the skills used, hence the movements on this device is characterized by strength, stability and the diversity of movements and their interconnection in a form that combines tuck flyaway, strength, stability and motor pronation to perform a series of motions ended with weakening. The significance of the study lies in preparing exercises for the special strength using training tools to assist in developing the physical, motor and skill abilities of players, because these exercises have a great role in building muscle strength and developing performance art, which requires performance exercises that related with the skill to be performed, exercises will be selected to correspond to the motor performance of the skill to be performed on a device that contributes to improving the performance art of this skill to achieve the best in gymnastics game.

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Statement of the Problem

The gymnastics art is a game that was improved, in which the performance rising to a greater extent,

we indicate specifically the still rings device that characterized by strength, stability, pronation and tucks flyaway of handstand, so an athlete needs to strength, speed, endurance, fitness, balance and flexibility in order to perform the skills in this device. Through the researchers' experience as trainer, former player and by follow up of all gymnastics tournaments that take place at the country level for young people as well as their the training courses, the researchers illustrated that there was a problem lies in weak performance of handstand skills of still rings for young people, which represented in big litigations by the execution (E) committee, as a result of tuck flyaway and non-stability that leads to litigate the score. The researchers believed that the lowly artistic performance according to trainers' views is due to the lack of physical preparation that associated with the skillful part because most of the gymnastics training skills depends on experience and self-assessment as well as the lack of use of devices and assistive training devices due to the lack of most of them, which encouraged the researcher to use the training devices as well as prepare exercises for skillful performance that work to improve physical and motor abilities and artistic performance by using the still rings device.

Aims of the Study

1- Preparing special exercises by using some tools to improve some motor and skillful abilities by using the still rings device.

2- Identify the effect of special strength exercises by using some tools to improve some motor abilities and the skill of handstand by using the still rings device.

3- Identify the significant differences between the experimental and control groups in pre and post-tests of the motor abilities and handstand skill on the still rings device.

Hypothesis

1. There are significant differences between the results of the pre and post-tests of the experimental and

control groups in motor abilities and the handstand skill by using the still rings device for the good of post-tests.

2. There are significant differences between the results of the post-tests of the experimental and control groups in motor abilities and the handstand skill by using the still rings device for the good of experimental group.

Limitations

Human limit: Gymnastics players (young people) who their ages ranged (10-12) years, Training Center in Thi-Qar.

Time limit: the period from 1/1/2019 to 1/9/2019.

Place limit: The hall of Nasiriyah Specialized Gymnastics Training Center

Practical Framework

Methodology

The researchers used a descriptive method with two equaling groups (experimental and control groups) of the pre and post-tests in order to appropriate the problem of the study.

The Sample and Community of the Study

The study community represented by the young gymnasts who have trained at the specialized training center in Nasiriyah, who numbered (8) players, their ages ranged between (10-12) years, the sample selected in the intentional way represented (100%), the random method was adopted in dividing the sample of the study, so the researcher adopted the method of the lottery by dividing the sample into two groups (experimental and control), each group included (4) players, the researcher homogenizing the study sample by using Coefficient of Skewness as in table (1), through the variables of coefficient of skewness value, less than ± 3 that means the sample normally divided.

Table (1). Shows the Homogeneity of the Study Sample Members in the Sample Specifications

No.	Variables	Measurement Unit	Mean X	SD	Coefficient of Skewness (SK.)
1	Length	Cm.	139,37	10,43	0,32
2	Mass	Kg.	33,75	7,36	0,02
3	Age	Month	132,00	9,07	0,00
4	Training age	Month	52,50	10,99	0,99

The researcher made equalization between the experimental and control groups, which illustrated by table (2)

Table (2) shows the equalization of the two groups

No.	Variables	Measurement Unit	Experimental group		Control group		Sig.	Significance Level
			Mean X	SD.	Mean X	SD.		
1	Length	cm.	137,50	8,081	141,25	12,91	0,64	Non-sig.
2	Mass	Kg.	35,25	8,73	32,25	6,65	0,60	Non-sig.
3	Age	Month	132,00	9,79	132,00	9,79	1,00	Non-sig.
4	Training age	Month	51,00	11,48	54,00	12,00	0,73	Non-sig.
9	Imbalance	Second	16,25	0,95	15,75	1,70	0,62	Non-sig.
10	Fitness	number	5,75	0,50	5,50	0,87	0,53	Non-sig.
13	Handstand	degree	3,50	0,57	3,25	0,50	0,53	Non-sig.

The Procedures of the Study

Fitness Test

Test name: Burpee (Squat Thrust) of stand:

Aim of the Test: to measure the fitness.

Age and gender level: from 9 to 17, both male and female.

Tools used: Stopwatch

Performance specifications: The experimenter takes stand mode, with the starting signal moves to squat, then to the Burpee Squat Thrust, then back to squat, and finally to stand mode, the body must be straight when passing standing mode, and in squat mode the ground must touch the hands repeatedly as much as possible for 10 seconds.

Scoring Points: each standing has one score, for example if the experimenter completed four exercises then turn in the fifth time to squat, would got only (4.25) degree, if he/ she reaches to Burpee (Squat Thrust), which provide him/her (4.5) degree and if he/she returns to the squat mode after Burpee (Squat Thrust) he will get (4.75) degree, every experimenter has the right to try

three times, then the best performance will be scored.

Hard balance test

The aim of the test: this test aims to measure the dynamic balance.

Tools used: Pommel horse - stopwatch, foam mats.

Performance specifications: The experimenter takes a parallel standing mode - capture the two rings of the Pommel horse, with the start signal, the player jumps to center open, and strength in the longest mode as long as possible.

Scoring Points: Calculating the time of stability per second.

Description of skill tests:

The researcher conducted pre-skill tests for the members of the study sample, the tests included the performance of the members of the study sample for the skill of handstand and was photographed and presented to the referees to be evaluated by a jury made up of four referees, it has done by agreed with the jury members to evaluate the artistic performance of the study sample by

watching TV show of the pre and post skills test. The questionnaire contained referees' scores, which each one were (10), and write off the highest and the lowest scores as well as adding the two mean scores then divided by 2, in order to extract the final score of the player.

Pre-Tests:

The researcher conducted pre-tests of the special motor abilities of the experimental and control groups as well as the artistic performance on the still rings device on Saturday (2/3/2019).

Special Exercises:

The researcher prepared special exercises aimed at improving motor abilities and skill handstand among the players, these exercises characterized as contributing to the achievement of the aims of the special preparation level (physical and skill) for young players (specialist center - Nasiriyah) as well as homogenizing the exercises insides with their motor and skill characteristics, that exercises were applied by extracting medium tension for all exercises used.

1. The first training unit was conducted on Monday (4 March 2019) after pre-tests.

2. The researchers prepared training exercises after taking the opinion of the experts to prepare a set of exercises for ability, fitness and balance.

3. Through these exercises the researchers aim to improve fitness and balance by using skill training using body weight.

4. Applying the exercises took eight weeks at the rate of three training units per week which are (Monday, Wednesday and Friday), the total time of the training unit was (25-40 minutes) taking into account the gender, age, training age and physical capabilities of the study sample.

Table (3) shows SDs. and means X of pre and post-tests for some skillful tests, motor abilities, calculated T value and the significant level of the experimental group.

No.	Abilities and Skills	Measurement Unit	Pre-test		Post-test		Sig.	Significance Level
			Mean X	SD.	Mean X	SD.		
1	Handstand	degree	3,25	0,50	6,75	0,95	6,48	sig.
2	Fitness	number	5,50	0,57	8,75	0,95	5,81	sig.
3	Imbalance	Sec.	15,75	1,70	23,50	1,29	7,24	sig.

View and analyze the results of pre and post-tests of motor and skill abilities in the experimental group:

4. The number of training units was (24).

6. Identify the aim to be reached through each training module.

7. The ratio ripple factor was 2-1.

8. The researcher supervised the special exercises and the training units were applied to the experimental group by the trainer.

9. The researcher used exercises in the main section.

10. The researcher used the method of training and repetition.

11. The researcher started applying training units in the special preparation period.

Post-Tests:

The researcher conducted tests for the sample of the study on Saturday (7/5/2019) to test the motor and skill abilities, after the expiry of the period of the exercises and in the same method of pre-test, the researcher was keen to prepare the post-tests similar to pre-tests in terms of spatial and temporal conditions as much as possible.

Statistical Methods:

The data was processed by a computer using the Statistical Package for the Social Sciences (SPSS 24), whereas the researcher used the following statistical methods:

Show, Analyze and Discuss the Results of the Study:

Presentation and analysis of the results of pre and post-tests of motor abilities and handstand skills in the control group:

Table (4) shows SDs. and means X of pre and post-tests for some skillful tests, motor abilities, calculated sig. value and the significant level of the experimental group.

No.	Motor Abilities and Skillful	Measurement Unit	Pre-test		Post-test		Sig.	Significance Level
			Mean X	SD.	Mean X	SD.		
1	Handstand	degree	3,50	0,57	8,25	0,50	12,43	sig.
2	Fitness	number	5,75	0,50	12,25	0,95	12,03	sig.
3	Imbalance	Sec.	16,25	0,95	28,75	0,95	18,46	sig.

Showing, analyze and discuss the results of the post-tests of the motor abilities and handstand skill for in the control and experimental groups:

Table (5). Shows SDs. and means X of post-tests for motor abilities and handstand skill of the experimental and control groups

No.	Motor Abilities and Skillful	Measurement Unit	Pre-test of the control group		Post-test of the experimental group		T	Sig.	Significance Level
			Mean X	SD.	Mean X	SD.			
1	Handstand	degree	6,75	0,95	8,25	0,50	2,77	0,03	sig.
2	Fitness	number	8,75	0,95	12,25	0,95	5,17	0,00	sig.
3	Imbalance	Sec.	23,50	1,29	28,75	0,95	6,53	0,00	sig.

Discuss the results of the Test of the Two Control and Experimental Study Groups:

Through the tables (3,4 and 5), the researchers believe that the training program used by the trainer has affected the members of the sample of the control group, and that the development that occurred in (motor abilities, skillful) of the members of the control group as a result of continuing training, feedback and commitment on weekdays All helped to develop and apply the training program prepared accurately, according to his style, in addition to his choice of exercises that play a role in the development, it is clear that the physical tests in the control group got evolved through the observation of the arithmetic means (X) but did not reach the significant similar to what happened in the experimental group, the researcher believes through these exercises that motor

abilities have been developed clearly although the development that occurred to the control group due to the continuation of training and exercises used by the trainer. The use of special exercises from the experimental group only in the main section of the training unit had a clear impact in the development of motor abilities as the main section contained special exercises prepared by the researcher which served as a new way to remove the boredom that dominated the players as a result, the use of exercises using assisting tools, as well as the use of the method of training with the weight of the body, which has had a great impact in the development of motor abilities as it led to the rush of players to perform their exercises seriously and with great interaction as a result of pleasure in the performance of their own exercises, that the association of abilities Skills are a necessary and important factor in creating a fully-

fledged player. We also note a great improvement in the development of fitness and the researcher also attributes this to the diversity in exercises that have given great benefit to most of the muscles of the player's body and to the process of linking movements together by consensus and agility and its use for it whether in the general or private direction, which led to stability and adjustment on the performance of exercise and the constant renewal of the motor path and compatibility between muscles involved in performance, concentration, motor binding, motor control. We also note an improvement in balance and the researcher may attribute this to the use of the experimental group and its application of exercises that worked on the development of this characteristic and the ability of these exercises to absorb the weight of motor weight with the organization of muscle tension, body weight, reaction of concentration and acquisition of the art of motor performance taking into account the lifting.

Conclusions

The researcher found out the following conclusions:

- 1- The special exercises that used assisting tools have an active role in the development of motor and skill abilities in the experimental group.
- 2- Using the tools to assist in the process of improving the performance of some skills which contributes to saving time and effort for the trainer and the player.
- 4- The experimental group has surpassed the control group, which applied special exercises in all the study variables that is significantly and clearly.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Thi-Qar, Iraq and all experiments were carried out in accordance with approved guidelines

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Psychological Analysis of Jenang Kutei Judges in Delivering a Verdict of Matai Bilai and *Cuci Kampong* (Purification Ritual) in Rejang Lebong Regency, Bengkulu Province, Indonesia

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Abstract

Jenang Kutai judges or judges of custom law are judges that are selected from traditional leaders, community leaders or religious leaders. They are highly respected as they are considered as a role model and are prestigious in the society. Well-mannered characteristics owned by custom law judges is underpinned by their maturity balanced with applicable norms in the society. As a judge, *Jenang Kutai* judge should be calm, assertive, fair, and bold in making decision or delivering a verdict. This is done in order to enforce the law. Even though sometimes such judges psychologically have sympathy for the defendant, they have to pass sentence because people they believe that God's punishment through hazard disaster will come for those who commit the crime and do not enforce the law.

Keywords: Psychology, Jenang Kutei, Tempung Mata Bilai Verdict, Cuci Kampong, Rejang Lebong Society

Introduction

The acknowledgement of custom law is officially ruled by and stated in the second amendment of The 1945 constitution of the republic of Indonesia article 18B paragraph (2) that states "*The state shall acknowledge and respect traditional societies along with their customary rights as long as these remain in existence and are in accordance with the societal development and the principles of the Unitary State of the Republic of Indonesia, and shall be regulated by law.*"⁽¹⁾

According to Soerojo Wignjodipoero, the existence of custom law is underpinned by the decisions in the society, particularly decisions made by society leaders concerning law enforcement activities.⁽²⁾ The aforementioned decisions are made for any kind of disputes and should be based on the result of deliberation. Such decisions are made by considering the values exist in the society and applicable within the society itself.⁽³⁾

Katrina Cuskelly defines custom law as "the custom and usage with law enforcement power". However, there is a possibility that custom law refers to custom acceptance and appropriateness since certain society members have already obliged to certain custom or after being regulated by state court. These two interpretations may result different meaning. In this case, the most comprehensive understanding on the definition of custom law is given by the constitution of Papua New Guinea.⁽⁴⁾

The definition states that an ethnic custom law is indigeneous law that is specifically applicable for certain society or ethnicity. On the other hand, Islamic law is certain law that is applicable along with the custom law and is applied based on the religion of its citizens. Oji continue states that the application of these laws dualism is influenced by British colonial law.⁽⁵⁾

Law of the Republic of Indonesia about village regulates the formation of institute of indigeneous village (Article 95) and village people (Article 96) under certain conditions. Therefore, there are efforts in discussion how to apply custom law along with common law, even though such efforts are not significant yet.

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The existence of *Jenang Kutei* as an indigeneous institution and *Kelpeak Ukum Adat Ngen Riyan Ca'o Kutei Jang* as the guidance for the people of *Rejang* tribe is in line with the statement of Von Savigny in which this called as *Volkgeist* or the core of the state. In this case, law is a reflection of *Volkgeist*, or the battle of human and space and time. *Volkgeist* is a concept of faith, context and locality⁽⁶⁾.

As a law enforcer in a court, a judge should have high integrity and be professional. Moreover, a judge also needs to gain trust from the society and justice seekers in order to perform his duty fairly. One of the characteristics that the society considers in trusting a judge is from his behavior, both in workplace and in daily life. In this case, integrity and dignity are closely related to personal trait and well-mannered character.⁽⁷⁾ Concerning the selection of *Jenang Kutei* judges, only selected people or the society leaders having comprehensive understanding about its custom and healthy psychology that may be selected for this position⁽⁸⁾.

Therefore, this present article aims to analyze how the psychological condition of *Jenang Kutei* judges in making decision of *Tempung Matai Bilai* and *Cuci Kampung* (a form of purification ritual) in *Rejang Lebong* regency, *Bengkulu* province.

Method

This study was a legal research in health. It employs qualitative, non-doctrinal approach.⁽⁹⁾ Data were collected using study of documentations or secondary data, then analyzed descriptively.

Findings and Discussion

The abundance of problems or conflicts happen in the society requires indigeneous judges or *Jenang Jutei* as the decision maker to fairly participate and decide the case according to the applicable custom law. They have to consider their decisions according to the *Kelpeak Ukum Adat Ngen Riyan Cao Kutei Jang*. For example, if there is a man who commits sexual assault, he will be charged with certain punishment in custom law as follow:

(1) *Conducting certain purification rituals. Those activities are not allowed to be conducted at night (however, in the case of Tempung matai bilal, the activities are no longer conducted as they were considered extreme under the new BMA leader)*⁽¹⁰⁾.

The other sanctions are fined as much as murder case (2) fine charged to female criminals is based on the demands approved by the male side. (3) The criminals are whipped 10 times by using a hundred pieces of small sticks⁽⁷⁾.

Another example of punishment is given to someone committed premarital sex. For such criminal, she is obliged to slaughter a goat. The slaughter is conducted after the baby is delivered. For the family who does not obey the law, a simple punishment is available. According to *Kadirman*, the punishment is limiting their social interaction⁽¹¹⁾.

Jenang Kutei judges should be selected from traditional leaders, community leaders or religious leaders. They are considered as selected person that this selection is officially authorized and stated in the decree of reagent. Currently, there are only three *Jenang Kutei* judges. Formerly, there were 20 judges, and then it remained five judges, and now there are only three judges. As judges, *Jenang Kutei* are highly respected as they are considered as a role model and are prestigious in the society.⁽⁷⁾

This make they are considered have stable state of psychological condition. As the results, they are trusted to make wise decisions. Their wisdom proves that such judges are able to survive in the middle of new culture diversity. Such judges have the ability to accommodate the elements of other culture and integrate their own culture with the development of other aspects in life⁽¹²⁾.

Well-mannered characteristics owned by custom law judges is underpinned by their maturity balanced with applicable norms in the society. Well-mannered person always use his/her sense, thought and careful consideration in everything he/she does. In other words, each action that is performed is logical. Noble attitude of judges indicates that being a judge is a noble job or *officium Nobile*. A profession particularly that is based on professional ethics and has been recognized by public is considered as a noble job or *officium nobile* if it consists of following aspects: solid professional association, professional standard, professional ethics, public recognition and formal educational background.⁽¹³⁾ The main duty of a judge is to fairly adjudicate every case filed to the court according to the applicable law without distinguishing people based on their ethnic, religion, race, profession or social status.

Judges' duty in adjudicating cases actually has two

interpretations; enforce justice and enforce the law. In term of enforcing justice, the main duty of a judge is to enforce justice without having extension to the law. As a law enforcer, a judge not only has to enforce justice but also have to reinforce the broken law⁽¹⁴⁾. One of the examples is concerning sanction for adulterer or rapist that is decided by the Village Consultative Body. The decided sanction is to conduct *Cuci Kampung*, a form of purification ritual and *Tempung Matai Bilai*

In delivering sentence or making decision toward the violation of custom law, the decisions made depend on the minority or majority of the violation itself. For minor violation, some sanctions given include reprimand, warning letter, apology or obligation to conduct alms giving ceremony or purification rituals. For more severe, major violation, the decided sanction usually include being excommunicated or outcasted from the society.⁽¹⁵⁾

Aharon Barak states that the duty of judges is not only to resolve disputes, but judges also have responsibility to bridge the gap between citizen and the law⁽¹⁶⁾.

According to Glendon Schubert, judges are ordinary people. Thus, it is assumed that judges and people involved in a case are human biological substance in term of personality. In this case, there are three main psychological function of personality substance, namely perception, cognition, and decision-making. Glendon Schubert employs behavioral jurisprudence analysis in analyzing judges' behavior.⁽¹⁷⁾ The result shows that there is a process of interaction and communication, interest articulation and aggregation. It also explains that personality variable is correlated with social and cultural spaces. Cultural spaces refer to widely-accepted pattern of faith and social values such as myth, custom and law. The contents of social spaces itself tend to be ideological values instead of direct, observable activities.

In regard to legal culture, Lawrence M. Friedman defines it as legally oriented values, ideas, attitudes and behavior.⁽¹⁸⁾ The overlapping socio-psychological segment between personality and social system is closely related to individual socialization and recruitment. Such segment is also correlated to one's attributes and behavior

Psycho-cultural segments in which personality and cultural system are overlapping is one's individual conception of his roles and ideology. Therefore, its three subsystems namely personality, social and culture share the same meeting point with segments of socio-

psychological, psycho-cultural and sociocultural. Due to the complexity of the problem judges and court may encounter, it is no longer comprehensive if the theory frameworks that are used to analyze the case are legal sociology and anthropology approach. Instead, it also needs legal psychological approach.⁽¹⁸⁾

Legal psychology or psychology of law perceives law as an embodiment of one's developmental psychology. This discipline analyzes one's legal behavior that may become the representative of certain psychological symptoms as well as the psychological basis underpinned that certain behavior. The study of legal psychology emphasis on psychological factors that influence one or people's behavior in every legal action they do. For example is judge's behavior or attitude in investigating, adjudicating and making decision. Judge's psychological condition may affect his ability in making decision or delivering the verdict. This situation is also applicable for the other law enforcement officers. As for the last segment, sociocultural segment is closely related to social and cultural system that represents the organizational pattern and accommodation and regulation output function from one's behavior.⁽¹⁹⁾

The use of custom law as the legal basis to solve cases occurred in society is considered due to the characteristic that custom law is not contradictory with society's interests. That is why there is a correlation between legal existence and its effectiveness. Legal effectiveness refers to a condition that certain law has achieved its goals. It means that the certain law has been completely, legally applicable.⁽²⁰⁾ In this case, custom law is applicable because it is a part of law originated from customs, social principles that are made and protected by authoritative leaders and functioned to control legal relations within the society.

Village people always identify themselves as an integrated part of the universe in a related, dependent and influential relation. The most important thing is how they can create harmonic, balanced atmosphere between society and the surrounding area. In other words, it can be said that the reputation of Indonesian people is formed and built from the reputation of village people.⁽²¹⁾

Conceptually, the core and the meaning of law enforcement is in the actions of balancing the correlation between values described in consistent, manifest principles and people's behavior as the elaboration of the last value. This is aimed to create and maintain peace

As a judge, *Jenang Kutai* judge should be calm, assertive, fair, and bold in making decision or delivering a verdict. This is done in order to enforce the law. Even though sometimes such judges psychologically have sympathy for the defendant, they have to pass sentence because people they believe that God's punishment through hazard disaster will come for those who commit the crime and do not enforce the law.

It is in line with what is stated by the law "... after a decision has been determined, Tepung Tawar ritual or purification ritual is conducted as a form of purification or the village people called as a way to make the situation in harmony as former/ original situation. According to the traditional leader, in Tepung tawar ritual, a bowl of rice water added by sergayau (an endemic plant), turmeric and pumpkin leaves are used. The traditional leader, then, splashes the mixed water into the palms of the people in dispute. It is done to symbolize that the dispute is settled without acrimony."⁽²²⁾

Conclusion

Jenang Kutei judges should be selected from traditional leaders, community leaders or religious leaders. They are considered as selected person that this selection is officially authorized and stated in the decree of reagent. As judges, *Jenang Kutei* is highly respected people as they are considered as a role model and are prestigious in the society.

As a judge, *Jenang Kutai* judge should be calm, assertive, fair, and bold in making decision or delivering a verdict. This is done in order to enforce the law. As a judge, *Jenang Kutei* should be psychologically assertive in making decision and giving sentence. That is why only selected people (traditional or religious leaders) that have good condition of psychology ad socio-culture that is eligible to be a judge in custom law.

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Mechanism of Family-coping in Treating Patient with Schizophrenia Viewed from Factors that Affected it at Public Health Center of Balowerti, Kediri

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Abstract

Coping is a cognitive process and behavior that aims at reducing depression while facing stress situation. Treating patient with schizophrenia is a stressor for family and the family will tend to undergo pressure situation from either the environment or the inside part until it can influence family-coping in treating family who suffers mental disorder, such as schizophrenia. Moreover, this research aimed at knowing factors that influenced mechanism of family-coping in treating patient with schizophrenia. Data analysis utilized logistic-regression-test. The result showed that the factors that influenced against family-coping were self-esteem and social-support, meanwhile, the factors that did not influence it were knowledge, stress, and patient's behavior in social-isolation.

Keywords: *schizophrenia, family, coping*

Introduction

The problem of mental health actually does not become one of problems of the mortality cause directly, but this problem can cause someone's inability to do many things and to behave well. Hence, it can cause a problem for a group, including society.⁽¹⁾ There are three types of hard mental disorder, which are schizophrenia, bipolar disorder, and acute psychosis. Schizophrenia is the most dominant disease that is suffered by the population in the world, which is in 1% until 3% in the world⁽²⁾.

Schizophrenia is a multifactorial disorder of neural development that is influenced by either genetic factor or environment factor and it is characterized by either positive, negative, or cognitive symptoms. Psychotic symptom is indicated by abnormality in form and content of mind, perception, emotion, and behavior. The symptoms that can be observed in the patient with schizophrenia are the appearance and general behavior,

speech disruption, behavior disorder, affective disorder, perception disorder, and mind disorder. Cognitive symptoms often precedes the occurrence of psychosis. The positive symptom includes suspicion, hallucination, being rowdy restless, strange behavior, hostility attitude, and formal thinking disorder. The negative symptom includes difficulty in starting conversation, flat effect, less motivation, less attention, being passive, being apatis, self-withdrawal socially, and discomfort. However, patient with schizophrenia tends to self-withdrawal socially⁽³⁾.

According to report result from WHO⁽⁴⁾, sufferer of mental disorder with schizophrenia diagnosis had reached 24 millions of people around the world. Meanwhile, according to data of Basic-Health-Research⁽⁵⁾, in Indonesia, mental disorder rate had undergone significant increase from 0.5 per mil in 2007 to be 1,7 per-mil in 2013, from the total population in 251 millions of people. West Java Province was one of provinces with the highest rate of mental disorder in Indonesia that reached 20% from 45 millions of people or around 9 millions of people. Among mental disorders which were often found, one of them was schizophrenia. Meanwhile, in East-Java showed rate of 2,2 of people

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based on population data in East-Java, which was 38.005.413 peoples, hence, it could be concluded that 83.612 peoples underwent mental disorder in East Java-Indonesia.

Patient with schizophrenia who could not function normally caused she/he needed a caregiver. Caregiver was an individual who generally treated and supported another individual in her/his life⁽⁶⁾. Family was the closest unit and was a “main caregiver” for the sufferer. Support from family and routine treatment could minimize the symptoms of schizophrenia. In line with the treatment process for the patient with schizophrenia, family would undergo physical and emotional fatigue. In order to overcome this condition, the family needed to conduct coping strategy during treating patient with schizophrenia. Lazarus & Folkman⁽⁷⁾ defined coping strategy was as a change from a condition to another

condition as a way to face unexpected situation which empirically, it was known as a process and divided it into problem focused coping (PFC) and emotion focused coping (EFC).

Method

Data collection in this research was conducted by using questionnaire that was distributed to 70 respondents of family with schizophrenia patient in area of Public Health Center of Balowerti, Kediri, East Java, Indonesia. The dependent variable was mechanism of family variable in treating patient with schizophrenia and the independent variables were knowledge, self-esteem, stress, social-support, patient’s behavior in self-withdrawal socially. The data were analyzed by utilizing logistic-regression-test.

Findings

Table 1. Distribution of knowledge, self-esteem, stress, social-support, coping-effort of care-giver and aggressive-behavior and social-isolation of patient

Care-giver’s knowledge	Percentage	Frequency
• Less	17.1	12
• Adequate	52.9	37
• Good	30	21
Care-Giver’s Self-esteem		
• Negative	50	35
• Positive	50	35
Care-giver’s stres		
• High	21.4	15
• Medium	54.3	38
• Low	24.3	17
Care-Giver’s Social-support		
• Less	21.4	15
• Adequate	45.7	32
• Good	32.9	23
Care-Giver’s coping-effort		
• Emotional based coping	45.7	32
• Problem based coping	54.3	38
Patient’s aggressive-behavior and social-isolation		
• Social-isolation	78.6	55
• Aggressive-behavior	21.4	15

It showed that the care-giver’s knowledge mostly had adequate, the most of care-giver’s self-esteem was negative, the most of care-giver’s stress was in medium, the most of care-giver had adequate social-support, the most of care-giver’s coping-effort had problem based coping, the most of patient with schizophrenia had behavior of social-isolation.

It showed that the value of Hosmer and Lemeshow Goodness of Fit was 4.689; p-value was 0.790, hence, the model was fit.

Table 2. Overall Model Fit

Interation	-2 Log likelihood
Step 0	96.526
Step 1	67.246

It was occurred the decrease value between the value of -2 Log Likelihood in block 0 and the value of -2 Log Likelihood in block 1, which was in $96.526 - 67.246 = 29.280$. This condition showed that the model was hypothesized in fit with the data, which meant that overall, logistic regression model that was used was a good model.

Based on logistic-regression-test:

1. Knowledge

Regression coefficient was 1.105; Wald-value was 3.302; p-value was 0.069: there was no significant influence of knowledge on family-coping.

2. Self-esteem

Regression coefficient was 2.062; Wald-value was 7.123; p-value was 0.008: there was a significant influence of self-esteem on family-coping.

3. Stress

Regression coefficient was -1.308; Wald-value was 3.417; p-value was 0.065: there was no significant influence of stress level on family-coping.

4. Social-support

Regression coefficient was 1.402; Wald-value was 7.506; p-value was 0.006: there was a significant influence of social-support on family-coping.

5. Social-isolation

Regression coefficient was -1.368; Wald-value was 2.641; p-value was 0.104: there was no significant influence of behavior of social-isolation on family-coping.

Discussion

Coping-mechanism

The result showed that the most number of coping-mechanism category was problem based coping. It was supported by a conducted research by Bakhtiar & Ariani⁽⁸⁾. Coping was defined as all cognitive and behavior efforts to solve, prevent, and endure the demands⁽⁹⁾. Family’s burden in treating the schizophrenia was a psychological distress for family situation which was indicated by the increase of physical activities, there was emotional and social pressure in treating the schizophrenia patient⁽¹⁰⁾. The family could have high pressure if they did not have good adaptive coping-mechanism⁽¹¹⁾. High pressure would be faced as a result of financial problem, lack of time to socialize, poor family health, the dependence from the family members to the schizophrenia, and there was family conflict. Moreover, that condition impacted to the family’s ability in treating schizophrenia patient and the decrease of family’s life quality⁽⁶⁾.

When the family knew that there was a family member suffered schizophrenia, this family would be in emotional focused coping stage. In this phase, the family would respond this as a hurtful situation and could make them feel stressful. In this phase, the family also could be through escape-avoidance coping strategy, which meant that they tended to avoid this problem, to escape from reality, and how to make important decision. Along the time, the experience and belief that they had and perception that was gradually positive to the family member who suffered schizophrenia could make the family in planful problem solving condition, that was a condition when the family showed their real effort to solve the problem. The way they solved the problem could be from asking for more information about this disease, how to treat the patient, and how to prevent the relapse of this disease.⁽¹²⁾

Knowledge

The result showed that knowledge did not affect coping-mechanism toward schizophrenia patient. This result was not in line with Bakhtiar & Ariani⁽⁸⁾. Treating

patient with chronic disease like schizophrenia was not easy. They needed knowledge, high willing, loyalty, and patience. The family would do some treatments continuously to make the patient got better, normal, and got back to the family again⁽¹³⁾ and this was not in line with conducted research by Wardaningsih et al.⁽¹⁴⁾, who showed that factors that affected coping-mechanism were faith, financial, knowledge, communication, and social-support. Coping-strategy that was often used could be seen from the family-coping strategies, such as internal family-coping that relied on family, problem control, holding and solving problem, and revealing the problem together.

Self-esteem

The result showed that self-esteem had a significant influence on family-coping. Coping-mechanism was influenced by several factors, such as physical health, faith or positive mindset, problem solving skill, social skill, social-support, occupation, age, sex, and education. Respondent's anxiety level was also influenced by several factors, such as family-coping material, intimidation against self-esteem that was coming from external factors like the fear of losing the loved one, divorce, the change of occupation status, group pressure, and social culture⁽¹⁵⁾.

Schizophrenia patient had limited ability in doing activities. Many psychological problems such as the loss of independency, social-role, health and mental condition, and other problems made them need continuous treatment. This treatment would cost much. Besides, this condition also could cause a pressure for the family⁽¹⁶⁾. One of psychological responses that was in subjective pressure was the feeling of shame⁽¹⁷⁾. The family who had another family member who suffered schizophrenia would feel embarrassed and this feeling tended to cause low self-esteem on the family. The pressure that was felt by the family and low self-esteem on the family would cause disorder against family's role and function, including for how mechanism of family-coping in treating family who suffered health problem.

Stress

The result showed that stress level did not affect coping-mechanism. Stress was part of human life. It was caused by transaction among individual with the environment that created gap among demands which were coming from many situations biologically, psychologically, and socially.

Family was an internal strength so that they had control against life and torture. Significant situation, such as having a family member who suffered this disease made them stressful so that it became demand to cope and adapt with the problem for surviving and developing. Stress emerged when the family felt that they could not cope the problem because of the condition of the family who suffered the disease, thus, they would feel stressful. Nevertheless, stress was not one of the factors that influenced coping-mechanism because the stress level from each person would be different. This difference could alter the stress level. Person with low stress level would be able to manage himself/ herself and would try to give strength to the other family members to manage their stress level and support each others for the effort of increasing family welfare with the schizophrenia patient.

Social-support

The result showed that social-support gave significant influence against coping-mechanism. According to Taylor et al.⁽¹⁸⁾, people with high social-support would feel that the other people noticed more and needed the individual and could direct the individual to the healthy life style, thus, for the family who had health problem on the family members could increase their caring to the environment, particularly against the family member's health.

Support from family, working colleagues, society in social space had negative correlation with the emergence of positive symptom from schizophrenia patient. It explicitly meant that social-support could minimize the patient's relapse, hence, the family could treat the patient easily and they could also manage self the coping. Sarafino⁽¹⁹⁾ stated that interaction with other people could modify even change people's perception toward particular situation.

Support from family showed positive impact to the patient in which they would have better health and it was different with the patient who did not have support anymore. People with high relation with others also had higher chance to live with better health and it was different with those who had low relation with other people⁽²⁰⁾. Gerungan⁽²¹⁾ stated that social relation could support people's health and welfare. Moreover, health and happiness were not only influenced by social welfare but also close relation that supported each others would cause low risk from a disease. Support would decrease a

chance to suffer from disease. It meant that people with good relation would have intimate relationship with other people, could rely on, could support each other so that they could prevent the disease.

Social-isolation Behavior

The results showed that exclusion behavior from the schizophrenia patient did not give any significant aspect against coping-mechanism. Keliat et al.(22) stated that schizophrenia was a chronic disease that was indicated by inability or communication difficulties, reality problem, abnormal behavior, cognitive disturbance, and the difficulty to do daily activities. There were positive and negative symptoms of this disease. The positive symptoms included missed perception, hallucination, sense problem (hearing, sighting, tasting, smelling, and touching) without any external stimulation, the change of thinking and behavior. Negative symptoms included apathy or ignorance, blocking, social-isolation from the society and decrease daily social activities. Besides, the negative symptoms on schizophrenia patient caused the client underwent function disorder in social-isolation..

Coping-ability for schizophrenia patient would need external input, such as social-support. It could be from family, working colleagues, or communities. Sarason⁽²³⁾ stated that social-support would really help individual to adapt well, along with positive coping and self-building. It could prevent someone to get disturbance from psychological effect especially for schizophrenia patient who tended to exclude themselves from society. According to Friedman et al.⁽²⁴⁾, there were four aspects of supports which could be given by the family. They were emotional support, informational support, instrumental support, and assessment support and they were correlated each others. If the individual got the support maximally, they would learn to use positive coping to defense themselves from either internal or external pressure.

Social-isolation on schizophrenia patient did not have any significant influence against family-coping-mechanism, but family-coping-mechanism and teamwork would give positive impact for the patient. It was because the tendency to isolate from society was influenced by how good the relation between the patient with other people around. Moreover, schizophrenia patient had limited ability to do activities. Some psychosocial problems such as the loss of independency, social roles, health and mental problem became a

stimulus of stressor, hence, they had difficulty to adapt in society. In this case, family support and routine treatment would be very important for schizophrenia patient, hence, the patient could adapt well with the social function and this could prevent the patient to isolate from the society. In conclusion, good social-support would give positive influence for coping-mechanism and good family-coping would give positive influence against schizophrenia patient's behavior. Nevertheless, skill that was obtained by the individual regarding good coping strategy from family could make the individual to behave independently. Thus, the individual could do his/ her role in social function as usual without having any social-isolation.

Conclusion

The result showed that the factors that influenced against family-coping were self-esteem and social-support.

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Effectiveness of Stress-Adaptation and Cognitive Behavior (SACB) Model for Independent Health Recovery for Clients with Coronary Heart Disease in the Community

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Abstract

The main risk factors of coronary heart disease are: hypertension, hypercholesterolemia, and smoking, as factors that can be controlled and are reversible. Other risk factors are age, race, gender, heredity, geography, diet, obesity, diabetes, exercise, behavior and other life habits, stress, social changes and reversible mass changes. Lifestyle management, stopping smoking and effective changes in hypertension can reduce risk and death. Through this research, it is expected that the effectiveness of the Stress-Adaptation and Cognitive Behavior (SACB) Model on the ability to independently recover health care for clients with coronary heart disease. The design of this study was pretest-posttest with control group. Samples were 29 patients with coronary heart disease in RW 03 and RW 08, Pondok Labu, South Jakarta, which were selected by cluster random sampling technique, which were further divided into intervention and control groups. The intervention given was the Stress-Adaptation and Cognitive Behavior (SACB) model. The research instrument was the ENRICHD Social Support Instrument (ESSI) and modified the SF-36 Mental Health Index and Social Functioning subscale. Measurements included rehabilitation behavior, self recovery, blood pressure and pulse. Data were collected through observation and questionnaires, then analyzed using logistic regression tests and Mancova. Based on the results of the study it can be concluded that the Stress-Adaptation and Cognitive Behavior (SACB) Model is effective for building the ability of people with coronary heart disease to recover health independently.

Keywords: *coronary heart disease; stress-adaptation and cognitive behavior (SACB) model; independent health recovery*

Introduction

In Indonesia there has been a shift in the incidence of heart and blood vessel disease, from the 10th in 1980 to the 8th in 1986. While the cause of death remains third. Many factors affect the occurrence of coronary heart disease (CHD) so prevention efforts must be multifactorial. Prevention must be tried as much as possible by controlling the risk factors for CHD. Primary prevention is aimed more at those who are healthy, but has a high risk, while secondary prevention is an effort to prevent worsening of the disease condition. Various studies have been conducted for more than 50 years, where there are variations in the incidence of CHD that differ in geographical conditions and certain social conditions that have been increasing since 1930, and starting in 1960 this disease became the main cause of death in industrialized countries.⁽¹⁾

The main risk factors of CHD are: hypertension, hypercholesterolemia, and smoking, as factors that can be controlled and are reversible. Other risk factors are age, race, gender, heredity, geography, diet, obesity, diabetes, exercise, behavior and other life habits, stress, social changes and reversible mass changes. Lifestyle management, stopping smoking and effective changes in hypertension can reduce risk and death.

Based on the 2013 Basic Health Research, the highest rate of hypertension was 30.9% and the lowest was 16.8%. CHD with hypertension as the cause becomes very alarming. In a sick condition, the client experiences continuous stress, and can aggravate his physical and psychological condition, thereby threatening productivity in daily activities, also decreasing the client's contribution in the family and community.⁽²⁾ Hypertension cases cause around 9.4 deaths worldwide

each year. Hypertension causes at least 45% of deaths due to heart disease and 51% of deaths due to stroke. Deaths caused by cardiovascular disease, especially CHD and stroke are expected to continue to increase to reach 23.3 million in 2030. Every year World Heart Day is celebrated every September 29.⁽³⁾

Likewise, A Randomized Controlled Trial of Stress Reduction in African American Treated for Hypertension for Over One Year through a 20-minute intervention in the form of Progressive Muscle Relaxation (ROP), results in a decrease in blood pressure.⁽⁴⁾ Clients with CHD have risk factors that can be avoided, namely smoking, obesity, lack of physical activity, and stress, including eating patterns. Overall risk factors are generally known by the client, but he often underestimates and violates them. Other healthy behaviors are avoiding fatty foods, consuming fibrous foods (vegetables and fruits), avoiding salt or flavoring, consuming vitamins, consuming water, avoiding soft drinks, and getting enough sleep.

Clients with CHD at home who have been left out of care need family support and health workers to be able to carry out their health recovery independently (ENFICHD) from the beginning of stress and must adapt to the conditions of illness, both ways of regulating lifestyle healthy to independent abilities, both cognitive abilities and monitoring their health conditions. Stress-Adaptation and Cognitive Behavior (SACB) models can strengthen the client’s ability to adapt through mindset and immune system, each other has a connection that can be explained through communication of cells that are experiencing stress and neurotransmitter factors⁽⁵⁾, in order to carry out recovery health independently through adjustments to coping mechanisms and health

status. Strengthened with the Cognitive Behavior model, it is expected that the client is able to recognize the structure, content and function in dealing with his pathophysiological conditions, especially the ability of assimilation until the client is able to independently monitor his health condition.⁽⁶⁾

Through this research, it is expected that the effectiveness of the Stress-Adaptation and Cognitive Behavior (SACB) Model on the ability to independently recover health care for clients with CHD.

Method

The design of this study was pretest-posttest with control group. Samples were 29 patients with CHD in RW 03 and RW 08, Pondok Labu, South Jakarta, which were selected by cluster random sampling technique, which were further divided into intervention and control groups. The intervention given was the Stress-Adaptation and Cognitive Behavior (SACB) model. The research instrument was the ENRICHD Social Support Instrument (ESSI) and modified the SF-36 Mental Health Index and Social Functioning subscale.⁽⁷⁾ Measurements included rehabilitation behavior, self recovery, blood pressure and pulse. Data were collected through observation and questionnaires, then analyzed using logistic regression tests and Mancova.

Findings

The analysis showed that there were differences in sex, education and history of DM between the intervention group and the control group. But there was no difference in history of hypertension and history of CHD.

Table 1. The equality test

Variable	Intervention group		Control group		P-value
	f	%	f	%	
Gender					0.004
• Male	11	44	2	8	
• Female	14	56	23	92	
Education					0.010
• Elementary school	1	4	-	-	
• Junior high school	18	72	5	20	
• Senior high school	6	24	20	80	

Cont... Table 1. The equality test

Variable	Intervention group		Control group		P-value
	f	%	f	%	
History of DM					
• Yes	8	32	17	68	0.011
• No	17	68	8	32	
History of hipertension					
• Yes	11	44	11	44	1.000
• No	14	56	14	56	
History of CHD					
• Yes	18	72	12	48	0.083
• No	7	28	13	52	

The analysis showed that there were differences in the duration of CHD between the intervention group and the control group. However there was no age difference between the intervention and control groups.

Tabel 2. The equality test of age and the duration of CHD

Variable	Group	n	Mean	SD	P-value
Age	Intervention	25	54.76	56	0.867
	Control	25	54.32	51	
Long suffering from CHD	Intervention	25	3.12	3.77	0.017
	Control	25	1.04	1.67	

Table 3. Comparison of respondents' self adaptation, self recovery, blood pressure and pulse before and after the intervention between the two groups

Variabel	Kelompok	Mean	SD	95% CI	t	P value
Self adaptation	Intervention Group					
	Before	9.960				
	After	10.080	0.600	-0.367 – 0.127	-1.000	0.327
	Difference	-0.120				
Self adaptation	Control Group					
	Before	11.650				
	After	11.640	0.400	-0.245 – 0.085	-1.000	0.327
	Difference	-0.080				

Cont... Table 3. Comparison of respondents' self adaptation, self recovery, blood pressure and pulse before and after the intervention between the two groups

Self recovery	Intervention Group Before After Difference	45.520 46.520 -1.000	2.380	-1.982 - -0.017	-2.100	0.046
	Control Group Before After Difference	48.400 46.360 2.040	7.976	-1.252 – 5.332	1.279	0.213
Systolic	Intervention Group Before After Difference	133.76 132.68 1.080	10.711	-3.341 – 5.501	0.504	0.619
	Control Group Before After Difference	141.20 142.29 -1.040	2.835	-2.210 – 0.130	-1.834	0.079
Diastolic	Intervention Group Before After Difference	85.040 80.720 4.320	10.823	-0.147 – 8.787	1.996	0.057
	Control Group Before After Difference	86.20 86.96 -0.76	5,117	-2.872 – 1.352	-0.743	0.465
Pulse	Intervention Group Before After Difference	94.400 92.560 1.840	6.749	-0.946 – 4.626	1.363	0.186
	Control Group Before After Difference	94.36 93.12 1.24	6.200	-1.319 – 3.799	1.000	0.327

The results of the analysis showed that there were differences in rehabilitation behavior in the intervention group before and after the intervention ($p = 0,000$), with the difference in attitude score = 2,640; there was a difference in self-recovery in the intervention group before and after the intervention ($p = 0.046$), with a difference in mean score = 1,000; and there was a diastolic blood pressure difference between before and after the administration of the intervention ($p = 0.057$), with the mean score difference = 0.4320.

Table 4. Comparison of knowledge, self-recovery and diastolic blood pressure, after intervention between the two groups

Variable	Group	n	Mean	SD	95% CI	F	P-value
Self adaptation	Intervention	25	-2.64	2.157	-3.684 – (-1.835)	32.260	0.000
	Control	25	0.12	0.665			
Self recovery	Intervention	25	-9.200	2.379	-2.960 – 1.664	1.556	0.056
	Control	25	2.040	7.976			
Diastolic blood pressure	Intervention	25	4.320	10.823	0.215 – 9.944	12.189	0.041
	Control	25	-0.760	-0.766			

The analysis showed that there were differences in self adaptation and diastolic blood pressure between the intervention group and the control group after the intervention ($p = 0,000$; $p = 0.041$).

Table 5. Effect of respondent characteristics on self adaptation, self recovery and diastolic blood pressure

Independent variable	Dependent variable	Mean Square	df	F	P-value
The duration of CHD	- Knowledge	21.174	1	10.341	0.003
	- Self recovery	3.949	1	0.103	0.750
	- Diastolic blood pressure	5.179	1	0.066	0.799
Gender	- Knowledge	9.401	1	4.591	0.038
	- Self recovery	40.248	1	1.049	0.312
	- Diastolic blood pressure	2.071	1	0.026	0.872
Education	- Knowledge	5.470	2	2.672	0.081
	- Self recovery	0.826	2	0.022	0.979
	- Diastolic blood pressure	65.661	2	0.834	0.442
Cognitive: history of DM and family support	- Knowledge	0.324	1	0.158	0.693
	- Self recovery	2.868	1	0.075	0.786
	- Diastolic blood pressure	57.082	1	0.725	0.399

Based on the results of the MANCOVA test, it was found that the length of suffering from CHD, gender and education affected the variable of respondents' knowledge about the treatment of CHD, including family support

Discussion

Differences in levels of knowledge, self adaptation, self recovery, blood pressure and pulse between before and after the intervention in the intervention group and

the control group

Based on the results of data analysis it is known that there are differences in knowledge in the intervention group between before and after the intervention; there were differences in self-recovery in the intervention group between before and after the intervention; there were also differences in diastolic blood pressure in the intervention group between before and after the administration of the intervention. Experience forms

the behavior of an individual, the ability of individuals to act and the appearance of desirable behavior is a very simple process of action (stimulus) and reaction (response). Hosland, et al (1953) in Notoatmodjo (1997) ⁽⁸⁾ said that the process of behavior change is essentially the same as the learning process. Three variables that influence it are attention, understanding, and acceptance. Understanding (cognitive) is the acquisition, structuring, and use of knowledge. In the learning process, a person who has long suffered from CHD will try to involve his relationship with the environment as a stimulus and response relationship, more than that, learning involves a very complex thought process, especially the desire to recover. Through Jean Piaget’s cognitivism, the client will carry out the processes of assimilation, accommodation, and equilibration both internally and externally with the everyday environment.

Thus, through exposure to information about CHD and how to recognize the signs of symptoms and the dangers instinctively to the respondent, from the beginning of the pre-test to post-test, the respondent came to understand the importance of maintaining his health condition (assimilation). Respondents apply knowledge about CHD (accommodation), until the respondent is able to treat himself with his own initiative, in order to monitor his health independently.

Clients with CHD who have implemented and internalized their abilities, will also automatically adapt to themselves, especially when clients initially experience stress which then adapts to stressors of CHD. The respondent’s ability to adapt to stress is that the client is able to adjust constructively to CHD, feel relatively free from tension and anxiety about the dangers of CHD, obtain satisfaction and independent efforts to monitor his health or life struggle against CHD, feel more satisfied to provide information about CHD to friends in the community, especially when carrying out control with the group.

The healthy people are people who can prevent interference caused by stressors, and are influenced by the size of the stressor, intensity, meaning, culture, and so on. Thus, the more individuals have varying coping capacities, which are influenced by the environment, stress conditions, and the sources and support available, the individual becomes healthy with adaptation, and has adaptive coping, including assessments of stressors, coping sources and coping mechanisms that are well.⁽⁹⁾

Differences in levels of knowledge, self-recovery and diastolic blood pressure after intervention between the two groups

After the intervention, it was found that there were differences in respondents’ knowledge and diastolic blood pressure between the intervention group and the control group. Diastolic blood pressure is an illustration of a heart pump disorder that can be categorized as follows.

Table 6. The Classification of blood pressure

Classification of blood pressure	Systolic (mmHg)	Diastolic (mmHg)
Normal	< 120	<80
Prehypertension	120-139	80-89
Stage 1 hypertension	140-159	90-99
Stage 2 hypertension	160 atau >160	100 atau >100

Clients with CHD who already have good knowledge, cognitively will continue to maintain themselves, always have an alarm to maintain healthy behavior. Many factors affect the occurrence of CHD, both can be avoided or can not be avoided. After the client is able to adapt to the stress of his CHD, of course with SOR (Cognitive Behavior theory), the respondent will keep himself healthy. Respondents from several questions and answers through the independent monitoring booklet can answer more than 85% correctly about how to recognize and prevent the increasingly severe CHD they are experiencing. Therefore, changes in blood pressure towards improvement are the result of good self-monitoring of respondents.

The effect of respondent characteristics on the level of knowledge, self-recovery and diastolic pressure of patients with CHD.

Based on the results of data analysis, duration of CHD, knowledge, self-recovery, diastolic blood pressure are influenced by the characteristics of the respondents. Based on the results of the MANCOVA test, it was found that the duration of CHD, gender and education had an influence on knowledge about the treatment of CHD.

Wahyuni & Rezkiki⁽⁹⁾ reported a significant difference if clients with CHD were given interventions for self-efficacy and empowerment, especially providing structured health education.

The elements of knowledge about CHD can be internalized by providing knowledge continuously through an independent health monitoring booklet, namely; Heart disease is a condition when the heart's blood vessels are damaged due to accumulation of fat or cholesterol in the heart's blood vessels. As a result, the heart blood vessels harden and narrow so that blood flow is blocked, so that the heart does not get the oxygen and food needed to function normally.

Clients with CHD at home who have been left out of care need family support and health workers to be able to carry out their health recovery independently (ENFICHHD) from the beginning of stress and must adapt to the conditions of illness, both ways of regulating lifestyle healthy to independent abilities, both cognitive abilities and monitoring their health conditions. Stress-Adaptation and Cognitive Behavior (SACB) models can strengthen the client's ability to adapt through mindset and immune system, each other has a connection that can be explained through communication of cells that are experiencing stress and neurotransmitter factors⁽⁵⁾, in order to carry out recovery health independently through adjustments to coping mechanisms and health status. Strengthened with the Cognitive Behavior model, it is expected that the client is able to recognize the structure, content and function in dealing with his pathophysiological conditions, especially the ability of assimilation until the client is able to independently monitor his health condition.⁽⁶⁾

Conflict of Interest-No

Source of Funding- Authors

Ethical Clearance- Yes

Conclusion

Based on the results of the study it can be concluded that the Stress-Adaptation and Cognitive Behavior (SACB) Model is effective for building the ability of people with CHD to recover health independently

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The Influence of Massage Therapy on Children Body Temperature which Fever

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Abstract

Massage is the oldest touch therapy known to man. With massage is expected to improve the evaporation process by widening blood vessels and opening pores in the child's body so that fever is expected to quickly go down. This study aims to identify whether there is an effect of massage therapy on the body temperature of children who have a fever. This research used pre and posttest control group design. Research location in Hospital Dr. Soekardjo Tasikmalaya. The sample size were 41 people. The result was a significant difference in the average body temperature before and after the compress (p-value=0.000) and massage therapy (p-value=0.000) in both the first and second measurements. Comparison of temperature reduction before and after the compress and massage therapy results were significant at first measurement (p-value=0.002) but not significant in the second measurement (p-value=0.0388). It is expected that nurses on duty in the children's room can increase the participation of families in handling health in children, especially children with fever. And for researchers, further research should be done regarding massage therapy with the use of topical alternative medicine to further enrich family knowledge in the management of sick children.

Keywords: *child fever; warm compresses; body temperature; massage therapy*

Introduction

Fever is a clinical sign of a disease in children. These health problems are often faced by health workers. Traditionally fever is defined as an increase in body temperature above normal. Many parents consider fever dangerous for children's health because it can cause seizures and brain damage⁽¹⁾. Body temperature in the condition of fever can be used as one important measure that can give clues about the deterioration or improvement of the patient's condition⁽²⁾.

Fever refers to an increase in body temperature as a result of infection or inflammation in response to microbial invasion, certain white blood cells secrete a chemical known as endogenous pyrogen which has many effects to fight infection⁽³⁾. Fever is a condition where an increase in temperature up to 38⁰ C or more. There also are taking limits of more than 37.8⁰ °C. Meanwhile, when a temperature greater than 40⁰ °C is called a high

fever/hyperpyrexia⁽²⁾. Broadly speaking there are two categories of fever namely infectious fever and non-infectious fever. Fever infection is the fever that occurs as the body's response to an increase in *set-point* such as flu, sore throat, mumps, measles, scarlet fever, fever, *typhoid* and so on. Non-infectious fever is an increase in body temperature due to excessive heat formation but not accompanied by an increase in *s-points* such as in patients with mumps/aspirin poisoning⁽⁴⁾. WHO stated the number of fever cases around the world reached 18-34 million. Children are the most susceptible to fever, although symptoms experienced by children are lighter than adults. In almost all endemic areas, the incidence of fever mostly occurs in children aged 5-19 years⁽⁵⁾.

Many ways are done to treat fever. The most commonly used method is, of course, taking fever-lowering drugs such as paracetamol or ibuprofen. Also, of course, treat the cause of fever, if due to infection by bacteria then given antibiotics to kill bacteria. But medicine alone is not enough, so compresses are needed to help reduce fever⁽⁶⁾. The factors that can be used in decreasing debris body temperature include traditional medicines, antipyretic drugs, and hot and cold compresses⁽⁷⁾. Wet warm compresses, dry warm compresses (bladder), wet cold compresses (water

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ordinary), dry cold compresses (ice crates), electric pillows and blankets, irradiation lamps, hot arcs⁽⁸⁾. Warm compresses are a method for lowering body temperature⁽⁹⁾. By the receptor temperature in the body, then a decrease in body temperature by cooling can be done on the hypothalamus, spinal cord, abdominal organs and around large veins⁽¹⁾. In addition to warm compresses, another traditional therapy for handling fever is by massage or massage. Massage is the oldest touch therapy known to man. Touch and massage in infants known as a *baby massage* after birth can assure ongoing body contact that can maintain a feeling of security in the baby⁽⁴⁾.

Massage has been practiced almost all over the world since a long time ago including in Indonesia. The art of massage is taught from generation to generation, although it is not known how massage and touch can have such a positive effect on the human body. The positive influence of touch on the process of growth and development of children has long been known to humans. But scientific research on this matter is still not much done. Although it still needs further research, the findings that have been produced have become the basis for routine baby massage to maintain a baby's health. Especially because this baby massage is cheap, easy, and is commonly done in Indonesia so it is not a new thing for our culture⁽¹⁰⁾. The results of Mardianti and Komalasari's research⁽¹⁰⁾ on the effect of massage therapy on the frequency of breastfeeding were carried out in 60 infants aged 1-3 months using a quasi-experimental design. there was no effect of massage therapy on the duration of breastfeeding (p-value=0.563).

Research on the effects of massage with coconut oil versus mineral oil and placebo (powder) on growth speed and behavior in premature babies⁽²⁾. Premature babies are randomized to receive a good massage with palm oil, minerals or powder. Massage oil is given by a trained person four times a day until discharge and subsequently by the mother until the baby is 31 days old. The result is that coconut oil massage produces a significantly greater

speed of weight gain compared to increases in mineral oil and powder in the premature baby group.

In the literature review written by Field⁽³⁾ about massage methods with kinesthetic and tactile touches, there is evidence that massage therapy influences weight gain, especially for premature babies, this has been applied in various countries including⁽¹⁾ in the Philippines, a group of experts Neonatologists reported a 47% increase in weight gain after the Field massage procedure.

Method

This research used pre-test and post-test with control design, where this design compares the difference between before and after being given compresses and antipyretics in the control group and the difference between before and after being given antipyretics and massage therapy in the experimental group. The experimental group performed massage therapy twice a day for 5 minutes after the antipyretic administration⁽¹¹⁾. Body temperature measurements were carried out before and after the experiment using a calibrated digital thermometer. The difference between before and after the experiment is assumed to be the effect of the experiment Group 1 was referred to as the control group that only received antipyretic and compress administration, while group 2 was called the experimental group that received antipyretic and massage therapy⁽¹²⁾. The sample was toddler-aged children who had a fever and were treated at Dr. Soekardjo Tasikmalaya in August to October 2019. The research instrument used was the SOP for the implementation of massage therapy and observation guidelines for the measurement of body temperature. Data were analyzed using paired t-test and independent t-test.

Findings

Table 1 shows the average body temperature before the intervention.

Table 1. Body temperature before the intervention

Group	Mean	SD	Min-Max	95%-CI
First measurement				
Control	38.5	0.8498	37.3-40.2	38.102-38.898
Experimental	38.586	0.6077	37.4-39.5	38.309-38.862
Second measurement				
Control	38.175	0.5288	37.5-39.6	37.840-38.322
Experimental	38.081	0.6750	37.2-39.5	37.859-38.491

After the intervention, body temperature in each group experienced changes, as shown in the following table 2.

Table 2. Body temperature after the intervention

Group	Mean	SD	Min-Max	95%-CI
First measurement				
Control	38.150	0.6194	37.5-39.6	37.860-38.440
Experimental	37.457	0.7096	36.0-38.5	37.134-37.780
Second measurement				
Control	37.2	0.8985	36.0-38.5	36.779-37.621
Experimental	36.995	0.5491	36.2-38.0	36.745-37.245

The results of the normality test is described in Table 3.

Table 3. The result of normality test

Body temperature	Shapiro-Wilk	Skewness
Before intervention	0.116	1.37
After intervention	0.09	1.10

The normality test based on Shapiro-Wilk on body temperature before intervention was 0.016, so the data was normally distributed, as well as the results of the division between skewness and standard error, the result was 1.37, which means that the data was normally distributed (Table 3).

Table 4. The Differences of Body Temperature in the Control Group

Measurement	Mean	SD	SE	Mean.diff	p-value
First					
• Before	38.500	0.8498	0.1900	38.500	0.000
• After	38.150	0.6194	0.1385	38.150	
Second					
• Before	38.175	0.6750	0.1509	38.175	0.000
• After	37.200	0.8985	0.2009	37.200	

Table 5. The Differences of Body Temperature in the Control Group

Measurement	Mean	SD	SE	Mean.diff	p-value
First					
• Before	38.585	0.6077	0.1326	38.585	0.000
• After	37.457	0.7096	0.1549	37.457	
Second					
• Before	38.081	0.5288	0.1154	38.081	0.000
• After	36.995	0.5491	0.1198	36.995	

Table 6. The Differences of Body Temperature Before and After Intervention in Control and Experimental Groups

Body temperature	Action	Mean	SD	Mean.diff	SD.diff	P-value
First	Before	38.50 38.586	0.8498 0.6077	-0.0857	0.2317	0.0714
	After	38.150 37.457	0.6194 0.7096	0.6929	0.2078	0.002
Second	Before	38.175 38.081	0.6750 0.5288	0.0940	0.1900	0.0624
	After	37.200 36.995	0.8985 0.5491	0.2048	0.2339	0.0388

Discussion

Compress and its effect on body temperature

The rationale for compressing is the conduction method, which is the heat transfer of another object by direct contact. When warm skin touches the warm, there will be heat transfer through evaporation, so that the transfer of heat energy becomes gas⁽¹⁴⁾. The body temperature of the first measurement in the control group before compressing was 38.500°C, while after a compress was 38,150°C. From T-test obtained p-value=0.000 (there is a significant difference in body temperature before intervention in the control group). At the second measurement, body temperature before compressing 38.175°C, while after the pack was 37.200°C. The mean difference in the first measurement was 0.350, meaning that the respondent experienced a change in temperature of 0.350 points as a result of the action taken. Likewise in the second measurement, the mean difference was 0.975, which means that there was

a change in temperature of 0.975 points after the fever was compressed. The T-test obtained p-value=0.000 (there is significant differences in body temperature before intervention in the control group). This is in line with research conducted by^{(8),(9)} who have all proven the effectiveness of giving compresses to children with fever through the tepid sponge or compress method plus alternative medicine.

Massage therapy and its effect on body temperature

Touch therapy or massage has been used since ancient times, at least since 1800 BC massage was the main form of treatment before the advent of the pharmaceutical era in around 1940. Touches in particular that contain elements of emphasis are known to have a variety of positive effects such as reducing oxygen demand and giving a feeling of being comfortable and being loved. A Cochrane meta-analysis found evidence suggestive that infant massage can increase the interaction and affinity

of the baby with the mother, improve sleep quality, reduce the baby's crying, and have a beneficial effect on stress hormones. But unfortunately, there is not enough evidence to support the positive impact of massage on changes in body temperature in children with fever. The mother is the parent closest to the child, where the mother's message to her child is gentle stroking of the fabric of affection. The mother's skin is the earliest skin recognized by a child. Touch and massage given by the mother is a form of communication that can build closeness between mother and child by combining eye contact, smile, facial expression. If the stimulation is often given, the mutual love relationship between mother and child will be stronger⁽¹⁵⁾. The purpose of massaging the body is to expedite the flow of blood so that we can feel the sensation of the body that gets better afterward.

In the research that has been done, the body temperature in children with fever has experienced the following changes in the first measurement of the average body temperature before doing massage therapy was 38.585 °C, while body temperature after massage therapy was 37.457 °C. The T-test obtained p-value=0.000 (there is significant differences in body temperature before and after massage on the first measurement. In the second measurement, the body temperature was 38.081 °C, while after massage was 36.995 °C. The mean difference in the first measurement is smaller than in the second measurement. This is possible because in the second measurement the respondent's initial temperature is the result of the previous intervention and the respondent has done massage intervention twice. The T-test obtained p-value of 0.000 (there is a significant difference in body temperature before and after massage therapy in the second measurement).

The results obtained in the first measurement of the control group before compressing was 38.50 and the intervention group was 38.586. The mean difference was -0.0857 (the mean of the experimental group was higher by 0.0857 points compared to the control group), so that the significance obtained by 0.714 meant that there was no significant difference in the respondent's initial temperature in the two groups prior to the intervention. Significant results were obtained in statistical testing after the intervention both in the control group and the experimental group (p-value =0.002). The mean difference was 0.6929 (massage therapy can make changes to a body temperature of 0.6929 points compared to the group of respondents who get compresses).

As in the first measurement, in the second measurement, the mean difference between the control and intervention groups before the intervention was 0.0940 (there was no differences in the initial temperatures of the two groups (p-value=0.624). This is possible because in both the control group and the experimental group the initial temperature is obtained a few hours after each respondent gets the intervention on the first measurement.

The difference in mean after administration of the action was 0.2048 while the significance of p-value=0.388 (there was no difference in the administration of massage therapy compared with the provision of compresses in reducing the temperature of children during fever). This result is not in line with the theory put forward by⁽⁵⁾ which states that massage in children is not permitted when children have a fever because it can cause hypermetabolism and excessive vasodilation in blood vessels. Massage in children can also cause a decrease in temperature so that it can be used as a non-pharmacological alternative in handling child fever.

Conclusion

The conclusion are:

1. There is significant differences in body temperature in the first and second measurements before and after the intervention was carried out in both the compressed group and the massage therapy group.
2. There is significant difference in the mean body temperature after the intervention in the compressed group compared with the massage therapy group at the first measurement.
3. There was no significant difference in mean body temperature after the intervention in the compressed group compared with the massage therapy group on the second measurement.

The suggestions are:

1. The hospital as a means of providing health services should be able to implement a policy that massage therapy can be an alternative antipyretic companion in handling fever in children.
2. Nurses on duty in the children's room are expected to increase the role of families in handling health in children, especially children with fever.

3. For researchers, further research should be done regarding massage therapy with the use of topical alternative medicine to further enrich family knowledge in the management of sick children.

Source of Funding-Authors

Conflict of Interest-No

Ethical Celarance-Yes

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Celiac Disease in Children with Short Stature (Incidence and Morphometric Study)

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Abstract

A study was aimed to determine the incidence of celiac disease (CD) and to make morphometric analysis of duodenal biopsy in children already diagnosed as a short stature in Mosul city. One hundred and seventy seven children aged between 3-17 years with short stature were examined. Their age, gender, serum antitransglutaminase antibody; and small intestinal biopsy were taken. The changes in the biopsy were evaluated and graded by Corazza and Villanacci grading system. Short stature children serologically positive for celiac disease were only subjected to small intestinal biopsy. Results revealed that most predominate age group were those between 11-17 years (mean 11.8 years), with a higher male gender (107/177, 60.4% than female (70/177, 39.6%). Of these CD represents in 54 out of 177 children, with a grade B (b) was the predominant one (24 out from 54)(44.5%). In conclusion, short stature can be the only symptom for celiac disease in children aged between 7-11 years with higher tendency in male than female. The health significance of short stature is to subject children to intestinal biopsy for celiac disease confirmation.

Keywords: *Celiac disease, short stature, villous atrophy, crypt hyperplasia.*

Introduction

Celiac disease (CD), is the commonest cause of malabsorption syndrome⁽¹⁾. It's a chronic inflammatory disorder of immunologically susceptible people, who expressed small intestine damage after a meal rich in gluten especially gliadin^(2,3). The gliadin once gain access to lamina propria, it modifies peptides engulfed and displayed on the surface of antigen presenting cells, which secrete cytokines and start the inflammatory response which will lead to tissue damage⁽⁴⁾. Serological testing during the course of CD reveals antibodies against gliadin and endomysin and transglutaminase⁽⁵⁾. The clinical signs of CD in children appeared once wheat introduced in the diet and are characterized by chronic diarrhea, with a bulky and pale greasy foul smelling stool, and failure to thrive^(6,7). The consequences will be villous atrophy, crypt hyperplasia, and intraepithelial T lymphocytosis⁽⁸⁾. These changes could lead to nutrient malabsorption syndrome^(9,10). The elimination of the condition after removal of diet containing gluten is the absolute confirmation of CD.

Recently, the disease has increased to 1% around the world, affecting children and adults⁽¹¹⁾. Many factors

play different roles in contribution to disease induction, including genetic, environmental and nutritional factors⁽¹²⁾. Although CD is a well-known cause of short stature in children, its diagnosis is often difficult because of more than 200 celiac diseases of different clinical features were reported, and the short stature may be one of the findings. CD is an autoimmune disease involving both gastrointestinal and extra gastrointestinal system⁽¹³⁾. CD could occur as classical, or silent disease and many patients have not diagnosed their condition with subsequent development of intestinal lymphoma⁽¹⁴⁾.

Materials and Method

One hundred and seventy seven children aged 3-17 years with short stature were examined. The following criteria were taken: age, gender, serum antitransglutaminase antibody; and small intestinal biopsy. Serologically positive children for CD were only subjected to small intestinal biopsy.

Tissue samples preparation and morphometric analysis:

Forty four duodenal tissue specimens were collected from serologically positive children, 33male

and 21 females (mean age 3-17 years).

The duodenal biopsies were fixed in neutral buffered formalin and processed for routine histological processing ⁽¹⁵⁾. Sections of (5µm thick) were made and stained with hematoxylin-eosin and used for morphometric analysis.

All parameters of biopsy duodenal samples were measured using the color USB 2.0 digital image camera (Scope Image 9.0- China) which was provided with image processing software. The height of each villus was measured from the top of the villus to the crypt transition and the crypt depth was defined as the invagination between two villi while the width of villi was estimated by measuring the average of the base and tip of the villus, the heights of 20 villi and the depths of 20 crypts were measured per each category, apparent villus surface area was estimated according to ⁽¹⁶⁾. All parameters were set in tables to achieve comparison among different classification of Corazza and Villanacci classification ⁽¹⁷⁾ which has divided the mucosal lesions into 2 categories:

Grade A: Nonatrophic, normal crypt and villous architecture and increased IEL numbers (>25 IELs per 100 enterocytes).

Grade B1: Atrophic, villous to crypt ratio <3:1, but the villi are still detectable and IEL numbers are increased (>25 IELs per 100 enterocytes).

Grade B2: Atrophic and flat, villi are no longer detectable and increased IEL numbers (>25 IELs per 100 enterocytes).The measurements were determined according to the basic principles of morphometric ⁽¹⁸⁾ and earlier morphometric studies of the human intestine ⁽¹⁹⁻²¹⁾.

The small intestinal mucosa parameters were studied at 100x magnification on strictly longitudinally sectioned crypts and villi, and were villi height /µm, villi width/µm, apparent villi surface area/µm², crypt depth/µm, crypt diameter/µm and no. of goblet cells per villus. Morphometric analysis was carried out by an investigator, blind to the age and gender of the subject.

Statistical Analysis

Means and standard errors were calculated for each parameter. Results were statistically analyzed with Mann-Whitney U test with SPSS for Windows 12.0 (SPSS Inc., Chicago, IL, USA).

Results

Figure (1), shows that all examined children were aged between 3-17 years, the most predominant age group were between 11-17 years (98 per 177) (55.4%).

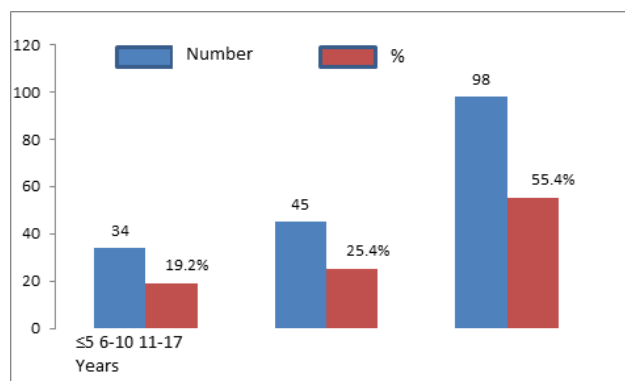


Figure 1: Age distribution of examined children.

Of these children, Males (107 per 177)(60.4%) were more than females (70 per 177) (39.6%).

Micromorphometric measurements and histopathological examination of duodenal biopsy samples represents (54 out of 177 children)(30.5%) (Figure 2).

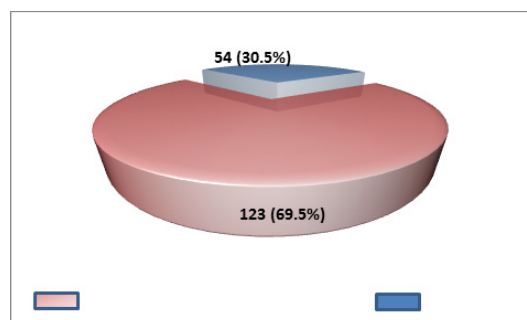


Figure 2: Percentage of positive CD patients

Thirty three out of 45 (61%) were males, while only 21(39%) females were reported by histopathological examination to be affected with CD (Figure 3).

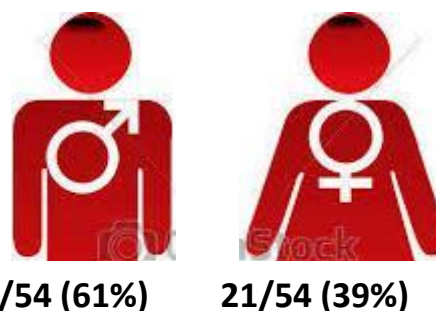


Figure 3: Gender distribution of CD patients.

From the histopathological and morphometric findings, it is evident that CD children were categorized

according to Corazza and Villanacci classification into B1 category (54/54) (100%).

From Morphometric measurement, it is clear that villi height was significantly reduced in B1(c) when compared to B1(b) and B1(a) ($p < 0.05$). The same picture with villi width, crypt depth, apparent villi surface area were shown in patients with B1(b) and B1(a). Crypt diameter and no. of goblet cells per villus in B1(a) were ($p < 0.05$) higher than those of B1 (b and c) (Figure 4&5).

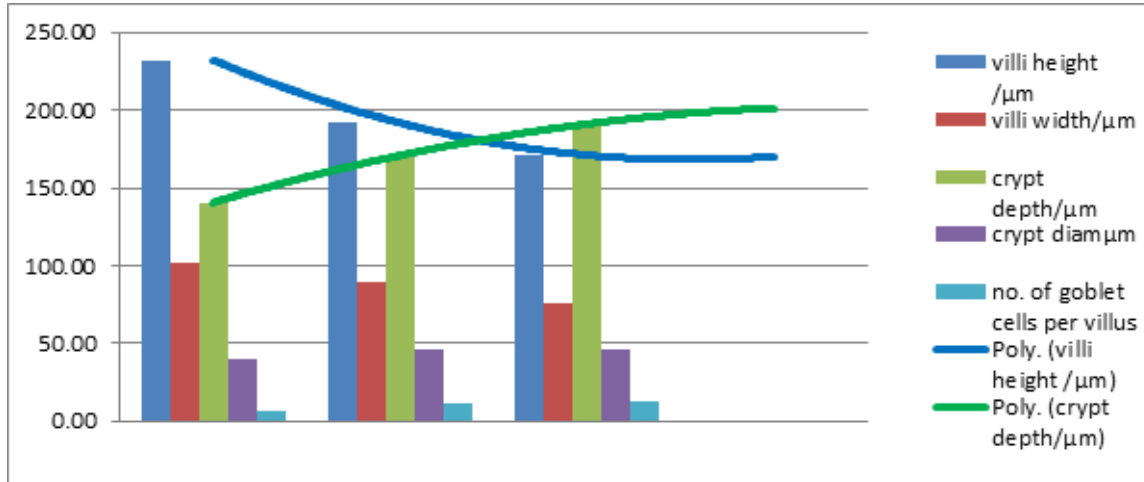


Figure 4: Diagrammatic representation of the inverse tendency of villi height and crypt depth in category B1 subdivisions in duodenal biopses

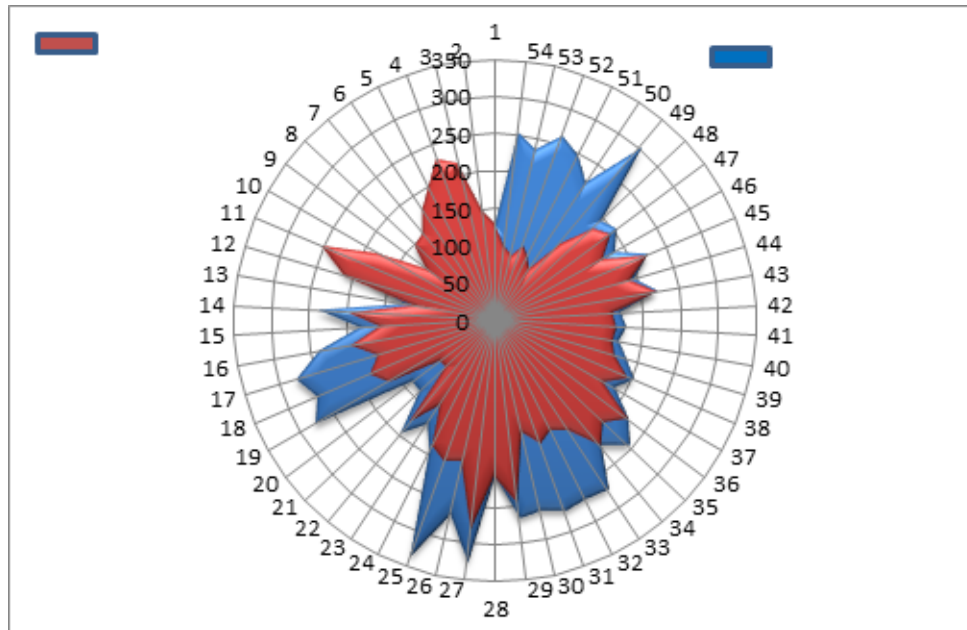
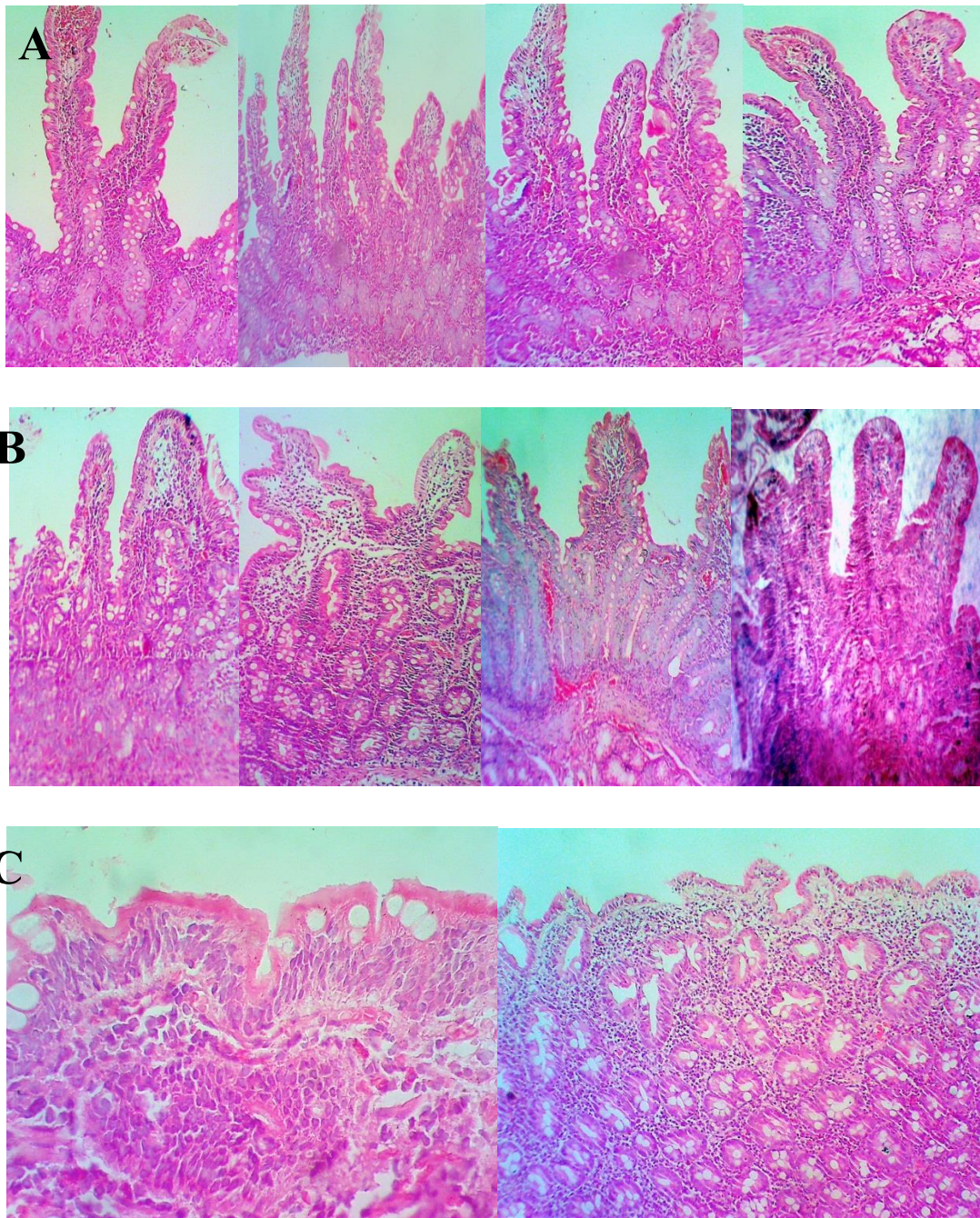


Figure 5: Radar representation of the inverse tendency of villi and crypt depth in category B1 subdivisions in duodenal biopses (from sample 1-12, the ratio 2-3; from sample 13-47, the ratio 1-2; from sample 48-54, the ratio 0-1).

The histopathological section illustrating the three subdivisions of B1 category according to Corazza and Villanacci classification are presented in the following figures:

Figure 6A, show the category B1 (a), with villus height: crypt depth of $< 3-2$. and increased in the number of intraepithelial lymphocytes ($> 25 / 100$ enterocytes).

Figures 6B, show the category B1 (b), show more advanced case of CD with more villus atrophy and broadness of the of the villi with less villus height: crypt depth ($< 2-1$); in addition to increasing in the number of intraepithelial lymphocytes ($> 25 / 100$ enterocytes) and obvious crypt hyperplasia.



Figures 6: A: The category B1 (a), with villus height: crypt depth of $<3-2$. and increased in the number of intraepithelial lymphocytes ($> 25 /100$ enterocytes). X 10⁶

B: The category B1 (b), subtotal villus atrophy and broadness of the of the villi with villus height : crypt depth of $<2-1$; increased in the number of intraepithelial lymphocytes ($> 25 /100$ enterocytes) and crypt hyperplasia. X10⁶

C: Subtotal villus, to almost total villus atrophy; no clear villus architecture; increased in the number of intraepithelial lymphocytes ($> 25 /100$ enterocytes); lymphoma and prominent crypt hyperplasia. X40⁶

The more advanced picture of category B1 according to Corazza and Villanacci classification is seen in figure 6C, in which it appears the subtotal villus to almost total villus atrophy; no clear villus architecture; increased in the number of intraepithelial lymphocytes ($> 25 /100$

enterocytes) and prominent crypt hyperplasia.

DISCUSSION

Celiac disease is a disease of all ages with a predominance of females with overall estimation of

1-2% in Europe and united states, ^(18,19) with 10-20% in first degree relatives ⁽²⁰⁾. In contrast, our findings revealed 33/54 (61%) males were diseased with CD versus 21/54 (39%) for females. This could be attributed to FOXP3 gene mutation (on X chromosome) in CD primarily of children and infants, especially in male children is associated with polyendocrinopathy and immune dysregulation ⁽²¹⁾.

Although serologic testing is recommended before duodenal biopsy in pursuing a diagnosis of CD, the titres are largely correlate with the degree of mucosal damage, especially villus atrophy ^(22,23), but biopsy is recommended when serologic results are non-diagnostic, or because up to 15% of all celiac patients are seronegative CD. Clinical, genetic and histopathology should be done in confirmation process to challenge of lack serum autoantibodies ⁽²⁴⁾.

The new sight for evaluation of the duodenal mucosal lesions in CD patients is the simplest one proposed by Corazza and Villanacci, by dividing them into two categories, nonatrophic and atrophic instead of the currently used Marsh-Oberhuber classification enhances more fruitful communication between pathologists and clinician, in addition to its simplicity, specificity and excitability ⁽²⁵⁾.

Detection of mucosal IgA tissue transglutaminase immune deposits is one of the most sensitive approaches, but Small-bowel biopsy remains the gold standard for diagnosing CD ^(26,27). Small-bowel mucosal biopsy is the standard for diagnosing CD in patient on a gluten-containing diet ⁽²⁸⁾. A presumptive biopsy diagnosis of CD can be made by characteristic findings of intraepithelial lymphocytosis, crypt hyperplasia, and villous atrophy plus confirmation when symptoms resolve on commencing a gluten free diet that return to normalized histology ^(29,30).

It is gluten with its two proteins, gliadin and glutenin, present in wheat, barley and rye are responsible for the toxic effects to coeliac patients. These proteins elicited autoimmune reactions, of theses the production of antibodies against tissue transglutaminase, and anti-endomysial antibodies ^(31,32). During gastrointestinal injury, Gliadin is toxic proteins in wheat which is a substrate of transglutaminase enzyme, provoking T- cell stimulation, ending in cytokines production and other tissue damage mediators, responsible for characteristic histopathological mucosal changes ^(33,34).

Increased IEL numbers represent an expansion of both cytotoxic T cells (60%–70% of the cytotoxic T cells express CD8) bearing the $\alpha\beta$ T-cell receptor, and $\gamma\delta$ T-cell receptor–positive lymphocytes (predominantly CD8–), with the former predominating ^(35,36). The disease is symptomatic and asymptomatic. The symptoms include abdominal pain, bloating, diarrhoea, or constipation. The systemic signs include weight loss, vitamin deficiencies, elevated liver enzyme levels, dermatitis herpetiformis, delayed puberty ⁽³⁷⁾. Refractory celiac disease occurs in adults is the main complication of CD after childhood period caused by continuous ingestion of gluten is likely to be associated with cancer diseases (lymphoma and adenocarcinoma) ⁽³⁸⁾, with great tendency to the oesophagus and large intestine, that could be reduced in gluten free diet ⁽³⁹⁾.

Conclusion

It could be concluded that early diagnosis of celiac disease by regular antibody testing and duodenal biopsy is important in order to prevent it and to prevent misdiagnoses with other autoimmune diseases, since celiac disease is silent and may be symptomatic or asymptomatic.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Association of Periventricular Edema Thickness and Optical Perineal Thickness in Hydrocephalus Non Communications by Magnetic Resonance Imaging Examination

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Abstract

Background: Hydrocephalus is a complex neurological disorder that characterized by increased amounts of cerebrospinal fluid and enlargement of the cerebral ventricles also subarachnoid space. Magnetic Resonance Imaging (MRI) is the first choice to diagnose hydrocephalus with better anatomical features. Periventricular interstitial edema is an indication of the presence of hydrocephalus, while Magnification of the diameter in the nerve sheath is an indicator of increased intracranial pressure in humans and apes.

Objectives: To analyze the correlation between the periventricular thickness of edema and optic perineurium thickness in non-communicating hydrocephalus with Magnetic Resonance Imaging (MRI) examination.

Method: The cross-sectional study using secondary data obtained 29 samples that met the criteria from January 2014 to April 2015 which was chosen by consecutive and then analyzed.

Results: Twenty-nine samples consisted of: women 16 (55.2%) and men 13 (44.8%), age <10 months (13.8%), age 10-19 months (34.5%), age 20-29 months (34.5 %), age 30-39 months (6.9%), age ≥39 months (10.3%). The age range of patients between 7 months and 46 months with mean age 21.93 ± 11.35 months. The results of the measurements showed that there was a correlation between the periventricular thickness of edema and the thickness of the optic peri nervus.

Conclusion: There was a correlation between the periventricular thickness of edema and the thickness of the optic peri nervus. The thicker the periventricular edema, the thicker the optic peri nervus.

Keywords : *Periventricular edema, Optic Nerve Opus, Non Hydrocephalus Communicans, Magnetic Resonance Imaging (MRI)*

Introduction

Hydrocephalus is a complex neurological disorder that characterized by increased amounts of cerebrospinal fluid and enlargement of the cerebral ventricles and/or subarachnoid space. Hydrocephalus is remaining an important problem in the world of medicine, especially when correlated with the growth and development of children due to brain growth disorders, so automatic if it was not handled properly and quickly then it will cause

disruption in the growth and more severe development, even case and could be fatal.

Statistically found that a good surgical and medical management was only about 40% of hydrocephalus patients have normal intelligence and about 60% have significant intelligence and motor defects. From these statistical data showed that although with neurosurgical treatment and neurosurgical management also good medical management it turns out that about 60% of patients still have a sequel to meaningful disorders.

Although many are found in infants and children, hydrocephalus actually possible occurs in adults. In infants the clinical symptoms appear more clearly,

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making it easier to diagnose. This is because the baby's head is still open so that the accumulation of brain fluid could be compensated by the widening of the skull bones. Infants with moderate and severe hydrocephalus require VP shunt and growth is favorable in 87% of cases¹. Seen by the enlarged diameter of the head of the increasingly larger due to the increase of the pile of cerebrospinal fluid. While in adults, skull bones are no longer able to widen. As a result, no matter how much cerebrospinal fluid is accumulated, it will not be able to increase the diameter of the head.

Prevalence of hydrocephalus 4.65 every 10,000 births. The incidence rate in the world is uncertain. The incidence of infantile hydrocephalus is estimated to be 0.6 every 1,000 births, possibly occur at any age, fetus, perinatal and neonatal. From 2010 data, hydrocephalus tops the Neuropediatric Surgery Division of Dr, Soetomo General Hospital and is in the 7th position of all neurosurgery cases (outpatient and inpatient)².

The characteristic of acute hydrocephalus is the presence of low-density periventricular bands on CT, low on T1, and high on T2 / FLAIR in MRI that reflecting what is described as periventricular interstitial edema³. Shofty et al's 2012 study stated a significant correlation between widening of optic nerve diameter and its envelope with increased ICT in patients with Idiopathic Intracranial Hypertension (IIH) patients compared to healthy patients. Measurements of optic nerve diameter and sheath were performed with MRI 1.5 T axial pieces with T2 sequences at the anterior 10 mm point of the optic foramen⁴.

Neuroimaging is important for the diagnosis and management of hydrocephalus. MRI is the first option for examination to get better anatomic details in diagnosing the cause of hydrocephalus, that allows for the better morphological definition of various central nervous system structures, cerebrospinal fluid space, periventricular edema, and lesions. Various pieces of images could be obtained (axial, sagittal, and coronal); bone structure usually does not interfere with the identification of intrathecal structures, and, like ultrasound, MRI is not the source of ionizing radiation. MRI is also useful for evaluating cerebrospinal fluid flow (CSF) and localization of obstruction in the case of hydrocephalus.

Method

Consecutive sampling was used with the criteria of

patients aged 0-3 years hydrocephalus noncommunicans that diagnosed with MRI examination from January 2014 to April 2015 at the Radiodiagnostic Installation of Dr. Soetomo General Hospital Surabaya. Methods were a measurement of the periventricular thickness of edema and thickness of neural nerve of the optic nerve at sequence T2 or FLAIR, conducted by a researcher under supervision from the supervisor as a consultant of neuroradiology.

Hydrocephalus is a pathological condition due to an imbalance between production and cerebrospinal fluid absorption resulting in ventricular dilatation and increased intracranial pressure^{5,6}. While Hydrocephalus noncommunicans is a circulation of cerebrospinal fluid circulation in the ventricular system itself. Periventricular edema is a low-density periventricular band of T1 in MRI, and high in T2 / FLAIR in MRI, reflecting what is described as periventricular interstitial edema, in this study periventricular edema was measured in the lateral posterior ventricle. The optic nerve diameter is a measure of the diameter of the optic nerve sheath as measured by the head MRI with T2 sequence, measured at 10 mm anteriorly from the optic foramen. The value of the optic nerve sheath diameter is expressed by millimeters (mm). MRI used is MRI 1.5 Tesla with brand Optima MR360w 1.5T.

Furthermore, the results of MRI examinations that have been collected were measured and then arranged in tabular form, and then performed with a correlation test by Spearman. **Results**

This research was conducted to find out the correlation between the periventricular thickness of edema and optic peri nervus thickness in patients with non-communicative hydrocephalus. The total sample was 29 patients in 15 months from January 2014 to April 2015. The research data was obtained in the form of measurement of the periventricular thickness of edema with the thickness of the optic peri nervus in non-communicative hydrocephalus patients.

Distribution of Patients by age group

The mean age of patients was 21.93 ± 11.35 months. The youngest was 7 months old and the oldest was 46. Distribution of patient age is shown in table 1.

Table 1. Distribution of patients by age group

Age category	Frequency	Percentase
<10 Months	4	13.8
10 – 19 Months	10	34.5
20 – 29 Months	10	34.5
30 – 39 Months	2	6.9
≥39 Months	3	10.3
Total	29	100.0

Distribution of Patients by Sex

Based on sex, 16 males and females were 13 patients. In table 2 is shown the results of the distribution of patients by sex.

Table 2 Distribution of patients by sex

Sex	Frequency	Percentase
Male	16	55.2
Female	13	44.8
Total	29	100.0

Periventricular thickness of Edema and Perinervus Optical Thickness

Based on table 3 it was explained that the result of analysis with Spearman correlation shows $r_s = 0.458$ and $p = 0.012$ ($p < 0.05$) which means there was a correlation between the periventricular thickness of edema and optical perinervus thickness. The thicker the periventricular edema, the thicker the optic perinervus.

Table 3. Measurement results of Periventricular Thickness of Edema and Perinervus Optical Thickness

Thickness	N	Median	Minimum	Maximum	Correlation
Periventricular Edema	29	1.04	0.74	Difficult to evaluate (severe HC) 1.43	$r_s=0.458$ $p=0.012$
Perinervus Optical	29	1.01	0.75		

Discussion

This research was conducted for 15 months and obtained 29 patients as samples who meet the criteria of the study sample. Based on that number, the youngest patient aged was 7 months and the oldest was 46 months. Hydrocephalus could occur at any age, fetus, perinatal and neonatal with an incident reported 0.48-0.81 every 1,000 live births⁷.

Based on sex, 29 patients consisted of 16 men (55.2%) and 13 women (44.8%). There was no significant difference in incidence for both sexes⁸. Incidence in male and female sex was the same, except in Bickers-Adam syndrome, X-linked hydrocephalus was transmitted by women and manifested in men⁹.

Hydrocephalus was characterized by cerebrospinal fluid imbalance (CSF) in its formation and absorption, this was manifested by dilatation of the ventricular

system. Approximately 55% of all cases of hydrocephalus were congenital. There were two types of hydrocephalus: communicant and non-communicating with subarachnoid space and the diagnosis could be established by examination of Computed Tomography (CT) and Magnetic Resonance (MR).

Hydrocephalus was not a disease, but a dynamic process that takes place in the size of the ventricular system change¹⁰. Increased water in the brain parenchyma could be detected by both CT and MRI. The CT appears as hypodensity in the periventricular and the ventricular layer becomes unclear. MRI appears to be the hyperintense rim around the lateral ventricle in Fluid Attenuated Inversion Recovery (FLAIR) or proton imaging density¹¹.

Previous research has shown that ultrasonography and MRI could be used to measure the diameter of the optic nerve sheath in normal dogs. Magnification of the diameter of the nerve sheath was an indicator of increased intracranial pressure in dogs. Research on humans and monkeys shows that increased intracranial pressure that measured by increasing in diameter on the optic nerve sheath. Furthermore, measurements of optic nerve sheath diameters in humans by using Magnetic Resonance Imaging (MRI)¹². MRI could help to identify ventricular enlargement due to hydrocephalus by the presence of high-signal halo periventricular on T2-weighted imaging. But there was a high periventricular T2 signal change as a result of the microvascular disease also could be seen¹³.

The diameter of the optic nerve sheath has been found to be a strong predictor of increased intracranial pressure, with high sensitivity and specificity in some studies also in systematic reviews. The increased intracranial pressure was a rapid emergency which has a significant impact on morbidity and mortality¹⁴. Optical nerves and surrounding envelopes could be image and measured on MRI using fat-suppressed T2-weighted sequences¹⁵. From the results, there was a correlation between the periventricular thickness of edema and optical peri nervus thickness. The thicker the periventricular edema, the thicker the optic peri nervus.

Conclusion

There was a correlation between the periventricular thickness of edema and the thickness of optic peri nervus in non-communicative hydrocephalus patients with MRI examination in Dr. Soetomo General Hospital Surabaya.

The result was; there was a correlation ($r_s = 0.458$) between the periventricular thickness of edema and optic peri nervus thickness. The thicker the periventricular edema, the thicker the optic peri nervus.

Ethical Clearance: This study protocol was approved by ethical clearance Dr.soetomo Surabaya, Indonesia teaching hospital research.

Conflict of Interest: The author reports no conflict of interest of this work.

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Outcome of Open Intraperitoneal Dual Mesh Versus on-Lay Mesh for Incisional Hernia Repair

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Abstract

Background : incisional hernia is any abdominal wall gap with or without a bulge in the area of a postoperative scar. There are different methods for treating incisional hernia . Mesh is always used to decrease the recurrence rate to less than 10%. Different types and different methods of mesh hernioplasty.

Objective : to compare the outcome of open intraperitoneal mesh versus on-lay mesh hernioplasty.

Method : this prospective study conducted in Al- Fayhaa Teaching hospital between February 2016 and February 2018. The patients with incisional hernia are divided into two groups . Group A treated by open intraperitoneal optimized composite mesh, and group B managed by on-lay mesh .the patients followed for 24 months following surgery to compare between the two groups regarding , operative time , hospital stay and post operative complications.

Result : eighty patients included in the study . In group A , the mean operative time was (90 ± 10.24 minutes) while for group B was (70 ± 17.53 minutes). The average hospital stay was (3.34 ± 1.27 days) and (5 ± 3.73 days) for group A and group B respectively .seroma developed in 12.5% for intraperitoneal group and 27% for on-lay group. Surgical site infection was 2.5% in group A and 15 % in group B. No patient developed recurrence of hernia in group A , while 7.5 % of group B developed recurrence during the period of follow up.

Conclusion: open intraperitoneal mesh hernioplasty is much better than on-lay method regarding the operative time , hospital stay and post operative complications.

Keywords : *incisional hernia , intraperitoneal , on-lay , hernioplasty.*

Introduction

Incisional hernia is any abdominal wall gap with or without a bulge in the area of a postoperative scar¹. Incisional hernia is common surgical problem and occurs in 2-10% of laparotomies².

The risk factors contributing to the development of incisional hernia include: anaemia, body mass index over $25 \text{ kg} / \text{m}^2$, smoking , chronic obstructive pulmonary

disease^(3,4) , multiple prior procedures , prior incisional hernia and, technical error during repair in addition to wound infection which increases the risk of incisional hernia to 1.9 time⁵ . Repair of incisional hernia have always been a challenging procedure for the surgeon because of the distorted anatomy following previous surgery .

There are different methods of treating incisional hernia .Until 1958 , suturing repair was used , but now is not recommended as it has high recurrence rate 31-54 % . For that reason an another method which is prosthetic mesh should always be used (either open or laparoscopic) to decrease the recurrence rate to less than 10%⁶ . But the mesh has many disadvantages like seroma ,hematoma , infection⁷ ,sinuses , adhesions and recurrence of hernia.

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There are different types of meshes like polypropylene (pp), polyester, expanded polytetrafluoroethylene (ePTFE) and combined meshes.

A more recent movement in the design of combined synthetic meshes is to construct a mesh consisting of a polypropylene base coated with absorbable polymers⁸. The main purpose of using combined mesh is to decrease the adhesion between the mesh and the bowel.

In incisional hernia, the mesh should be wide enough to cover the defect in all directions (at least 4 cm wider than the defect) since smaller size may lead to recurrence⁹. The ideal mesh must have good tensile strength, be inert, non-carcinogenic, stable in case of infection and able to develop an inflammatory response and avoid tissue rejection¹⁰. The mesh is placed in a variety of ways. Techniques of mesh placement include on-lay, intraperitoneal and sandwich. In on-lay technique, the mesh is placed over the external oblique fascia. In the intraperitoneal technique, the mesh is placed intraperitoneally. In sandwich technique, one mesh is placed on-lay and one is placed intraperitoneally. It is known that an ideal mesh to be used inside the peritoneal cavity in contact with the bowel needs to have a high reactivity side to promote tissue growth at the abdominal wall and another side with the capacity to avoid adhesion¹¹.

The Parietex composite mesh is made from a composite structure of mono-filament polyester textile on one side and a hydrophilic absorbable collagen film on the other side to decrease the adhesion between the mesh and the bowel.

Aim of the Study

is to compare the outcome of incisional hernia repair between two methods of mesh hernioplasty: open intraperitoneal dual mesh and on-lay mesh repair.

Patients and method

This prospective study was carried out in Al-Fayhaa Teaching Hospital in Basra from February 2016 to February 2018.

Total 80 patients with incisional hernia admitted to the surgical unit as elective cases, divided into 2 groups: group A (n= 40) managed by open intraperitoneal optimized composite mesh (polyester with collagen coated film). The other group is group B (n = 40) managed by on-lay polypropylene mesh. All patients

received the same preoperative antibiotic (ceftriaxone 1 gram intravenously with induction of general anaesthesia and 4000 IU of low molecular weight heparin subcutaneously). Regarding group A the mesh was fixed intraperitoneally by multiple nylon sutures on the collagen side toward the abdominal cavity, while in group B we used (polypropylene) mesh fixed to the anterior rectus sheath. Subcutaneous redivac drain was used for both groups. Post-operative antibiotics were used for 7 days. The patients were followed for 24 months following surgery. In some cases when complications occurred we managed them accordingly. The data were analysed using SPSS statistics software version 23, mean, average and Dunnett multiple comparison test.

Inclusion criteria

1. Midline incisional hernia.
2. The hernial defect less than 10 cm diameter.
3. Body mass index less than 40 kg/m².

Exclusion criteria

1. Emergency surgery (incarcerated hernia).
2. Chronic obstructive pulmonary disease.
3. Immunocompromised patient.
4. Smoker patients.
5. Recurrent incisional hernia.
6. Non midline hernia.

Parameters of comparison

1. Age of the patient.
2. Gender.
3. Duration of surgery.
4. Hospital stay post operation.
5. Drain removal time.
6. Return to the usual activity.
7. Post-operative complications (early and late).

Result

Eighty patients complaining of incisional hernia referred to Al-Fayhaa Teaching Hospital from February

2016 to February 2018 were managed as two groups by using intraperitoneal dual mesh and on- lay mesh.

Regarding the age , patients were divided for five groups as shown in table 1.

Table 1 : The age distribution of patients in both groups.

Age (year)	Group A (intraperitoneal)	Group B (on-lay)
20 _ 29	3	2
30_ 39	15	9
40_ 49	12	14
50 _59	7	10
60 and above	3	5
Total	40	40

Table 2 : gender distribution in both groups.

Gender	Group A (intraperitoneal)	Group B on-lay)
Male	18 (45%)	11 (27.5%)
Female	22 (55%)	29 (72.5%)
	40 (100%)	40 (100%)

In intraperitoneal mesh group 45% (n= 18) were male and 55% (n= 22) were female . On-lay group 72.5% were female. Female forms 63.75% (n= 51) of all patients.

Table 3 : different parameters for comparison.

	Group A (Intraperitoneal)	Group B (on-lay)	P value
Duration of surgery Minute (mean \pm SD)	90 \pm 10.24	70 \pm 17.53	P= 0.001
Hospital stay (Average \pm SD)	Average 3.34 \pm 1.27 days Range 2-6	Average 5 \pm 3.73day Range 3-8	P= 0.05
Time of drain removal	7 day	10 day	P= 0.01
Return to usual activity (median \pm SD	28 \pm 4.32 days	50 \pm 6.75 days	P= 0.05

In group A (intraperitoneal mesh) , the operative time ranged from 60 to 110 minutes with a mean operative time of 90 \pm 10.24 minutes , while in group B (on-lay) the operative time ranged from 50 to 95 minutes with a mean operative time of 70 \pm 17.53 minutes (p= 0.001).

The duration of hospital stay ranged from 2-6 days with an average duration of (3.34 ± 1.27 days) in intraperitoneal group , while in on-lay group the duration ranged from 3-8 days with average of (5 ± 3.73 days) $p= 0.05$.

Table 4 : early and late complications in both groups.

Post operative complications	Group A (Intraperitoneal)	Group B (On-lay)	P value
Early complications			
Seroma	5 (12.5 %)	11 (27%)	<0.05
Haematoma	1 (2.5%)	4 (10%)	<0.01
Surgical site infection	1 (2.5%)	6 (15%)	<0.001
Late complication (Recurrence)	Zero (0%)	3 (7.5%)	< 0.05

Early and late complications were listed in table 4 .seroma developed in 12.5% in intraperitoneal group and 27 % in on-lay group ($p= 0.05$). Haematoma developed in 2.5% and 4 % in intraperitoneal and on-lay groups respectively $p=$.

Regarding surgical site infection developed 2.5 % of group A and 15% of group B ($p= 0.001$).

Recurrence of the incisional hernia which is the late complication was noted in 3 patients (7.5%) in on-lay group , while non of intraperitoneal group developed recurrence during the period of follow up ($p< 0.05$).

Discussion

Incisional hernia is a common surgical problem encountered in clinical practice . The outcome of the surgery is based not only on the technique used but on the experience of the operator, meticulous dissection , tension free repair etc.¹². Repair of incisional hernia is an ongoing challenge in surgical practice and a wide spectrum of surgical techniques have been developed ranging from direct suture technique to the use of various types of mesh to close the defect and strengthening the musculofascial tissues to avoid recurrence ¹³.

When considering the best location for the placement of mesh , a number of features are to be considered. Firstly , technique that avoid the devascularisation of flap will prevent wound complications like infections, flap necrosis, and surgical site infection . Secondly , technical ease and duration of surgery may affect the surgeon's choice ¹⁴.

In our study the mean duration of surgery , in cases underwent intraperitoneal mesh repair was (90 ± 10.24 minutes), while in cases with on-lay mesh repair was (70 ± 17.53 min.) the difference is statistically significant($p= 0.001$) . Other studies showed similar result (Godara et al. ¹⁵ . And Glysteen ¹⁶.)

This difference in time is may be due to more time needed in intraperitoneal method to create wider clear intraperitoneal surface and release the adhesion of previous surgery , while in on-lay method no need for that as the mesh fixed to the anterior rectus sheath. Miller K, et al showed longer time needed for intraperitoneal mesh fixation as compared to on-lay method ¹⁷.

The average duration of hospital stay was 3.34 ± 1.27 days (range 2-6 days)for intraperitoneal group and 5 ± 3.73 days (range 3-8 days) for on-lay group ($p= 0.05$). Other study showed average hospital stay 7 days for intraperitoneal group and 9 days for on-lay group ¹⁸.

Regarding post operative complications, seroma developed in 12.5% and 27% in intraperitoneal and on-lay mesh respectively ($p= 0.05$) , Godara et al study shows similar rate of complication ¹⁵ . Seroma formed in on-lay more than intraperitoneal technique , may be due to that on-lay technique needs more subcutaneous dissection to place the mesh which leads to devitalized tissue and seroma formation.

Other study by Salamone G, Licari L ¹⁹, showed the similar result of our study.

The difference of heamatoma formation is significant

between both groups , it founds in 2.5% and 10% in intraperitoneal and on-lay mesh respectively ($p= 0.01$).

Surgical site infection in intraperitoneal technique was 2.5% while in on-lay technique it was 15% (the difference is statistically significant $p= 0.001$). The superficial location of mesh makes it in danger of infection if there is wound infection. This infection treated by antibiotics and wound dressing and no need for mesh removal. This result agreed with many other studies that found on-lay technique is associated with higher rate of wound infection ^{20,21}.

The recurrence of hernia in our study is 7.5% in on-lay mesh while in intraperitoneal mesh , non of our patients developed recurrence , this result agreed with study done by Vries Reillingh et al .who noticed recurrence of 23% in on-lay technique and no recurrence in intraperitoneal technique ²². Gleysteen found recurrence rate of 20% and 4% on-lay and intraperitoneal mesh respectively ¹⁶. Other studies showed higher recurrence rate with on-lay mesh as compared with intraperitoneal mesh ^{13,23,24}. This lower recurrence rate in Intraperitoneal mesh may be explained that mesh in this place can not be dislodged or ruptured by increasing intra-abdominal pressure , but instead is fixed in place by the same force that caused the hernia.

Conclusion

From our study we concluded that the use of intraperitoneal composite mesh is better than on-lay placed mesh regarding the hospital stay and postoperative complications.

Ethical Clearance: Ethical clearance taken from Al Fayhaa Teaching hospital.

Funding Source: Self

Conflict of Interest: Nil

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Teachers' Knowledge Regarding Attention-Deficit Hyperactivity Disorder between Pupils at Elementary Schools in Mosul City

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Abstract

The Objective: To assess the knowledge level of teachers' regarding pupils with attention-deficit hyperactivity disorder at Mosul elementary schools.

The Methodology: A descriptive study was applied at Mosul elementary schools in from 18th of January till 4th of June / 2019. The sample involved of (200) teachers working in the selected purposively from elementary schools from Mosul city, (100) teachers from every one side of the city, (10) teachers from each school that selected in this study.

The Result: The socio-demographic characteristic of the study presents that 72% (144) of them females , 35% (70) at age (36-45) years old, 68.5% (137) graduated from institute of teaching , 48% (96) of them have (1-15) years of general experience in the field of teaching, , 81% (162) of them not have any participation in training courses in ADHD between children, 70% (140) of them not have previously reading source of ADHD. The total teachers' knowledge was 75.5 % (151) of them at not acceptable level.

The Recommendations: Continuous extensive special programs, training course and workshops should be design and implement at elementary schools in Mosul City

Keywords: Teachers' knowledge, Attention-Deficit Hyperactivity Disorder in Pupils

Introduction

Attention deficit hyperactivity disorder (ADHD) is represented as physical movements which exceed the normal limit or the acceptable limit, and it shows in the form of a group of behavioral disorders arise as a result of many psychological and organic causes, hyperactivity includes random, involuntary and unsuitable movements appear as a result of organic or psychological causes,

and it is accompanied with an attention deficit (1, 2). Therefore this problem is signified as a very common disorder that result of the diagnosed children pupils' population number with ADHD, there is an abundance of research available on empirically supported methods of identifying and treating ADHD⁽³⁾. In addition, there are professionals from multiple disciplines who aide in diagnosing and treating this disorder⁴. Medical providers, mental health providers, and educators can all play roles throughout the diagnostic and treatment process⁽⁵⁾. The elementary school teachers are the most often that represent the first person have to face these behaviors in the classroom and should be able to make a referral for assessment for ADHD (if the child didn't diagnose yet), because the children with exhibit behaviors become unable to cope with structured school environment, their

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peers and their teachers^(6, 7). Worldwide population of children younger than 15 years is 1.8 billion that is 28% of world population is children pupils. Schools play a crucial and formative role in spheres of cognitive, language; emotional, social and moral development of children, there is now growing recognition that schools have significant role in promoting mental health⁽⁸⁻¹²⁾.

The Objectives of the Study

1. To assess the teachers' knowledge levels regarding attention-deficit hyperactivity disorder between pupils at elementary schools in Mosul City.

2. To find out the relationships between the socio-demographic variables and the teachers' knowledge level regarding attention-deficit hyperactivity disorder between pupils at elementary schools in Mosul city

Material and Method

Design of the study: A descriptive study was carried out at the selected elementary schools in Mosul city to assess the teachers' knowledge level regarding attention-deficit hyperactivity disorder between pupils from 18 of January till 4 of June / 2019.

Sample of the study: The sample consisted of (200) teachers working in the selected purposively from elementary schools from Mosul city, (100) teachers from each side of the city, (10) teachers from each school that selected in this study.

Study tool: The questionnaire was constructed and provided for teachers to assess the knowledge which consists of two parts. The first part concerns the demographic information, while the second part was related to the teachers' knowledge in attention deficit hyperactivity disorders. The first section is the teachers' knowledge regarding ADHD in generals, the second section regarding the sign and symptoms, the third sections regarding causes and diagnosis, the fourth sections regarding general managements of students' children, the fifth section regarding the teachers' role in classroom through dealing with ADHD student's children, lastly the sixth section regarding school role through dealing with ADHD student's children.

Results

The table (1) presents that the teachers' knowledge level results regarding ADHD in the right and left side of Mosul city, the result of the teachers' knowledge regarding ADHD at the two side show that at fail and not acceptable level in all items of the teachers' knowledge questionnaire. The table (2) presents that the teachers' knowledge level results regarding ADHD in the Mosul City that content; the teachers' knowledge result regarding ADHD show that all items of the teachers' knowledge questionnaire at fail level except the total teachers' knowledge at not acceptable level.

Table (1): The Teachers' Knowledge Level Results Regarding ADHD in the Right and Left Side of Mosul City

No	Teachers Knowledge Level	Estimates	The Right Side		The Left Side	
			Feq	%	Feq	%
1.	Teachers' knowledge regarding ADHD in general	Fail	48	48.0	40	40.0
		Not Acceptable	32	32.0	34	34.0
		Acceptable	17	17.0	24	24.0
		Good	2	2.0	1	1.0
		Excellent	1	1.0	1	1.0
2.	Teachers' knowledge regarding sign and symptoms of pupils with ADHD	Fail	56	56.0	46	46.0
		Not Acceptable	29	29.0	42	42.0
		Acceptable	14	14.0	10	10.0
		Good	1	1.0	1	1.0
		Excellent	.0	1.0	1	1.0

		EXCELLENT	GOOD	ACCEPTABLE	NOT ACCEPTABLE	FAIL
3.	Teachers' knowledge regarding the causes and diagnosis of pupils with ADHD	Fail	51	51.0	39	39.0
		Not Acceptable	33	33.0	47	47.0
		Acceptable	16	16.0	10	10.0
		Good	0	0	4	4.0
		Excellent	0	0	0	0
4.	Teachers' knowledge regarding the general managements' of pupils with ADHD	Fail	64	64.0	65	65.0
		Not Acceptable	27	27.0	27	27.0
		Acceptable	6	6.0	8	8.0
		Good	3	3.0	0	0
		Excellent	0	0	0	0
5.	Teachers' knowledge regarding the teacher roles inside the classroom with pupils having ADHD	Fail	60	60.0	62	62.0
		Not Acceptable	34	34.0	31	31.0
		Acceptable	5	5.0	7	7.0
		Good	1	1.0	0	0
		Excellent	0	0	0	0
6.	Teachers' knowledge regarding the school roles with pupils having ADHD	Fail	64	64.0	75	75.0
		Not Acceptable	24	24.0	20	20.0
		Acceptable	11	11.0	5	5.0
		Good	0	0	0	0
		Excellent	0	0	0	0
		Fail	22	22.0	15	14.9

Table (2): The Teachers' Knowledge Level Results Regarding ADHD in the Mosul City

No	Teachers Knowledge Level	Estimates	Feq	%
1.	Teachers' knowledge regarding ADHD in general	Fail	88	44
		Not Acceptable	67	33.5
		Acceptable	41	20.5
		Good	3	1.5
		Excellent	1	0.5
2.	Teachers' knowledge regarding sign and symptoms of pupils with ADHD	Fail	104	52
		Not Acceptable	70	35
		Acceptable	24	12
		Good	1	0.5
		Excellent	1	0.5
3.	Teachers' knowledge regarding the causes and diagnosis of pupils with ADHD	Fail	91	45.5
		Not Acceptable	78	39
		Acceptable	27	13.5
		Good	4	2.0
		Excellent	0	0

Cont... Table (2): The Teachers’ Knowledge Level Results Regarding ADHD in the Mosul City

4.	Teachers' knowledge regarding the general managements' of pupils with ADHD	Fail	129	64.5
		Not Acceptable	54	27
		Acceptable	14	7.0
		Good	3	1.5
		Excellent	0	0
5.	Teachers' knowledge regarding the teacher roles inside the classroom with pupils having ADHD	Fail	124	62
		Not Acceptable	64	32
		Acceptable	11	5.5
		Good	1	0.5
		Excellent	0	0
9.	Teachers' knowledge regarding the school roles with pupils having ADHD	Fail	140	70.0
		Not Acceptable	45	22.5
		Acceptable	14	7.0
		Good	1	0.5
		Excellent	0	0
10.	The Total Teachers' Knowledge	Fail	37	18.5
		Not Acceptable	151	75.5
		Acceptable	12	6.0
		Good	0	0
		Excellent	0	0

Discussion

The finding that present in table (1) shows teachers’ knowledge in the right side of Mosul city, that the teachers’ knowledge regarding ADHD in general are 48.0 % of them at fail level of estimate knowledge level, teachers’ knowledge regarding sign and symptoms of pupils with ADHD are 56.0% of them at fail level of estimate knowledge level, teachers’ knowledge regarding the causes and diagnosis of pupils with ADHD are 51.0 % of them at fail level of estimate knowledge level. The teachers’ knowledge regarding the general managements’ of pupils with ADHD are 64.0 % (64) of them at fail level of estimate knowledge level, teachers’ knowledge regarding the teacher roles inside the classroom with pupils having ADHD are 60.0% (60) of them at fail level of estimate knowledge level, teachers’ knowledge regarding the school roles with pupils having ADHD are 64.0% of them at fail level of estimate knowledge level, and lastly the total teachers’ knowledge of the right side of Mosul city are 71.0% of them at not acceptable level of estimate knowledge level. But the left side of Mosul city shows that the teachers’ knowledge

regarding ADHD in general are 40.0 % of them at fail level of estimate knowledge level, teachers’ knowledge regarding sign and symptoms of pupils with ADHD are 46.0 % of them at fail level of estimate knowledge level, teachers’ knowledge regarding the causes and diagnosis of pupils with ADHD are 47.0 % of them at not acceptable level of estimate knowledge level, teachers’ knowledge regarding the general managements’ of pupils with ADHD are 65.0 % of them at fail level of estimate knowledge level. The teachers’ knowledge regarding the teacher roles inside the classroom with pupils having ADHD are 62.0 % of them at fail level of estimate knowledge level, teachers’ knowledge regarding the school roles with pupils having ADHD are 75.0 % of them at fail level of estimate knowledge level, and lastly the total teachers’ knowledge of the left side of Mosul city are 78.0 % of them at not acceptable level of estimate knowledge level. This result agree with Alkahtani (2013), and Safaan et al. (2017) shows in there study that more than half (59.0%) of the studied primary school teachers had poor total knowledge about ADHD compared to only 10.2% of teachers had good knowledge. demonstrates that two thirds of teachers had

poor knowledge about responses of teachers regarding ADHD treatment subscale followed by responses regarding ADHD general information subscale (52.2%) then responses regarding symptoms & diagnosis ADHD subscale (41.6%).^(14, 15). The teachers' knowledge in the Mosul City that the teachers' knowledge regarding ADHD in general are 44.0 % of them at fail level of estimate knowledge level, the teachers' knowledge regarding sign and symptoms of pupils with ADHD are 52.0 % of them at fail level of estimate knowledge level, the teachers' knowledge regarding the causes and diagnosis of pupils with ADHD are 45.5 % of them at fail level of estimate knowledge level, the teachers' knowledge regarding the general managements' of pupils with ADHD are 64.5 % of them at fail level of estimate knowledge level. The teachers' knowledge regarding the teacher roles inside the classroom with pupils having ADHD are 62.0 % of them at fail level of estimate knowledge level, the teachers' knowledge regarding the school roles with pupils having ADHD are 70.0% of them at fail level of estimate knowledge level, and lastly the total teachers' knowledge of Mosul city are 75.5 % of them at not acceptable level of estimate knowledge level. This result agree with Alkahtani (2013) show in his study that teachers' overall percentage score of correct responses (items answered correctly) was reflects poor knowledge of ADHD. Incorrect responses (items answered incorrectly) percentage was indicate misperceptions of ADHD. Don't know responses (items that teachers admitted they just don't know) percentage was point to a lack of knowledge of ADHD among teachers. Teachers' overall percentage scores of the correct, incorrect, and don't know responses are presented graphically^(14,15).

The Conclusion and Recommendation:

According to the results of the present study, the researchers conclude the teachers of the elementary schools in Mosul city do not have appropriate and adequate knowledge regarding the attention-deficit hyperactivity disorder in pupils. There is no significance correlation between the teachers' knowledge and all demographic characteristics except the training courses. According to the results and conclusion of the present study, the researchers recommend the Ministry of Education, Nineveh Education Directorate and ministry of health, Nineveh Health Directorate to increase joint cooperation between them and focusing on the school health system within the school and health center, also in addition to activating the social researcher system in the

elementary school.

Ethical Consideration: before data collection, an official permission was obtained from the Ministry of Education/ Nineveh Directorate , and Written approval of participants was obtained prior to the start of data collection.

Conflicts of Interest: Nil

Source Funding: Self

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Antibacterial Properties of New Cement Based Capping Material Prepared from Egg Shell and Biopolymer (Chitosan)

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Abstract

Backgrounds : This study evaluated the antimicrobial properties of a newly prepared, cement-based capping material and biopolymer (chitosan) with Mineral Trioxide Aggregate MTA and Biodentine. **Method:** The antibacterial effects of a set of specimens against *Streptococcus mutans*, *Rothia dentocariosa*, and *Enterococcus faecalis* were evaluated by agar diffusion tests. Thirty disc-shaped specimens (10 of each type of materials; 6 mm in diameter × 2 mm in thickness) were prepared. One specimen for each material was placed on each agar plate, and the plates incubated for 24 h. After incubation, the diameter of the inhibition zone was calculated at three different points and averaged. **Results:** Statistically significant differences were found among new calcium-based capping material, MTA, and Biodentine. An ANOVA test was used to evaluate the effect of materials against each type of bacteria. This revealed that the inhibition zones produced by the new cement based capping material mixture were statistically significantly larger than those produced by the other materials. **Conclusions:** Within the limitations of the experimental methods employed in the present study, the cement-based capping material prepared from egg shells and the biopolymer chitosan has better antimicrobial properties than Biodentine and MTA.

Key words: Egg shell and biopolymer (chitosan), antibacterial , Eggshell

Backgrounds

Streptococci, lactobacilli, and Actinomyces species are the main cariogenic microflora presented on the surface of fissures, smooth-surface coronal caries, or root-surface caries. Members of the mutans group of streptococci spacially, *Strep. mutans* and *Strep. sobrinus* are considered to be the primary etiological causes in the induction of coronal and root caries ¹.

One of the bacteria most frequently involved bacteria in dental caries is *Streptococcus mutans*; it efficiently degrades fermentable carbohydrates to acids, which can demineralize tooth tissue (Van Houte et al; 1991; Brukiene et al; 2005; Konradsson et al; 2006)². Superficial infected dentin contain greater numbers of bacteria compared with deeper dentin. The application of strict anaerobic sampling and cultivation methods

always reveals greater bacterial retrieval, including that the environment of carious dentin promotes the survival of obligately anaerobic bacteria. Thus, species of Propionibacterium, Eubacterium, and Bifidobacterium are predominate microflora of deep carious dentin, including Actinomyces, Lactobacillus, and some streptococci, but rarely *S. Mutans* ³. The antibacterial effect is an important property because killing bacteria is a direct strategy for eliminating the cause of dental caries ^{4, 5}. Dental cements play an important role in assuring a healthy, infection-free oral cavity because they facilitate the sealing of damaged areas. However, it is still likely for infections to appear within these cements, and as such, antimicrobial activity must be one of the essential properties of dental cements ^{6, 7}. Dental cements are greatly used in odontological treatment. However, due to the dangerous nature of some of the materials used and the reduced biological efficiency, newer and safer substitutions are needed, particularly those possessing higher antimicrobial activity than their traditional counterparts ⁸⁻¹⁰.

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Antibacterial activity and sterilization of carious dentin could be supplied by cements containing calcium hydroxide¹¹. Among the pioneer contaminants of dental cements, there are several types in the oral cavity, such as *Enterococcus*, *Lactobacillus*, and *Streptococcus* species. The inability to prevent these species may lead to tissue invasion with consequential pulpal necrosis and tooth loss. Thus, the search for new compounds that may ameliorate biocompatibility and functionality via enhanced antibacterial properties of cements has gained importance¹². Antimicrobial action and the ability to enhance the formation of mineralized tissue are both dependent on an alkaline pH¹³.

The aim of this study was to compare and evaluate the antimicrobial action changes caused by new capping cement material (prepared from egg shells and biocompatible chitosan) with MTA and Biodentine materials.

Method

In this study, we compared three experimental groups:

- New cement based capping material prepared from egg shells and the biopolymer chitosan (experimental material). The powder to liquid ratio was 1 spoon of powder to 8 drops of liquid; mixing time: 45 seconds, working time: 2 min, setting time: 5.45 min.

- Mineral Trioxide Aggregate (Rootdent, Tehnodent, Russia) (control group).

- Biodentine material (septodont, France) (control group).

The microbiological study was carried out in the Bio[®] Laboratory of Microbiology in Erbil, Iraq.

The antibacterial effects of specimens against *S. mutans*, *Enterococcus faecalis*, and *Rothia dentocariosa* were evaluated using agar diffusion tests as described by Bauer et al.¹⁴. After isolation and identification, a single colony from each type of bacteria was transferred into 5 mL of sterile Brain Heart Infusion BHI broth (Lab, UK) and incubated at 37°C for 24 h. In order to prepare the experimental suspensions, a McFarland 0.5 turbidity

tube was prepared and used to make suspensions of the strains in a brain-heart infusion at approximately 1.5×10^8 organisms/mL, which were flood-inoculated onto the surface of Muller-Hinton agar (Lab, UK) plates¹⁴.

Thirty Petri plates with 20 mL of Muller-Hinton agar were inoculated with the microbial suspensions using sterile swabs that were spread onto the medium. Ninety disc-shaped specimens (30 of each type of materials; 6 mm in diameter \times 2 mm in thickness) were prepared and divided into three groups:

- Group A: 30 experimental specimens composed of calcium-based cement subdivided into:

A1: 10 specimens inoculated with *E. faecalis*

A2: 10 specimens inoculated with *S. mutans*

A3: 10 specimens inoculated with *R. dentocariosa*

- Group B: 30 specimens composed of Biodentine subdivided into:

B1: 10 specimens inoculated with *E. faecalis*

B2: 10 specimens inoculated with *S. mutans*

B3: 10 specimens inoculated with *R. dentocariosa*

- Group C: 30 specimens composed of MTA subdivided into:

C1: 10 specimens inoculated with *E. faecalis*

C2: 10 specimens inoculated with *S. mutans*

C3: 10 specimens inoculated with *R. dentocariosa*

Three discs (one for each material) were placed on each agar plate using sterile forceps and incubated in an aerobic candle jar at 37°C for 24 h. After incubation, the diameter of the inhibition zone was calculated at three different points and averaged. The sizes of the inhibition zones for each material were measured based upon the diameters of the halo of inhibition and the disc's diameter as follows:

Size of inhibition zone = diameter of halo – diameter of the disc (Figures 1–3).

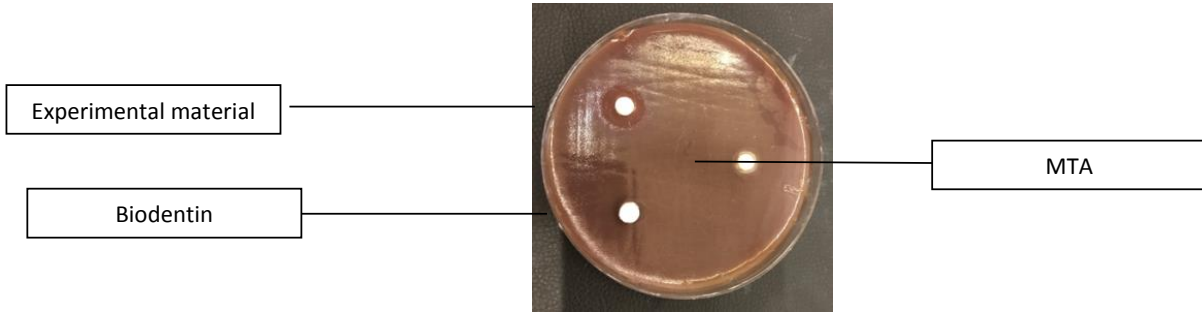


Figure 1: The zones of bacterial growth inhibition against (*Streptococcus mutans*).

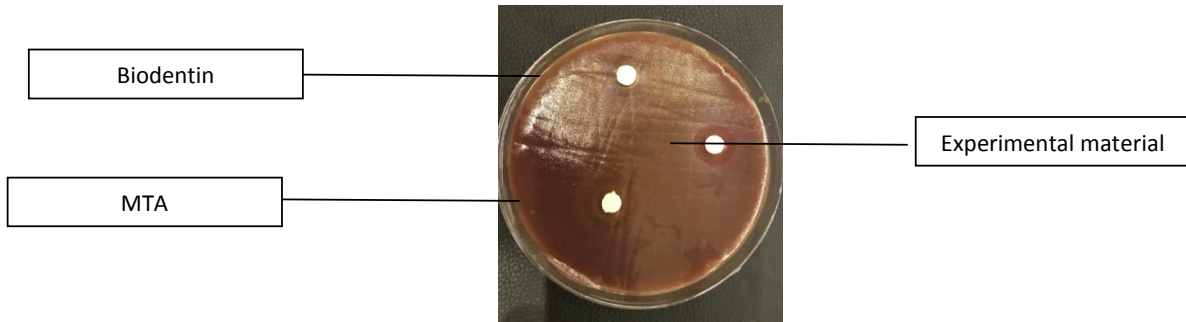


Figure 2: The zones of bacterial growth inhibition against (*Enterococcus faecalis*).

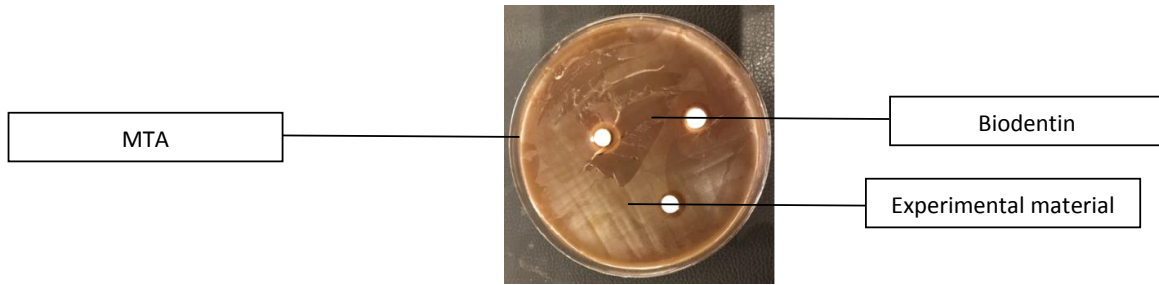


Figure 3: The zones of bacterial growth inhibition against (*Rothia dentocaris*).

Results

The antibacterial activities of the tested materials determined by the means and standard deviations of growth inhibition zones for various microorganisms after 24 h are shown in [Table 1](#). All materials showed antibacterial activity. The results of the 24-h incubation revealed that the experimental materials were the most effective against all tested bacterial strains, while the growth zones for the MTA and Biodentin groups were smaller.

Table 1. The diameters (in mm) of the zones of bacterial growth inhibition against the bacterial strains.

Materials	E. faecalis		S. mutans		R. dentocariosa	
	Mean	SD	Mean	SD	Mean	SD
Experimental cement	13.500	0.3590	11.700	1.1353	8.000	1.4907
Biodentin	9.200	1.6865	9.700	1.1353	6.300	0.9487
MTA	6.560	0.4142	8.000	1.4907	5.000	0.7454

The ANOVA test showed that there were statistically significant differences ($p < 0.0001$) among the sizes of the inhibition zones produced by the tested materials for all bacterial strains (Tables 2–4).

Table 2. ANOVA shows the effect of testing materials against *E. fecalis*.

Group	Sum of Squares	Df	Mean Square	F	Sig.
Between groups	45.267	2	22.633	18.462	0.000
Within groups	33.100	27	1.226		
Total	78.367	29			

Table 3. ANOVA test shows the effect of testing materials against *S. mutans*.

Group	Sum of Squares	Df	Mean Square	F	Sig.
Between groups	68.600	2	34.300	21.437	0.000
Within groups	43.200	27	1.600		
Total	111.800	29			

Table 4. ANOVA shows the effect of testing materials against *R. dentocariosa*.

Group	Sum of Squares	Df	Mean Square	F	Sig.
Between groups	245.411	2	122.705	117.052	0.000
Within groups	28.304	27	1.048		
Total	273.715	29			

Discussion

The development and progression of pulpal and periapical diseases, as well as endodontic treatment failure were essentially attributed to Microorganisms. Treatment consequences will depend on the successful elimination of the associated microorganisms and infected tissues¹⁵.

The agar diffusion test is routinely used to explore the antimicrobial properties of dental materials. This method involves placing the tested material on an agar plate inoculated with oral bacteria. Using this method, an inhibition zone around the material is produced. To produce a zone of inhibition, the material needs to ooze a soluble antimicrobial agent. If the amount of the antimicrobial agent removed is not sufficient, the zone of inhibition will not be produced. In general, larger zones

correlate with the concentration and/or potency of the tested bactericide. This also proposes the susceptibility of the tested bacteria to a specific antimicrobial agent, and the size of the inhibition zone can be measured using a graduated ruler^{16–18}.

The bacterial strains used throughout the experiments were *S. mutans*, oral Lactobacilli, and *E. fecalis*. These microorganisms play an important role in dental biofilm formation and in the etiology and progression of caries. *S. mutans* is one of the bacteria most frequently engaged in dental caries. It efficiently degrades fermentable carbohydrates into acids, which can demineralize tooth tissues^{19–21}.

Fransson et al. (2014) consummated that *E. faecalis* reduced the activity of odontoblast-like cells, and it had an inhibitory effect on collagen-1 production. Thus,

it decreases the ability of odontoblasts to induce the synthesis of tertiary dentine²². *E. faecalis* has also been shown to be a highly resistant bacteria in the root canal system, and it plays major role in endodontic treatment failures²³.

The results of this study revealed the effective antibacterial activity of experimental new calcium-based capping material, which showed larger growth inhibition zones of tested bacteria compared to MTA and Biodentine. This may be associated to the liberation of ions and alkalinity of new capping material.

The experimental cement consisted of 70% CaO, 25% MgO, 3% hydroxyapatite (HA), 1.5% bismuth oxide, and 0.5% calcium acetate. Calcium-based cement has an antibacterial effect, and it is a possible candidate for use in pulp capping and cavity lining²⁴. Li et al. (1998) showed that HA has antibacterial properties against cariogenic bacteria. They concluded that it would be best to harness the antibacterial properties of HA by using it as a base in the treatment of carious cavities in order to inhibit residual cariogenic bacteria²⁵.

Tin-oo et al. (2007) found that tubes containing 200 mg or more of HA completely inhibited *S. mutans*, and no bacterial growth was seen. This finding has shown that HA displays solid antibacterial properties. The bacterial growth inhibition could be related to magnesium ions or active oxygen released by MgO into the medium²⁶.

Sawai et al. (1995a) showed that MgO, CaO, and ZnO exhibited strong antibacterial activity. They found that MgO and CaO powders displayed bactericidal effects against Gram-positive and Gram-negative bacteria, while ZnO powder inhibited the growth of Gram-positive bacteria more strongly than Gram-negative bacteria²⁷.

The polycationic structure of chitosan CH is necessary for antibacterial activity. Electrostatic interactions between the polycationic structure and the predominantly anionic components of the microorganisms' surface (such as Gram-negative lipopolysaccharide and cell surface proteins) play a primary role in antibacterial activity, because environmental pH is below the pKa of CH and its derivatives²⁸.

Liu et al. (2006) found that the antibacterial activity of low molecular weight (MW) CH against *Escherichia coli* is higher than that of the high MW CH with the same degree of deacetylation²⁹. *R. dentocariosa* was originally

isolated from dental plaques and caries. It is found in the oral cavity and pharynx of humans where it forms a portion of the normal microflora³⁰. *R. dentocariosa* was seen in over 30% of healthy individuals by an investigation of throat swabs³¹. Furthermore, it can also be extracted from respiratory tract specimens as part of the normal oral flora²⁹.

Biodentine showed some initial bacterial inhibition, but this was significantly lower than that of the new cement based capping material and MTA, which displayed a large spread in data. The fact that Biodentine revealed zones of inhibition implies that Biodentine itself has some definite antimicrobial effects. This might be related to Biodentine's high pH³². Because *E. faecalis* can live in alkaline environments, this may play a role for the smaller inhibition zone of Biodentine against *E. faecalis*. Perhaps the inherent and persistent alkalinity of Biodentine is just enough to smash *E. faecalis*³³. Biodentine powder is composed mainly of tricalcium silicate, calcium carbonate, and zirconium oxide as a radio-pacifier. Meanwhile, liquid Biodentine contains calcium chloride as the setting accelerator and water as the reducing agent. The addition of up to 30% calcium carbonate, calcium sulfate, and calcium chloride resulted in an improvement in the physical properties of tricalcium silicate cement. It also improved the degradability and bioactivity of the resultant material. Calcium silicate hydrate gel, calcium hydroxide and unreacted tricalcium silicate are resulted from the hydration of tricalcium silicate. The antibacterial and anti-inflammatory properties of the calcium hydroxide produced from the tricalcium silicate hydration, mainly due to the high (alkaline) pH of the surrounding environment after it dissolves³⁴⁻³⁵.

Conclusions

Within the limitations of the experimental methods employed in the present study, a number of conclusions can be seen. All tested materials have antibacterial properties against the tested bacteria. Furthermore, the experimental new calcium-based capping material cement showed remarkable antibacterial activity against the bacteria tested, which was comparable to that of MTA and better than Biodentine.

Conflict of Interest: Not

Ethical Clearance: The study was approved by the Ethics Committee of the College of Dentistry, Hawler Medical University, Kurdistan Region, Irbil-Iraq.

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Bow tie Model of Palliative Care as an Early Approach to Providing care for Patients with Heart Failure

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Abstract

Background & objective: In patients with heart failure due to the complications of the disease and the lack of definitive curative treatment, in the majority of cases, the emphasis is laid on reducing these complications and the symptoms of the disease. Therefore, to manage the symptoms and the complications, and reduce the effect of the disease on the patients' quality of life, in addition to routine care, additional care is required among which palliative care is of great importance. The present narrative review aimed to introduce bow tie model of palliative care as an early approach in care for patients with heart failure. **Methodology:** This study introduces early palliative care for patients with heart failure by reviewing the literature on the bow-tie model. **Results:** Although the bow-tie model Early Palliative Care is an important part of end-of-life care, it is not limited to that stage. It is also applied for patients who are in the early stages of their disease. **Conclusion:** Based on the NYHA New York Heart Association functional classification, patients with heart failure are classified in one of four categories and it seems that bow tie model of palliative care is an effective method of reducing the symptoms, complications, and effect of the disease on the quality of life of the patients especially in the patients of Class I and class II who are in the early stages of the disease.

Keywords: Palliative care, Bow-tie model, Heart failure

Introduction

Nearly 23 million people worldwide and over 5.8 million people in the United States suffer from heart failure¹. Heart failure is also one of the leading causes of disability and death in Iran². In Iran, about one percent of the population over the age of 50 and ten percent of the elderly people over the age of 80 suffer from heart failure^{2,3}, so that regarding the epidemiological transition and the increasing rate of the elderly population as well as the criticality high prevalence of cardiovascular risk factors in both genders, only 4% of the 15-44 age group and 1% of the 45-64 age group had no cardiovascular risk factor, the high incidence and prevalence of heart failure is justifiable as in the not too distant future, it will be more than its present prevalence of 3500 patients per 100,000 population along with a change in population pyramid and the aging of Iran's young people^{2,3}.

Heart failure is a debilitating disease profoundly affecting the functional conditions, quality of life and socioeconomic status of the patients and their families⁴. Furthermore, it impairs the patients' sexual function, occupational and family roles, and social life^{5,6}. Due to the complications of the heart failure and the reduced quality of life, the patients, in addition to medication treatment, require special care to relieve pain and disability, so they can adapt to the existing conditions and apply their ability to continue living and pursue their physical and occupational activities decently⁷.

In patients with heart failure due to the complications of the disease and the lack of definitive curative treatment, in the majority of cases, the emphasis is laid on reducing these complications and the symptoms of the disease. Therefore, to manage the symptoms and the complications, and reduce the effect of the disease on the patients' quality of life, in addition to routine care, additional care is required among which palliative care is of great importance^{8,9}. This is interdisciplinary and patient-centered care, which motivates the patient to continue the care and provides spiritual support, physical comfort and cooperation with the patient's

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family to care for patient¹⁰. If we use palliative care in the early stages of the disease, it can lead to positive consequences such as reduced complications, relief from physical and mental stress, and ultimately improvement in the patient's quality of life¹¹. Considering the above, the present narrative review aimed to introduce bow tie model-based palliative care as an early approach in care for patients with heart failure.

Methodology

The present study is a narrative non-systematic review conducted a comprehensive synthesis of published studies on bow tie model-based palliative care in patients with heart failure. To do so, keywords including bow tie model, palliative care, and heart failure were searched in databases of PubMed, Scopus, Google Scholar, and Science Direct using the AND and OR indicators.

Results

After examining the available studies, texts, and specialized websites, the followings explained in order.

Palliative care

Palliative care is an approach that improves the quality of life of patients and their families facing the problems associated with life-limiting illnesses through the prevention and relief of suffering by means of early identification, impeccable assessment, and treatment of pain and other physical, spiritual and psychosocial problems. In fact, from the moment on the diagnosis is established, palliative care helps the patients and their families to cope with the pain, suffering, and complications caused by the disease¹² and emphasizes that more particular attention should be paid to the person with the disease than to those with other diseases. Actually, comprehensive patient care will never be provided without palliative care¹³.

Bow tie model-based palliative care

This care model guarantees the patient survival along with curative treatment and delineates the path of care well, and demonstrates the dual reality of "hope for the best, plan for the worst." Trying to survive is a remarkable reality in this model of care, but the reality of death is also taken into account, and the concepts and pathways existing in this model can be defined by different cultures and implemented with regard to the broad definition of homecare in those cultures^{14, 15}.

Bow tie model was first introduced by Dr. Philippa H. Hawley medical oncologist of Vancouver Cancer Centre and derived from the Canadian Hospice palliative Care Association Model¹⁴. This model places greater emphasis on palliative care and reducing disease complications, and it is not restricted to patients receiving end-of-life care but is also applicable to patients who are in the early stages of their disease¹⁶.

This model emphasizes complementary methods of both palliation and treatment as both concepts are simultaneous and the path of care is not one-sided. The model's name is derived from two symmetrical triangles of "disease management" and "palliative care" that take the form of a bow tie^{14, 15}. This model can be implemented according to the patient's specific circumstances, and the goal of palliative care model is to manage the symptoms and complications of the disease that can improve the patient's quality of life and widen the gap between the onset of disease and disability resulting from its progression. Unlike single-sided triangles, a double-sided triangle of this care model can have all the consequences of a disease, from its diagnosis to the end, which means that survival and death are both acceptable and possible. The shape of each triangle corresponds to the base of the other triangle, indicating that palliative care can be implemented from the moment on the diagnosis is reached or from early stages of the disease and continued with medication therapy for the rest of life. This model suggests that palliative care is not only restricted to the last few months of a patient's life, but also plays an important role early in the course of the disease and during it as well, and potentially survivorship is its main goal¹⁴. In addition, it builds patients' hopes up and reduces their negative emotions such as expecting impending death¹⁷ Fig.1.

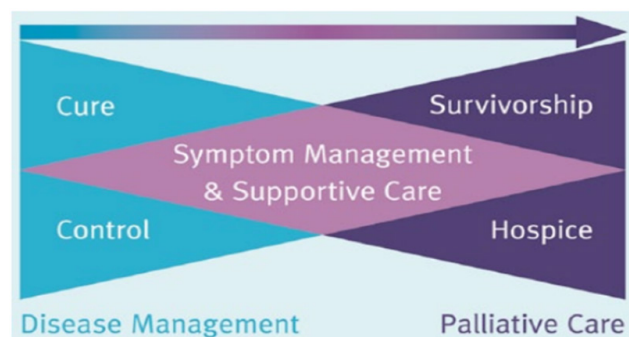


Figure 1: Palliative care based on the Bow tie model, Hawley, 2017¹⁸.

Discussion and Conclusion

In the present model of care, patient recovery is considered as one of the goals of palliative care implementation, and regarding the onset of palliative care early in the course of the disease, the complications are far less severe. On the other hand, with regard to control over the complications of the disease, the gap between the diagnosis and the end-stage of the disease widens so that the patient can spend more time without the adverse and debilitating effects of the disease¹⁴. In a study by Temel et al. 2010, the results indicated that early palliative care has led to improved quality of life, control of depression symptoms, and increased survival of patients with non-metastatic small cell lung cancer¹⁹.

There is currently no comprehensive and inclusive palliative care for patients with heart failure, and there is just limited number of patients whom the care is available for. Furthermore, there is evidence that shows the lack of management and palliative care for the patients in early stages of heart failure^{20, 21}. Therefore, it is essential to adopt early palliative care for patients with heart failure who do not have adequate access to medication and pain relief treatments and also have a low quality of life due to the disease¹¹.

Based on the NYHA functional classification, patients with heart failure are classified in one of four categories and it seems that bow tie model of palliative care is an effective method of reducing the symptoms, complications, and effect of the disease on the quality of life of the patients especially in the patients of Class I and class II who are in the early stages of the disease. Because in this model, unlike previous models where palliative care is utilized solely for patients with a terminal illness, implementation of palliative care begins from the moment on the diagnosis is established and increases along with disease progression according to the patient's needs¹⁴.

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Community Acquired Pneumonia; Chest X-Ray Findings in Three Different Times

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Abstract

Introduction: community acquired pneumonia is common health problem with concerns regarding chest-X-ray findings in different occasions during the disease course. The aim of this study is to compare chest-X-ray findings at presentation, 3 days and 6 weeks after presentation.

Methods: A prospective, observational study was conducted. The consecutive cases of single center were collected from January 2016 to January 2017. The diagnosis was made whenever there was new infiltrate in the CXR with compatible clinical features. All patients with nosocomial infection were excluded from the study. The included data were demographic characters, history, clinical examination, and CXR findings.

Results: The study included 60 patients, 44(73.3%) were male while 16(26.7%) were female. The age of the patients ranged from 19 to 87 years with a mean age of 57.81 years. Chronic obstructive pulmonary disease (COPD) is the most concomitant respiratory disease (11, 18.3%), followed by asthma (9, 15%), and pulmonary fibrosis (9, 15%), other 6 cases (10%) had history of bronchogenic carcinoma, while pulmonary tuberculosis (TB) was found in 3 cases (5%). Cough was the most common presenting symptom which was found in all the cases (60, 100%). Smoking did not correlated with the CXR findings significantly at presentation, 3 days and 6 weeks post complaint (P-value 0.189,0.185 , 0.265 respectively). The most common side of affection was right upper zone which was found in 20 (33.3%) cases. Severity of the CAP significantly related to the pattern of pulmonary involvement which was evident in the CXR (P-value 0.000).

Conclusion: community acquired pneumonia is usually diagnosed by compatible clinical presentation and radiological characteristics. Timing of CXR influences its role in both diagnosis and follow up.

Keywords: *Community acquired pneumonia, chest-X-ray, timing, cough.*

Introduction

Community acquired pneumonia (CAP) is described as the development of symptoms and signs of pneumonia (such as cough, fever of >38.5 C, and respiratory distress) in a patient with a previous healthful condition due to an infection with a microorganism which has been gained outside the hospitals¹. It is a common health problem and a frequent cause of hospitalization². Globally, its incidence ranges from 150 to 1500 cases in each 100 000 persons per year with an annual mortality rate of 0.02%². As far as its clinical presentation varies, the

diagnosis depends on the radiological findings despite of limitation in sensitivity and specificity. The Chest-X-ray (CXR) reveals new parenchymal infiltrate in different pulmonary locations with or without complications like cavitation, lung abscess, or plural effusion^{2,3}. The most common scoring system used to evaluate the severity of the condition is Confusion, Urea, Respiratory rate, Blood pressure, 65 (65-CURB)⁴. The list of the differential diagnosis is long, being atelectasis, underlying vascular and bronchial diseases³.

Due to the crucial relevance of CXR to the condition as a first line diagnostic image in CAP and its critical role as a predictor of the various complications and mortality, it is worthy to examine and interpret CXR findings in different times during the disease period². The aim of this study is to present and discuss the CXR findings

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of the cases with CAP in three different occasions (at presentation, day 3 and week 6).

Method

Study design and setting:

A prospective, observational study was conducted. The consecutive cases of single center were collected from January 2016 to January 2017.

Participant selection and data collection:

Those cases with clinical and radiological features consistent with CAP were included in the study. The diagnosis was concerned whenever there was new infiltrate in the CXR with compatible clinical features. The compatible clinical features were defined as fever (temperature more than 38 centigrade) or hypothermia (temperature less than 36 centigrade), dyspnea, pleuritic chest pain, cough, with or without sputum. Findings on clinical examination which were compatible the diagnosis were cyanosis, tachypnea (respiratory rate: more than 25 breaths/minute), use of accessory muscles of respiration, and added sound like wheeze and crackles. All patients with nosocomial infection were excluded from the study. The collection of the data were performed in the form of interview and form. The data included demographic characters, history, clinical examination, and CXR findings. The data used to support the findings of this study are included within the supplementary information file.

Data analysis:

The data were transferred from the forms into the Statistical Package for the Social Sciences (SPSS) after coding. Descriptive analysis (mean, range, standard deviation and percentage) were used to describe the sample. Chi square test was calculated to determine the relationship between categorical data, and paired T-test was analyzed to determine the relationship between the numerical data whenever necessary. Two-tailed fashion was used for all tests. The level of significance was set at 0.05.

Results

The study included 60 patients, 44(73.3%) were male while 16(26.7%) were female (male to female ratios 2.75: 1). The age of the patients ranged from 19 to 87 years with a mean age of 57.81 years and standard deviation of 20.04. Thirty-eight patients (63.3%) were living inside the cities and others (22, 36.7%) came from the rural areas. Regarding smoking history; 23 patients (38.3%) have never smoked, 9 patients (15%) were social smokers, 4 patients (6.7%) were passive smokers, others (24, 40%) were ex-smoker. Among the latter, 14 patients (58.3%) smoked more than 20 pack-years, and 10 patients (41.7%). Forty patients (66.7%) have never drunk alcohol, 12 (20%) were drinker, and 8 patients (13.3) were ex-drinker. Eleven patients (18.3%) had history of recent traveling. Chronic obstructive pulmonary disease (COPD) is the most concomitant respiratory disease (11, 18.3%), followed by asthma (9, 15%), and pulmonary fibrosis (9, 15%), other 6 cases (10%) had history of bronchogenic carcinoma, while pulmonary tuberculosis (TB) was found in 3 cases (5%). Cough was the most common presenting symptom which was found in all the cases (60, 100%), Table 1.

Table 1: Shows the frequency of the symptoms at the time of presentation.

Variables	Numbers (%)
Cough	60 (100%)
Sputum	58 (96.7)
Fever	53 (88.3)
Shortness of breath	29 (48.3)
Chest pain	22 (36.7)
Hemoptysis	13 (21.7)

The most frequent 65-CURB score was score 1, figure1.

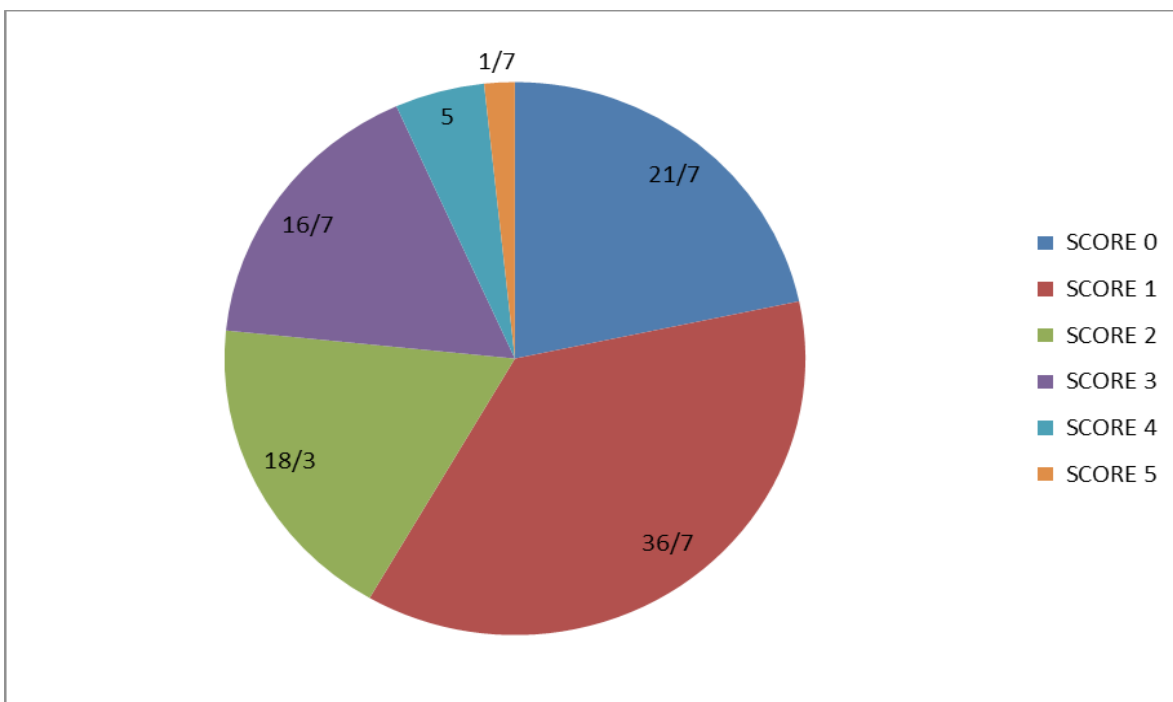


Figure 1: distribution of the patients according to the 65-CURB.

Smoking did not correlated with the CXR findings significantly at presentation, 3 days and 6 weeks post complaint (P-value 0.189,0.185 , 0.265 respectively).

The most common side of affection was right upper zone which was found in 20 (33.3%) cases, table 2.

Table 2: chest x-ray findings on presentation.

CXR on Presentation	Number (%)
Right upper zone	20(33.3)
Right middle zone	23(38.3)
Right lower zone	16(26.6)
Left upper zone	7(11.6)
Left middle zone	9(15)
Left lower zone	7(11.6)

Severity of the CAP significantly related to the pattern of pulmonary involvement which was evident in the CXR (P-value 0.000) table 3.

Table 3: severity of the CAP and CXR findings.

CXR on Presentation	65-CURB N(%)						P value
	0	1	2	3	4	5	
Right upper zone	3(5)	6(10)	2(3.34)	0(0)	0(0)	0(0)	0.000
Right middle zone	4(6.66)	4(6.66)	1(1.66)	1(1.66)	0(0)	0(0)	
Right lower zone	1(1.66)	4(6.66)	1(1.66)	1(1.66)	0(0)	0(0)	
Left upper zone	2(3.33)	2(3.33)	1(1.66)	1(1.66)	0(0)	0(0)	
Left middle zone	2(3.33)	2(3.33)	1(1.66)	0(0)	0(0)	0(0)	
Left lower zone	0(0)	2(3.33)	0(0)	0(0)	0(0)	0(0)	
Left (middle zone , lower zone)	0(0)	0(0)	0(0)	1(1.66)	0(0)	0(0)	
Left (upper zone , middle zone)	0(0)	0(0)	0(0)	1(1.66)	0(0)	0(0)	
Right (upper zone , middle zone)	0(0)	2(3.34)	2(3.33)	3(5)	1(1.66)	0(0)	
Right (middle zone , lower zone)	0(0)	0(0)	1(1.66)	1(1.66)	0(0)	0(0)	
Right lower zone , Left lower zone	0(0)	0(0)	2(3.33)	0(0)	1(1.66)	0(0)	
Right lower zone left(middle zone , lower zone)	0(0)	0(0)	0(0)	0(0)	1(1.66)	0(0)	
Right (middle zone , lower zone), Left lower zone	0(0)	0(0)	0(0)	1(1.67)	0(0)	0(0)	
Right (middle zone , lower zone), left middle zone	0(0)	0(0)	0(0)	0(0)	0(0)	1(1.66)	
right upper zone , middle zone, lower zone	1(1.66)	0(0)	0(0)	0(0)	0(0)	0(0)	

CXR was positive in all of the cases on presentation, at 3 day follow up, 35% showed complete resolution, 25% improved, 31.7% did not reveal any change, while 8.3% deteriorated. At 6 weeks, 55% showed complete resolution, 35% improved, 6.7% did not reveal any change, while 3.3% deteriorated. Resolution of the CXR was significantly related to the initial pattern of the chest involvement (P-value = 0.002), table 4.

Table 4: Relation of CXR findings at 3 days and 6 weeks with the initial pattern of chest involvement.

CXR on Presentation	Follow Up CRX at 3 days and 6 weeks				P value
	Improvement	Complete resolution	No changes	Deterioration	
	N 3 days/6 weeks				
Right upper zone	6/1	4/9	1/1	0/0	0.002
Right middle zone	1/1	8/9	1/0	0/0	
Right lower zone	2/3	2/3	2/1	1/0	
Left upper zone	2/2	3/4	1/0	0/0	
Left middle zone	1/0	3/4	1/1	0/0	
Left lower zone	0/1	1/1	1/0	0/0	
Left (middle zone , lower zone)	0/1	0/0	1/0	0/0	
Left (upper zone , middle zone)	1/1	0/0	0/0	0/0	
Right (upper zone , middle zone)	1/4	0/3	4/0	3/1	
Right (middle zone , lower zone)	0/2	0/0	1/0	1/0	
Right lower zone , Left lower zone	0/2	0/0	3/1	0/0	
Right lower zone left(middle zone , lower zone)	0/1	0/0	1/0	0/0	
Right (middle zone , lower zone), Left lower zone	1/1	0/0	0/0	0/0	
Right (middle zone , lower zone), left middle zone	0/0	0/0	1/0	0/1	
right upper zone , middle zone, lower zone	0/1	0/0	1/0	0/0	

Discussion

Community acquired pneumonia occurs more commonly in male patients. In the study of Bruns et al, 66% of their patients were male⁵. Monkada and colleagues reported 55.5% male predominance ². Even in pediatric population, the picture remains the same. In their prospective study, Michelow, and associates reported a male to female ratio of about 1.7: 1 in pediatric age group ⁶. In the current study, the ratio of male to female was 2.75:1. The high rate of male affection in CAP is not well understood. Smoking may play a role but this argument is challenged by the high incidence of CAP in pediatric population⁶.

Smoking has been recognized as a risk factor of CAP. A person with smoking history has at least two folds increased risk of CAP compared to the healthy population ⁷. Generally, there are three theories behind the increased risk of CAP in the smokers. First, structural and physiological changes induced by the tobacco.

Second, increasing bacterial virulence by the tobacco. Lastly, disturbance of the immune system by the tobacco ⁸. In this study, 35 cases (55%) were either current or ex-smoker. Although there is no comparison group, this may comply with the international standard.

Excessive use of alcohol is another well-known risk factor for development of CAP, it has a crucial impact on the complication and outcome, and it prolongs the hospital stay ¹⁰. In the present study, 20 patients (33.3%) were either current or ex-drinker. Patients with COPD have an increased risk for developing CAP by fourfold. This is independent of smoking history. The increased risk of CAP in cases of COPD is confirmed but the mechanism is not well understood ⁷. In the current study, the most common comorbid disease accompanying CAP was COPD being recognized in 11 patients (18.3%).

The symptoms of CAP include but not limited to cough, hypo or hyperthermia, sputum, lethargy, chest pain, shortness of breath, palpitation and in the severe

form, it may present with disturbed level of consciousness⁵. In the study of Monkada and associates, the most common presenting symptoms were cough (97.8%), shortness of breath (87.5%) and chest pain (63.5%)². In the present study, cough was the most common symptoms found in all the patients (100%). The second most common symptom was sputum (96.7%), followed by fever (88.3%) and shortness of breath (48.3%).

Chest-x-ray is a simple and handy diagnostic image. It is not only used to diagnose CAP but also to exclude other conditions which may present with similar signs and symptoms¹⁰. Timing of CXR is another crucial consideration by some authors^{5,11}. Claessene and associates revealed the low sensitivity and specificity of CXR in the early course of the disease development. They examined the diagnostic accuracy of early CXR in CAP against chest computed tomography scan (CT-scan). In their experiment, CXR illustrated a parenchymal infiltration in 188 patients (61%). The diagnosis initially was categorized as definite in 44.8% of the cases, possible or probable in 53.8%, and it was excluded in 4 patients (1.2%). CT-scan showed a parenchymal infiltration in 40 cases (33%) who were initially labeled as infiltration-free on CXR and it excluded CAP in 29.8% of the 188 patients with parenchymal infiltration revealed by CXR. CT-scan modified the categorization in 187 (58.6%), leading to exclusion of 28.8% and 50.8% definite cases of CAP¹¹.

In the study of Bruns and colleagues, clearance of CXR infiltrate in patients with CAP occurred in the 7th day in 25% of the cases, this ratio increased to the 50% in the fourth weeks of follow up. Findings like high respiratory rate, dullness to percussion, high C-reactive protein (CRP) level, and multilobar disease were shown to be independent predictors for CXR findings in the 7th day of follow up, while only a high CRP level at the presentation was found to be a predictor for delayed clearance of CXR abnormalities in the 28th day¹¹. In the current study, CXR was positive in all of the cases on presentation, at 3 day follow up, 35% showed complete resolution, 25% improved, 31.7% did not reveal any change, while 8.3% deteriorated. At 6 weeks, 55% showed complete resolution, 35% improved, 6.7% did not reveal any change, while 3.3% deteriorated. In both timelines, early pattern of chest involvement on CXR was the predictor of deterioration (the more severe early involvement, the higher chance to deteriorate).

Monkada and his colleagues denied that the CXR findings would expect the severity of the disease and predict and outcome². The result of this study revealed the reverse of this conclusion. Chest-X-ray findings on presentation significantly related to the severity of the score (65-CURB) and consequently, the outcome of the disease.

There are few limitations for CXR in the diagnosis of CAP. First of all, it is almost normal in the early stage of the disease. From this perspective, some authors recommend early chest CT-scan to diagnose and predict the outcome¹¹. Secondly, it necessitates a radiation exposure¹⁰. Thirdly, sensitivity and specificity depend on the quality of the images and experience of the inspectors (interobserver and intraobserver disagreement). Fourthly, there is no correlation between the CXR findings and the etiology of the infection. It does not differentiate viral from bacterial infection³.

In conclusion, CAP is usually diagnosed by compatible clinical presentation and radiological characteristics. Timing of CXR influences its role in both diagnosis and follow up.

Conflict of Interest: Not

Ethical Clearance: The study was approved by the Ethics Committee of the College of Medicine, University of Sulaimani, Kurdistan Region, Iraq.

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Variation of Alkalinephosphatase and Transaminases Levels in Different Trimesters of Pregnancy Iraqi Women

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Abstract

The level of enzymes Alkaline phosphatase (ALP) and transaminase (AST & ALT) were measured in 99 Iraqi pregnant women from different areas in Baghdad city and compared with a control group comprising non-pregnant women (29 women). Those pregnant women were classified into three groups according to the semester of pregnancy. (Group I to III). New inclusion and exclusion criteria were applied in this study to increase the specificity. The result revealed a significant increase in the corresponding enzymes ($p < 0.001$) for each trimester of pregnancy when compared with the control group (non pregnant women). There were no significant changes in enzymes activity between group I (first trimester) and group II (second trimester). The significant changes in ALP were observed between group I (first trimester) and group III (third trimester) $p < 0.001$. The same trend was observed between group II (second trimester) and group III (third trimester). The result also revealed insignificant changes in AST/ALT ratio among all the groups including control group ($p > 0.05$).

Conclusion: This study indicates the importance of the establishment of new reference values for the above mentioned enzyme during pregnancy and unsuitability of ALP in liver function test during pregnancy.

Key words: Alkalinephosphatase, transaminases levels, different trimesters, pregnancy Iraqi women.

Introduction

Pregnancy defined as a physiological state which occurs physical change in the reproductive age of a woman. From the time of the reproductive system of a woman changes through the three trimesters of pregnancy. The reproductive system and other systems of the body represented by the renal, endocrine, nervous, cardiovascular, respiratory, gastrointestinal system and hepatobiliary system are also affected. The levels of estrogens (estradiol) and progesterone increase cumulatively during pregnancy^[1]. These sex hormones have effects on hepatic metabolic, synthetic, and excretory functions^[2]. The biliary excretion of bromo sulfo phthalein decreases during late pregnancy and the clearance of some compounds that are secreted into bile may therefore be impaired⁶. The liver has a central and critical biochemical role in the metabolism, digestion, detoxification and elimination of substances from the body^[3].

Liver functions are determined by measuring the concentration of substances produced by hepatocytes or

by estimating the serum content of substances released from these cells as a result of damage and determine the capability of liver to perform metabolic functions like detoxification, conjugation^[4]. Serum aminotransferase assays are the most common laboratory tests for detection of liver diseases and these include aspartate aminotransferase (AST, E.C.2.6.1.1), and alanine aminotransferase (ALT, E.C.2.6.1.2). They are excellent markers of hepatocellular injury^[5]. AST is found primarily in the heart, liver, skeletal muscles, kidney, brain, pancreas, lungs, leucocytes and red blood cell while ALT is found primarily in the liver, kidney, with lesser amount in the heart and skeletal muscles. ALT is thought to be more specific for hepatic injury because it is present mainly in the cytosol of the liver cells and in low concentration elsewhere¹⁵ while AST is both cytosolic (20% of total activity) and mitochondrial (80% of total activity), it is less sensitive and specific for the liver reference^[6]. The pregnant woman's physiological changes to support fetal growth and development. During pregnancy, the serum estrogen and progesterone levels increase progressively and reach a maximum

during the third trimester. These sex steroids have effects on metabolic, synthetic, and excretory hepatic functions^[7]. The increase in plasma volume that occurs during pregnancy leads to haemodilution and decreases the serum protein concentrations. Serum alkaline phosphatase levels increase in late pregnancy because of both a production of the placental isoenzyme and an increase in the bone isoenzymes. It is therefore not surprising that changes in liver function tests (LFTs) occur during pregnancy^[8].

Alkaline phosphatase ALP (E.C.3.1.3.1) is present in practically all tissues of the body, especially at or in cell membranes and it occurs in particularly high levels in intestinal epithelium, kidney tubules, bones (osteoblasts), liver and placenta^[9]. It catalyzes the hydrolysis of phosphate esters in alkaline environment generating an organic radical and inorganic phosphate^[10]. Hepatobiliary disease and bone disease associated with increased osteoblastic activity are linked to increased serum alkaline phosphatase.

The ratio of AST to ALT is of use in Wilson disease, CLD and alcoholic liver disease and a ratio of more than 2 is usually observed. The lack of ALT rise is probably due to pyridoxine deficiency. In NASH the ratio is less than one in the absence of fibrosis on liver biopsy^[11]. In viral hepatitis the ratio is usually less than one. The ratio invariably rises to more than one as cirrhosis develops possibly because of reduced plasma clearance of AST secondary to impaired function of sinusoidal cells^[12]. ALT exceeds AST in toxic hepatitis, viral hepatitis, chronic active hepatitis and cholestatic hepatitis.

Many previous studies dealing with liver function test in different trimesters of pregnancy were carried out. Most of these studies lack specificity because there were no clear exclusion and inclusion criteria involvement. Also the relationship between alkaline phosphatase and transaminase enzymes were elucidated in order to draw some conclusions for the lab. Investigation of those parameters in different trimesters of pregnancy. In this study new introduced **inclusion criteria** :

- 1- 1-All antenatal cases between 18 to 40 years of age.
- 2- spontaneous conception.
- 3- 3-singleton pregnancy.
- 4- No history of hypertension, diabetes or liver

disease.

Also all pregnant women with the following criteria were excluded from our study:

- 1- Known liver disease .
- 2- Hypertensive patients.
- 3- Assisted conception.
- 4- Multiple pregnancy.

Method

Study Design and Subjects

This study was a hospital based cross sectional in vitro study collected specimens at private Hospital, Alkadra'a hospital over a period of seven months (between November 2017 to June 2018). A cross sectional study consists of 102 pregnant women and 31 matched control (age matched non pregnant women).

Among the 102 pregnant women, 32 were in first trimester (within 1-3 month), 34 were in second trimester (within 4-6 month) and 36 were in third trimester (within 7-9 month). Subjects were recruited according to simple random sampling method meeting the selection criteria.

A written consent were taken from the pregnant women and control group before recruiting them in this study.

Blood Sample Collection

A volume of 3 ml of venous blood was drawn from each volunteer using a disposable vacutainer system in Plain and separator serum (SST) tubes vacutainer. Serum or plasma separated within half an hour and stored at -20 C temperature till analysis was carried out.

Analysis of Specimens

Serum alanine transaminase (ALT) activity was measured by modified IFCC UV enzymatic kinetic method. Serum aspartate transaminase (AST) activity was measured by modified IFCC UV enzymatic kinetic method. Serum alkaline phosphatase (ALP) activity was measured by DGKC colorimetric Kinetic method. AST/ALT ratio was also calculated. All biochemical analysis was carried out on spectrophotometer UV/VIS clinical chemistry analyser using kits (LINEAR CHEMICALS)

Results and Discussion

Table (1) : Serum AST,ALT,ALP enzymes in nonpregnant and pregnant women (first, second and third trimester)

All data are expressed as mean ± SD. p value < 0.001 considered as statistically significant .

variables	Controls(non pregnant women) N=29 (mean+ SD)	Cases pregnant women		
		1st trimester N=31 (mean+ SD)	2nd trimester N=33 (mean+ SD)	3rd trimester N=35 (mean+ SD)
AST(U/L) Limited range	15.1 + 5.6 (13.02+17.2)	22.1+ 6.7 (19.6-24.6)	21.3 + 6.8 (18.9-23.8)	20.4 + 5.7 (18.5-22.4)
ALT(U/L)	13.8 + 3.9 (12.3-15.4)	19.7+ 6.2 (17.5-22.05)	20.4 + 7.8 (17.6-23.1)	20.8 + 7.3 (18.3-23.4)
ALP(U/L)	76.01 + 14.9 (70.3-81.7)	100.8+ 47.6 (83.3-118.2)	108.9+32.0 (97.6-120.3)	152.5 + 45.1 (137-168)
AST/ALT	1.3 ± 0.5	1.2 ± 0.7	1.3 ± 0.6	1.2 ± 0.5

Table(2) The probability according to Kruskal-Wallis test for AST, ALT , APL AST/ALT among the studied groups

Probability				
Groups	AST	ALT	ALP	AST/ALT
Total patients group vs. controls	P < 0.001	P < 0.001	P < 0.001	P > 0.05
Group1 vs. group2	NS	NS	NS	P > 0.05
Group1 vs. group3	NS	NS	P < 0.001	P > 0.05
Group1 vs. controls	P < 0.001	P < 0.001	P < 0.001	P > 0.05
Group2 vs. group3	NS	NS	P < 0.001	P > 0.05
Group2 vs. controls	P < 0.001	P < 0.001	P < 0.001	P > 0.05
Group3 vs. controls	P < 0.001	P < 0.001	P < 0.001	P > 0.05

NS: Non-significant at the level ≥ 0.05

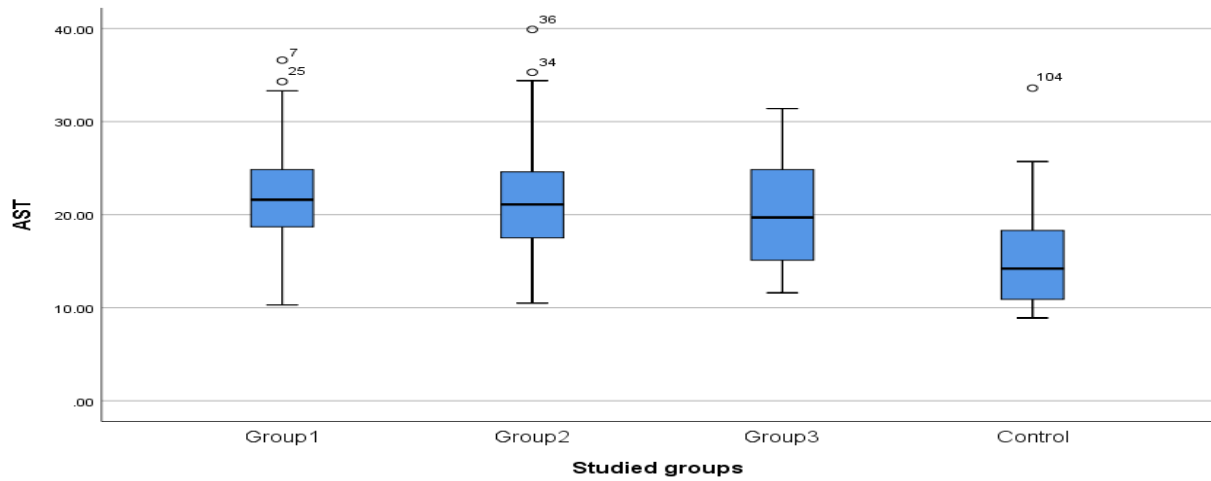


Figure (1): AST level in patients subgroups compared to controls

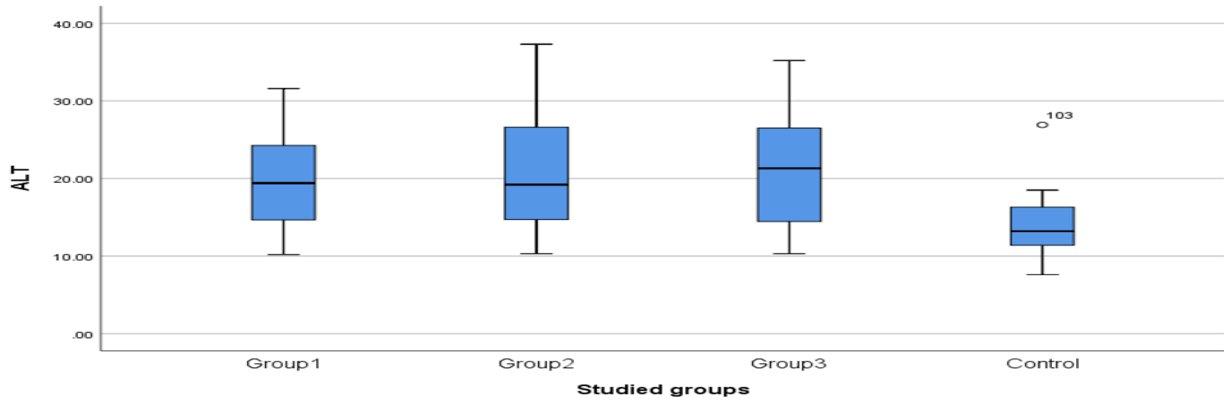


Figure (2): ALT level in patients subgroups compared to controls

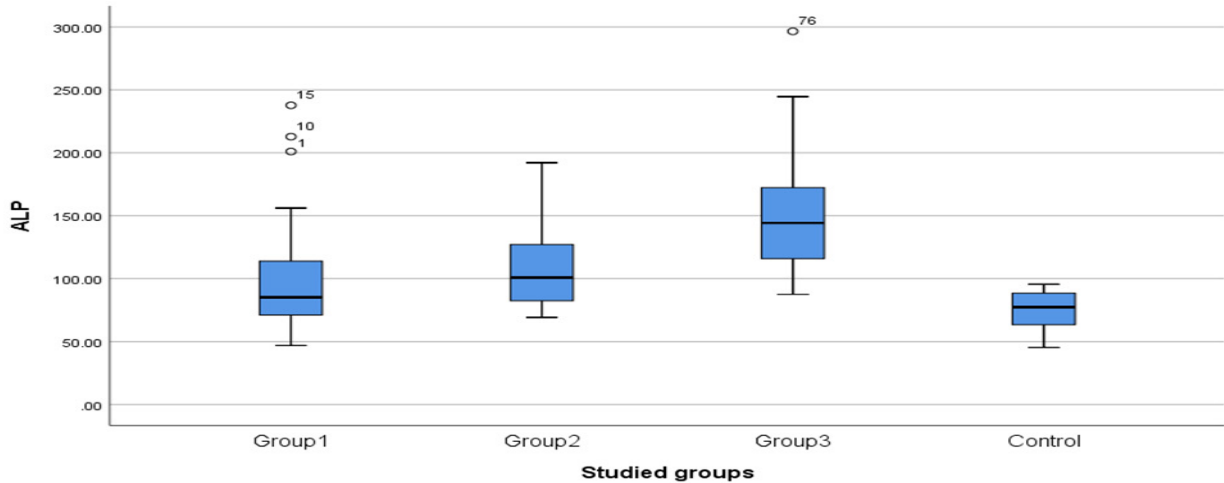


Figure (3): ALP level in patients subgroups compared to controls

The result shown in table(1)(2) revealed a significant increase in the serum levels of AST, ALT and in the successive these trimesters of pregnancy in comparison to the control group. This result agree with Mdhurima Bora,etal in case of ALT, there is gradual increase in 1st , 2nd and 3rd trimester when compared with control non

pregnant group. $P < 0.001$. This supports few studies, a slight increase in ALT and or AST has been found in third trimester [13,14,15]. This may be attributed to hormonal factors that may lead to changes in such enzyme. It is well known that sex steroids have diverse effects on metabolic synthetic and excretory hepatic function.

Some previous studies didn't indicated the differences in the level of those enzymes during pregnancy. such changes in our result to can be attributed to the inclusion and exclusion criteria outlined in our study.

The results also showed a significant increase in ALP level with the progress of pregnancy. This change in the level of the corresponding enzyme can be attributed to the increase rather than elevation of hepatic isoenzyme. In addition to that, there is an increased production of bone isoenzyme with gestational age as a result of fetal bone development .such diversity of the source of serum ALP shows that it is not a reliable or suitable test for liver disease especially during the pregnancy. This results agree with Mdhurima Bora, Arpana Hazarika etal ALP values of the experimental group (all three trimesters). In case of 1st trimester it is significant ($P < 0.05$) and in case of 2nd and 3rd trimester the increase in ALP values become highly significant, $P < 0.001$. This increase during pregnancy is not due to an increase in the hepatic isoenzyme but rather largely due to the production of the placental isoenzyme^[16,17]. During the third trimester there is also an increase in the production of the bone isoenzyme as documented by an increase in its serum level up to six weeks post-delivery.

The revealed that AST/ALT ratio is statistically insignificant. This can be attributed to the fact that there is a concomitant changes in the level of both these two enzymes and This will tend to keep the numerical value of the ratio AST/ALT nearly similar to its value in the control group.

Finally establishment of reference values for aminotransferases is quiet essential for the diagnosis of liver disease and other diseases associated with the changes in the level of these enzymes . in addition to that ,ALP is not suitable for diagnostic purposes in pregnancy and this may be substituted by other diagnostic tools.

Conflict of interest : Nil

Source of funding: Self –funded

Ethical Clearance: Ethical approval for this study was obtained from the scientific committee of university of Al-Farahidi /college of pharmacy before any measurements were carried out. Written informed consents were obtained from the pregnancy Iraqi women.

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Based Assistance Continuum of Care Can Increase Family Independence in Overcoming Health Problems Pregnant-Women

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Abstract

Pregnancy is a natural process during pregnancy does not rule out the possibility of problems or complications that can interfere with health. This study is the development of a minimum standard of visits for pregnant-women and the care provider acts as a ball-picker, with the aim of empowering the family to be independent in recognizing pregnancy complications, overcoming minor complaints, meeting nutritional needs, carrying out pregnancy checks and taking blood tablets. Visits are carried out continuously 15 times during pregnancy and communicating until the mother gives birth. This study used experimental design with control. The research subjects were 120 people taken by simple random sampling. Data were collected using observation sheets, then analyzed using the logarithmic-formula (Log^{10}). The results showed an increase in the level of family independence in recognizing complications during pregnancy, family independence in overcoming mild complaints in pregnancy, independence in fulfilling the nutritional needs of pregnant-women, family independence in carrying out pregnancy examinations, independence the family in giving tablets added blood. The average independence change is 37.4%, based assistance continuum of care that is done by conducting intensive visits and more often can increase family independence in overcoming health problems of pregnant-women, able to reduce self care deficits, improve family capacity in meeting demands self care and families are able provide care for pregnant-women independently.

Keywords: *Mentoring, Continuum of Care, Family Independence*

Introduction

Family approach is a community health centers service that combines individual health efforts and continuous first-level public health efforts based on data and information from family health profiles that focus on promotive and preventive efforts. Based on the Regulation of MoH-RI, four priority areas or targets are established: 1-reduction in maternal and infant mortality (MMR and IMR), 2-decreasing prevalence of stunting, 3-prevention of infectious diseases, 4) prevention of non-communicable diseases.¹

MMR and IMR is still a top priority. East Java until 2015 was ranked third with the highest MMR reaching 89.6/100,000 live-births.² Batu is city with the population

of men is 49.33% and 50.67% of women, the general structure of the population tends to refer to the younger age group, the number of fertile couples 4710 and the number of pregnant-women in one year ranges from 1,300 and is expected to increase 1 percent annually, the total coverage of pregnant-women (K4)=95% (target=100%).³

The high maternal mortality rate is made possible by the direct causes of preeclampsia, bleeding, inadequate quality of maternal services, unhealthy conditions of pregnant-women and the determinant factor of 3-Too late in decision making, to health facilities and for help.

The strategy to reduce MMR in the National Medium-Term Health Development Plan 2015-2019 is carried out through the Healthy Paradigm where preventive promotive programs are the main pillar of health by implementing a family-based approach continuum of care since pregnancy. A based approach

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continuum of care is needed, given that during pregnancy 15% of complications cannot be predicted. With a-based approach continuum of care during pregnancy, it will be able to care for pregnant-women, not only in physical condition but also in social-mental conditions but also to care for the social health of pregnant-women. Based mentoring Continuum of care is a strategy developed by The Lancet Neonatal Survival Series. The effect of continuity of care by midwives in pregnant-women was 63.0% more likely to experience spontaneous vaginal birth and 23.1% less experienced episiotomy.⁴

This study aims to develop a minimum standard care program for pregnant-women by providing based mentoring continuum of care, emphasizing strengthening preventive, wellness, providing coaching functions, assisting families in solving problems, with the final results of seeing family independence in 1-recognize pregnancy danger signs, 2-deal with minor complaints during pregnancy, 3-fulfill the nutritional needs of pregnant-women, 4-carry out antenatal care, 5-consume blood-added tablets.

Methods

This research was an experimental study with control, namely providing assistance to pregnant-women on an ongoing basis using development assistance modules from maternal and child health books, with population of 120 pregnant-women (60=treatment-groups and 60=control-groups), selected by simple

random sampling.

Data were collected by socializing about mentoring first, then implementing mentoring with stages: 1-implementing mentoring by families, 2-researchers and numerators acting as facilitators and making 15 visits to pregnant-women, 3-the companion conduct a study of the characteristics of pregnant-women and pregnancy, 4-observations on the first and second weeks will be observed in 5 aspects of independence, 5-mentoring starts from the third week to the week before delivery, 6-the facilitator will record the results of the mentoring activities and conduct an evaluation of the mentoring results, 7-the researchers actively communicate, and once a month meet for discussion on mentoring, 8-at the end of the week will be observed conservation of the level of family independence.

The stage of data analysis were: calculating the difference between the average value after being reduced before; do equality by taking the logarithmic value calculated using excel with the formula \log^{10} , then multiplied by 100%, the final multiplication value was used to evaluate effectiveness.

Findings and Discussion

The results and discussion be elaborated on the data obtained.

Table 1. Condition of Mothers During Mentoring

	Intervention			Control	
	Parameter	Amount	Percentage	Amount	Percentage
Increase Body Weight	50-55 kg	32	53.3	23	38.3
	56-60 kg	23	38.3	32	53.3
	61-65 kg	5	8.4	5	8.4
Body-Index	≥20	1	1.7	1	1.7
	21-25	53	88.3	6	10
	26-30	6	10	53	88.3
Systole-Pressure	110	36	60.0	34	56.7
	120	22	36.7	22	36.7
	130	1	1.7	2	3.3
	140	1	1.7	2	3.3
Diastole-Pressure	70	21	35.0	22	36.7
	80	38	63.3	35	58.3
	90	1	1.7	3	5.0

Cont... Table 1. Condition of Mothers During Mentoring

	Intervention			Control	
	Parameter	Amount	Percentage	Amount	Percentage
Complaints most	Nausea, vomiting	1	1.7	3	6.6
	Headache	20	33.3	23	38.3
	Pain Waist	19	31.7	21	35
	Whitish	6	10	7	11.7
	Leg Cramps	8	13.3	3	6.6
	Hard Peeing Big	6	10	3	6.6
High Fundus uteri	accordance gestation	60	100	58	96.7
	Not suitable gestational age	0	0	2	3.3
Fetal Heart Rate	<120 x/mnt	0	0	0	0
	120-140 x/min	60	100	60	100
	>140 x/mnt	0	0	0	0

Table 2. Differences independence of Family to Address Health Issues Pregnancy Before the intervention

	Intervention					Control				
	Mean	SD	Diff	Log10	100%	Mean	SD	Diff	Log10	100%
Recognizing & overcoming complications	1.74	1.24	0.49	0.24	24	1.61	1.09	0.52	0.21	21
Overcoming minor complaints	3.24	1.74	1.49	0.51	51	3.07	1.49	1.58	0.49	49
Meeting nutritional needs Prenatal	1.74	1.24	0.49	0.24	24	1.54	0.89	0.65	0.187	18.71
Examination	4.24	2.32	1.91	0.63	63	3.94	2.18	1.76	0.59	50
Add blood tablet consumption	1.62	1.35	0.28	0.21	21	1.59	1.3	0.29	0.2	20

Table 3. Differences independence of Family to Address Health Issues Pregnancy After the intervention

	Intervention					Control				
	Mean	sd	Diff	Log10	100%	Mean	SD	Diff	Log10	100%
Recognizing & overcoming complications	4.9	0.44	4.46	0.69	69	2.07	1.39	0.68	0.32	32
Overcoming minor complaints	7.5	1.2	6.3	0.87	87	4.3	2.3	1.9	0.6	60
Meeting nutritional needs	4.87	0.5	4.36	0.69	69	2.74	1.67	1.07	0.44	44
Pregnancy checks	7	0	7	0.85	85	5.9	1.88	4.02	0.77	77
Add blood tablet consumption	3.8	0.6	3.2	0.6	60	3.2	1.3	1.9	0.5	50

Table 4. Differences in Changes in the Level of Independence Before and After Assistance in Intervention and Control Groups

	Interventions			Control		
	Before	After	Diff	Before	After	Diff
Recognizing & overcoming complications	24	69	45	21	32	11
Addressing minor complaints	51	87	36	49	60	11
Meeting nutritional needs	24	69	45	18.7	44	25.3
Pregnancy checks	63	85	22	50	77	27
Consumption of added blood tablets	21	60	39	20	50	30
Average			37.4			20.86

Discussion

Family Independence in Recognizing Pregnancy Complications

At the beginning of the measurement provided an opportunity for family non-independence in recognizing pregnancy complications. The family does not recognize when a pregnant woman experiences severe headaches, suddenly bleeds from birth-canal, excessive nausea-vomiting, swollen-hands and face and blurred-vision are complications of pregnancy but it is normal for pregnancy to be given after assistance sustainably the family is more independent in recognizing the complications that might occur during pregnancy. Families know and recognize signs-symptoms such as severe-headaches, sudden-bleeding from the birth-canal, excessive nausea-vomiting, swollen-hands and face and blurred-vision, which are complications in pregnancy.

During the mentoring, there were four pregnant-women who had to be referred to health facilities because 2 people had increased blood-pressure on the second and third visits, 2 people were due to obesity and high-risk pregnancies with Poedji-Rochyati score of 10-18. Escort until the mother gives birth at 2 people’s health facilities in the hospital, 2 people at the health center, with a healthy mother and fetus.

The independence of the family in recognizing complications between those who were given continuous assistance using the mentoring module had a different effect from the control that used maternal and child health books. The level of independence of the assisted families is higher than the control. During mentoring, the companion acts as a driver, motivator and educator. Direct involvement of the family as a companion plays a role in facilitating the family to quickly recognize the complications.

Family Independence in Overcoming Mild Complaints during Pregnancy

Family independence in overcoming mild complaints during pregnancy shows different results before and after mentoring. Before being given assistance, both the mentoring and control group had the largest percentage in the independent category. Families do nothing if pregnant-women experience nausea vomiting, complain of vaginal discharge and itching on the birth canal, complain of low back pain, cramps in the legs during sleep at night, and difficulty defecating.

During and after mentoring, families are more independent in dealing with minor complaints that occur during pregnancy, namely nausea, mild-headaches, leg-cramps, difficulty defecating and low-back pain.

When the mother experiences nausea-vomiting, the family gives the mother a warm sweet-drink like sweet-tea and prepares and helps give the biscuits before the mother gets up in the morning. The family does not recommend that pregnant-women not use high-heels sandals or shoes, deliver and accompany mothers to take part in pregnancy exercises to avoid low-back pain. When pregnant-women experience cramps in the legs, the family helps the mother to sit and stand. The family immediately takes the mother to the midwife if the mother experiences leucorrhoea or complaints getting heavier.

Family Independence in Fulfilling Nutrition Needs during Pregnancy

The results showed a change in the level of family independence in meeting nutritional needs during pregnancy. Before being given assistance to both the assisted and control group, the family did not know the food that should be given during pregnancy. The food given and eaten by pregnant-women is the same as other family meals, there is no difference in either portion or frequency. If pregnant-women experience nausea-vomiting, the mother has difficulty defecating the family as a normal thing for pregnant-women, so they have not tried to overcome it through food.

After being given assistance, families are more independent in meeting nutrition during pregnancy. Families in fulfilling nutritional needs prioritize foods that contain protein such as fish, eggs, chicken liver and follow recommendations as stated in the mentoring module that is to meet the nutritional needs of quality pregnant-women fulfilling the elements of nutrition, carbohydrates, proteins, fats, vitamins and minerals. The food consumed during companion for carbohydrates is rice and bread. Proteins: tempeh, tofu, eggs, sea fish, fresh fish, chicken and beef; Fat: from cooking oil, Vitamins: spinach, lettuce, mustard greens, broccoli, carrots, kale, pumpkins and fruits. Mothers also drink an average of 6-7 glasses a day.

Family Independence in Conducting Pregnancy Examinations

Family independence in conducting prenatal-care before and after mentoring in both the mentoring and control group showed the same results. Before family assistance has shown independence in carrying out pregnancy checks, the family knows and understands well when knowing signs of pregnancy immediately

brings the mother to the midwife or community health care. During pregnancy, the family brings pregnant-women to check their pregnancy 9 times, which is 1 time at gestational age 1-3 months, 3 times at gestational age 4-6 months and 5 times at gestational age 7-9 months. The family also immediately checks the pregnancy if there are minor complaints that cannot be overcome by themselves and the signs of childbirth.

Family Independence in Consuming Tablets Adding Blood During Pregnancy

Before being given assistance to the independence of the poor family in helping mothers consume tablets plus blood, this was due to a mother's complaint that after taking tablet medicine the blood of the mother felt nauseous and had difficulty defecating.

During the mentoring, the family as a companion assisted by the accompanying coordinator was educated about the importance of consuming blood-added tablets for pregnant-women contributing to family independence in helping to consume tablets with more blood. The results of observations during mentoring, every day pregnant-women routinely take tablets plus blood one tablet before going to bed using warm-water, this is done to avoid possible side effects that arise, namely headache, nausea and difficulty defecating.

The Effectiveness Assistance on of Continuum of Care Family Independence in overcoming the health problems of pregnant-women

It was found that-based mentoring continuum of care had high effectiveness on family independence in overcoming health problems of pregnant-women. Families given assistance have high independence in overcoming health problems. As long as independent family assistance in recognizing complications, the family is able to overcome minor complaints that occur during pregnancy, the family can independently fulfill the nutritional needs, carry out antenatal-care and independently consume blood-added tablets. Families are able to make decisions when they know that an increase in blood-pressure and an increase in body-weight exceed the normal limit by immediately bringing the mother to the nearest health facility, the community health center.

As long as the health assistance of pregnant-women is well monitored, pregnant-women do not experience health problems resulting in pain, 98% of maternal

blood pressure within the normal range, 98% of maternal nutritional status with a BMI between 23-24, high fundus uterine according to gestational age, 98% of fetal heart-rate within normal limits.

The assistance continuum of care is carried out functions in guiding, sustaining, protecting, supporting and empowering functions, namely functioning to guide the assisted family in the decision-making process, enabling and strengthening the assisted family and coping fully or independently when problems occur health for pregnant-women based assistance Continuum of care carried out in this study is mentoring that refers to quality care by using the principle of family-empowerment that is guided and tracks pregnant-women from time to time during the mentoring period, and optimizes family independence in overcoming health problems for pregnant-women.¹ Family empowerment functions as a link between maternal and child care, and the development of a health system approach to strengthening maternal and child health services.⁵ Based mentoring Continuum of care with reference to the quality of care from the results of research effectively increases family involvement as human resources is the potential to empower themselves in achieving independence to solve and overcome health problems for pregnant-women, so as to reduce the incidence of morbidity in pregnant-women, this is appropriate Van den Broek, NR and Graham WJ's opinion that quality care must be at the core of all strategies to accelerate reducing maternal and child mortality.⁶

Mentoring with a-based approach continuum of care during pregnancy, effectively increases family independence in caring for pregnant-women, not only in physical condition but also in social, mental conditions but also caring for the social health of pregnant-women. With based assistance continuum of care, maternal health problems can be overcome, mothers give birth normally, mothers are healthy, babies are also healthy. This is also reinforced by the results of previous studies from McLachlan, HL, Forster, DA and friends, that ongoing care provided by midwives during pregnancy to low-risk women can reduce the rate of Caesarean section.⁴ Case management using continuous care or continuum of care for pregnant-women diagnosed with HIV shows lower results for transmission to infants.⁶

Conclusions

1. Based mentoring continuum of care effectively

increases family independence in recognizing pregnancy complications by 45%.

2. Assistance continuum of care effectively increases family independence in overcoming mild complaints during pregnancy by 36%.

3. The continuum of care is effective in increasing family independence in meeting nutritional needs during pregnancy by 45%.

4. The continuum of care is effective in increasing family independence in carrying out a 22% pregnancy checkup.

5. Mentoring continuum of care effectively increases family independence in giving blood tablets to pregnant-women 39%.

6. Family assistance is Continuum of care effective in increasing family independence in overcoming health problems for pregnant-women.

Source of Funding- author

Conflict of Interest- No

Ethical Clearance- Yes

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Overweight and Obesity Associated Factors among High School Students: A Cross Sectional Study in Erbil

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Abstract

Introduction: The overweight of youth and teens is one of the fundamental issues in the world that seems to be lifestyle and inactivity of the causes of overweight. The purpose of this study was to investigate the causes of obesity / overweight in high school students.

Methods: In this cross-sectional study, 1,000 students in the age range 16-18 years of Erbil, Iraq in 2016-2017 were randomly selected. Data were collected via questionnaire. Data were examined using SPSS 22 for windows and analyzed by appropriate statistical tests.

Results: surveys demonstrated that 30% of youth aged 16 to 18 were overweight or obese. About 30 percent met physical activity guidelines; however, physical activity was not associated with overweight or obesity in this sample. Computer games, watching TV (0.007) and irregular sleep (P-value=0.019) were among other known factors/ affecting obesity/overweight in this study.

Conclusions: According to findings, we concluded that a trend toward being overweight/ obese in youth and there are many factors involved, such as irregular sleep and lack of mobility in overweight.

Key words: *Overweight , obesity , high school students*

Introduction

Overweight and obesity are the fifth leading risk for global deaths Worldwide, about 2.8 million deaths and 35.8 million (2.3%) of global Disability Adjusted Life Years (DALYs) are caused by overweight or obesity¹. According to one US national study, the high prevalence of overweight and obesity during childhood and adolescence has been confirmed in recent decades and currently one child in ten is overweight or obese.² It is stated in one of the studies about 11% of US children and adolescents are classified as overweight (body mass index [BMI] > 95th percentile), and an additional 14% of children and adolescents have a BMI between the 85th and 95th percentiles of the reference population

that places them at risk for becoming overweight^{3,4}. It should be noted that 44% of the diabetes burden, 23% of the ischemic heart disease burden and between 7% and 41% of certain cancer burdens are attributable to overweight and obesity^{5,6}. Data from the third National Health and Nutrition Examination Survey (NHANES III) presented Rapid outbreaks overweight in adolescents⁷. The prevalence of overweight in Iraq is experiencing a shift from underweight to overweight along with rapid socioeconomic and nutritional transition particularly in their area population. Inactivity and obesity are the leading cause of non-communicable diseases. The World Health Organization (WHO) has announced that at least 60 minutes of physical activity are necessary for all children aged 5 to 17 years⁸.

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Given the increasing prevalence of overweight in Iraq and the importance of prevention and control of associated factors, we decided to assess the overweight in high school students and its relationship with lifestyle for the first time in Erbil.

Materials and Method

This cross-sectional study, conducted from the 20th of September 2016 to the 10th of March 2017 where students of grade 10, 11 and 12 of public schools (between 16-18 years of age) across Erbil city of Kurdistan region of Iraq were taken as the primary sampling unit.

The sample was collected by multistage cluster sampling technique. Schools are divided into 6 groups according to the municipalities of Erbil city, to cover all quarters of the city. Schools were randomly selected according to the number of students in each region. The total number of selected schools was 32 distributed in the 6 municipalities. Of the 36,777 students in these schools, 1,000 students were randomly selected. From each school a single class was selected randomly; For Data collection from each class was attended by the counseling specialist of the school.

Questionnaire Design:

A questionnaire that was designed by the CDC (Centers for Disease Control and Prevention) was modified and used as data collection⁹. The questionnaire had three parts including demographic information, habits and life style of the students and socio-economic status (SES) that was calculated taking into consideration age, education and occupation of the father, car ownership and house ownership, according to the formula designed by Omer and AL-Hadithi¹⁰ and They were asked to choose between low SES, middle SES, and high SES which is one of the best types of descriptions. For better understanding; the questionnaires were adapted to each school's language of instruction (local Kurdish and also to Arabic language).

After collecting the questionnaires, Data were examined using statistical package for social sciences (SPSS) version 22 (SPSS Inc. Chicago, IL) for windows. Data were analyzed through the use of simple descriptive statistical data analysis approach and inferential data analysis approach. Chi-square test of association was used to assess the association between the prevalence and several risk factors and Fisher's exact test was used instead of the Chi square test when the expected count of more than 20% of the cells of the table was less than 5. P value of ≤ 0.05 was considered as statistically significant.

Ethical Consideration: This research study followed the tenets of the Declaration of Helsinki and written informed consent was obtained from all patients.

All students were assured that their participation in the study was voluntary; they were informed about the purpose of the study; their anonymity and confidentiality were assured. Also an official permission from Erbil General Directorate of Education and from schools' administrations to collect data was obtained.

Results

Total 1000 high school students were analyzed. Among them were 572 women and 428 men with an average age of 16.94 ± 0.79 .

According to Table 1, the prevalence of overweight and obesity in the whole sample was 30% that was significantly higher in men than in women ($p=0.001$). Youth who reported a low socio-economic status were Overweight and obesity higher than those from households with high socio-economic status but this difference was not significant ($p=0.595$). There is no relationship between obesity/overweight with different municipalities ($p=0.418$) and living with parents ($p = 0.836$). Obese caregivers, compared to desirable weight parents, were more likely to have overweight or obese children. The relationship between diabetes and overweight of parents with overweight in youth was also determined that only maternal diabetes was significant in this regard (0.040).

Table 2 shows the effect of dietary habits on overweight and obesity. These results indicate that the rate of eating, Time to eat, and type of food is effective in overweight and obesity. For example, eating food before bed and also eating rice more than once a day is significantly associated with overweight and obesity.

Table 3 examines the degree of sleep and mobility, these results show, Although inactivity is one of the main causes of overweight and obesity, and there is a meaningful relationship, but there is not related to the type of activity. Significant association was detected between the prevalence of Overweight and obesity with regular sleeping as presented which shows also that the prevalence among those who take a nap was significantly higher than the prevalence among those who don't take a nap ($p < 0.001$).

Table1. Youth demographic information and family/parental characteristics with youth overweight and obesity status

Variables	N	Prevalence of overweight & obesity		P_value
		No.	%	
Age (years)				
16	346	126	(36.4)	0.005
17	364	98	(26.9)	
18	290	76	(26.2)	
Gender				
Male	428	157	(36.7)	0.001
Female	572	143	(25.0)	
Class				
10	348	128	(36.8)	0.003
11	371	100	(27.0)	
12	281	72	(25.6)	
SES				
Low	253	82	(32.3)	0.595
Middle	425	126	(29.6)	
High				
Overweight	322	92	(28.6)	0.414
Father	175	57	(32.6)	0.173
Mother	194	66	(34.0)	0.449
Diabetes	115	31	(27.0)	0.040
Father	112	43	(38.4)	
mother				

Table 2. The characteristic dietary habits of youth with obesity and overweight

	N	Prevalence of overweight & obesity		P
		No.	(%)	
daily eating pattern < 0.001*				
Less than normal	87	7	(8.0)	
Normal	748	236	(31.6)	
Overeat	109	44	(40.4)	
Binge	3	2	(66.7)	
Serious eating disorder	38	3	(7.9)	
Excessive snacking	15	8	(53.3)	
eat/snacks just before bedtime 577 236 (40.9) < 0.001				
eat breakfast	863	275	(31.9)	0.001
eat lunch	996	299	(30.0)	>0.999*
eat supper	885	822	(31.9)	< 0.001
eat between meals	923	292	(31.6)	< 0.001

Cont... Table 2. The characteristic dietary habits of youth with obesity and overweight

eat between supper and bed time	563	237	(42.1)	< 0.001
eat fruits/vegetables during the day	862	265	(30.7)	0.200
drink soft drinks during the day	564	187	(33.2)	0.013
eat chocolate, potato chips, etc	653	197	(30.2)	0.873
drink tea	759	260	(34.3)	< 0.001
drink juice	732	233	(31.8)	0.037
have lunch/dinner outside at restaurants	377	129	(34.2)	0.024
eat rice				< 0.001
More than once a day	188	72	(38.3)	
Once a day	176	54	(30.7)	
2-3 times / week	325	110	(33.8)	
Weekly	220	44	(20.0)	
Others (eating rice with other foods)	91	20	(22.0)	

*By Fisher's exact test

Table3. Effect of exercise and sleep on overweight and obesity

	N	Prevalence of overweight and obesity		P
		No.	(%)	
exercise/physical activity	848	261	(30.8)	0.205
Riding bicycle	137	39	(28.5)	0.673
Play football	281	77	(27.4)	0.262
Walking/running	714	209	(29.3)	0.427
Way to school				0.087
Walking	772	242	(31.3)	
Car/Bus	228	58	(25.4)	
sleep regularly	691	223	(32.3)	0.019
take a nap during the day	513	220	(42.9)	< 0.001
watch TV/play video games/computer	943	292	(31.0)	0.007

Discussion

In this study to assess the overweight in student, Factors affecting it and its relationship with lifestyle, our estimates of overweight/obesity showed the prevalence of overweight and obesity in the whole sample was 30%. In a study in Tehran, which was conducted on 158 children, this number is reported to be 36%¹¹.

We found that the relationship between socio-economic status and overweight in children was significant, so that by increasing SES, overweight among children increased. In other studies, they have merely examined the economic situation, all of which express the significance of this relationship. In other studies, it was also well-documented that low socioeconomic groups are heavily influenced by obesity^{12, 13}.

The, 66.6% of parents were overweight in our study which coincided with the study of Jeremiah and colleagues; they reported parental obesity about 70%⁹. In general, studies show that children who are at least one of their parents are obese have a higher risk for obesity than parents with healthy weight¹⁴⁻¹⁶.

A study by Patrick et al. showed that those who were overweight had less physical activity¹⁷. According to the results of this study, the relationship between overweight and physical activity was significant but have no significant relationship with physical activity. Low physical activity and reducing energy consumption and reducing the oxidation of fats in the body leads to overweight. Results of the some study showed that the consumption of more fruits, vegetables and protein are seen in children and youth with regular physical activity⁴. But in our Study there was no significant difference related to less use of fiber and vegetables with the overweight.

The results of this study revealed the relationship between sleep and overweight, so that people who had a regular sleep and were napping during the day were less likely to be obese and overweight. The relationship between sleep deprivation and obesity has been studied in epidemiological studies in different countries¹⁸. Sleep deprivation is associated with reduced energy consumption¹⁹. St-Onge and Associates study of 5115 people showed that sleep deprivation is associated with body mass index, body composition and abdominal obesity²⁰.

We concluded that a trend toward being overweight/obese in youth and there are many factors involved, such as irregular sleep and lack of mobility in overweight. It seems that people in terms of diseases and genetic factors should also be compared in future studies.

Conflict of Interest: Not

Clearance Ethical: The study was approved by the Ethics Committee of the college of medicine of the Hawler medical university.

Source of Funding: Not

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The Influence of Disaster Counseling with Animation Video on Preparednes Students in Elementary School in Palu

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Abstract

Background: The Central Sulawesi region is one of the areas prone to earthquakes and tsunamis in Indonesia. The low level of knowledge of the community, especially children who are the age most vulnerable to the risk of victims in a disaster. The vulnerability of children to disasters is triggered by a limited understanding of the risks around them, which results in the absence of preparedness in the face of disasters. This study aims to know the influences of disaster counseling with animation video on preparedness students in elementary school in sigi district.

Methods: This research used a quasi-experimental with the pretest-posttest design. 40 respondents, grade IV and V student, were determined by the total quota sampling technique. Data was collected using questionnaires and observation sheets. Data analysis using t-dependent and will be presented in tabular form.

Results: Shows that the average value of respondents' knowledge before video playback (pre-test) is 83.12. Meanwhile, the average value after playing the video (post test) is equal to 92.62. This shows that an increase in the average value of respondents after the video playback. The results of the t-dependent test showed that the animation video method had a significant influence on improving preparedness ($p = 0,000$).

Conclusion: Shows that counseling with animation video method can have a greater influence on the increase in preparedness

Keywords: *Counseling, animation video, Preparedness*

Introduction

In tectonic terms, Indonesia's territory is at the confluence of three active large tectonic plates of the world, namely the Eurasian, Pacific and Indo-Australian

plates. The Central Sulawesi region is one of the earthquake prone areas in Indonesia, because this area is located close to the source of the earthquake which is on land and at sea.¹

Safer schools are needed to protect children's lives during disasters. The concept of school safety is not limited only to prevent the collapse of school buildings during disasters and the safety of teachers and students, but more broadly to achieve a greater goal, namely "disaster risk management", because children play

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the role of future generations. Something they have learned about safety today will be useful in developing a “community that is responsive to disaster risk” in the long run. Here is the importance of education about disasters in school safety^{2,3}.

Preparedness is all forms that are carried out to avoid the risk of a disaster that will occur, if a disaster occurs when and if the disaster is still a long time will occur, then preparedness to avoid risk is the best way. Preparedness is any activity prior to a disaster that aims to develop operational capacity and facilitate effective responses when a disaster occurs⁴⁻⁶

This research was conducted by utilizing animated video media that is in accordance with the characteristics of grade IV and V elementary school students, which have begun to understand the cumulative aspects of the material, have the ability to understand how to combine several classes of objects that vary in their level. Besides that students have been able to think systematically about concrete objects and events and students have achieved high objectivity because students have been fond of investigating, trying, and experimenting which are stimulated by probing drives and great curiosity.⁷

Based on the background described above, the researcher conducted a study entitled the effect of video media for earthquake disaster preparedness on the level of student preparedness in SD 2 Talise, Central Sulawesi.

Materials and Method

The research design used was quasi experimental (quasi-experimental) using pre and post test. This research was conducted at Talise Palu Elementary School. The respondents consisted of 40 students, determined by total sampling technique. Inclusion criteria in this study are: 1) Students in grades 4 and 5; 2) have never received a disaster alert counseling.

The extension instrument used to collect data in this study was in the form of animated video media about earthquake disaster preparedness as a learning medium and a questionnaire that had been tested for validity and reliability before to determine the level of respondent's knowledge about disaster preparedness.

The questionnaire will be tested on subjects that are not research samples but have characteristics that are almost the same as research samples that are students in grades IV and V Elementary Schools in Palu.

The time of the research is August 2019. The counseling group with audio-visual media will be given counseling by instructors who have been certified using a 30-minute animated video. Data collection was carried out before and after counseling was given. Data were collected using a questionnaire and observation sheet. Research on the level of preparedness is carried out by asking 20 questions to respondents with a value of 1 for each correct answer and 0 for incorrect or unknowable answers. The assessment based on the preparedness index value used based on Preparedness is grouped into four parameters namely knowledge and attitudes / Knowledge and Attitude (KA), emergency planning (EP), warning system / Warning System (WS) and resource mobilization⁸. The collected data was then analyzed using univariate analysis and bivariate analysis. Univariate analysis was used to determine the characteristics of the respondent's data (including age and sex) and the data of each variable, namely the level of preparedness in each group. Bivariate analysis used to determine differences in the level of preparedness before and after counseling was given to each group using the t-dependent test, the data obtained from subsequent studies will be presented in tabular form.

Written permission was obtained from the Research Ethics Commission of the Tadulako University Medical School. Each respondent is explained in advance about the research procedure to be carried out, and if agreed, the respondent completes the consent form to participate in the research, and begins to take part in the research activities.

Results

Data on the characteristics of respondents by age shown in table 1, shows that all respondents were in the same age group, namely elementary school age. Most respondents (55%) were 10 years old and most respondents were women (52.5%).

Table 1: Frequency distribution of respondent characteristics based on age and gender

Characteristics	Frequency (n)	Percentage(%)
Age		
10 year	22	55
11 year	18	45
Gender		
Male	19	47,5
Female	21	52,5

Table 2: Distribution of Respondents by Level of Preparedness Before video playback

Characteristics	Frequency (n)	Percentage(%)
Sangat Siap(80-100)	30	75
Siap(65-79)	7	17.5
Hampir Siap(55-64)	1	2.5
Kurang Siap(40-54)	1	2.5
Belum Siap(< 40)	1	2.5
Total	40	100

Table 2 shows that respondents who had the most prepared categories were 30 children (75%) before the video screening and the lowest preparedness in the categories of almost ready, less ready and not ready, each with 1 child (2.5%).

Table 3: Distribution of Respondents by Level of Preparedness After video playback

Characteristics	Frequency (n)	Percentage(%)
Very ready (80-100)	38	95,0
Ready (65-79)	2	5,0
Almost ready (55-64)	0	0
Less ready (40-54)	0	0
Not ready yet (< 40)	0	0
Total	40	100

Table 3 shows that respondents who had the highest level of preparedness before the video screening were very ready to be 38 children (95%) and the lowest preparedness in the ready category was 2 students (5%).

Table 4: Effects of Disaster Preparedness Animated Video Screening on the level of disaster preparedness

Variable	Min	Maks	Mean	SD	p
Before Video Screening	30	100	83,12	13,899	0,000
After Video Screening	65	100	92.62	8.085	

Based on the results of the data normality test, it is known that the research data do not meet the criteria for processing by using the T dependent test (parametric test). Therefore, data processing is done by using an alternative nonparametric test that is Wilcoxon test. The comparative distribution of respondents' pre-test and post-test scores and the effect of video playback are listed in Table 4

Discussion

Based on the characteristics of respondents, respondents are elementary school students in grades IV and V whose age range is between 8-12 years. According to Susanto the characteristics of development include developments in cognitive aspects, namely in the concrete operational stage (ages 7-11 years), at the stage These students have started to understand the cumulative aspects of the material, for example volume and amount, have the ability to understand how to combine several classes of objects that vary in their level. In addition, students are able to think systematically about objects and events that are concrete and formal operational stages (ages 11-15), at this stage students are already in their teens, the cognitive development of students at this stage already has the ability coordinate two kinds of cognitive abilities both simultaneously (simultaneously) and sequentially. So that in this study the learning method used video animation which of course can be well understood at the age of 8-12 years.

Based on the research results obtained, it is known that the average value of the respondents before the video screening (pre-test) was 83.12. Meanwhile, the average value after playing the video (post test) is equal to 92.62. This shows that an increase in the average value of respondents after the video playback.

After doing statistical tests using Wilcoxon test obtained p value of 0,000 ($p < 0.05$). The results of this test indicate that there are significant differences regarding the level of disaster preparedness before and after video playback. there is an influence of video animation media on earthquake disaster preparedness on the level of student preparedness at SDN 2 Talise Central Sulawesi.

These results are consistent with what was revealed by Agustiniingsih in an educational journal, that video media can be utilized in the learning process because it can effectively describe the material presented, especially material that is dynamic. (9) According to Munir's theory

the function of animated video can attract attention with the movement and sound in animated video barrel, simplify the appearance of presentations, facilitate the composition of presentations, make it easier to describe a material, to be able to explain something complicated with just pictures or words.

The results of this study are also the same as the research conducted by Wulandari, that there is an influence of the use of video media on the level of preparedness of SMA Negeri 1 Manantwarno students, where there is an increase in student preparedness in the face of an earthquake.

Based on the overall results of the study, it can be seen that the animation of video playback can help to increase one's knowledge significantly, so that this media can be used when providing earthquake disaster preparedness learning by paying attention to more interesting and not boring video quality and the time and environmental conditions when video playback. After the video screening, respondents have at least experienced an increase in earthquake preparedness in the very prepared category. Based on Wells knowledge about preparedness is an effort to reduce the risk and impact of disaster losses, that is knowledge of disasters, actions to prepare, support and rebuild communities after a disaster occurs. Knowledge of disasters is the main key in preparedness¹⁰.

Conclusion

Based on the results of research and discussion that has been described previously, we can get some conclusions as follows:

1. There is an increase in the level of preparedness in the category of very ready, where before giving counseling that is 75% to 95% after being given counseling with animated video media
2. There is an effect of counseling with earthquake disaster prepared video animation media on the level of student preparedness at SDN 2 Talise Central Sulawesi with a p value of 0,000 ($p < 0.05$).

Ethical Clearance- Taken from university Ethical committee

Source of Funding- Self

Conflict of Interest ; None

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The Influence of Breathing Ball Technique on Length of Labor in Phase I Active in Independent Practice, Midwifery Sriwati

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Abstract

First stage or first stage of opening takes place from zero opening (0 cm) to complete opening (10 cm). First stage for primigravida lasts 12 hours, while multigravida lasts for 8 hours. Based on the Friedman curve, calculated opening for primigravida 1 cm/hour and opening for multigravida 2 cm/hour. Efforts to determine the speed of labor for the first time were given a breathing ball technique. The purpose of this research is to know the effect of breathing ball on the duration of the first phase of active labor in PMB Sriwati.

This type of research is a pre-experimental study with the one-shot case study. The total sample is 30 respondents, 15 primigravida respondents, and 15 multigravida respondents. Data were analyzed using the Mann-Whitney test. The intervention was given during the first stage of labor during the active phase for 32 minutes, every 32 minutes there were 4 stages of breathing ball, the duration of the duration was 8 minutes, each mother could rest whenever she wanted.

The results of the analysis of the breathing ball technique on the duration of labor in the first phase of labor in the active phase of the p-value of 0,000 <0.05.

The conclusion was that there was a significant influence on the breathing ball technique on the length of labor in the active phase I in the Sriwati Independent Practice Midwife. For midwives, especially in the Independent Practice of Midwife Sriwati to train pregnant women from an early age in performing breathing ball techniques by doing exercises in classes of pregnant women every 2x in a week, and this research can be developed with pain variables in the first phase of active mothers.

Keywords: *Breathing ball, length of labor, active phase*

Introduction

Childbirth is the process of expulsion from the conception that can live from inside the uterus to the outside world. Labor includes a physiological process that allows a series of major changes in the mother to give birth to the fetus from the birth canal⁽¹⁾.

The first stage or first stage of opening takes place from zero openings (0 cm) to complete opening (10 cm). The first stage for primigravida lasts 12 hours, while multigravida lasts for 8 hours. Based on the Friedman curve, calculated primigravida opening 1 cm/hour and opening multigravida 2 cm/hour. For the latent phase from opening 0 to opening 3 cm and the active phase starting from opening 4 cm to 10 cm⁽²⁾.

Pain that may be felt by women during childbirth is quite varied, such as how they respond. For this reason, the labor environment and the support provided by professionals and colleagues, as well as the methods

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used to relieve pain, are important because they can influence reactions during labor and play an important role in the development of symptoms of traumatic stress after childbirth⁽³⁾ which targeted all women scheduled to give birth at Akershus University Hospital in Norway. Questionnaires were given at three different stages: from pregnancy weeks 17 to 32, from the maternity ward, and from 8 weeks postpartum. Data were also obtained from the hospital's birth record. Using structural equation modeling, a prospective mediation model was tested. Results: Posttraumatic stress symptoms were significantly related to both labor pain ($r = 0.23$). While labor pain is a normal process that can cause physiological and psychological stress which is common where 90% of women are accompanied by pain⁽⁴⁾. Breathing ball is one of the non-pharmacological pain relief methods to help mothers cope with labor⁽⁵⁾.

Non-pharmacological methods can relieve pain sensations in a number of ways, by promoting women's well-being, comfort, and sense of control in labor and Breathing ball is one method to help mothers cope with labor and delivery⁽⁶⁾.

According to Surtiningsih et al, (2016) respondents, 40 primigravida mothers with a gestational age of 34 to 35 weeks were divided into 2 intervention groups with breathing ball techniques for 6 meetings and control groups. This technique is very effective in shortening the length of the active phase I with a p-value $0,000 < \alpha 0.05$ and an effect size of 0.6 is also effective in shortening the second time with a p-value of $0.007 < \alpha 0.05$ with an effect size of 0.43. The results of the study concluded that breathing ball effectively shortens the length of the first and second stages of labor in primigravidas⁽⁷⁾.

According to Renaningtyas, et al (2013) the results of the study showed that there was a relationship between pelvic rocking implementation and breathing ball on the duration of I. X counted > X table (13,333 > 9,488), and p-value ($0.01 < 0.05$) by doing pelvic rocking with a breathing ball is able to facilitate labor, especially in the first stage and help mothers experience the time of delivery when the first⁽⁸⁾. Research purposes was knowing the effect of the breathing ball technique on the active time phase I in PBM Sriwati.

Materials and Method

This type of research is a pre-experimental study with posttest only design or also called the one-shot case study. This design treatment or intervention has been

carried out, then carried out measurements (observation) or posttest (02). The sample in this study was normal maternity mothers in gestational age 37 to 42 weeks when I active phase of 15 respondents in the primigravida group and 15 respondents in the multigravida group at the Independent Sriwati Midwifery Practice.

Research Results

Univariate Analysis Results

Table 1 Distribution of Respondents Based on the characteristics of the breathing ball technique at BPM Sriwati, 2019

Characteristics	f	%
Parity		
Primigravida	15	50
Multigravida	15	50
Gestational age		
38 week	6	20.0
39 week	16	53.3
40 week	6	20.0
41 week	2	6.7

Source: Primary Data 2019

Table 1 shows that the number of primigravida and multigravida each was 15 respondents, while the characteristics of respondents based on gestational age were dominated by 39 weeks 16 (53.3%).

The results of the analysis to determine the distribution of respondents based on parity of length of labor in first phase active delivery mothers with breathing ball techniques can be seen in the following table:

Table 2 Distribution of Respondents Based on parity with the length of labor with breathing ball techniques at BPM Sriwati in 2019

Parity	Breathing ball technique			
	fast labor		Prolonged labor	
	f	%	f	%
Primigravida	13	43.3	2	6.6
Multigravida	15	100.00	0	0

Table 2 shows that the distribution of respondents based on parity, the length of labor in multigravida, there were 100% of rapid labor, while the duration of labor in primigravida, there were 2 (6.6%) of respondents who experienced long labor.

Bivariate Analysis Results

The results of the analysis to find out the length of labor by giving breathing technique to first-phase active mothers can be seen in the following table:

Table 3 distribution of labor time in primigravida and multigravida with breathing ball techniques in PMB Sriwati, 2019

Variable		n	Min.	Max.	Mean Rank
Duration of Childbirth	Primigravida	15	2,25	7,42	4,0447
	Multigravida	15	2,15	3,33	2,9553
Z					-5,236
Asymp. Sig. (2-tailed)					0.000

Table 3 shows that the distribution of primigravida length of labor by breathing ball technique using the Mann-Whitney test obtained a minimum time of delivery time is 2.25 hours and a maximum length of 7.42 hours with an average value of -4.0447, while in multigravida obtained the minimum length of labor is 2.15 hours and the maximum length of labor is 3.33 hours with an average value of -2.9557 with a p-value = 0.000 < 0.05. Therefore, the result is that Ha is accepted and Ho is rejected, so it can be concluded that there is an effect of giving breathing ball technique to the duration of the first phase of active labor in Sriwati’s PMB.

Discussion

The Effect of Breathing Ball Technique on the Length of the First Stage of Labor in Active Phase in the Independent Practice of Midwife Sriwati

Based on the characteristics of the respondent’s average gestational age of 38-41 weeks, the highest number of respondents at 39 weeks gestational age. The parity group in primigravida and multigravida each of 15 respondents. WHO⁽⁹⁾ concludes that there is no evidence to support the supine position during the first stage of labor. Based on current findings, it is recommended that women in low-risk labor should be informed of the benefits of an upright position, and be encouraged and assisted to take whatever position they choose⁽¹⁰⁾ while supine positions on an inclusive back should be

avoided⁽¹¹⁾.

There are several potential mechanisms to explain why using a breathing ball can reduce labor pain. The first endogenous mechanism is the gate control theory, which consists of applying light massage to the affected part. This mechanism acts primarily on the sensory component of pain, by blocking part of the nociceptive message in the spine. Based on this theory, breathing ball can provide support for the perineum without putting significant pressure^{(12);(13);(14)}.

This study concludes that clinical implementation of the use of balls during labor can be an effective non-pharmacological intervention in reducing pain perception and improving the experience of childbirth⁽¹²⁾.

The results of breathing ball technique analysis on the duration of labor in the first phase of labor in the active phase based on the Mann-Whitney test obtained a p-value of 0,000 < 0.05 so that the results were obtained that Ha was accepted and H0 was rejected. The results of this analysis can be concluded that there is a significant influence on the breathing ball technique on the length of labor in the first stage of labor in the active phase⁽⁸⁾.

The results of this study are in line with the research of Renaningtyas et al. (2013) in a study entitled “The Relationship of Pelvic Rocking Implementation with Breathing Ball to the Length of First Time in Maternity Mothers”, this shows that the breathing ball technique

can accelerate Kala I delivery compared to only given standard treatment with p-value (0.01 <0.05) Renaningtyas et al, (2013) explains this breathing ball technique is effective because it increases the relaxation of pelvic muscles so that labor is easy and fast⁽⁸⁾.

Likewise the results of research by Tavooni, 2011 suggested that the mean pain score in the Breathing ball group was significantly lower than the average pain score in the control group (P <0.05), but there were no significant differences in the two groups between the duration active phase labor or the interval between uterine contractions (P <0.05)⁽¹⁵⁾.

Research conducted by Zaky at the Labor and Delivery Unit at El-Shatby University Maternity Hospital in Alexandria shows that there is a statistically positive correlation between the effects of birth ball pelvic rocking exercise on the progress of labor in terms of decreasing the interval and increasing the duration and frequency of uterine contractions, cervical dilatation, and decreased fetal head in the study group. While the control group showed little progress with statically significant differences (<0,0001) *. In addition, the control group expressed more pain scores, spending longer duration from the 1st, 2nd and 3rd stage of labor than the study group. The researchers recommend that practicing with birth ball pelvic rocking exercise is recommended as one of the significant modalities to improve labor progress, manage pain, and improve self-control and gain a more satisfying maternity experience⁽¹⁶⁾cervical dilatation and fetal head descent/fifth among the study group. While the control group showed less progress with highly statically significant differences (<0.0001).

The results of data collection conducted in the field found that out of 30 respondents there were 2 respondents who had experienced long labor, this is because respondents were not active in doing breathing ball techniques by only doing 1 round of this technique.

The breathing ball technique can help the mother in an upright position, staying upright when in labor will allow the uterus to work as efficiently as possible making the pelvic plane wider and open. In other words, it can stimulate dilatation and widen the lower door of the pelvis, sit straight on the ball then the gravity of the earth will help the fetus or the lowest part of the fetus to immediately descend into the pelvis⁽¹⁷⁾.

Another study according to Surtiningsih et al, (2016) entitled The Effectiveness of pelvic rocking exercises on the length of time of delivery in primiparous mothers,

respondents 40 primigravida mothers with a gestational age of 34 to 35 weeks. The results showed that the breathing ball technique was effective in shortening the length of the active phase I with a side effect of 0.6 was also effective in shortening the length of the second stage with an effect size of 0.43. From the results of the study concluded that breathing ball effectively shortens the length of the first and second stages of labor in primigravidas⁽⁷⁾.

Breathing ball has been introduced to midwifery settings to facilitate mobilization techniques in women giving birth. This study reports an evaluation of the results of the use of breathing ball in the intrapartum period. The relationship between duration of use and perception of pain intensity has been explored. Although not statistically significant, the clinical significance of a high level of satisfaction must be recognized. Results including the duration of the first and second stages of labor and the way labor were also evaluated⁽¹¹⁾.

This research has explained the effects of pelvic rocking exercises while sitting on Breathing ball during childbirth. His findings indicate that Breathing ball can reduce pain and, increase progress and shorten the stage of labor⁽¹⁶⁾cervical dilatation and fetal head descent/fifth among the study group. While the control group showed less progress with highly statically significant differences (<0.0001).

Obstacles when researching when asking for mother's approval to be a respondent, some of the mothers are not willing to be respondents because they are afraid of the birth ball that researchers use as material for research, there are also mothers who do not want to be respondents because of cultural factors, mothers assume their grandmothers also never do anything like that but during childbirth is fine.

Conclusions and Suggestions

Based on the results of this study, it can be concluded that there is an effect of breathing ball technique on the duration of labor in the first phase of the active maternal phase in the Independent Practice of Sriwati Midwife.

Research needs to be done with more samples and places.

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Conflict of Interest – Nil

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Cardiac Emergency Prevention Through Personal and Environmental Factors

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Abstract

Cardiovascular disease is the number one cause of death for non-communicable diseases. There are many types of cardiovascular disease, but the most common and well-known one is Coronary Heart Disease. Those who are diagnosed with coronary heart disease need to always be vigilant since it is highly possible for them to experience the cardiac emergency at any time, which can cause death. This study aims to determine how the efforts to prevent coronary heart disease patients against cardiac emergency through personal and environmental factors. The results of this study are expected to improve the quality of health services in coronary heart disease patients and increase the efforts of preventing cardiac emergencies in the patients with coronary heart disease independently. There were 118 patients with a medical diagnosis of coronary heart disease as the sample of this study. It utilizes the observational analytic method with cross sectional research design. The analysis technique used was variance or component-based Structural Equation Modeling (SEM). The results showed that there were coronary heart disease patients who had suffered from the disease for more than 1 (one) year (87.3%), had comorbidities: hypertension or diabetes mellitus (85.6%), had experienced a chest pain (79.7%), had a hereditary factor of heart disease (69.5%), and had a healthy lifestyle (69.9%). The results of the structural model analysis between personal factors and environmental factors indicate that there is a significant influence on preventing the cardiac emergencies.

Keywords: *cardiac emergency; personal; environmental*

Introduction

In Indonesia, non-communicable diseases increase every year causing more than 36 million people to pass away (63% of all deaths)⁽¹⁾. The number one cause of the death for non-communicable diseases in general is cardiovascular disease. It is a disease associated with the heart and blood vessel abnormalities. There are many types of cardiovascular disease, but the most common and well-known one is Coronary Heart Disease. Coronary Heart Disease is a heart function disorder due to lack of blood in the heart muscle caused by the narrowing of the coronary arteries. It is clinically characterized by the chest pain or discomfort feeling in the chest. Sometimes, there is a heavy pressure in the chest while climbing /

doing strenuous work, walking in a hurry or walking too far. It is defined as coronary heart disease if someone has been diagnosed with angina pectoris and / or myocardial infarction by a doctor, or has never been diagnosed with coronary heart disease but has experienced symptoms / history of the chest pain / feeling of pressure, severe / discomfort in the chest, pain / discomfort in the middle of the chest / front left chest / which spreads over the left arm, pain / discomfort in the chest felt while climbing / climbing stairs / walking in a hurry, and pain / discomfort in the chest which disappears when stopping the activity / taking a rest⁽²⁾. Sudden deaths caused by the heart disease represent about 25-30 percent of all cardiovascular deaths, and are estimated to cause 70,000 to 90,000 deaths each year⁽³⁾. The cardiovascular system is very vital, therefore it should always be treated in order to stay healthy and be able to function normally. The prevalence of heart disease (doctor diagnostics) at all ages by province in 2018 is 1.5 million.

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Those who are diagnosed with coronary heart disease need to always be vigilant since it is highly possible for them to experience the cardiac emergency at any time, which can cause death. The phenomenon of sudden death was the only manifestation of disease in almost half of all subjects with myocardial infarction(4),(5). Most sudden deaths occur before the patient is hospitalized(3). The results of this study indicate that the patients with coronary heart disease are at risk of having a heart attack in any kind of situations(6). The death occurs due to the patients not getting any help or handling late. When a cardiac emergency arrest occurs, the patients must immediately get help either from themselves or others because if they are not treated immediately, they can get into a worse condition or death. The cardiac emergency can occur anywhere, and at any time. Sometimes it happens when the patient is alone.

An effective approach to prevent the cardiac emergencies must be undertaken for individuals at risk followed by risk factor control(7),(8). Therefore, the patients must be treated thoroughly since they are diagnosed with the coronary heart disease. It is not only about the treatment, but they must be able to prevent, anticipate and help themselves in the event of an attack, so they can avoid the death.(9)

This study aims to determine the efforts of preventing the coronary heart disease patients against cardiac emergencies through personal and environmental factor approaches. The results of this study are expected to improve the quality of the health services in coronary heart disease patients and increase the efforts of preventing the cardiac emergencies in the patients with coronary heart disease independently.

Materials and Method

The subjects in this study were 118 patients with a medical diagnosis of coronary heart disease. Research location was Polyclinic of Cardiovascular, Dr. Soetomo Hospital, Surabaya, a tertiary referral hospital that prioritizes broad sub-specialist and sub-specialist services. Time of research was July to August 2017.

This research utilized observational analytic method; a research approach without intervening the population in data collection. The analytic intended in this study was an explanation of the influence between variables. This study applied a cross sectional design where all variables were measured at the same time. These were the variables that influence the process of prevention of cardiac emergency, including personal factors and environmental factors (Figure 1).

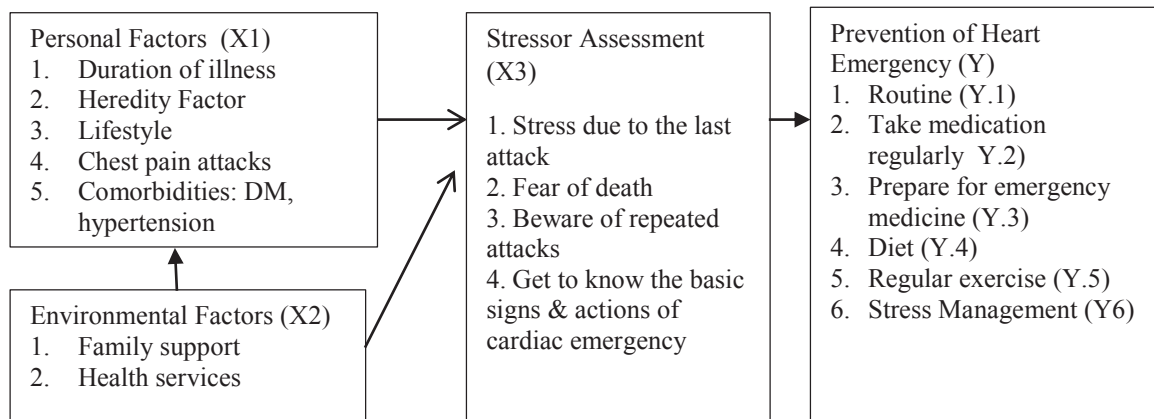


Figure 1. Research Conceptual Framework

The data were collected using a closed questionnaire and analyzed descriptively and inferentially. The results of the observations on 118 will then be analyzed. The analysis technique used is a structural equation model of variance or component-based Structural Equation Modeling (SEM).

Results

Personal factors in this study were measured through 5 indicators, namely: duration of illness, chest pain, presence of comorbidities, hereditary diseases and lifestyle. The complete data can be seen at Table 1.

Table 1. Distribution of Personal Factors in Coronary Heart Disease Patients

No.	Indicators	Frequency	Percentage
1	Duration of illness		
	<1 year	15	12.7
	>1 year	103	87.3
2	Chest pain attack		
	Experienced chest pain	94	79.7
	Not experienced chest pain	24	20.3
3	Comorbidity		
	There is comorbidity	101	85.6
	There is no comorbidity	17	14.4
4	Hereditary disease		
	There is a hereditary disease	82	69.5
	There is no hereditary disease	36	30.5
5	Lifestyle		
	Unhealthy	35	29.7
	Healthy	82	69.9

The results showed that there were Coronary Heart Disease patients who had suffered from the disease for more than 1 (one) year (87.3%), had comorbidities: hypertension or diabetes mellitus (85.6%), had experienced a chest pain (79.7%), had a hereditary factor of heart disease (69.5%), and had a healthy lifestyle (69.9%).

Environmental factors are constructed by two indicators: family support and health services which can be seen in table 2.

Table 2. Distribution of Environmental Factors in Coronary Heart Disease Patients

Indicators	Category						Total	
	Good		Fair		Poor			
	n	%	n	%	n	%	n	%
Family Support	65	55.1	35	29.9	18	15.3	118	100
Health Services	49	41.5	17	14.4	52	44.1	118	100

The results of the 2 indicators of the environmental factors showed that half (55.1%) of Coronary Heart Disease patients received a good family support, while the health service indicator was more in the unfavorable category.

The results of the analysis to see the measurement model (outer model) by testing the construct validity and construct reliability are shown in Table 3.

Table 3. The Results of Convergent Validity Test

Latent Variable	Indicators	Convergent Validity Test		
		Loading Value	T-Statistics Value	Validity
Personal Factor (X1)	Duration of illness	0.902	44.976	Valid
	Chest pain attacks	0.804	17.082	Valid
	Heredity factors	0.777	13.688	Valid
	Comorbidities	0.827	17.021	Valid
	Lifestyle	0.7050	13.178	Valid
Environmental factor (X2)	Family support	0.909	26.638	Valid
	Health services	0.743	9.757	Valid

The convergent validity test results explain that the factor loading value of the indicator is >0.5 and all indicators are significant for measuring the factor variables (T-statistic is more than 1.96). The conclusion of the analysis is that the above indicators are valid for measuring the latent variables and showing the criteria of goodness of a measurement model (outer model).

Structural model analysis is performed to examine the effect of the exogenous factors on the endogenous factors. The value used as a reference is the T-table value (109; $0.025 = 1.96$) with margin of error (α) = 5%. The results of the full significance test are explained in the following table.

Table 4. Significance Test Results on the Structural Model (Inner Model)

Path	Path parameter coefficient	Test of		Influence
		Relationship Significance		
		T-Statistics	T-Table	
(X1) Personal factor → (X3) Stressor assessment	0.215	2.099	1.96	Significant
(X2) Environmental factor → (X3) Stressor assessment	0.309	3.374	1.96	Significant
(X2) Environmental factor → (X1) Personal factor	0.374	5.221	1.96	Significant
(X3) Stressor assessment → (Y) Cardiac Emergency Prevention	0.273	3.179	1.96	Significant

Based on the structural model test results using the T test, all the T-statistic values are greater than the T-table. The conclusion is that there is a significant influence between exogenous factors and endogenous factors.

Discussion

The majority of coronary heart disease patients have been suffering from this disease for more than a year and have experienced chest pain. The acute coronary syndrome is caused by the imbalance between myocardial oxygen demand and supply which causes cell death and myocardial necrosis. The pain is experienced due

to lack of oxygen in the heart muscle. If this condition is not resolved immediately, it will cause arrhythmia that is very likely to occur the cardiac emergency⁽¹⁰⁾. Suffering from particular pain for a long time and having experienced chest pain is an unfavorable condition since it can have a psychological impact on the patient. It may cause boredom for individuals to undergo therapy. The

experience of chest pain is an unpleasant condition for the patient and a stressor⁽¹¹⁾. The psychological disorders experienced by the coronary heart disease patients will affect the treatment, especially in undergoing the treatment of the regular diet. The majority of the patients have comorbidities such as hypertension, diabetes or hyper cholesterol. Hypertension is one of the factors causing coronary heart disease. The 50% of myocardial infarction suffer from hypertension and 75% of them suffer from left ventricular failure due to the hypertension⁽¹²⁾. High and persistent blood pressure will cause direct trauma to the coronary artery walls. Diabetes is one of the predispositions to vascular disease. Men who suffer from diabetes have a 50% higher risk of illness than normal people, while women have a double risk⁽¹³⁾. Hypercholesterolemia is a major factor in coronary heart disease. The blood cholesterol level is affected by the daily composition of food. The patients who have comorbidities have a higher risk of experiencing cardiac emergency. Therefore, the intensive care needs to be done such as taking medication regularly, controlling blood sugar, maintaining the blood pressure, and choosing a healthy lifestyle⁽¹⁴⁾. In addition, the patients who experience diabetes or hypertension are at risk for coronary heart disease^{(14),(15),(16)} Several studies have shown that genetic factors predispose to the sudden death⁽⁴⁾. In recent years, the cardiovascular disease inherited due to genetic basis reaches more than 50% and can cause sudden cardiac death⁽¹⁶⁾.

Family support is necessary in treating coronary heart disease patients, especially in terms of taking medication regularly, doing routine medical check-ups at the hospital, helping to provide food according to the patients' diet, and supporting regular exercise. The results showed that half of the Coronary Heart Disease patients have good family support. This support is needed for the patients to take care of themselves better and avoid the cardiac emergencies. The coronary heart disease patients have to take the medication regularly and have a healthy lifestyle. They need to get an intensive care by doing routine medical check-ups which include blood pressure, blood sugar, and blood fat levels⁽¹⁴⁾. Furthermore, half of the coronary heart disease patients do not have good family support. Therefore, they try to overcome their health problems independently. The family does not provide support for regular medical check-ups to the hospital in which the patients need to go alone and take care of themselves. This condition is not good since they need support from the family to live

a life with the illness. The deaths from coronary heart disease can be prevented up to 80% by regular medical check-ups⁽¹⁴⁾.

The results of the research on the health services received by the patients with coronary heart disease showed that more than half of them stated that the services provided were not good. It is related to the lack of health education received by the patients with coronary heart disease, especially in terms of indications and symptoms of the heart attacks, as well as actions that must be taken when an attack occurs. The discussion results with the experts indicate that there is no Standard Operating Procedure (SOP) related to the health education for coronary heart disease patients from both the nursing and medical professions. Some of the doctors or nurses have conducted the health education, limited to their abilities and to answer the patient questions. If the patient does not give any question, the doctor or nurse does not give explanation, so the counseling varies both in quality and quantity.

Based on the results of the structural model analysis between personal factors and environmental factors, the T-statistic value (3.374) is greater than the T-table (1.96) which means that there is a significant influence between personal factors and environmental factors in preventing cardiac emergencies.

Conclusion

Patients with coronary heart disease are at risk for recurrent attacks of chest pain that can lead to cardiac emergencies. The personal factors including the duration of illness, chest pain attacks, the presence of comorbidities and hereditary diseases, as well as the environmental factors in the form of family support and good health services are very influential in the treatment of coronary heart disease patients to prevent the cardiac emergencies.

Ethical Clearance: Yes

Source of Funding: Authors

Conflict of Interest: No

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Investigation of *cpa.* and *zpx.* Genes in *Cronobacter sakazakii* Isolation from Clinical Specimens in Thi-Qar Province and

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Abstract

Cronobacter sakazakii is a member of Enterobacteriaceae family and it is a food-born pathogenic bacteria which can cause several diseases for human and animals. The present study focused on the isolation of this species from clinical specimens from different sexes and ages in addition to hospital environments specimens and then investigation of *cpa.* and *zpx.* genes. The specimens have been taken from group of hospitals in Al-Nasiriyah city (center of Thi-Qar province- south of Iraq). The identification was done by both phenotypical methods and confirmed by API. 20 E. system. Then investigation of *cpa.* and *zpx.* genes by conventional PCR.

Out of 400 specimens (100 from each Burn humans, stool of patients with diarrhea, urine with UTI. in addition to hospital environments specimens) there were 16 (4 %) of specimens gave positive for *C. sakazakii* included : 4 from 100 burns specimens (4%), 6 from 100 stool specimens (6%), 0 from 100 urine (0%) and 6 from 100 hospital environments specimens (6%). The 16 isolates have been tested for presence of *cpa.* and *zpx.* genes by PCR., a number of 13 (81.25%) and 16 (100%) gave positive for these genes respectively. This species was exist in the clinical specimens and can cause diarrhea and burn infection in the area of study with ratio equal to what obtain by other researchers. Additionally this species considered hazardous because of having the *cpa.* and *zpx.* genes.

Key words: *Cronobacter sakazakii*, *cpa.*, *zpx.*

Introduction

Cronobacter sakazakii is one member of Enterobacteriaceae family which characterized by *gram-negative, rod-shaped*, facultative anaerobic, motile with a peritrichous flagella.⁽¹⁾ Firstly, it was identified and named as “yellow pigmented *Enterobacter cloacae*” by Urmenyi and white-Franklin (1961).⁽²⁾ The Japanese bacteriologist “Riichi Sakazakii” reclassified it (in 1980) as new species -*Enterobacter sakazakii*- based on genotype and phenotype classification.⁽³⁾ In 2007 it has been re-ranged in new genus called *Cronobacter* based on revised taxonomy.⁽⁴⁾ From 2008-2012, the genus *Cronobacter* subjected to more revisions which now consists of 7 species: *C. sakazakii*, *C. dublinensis*, *C. malonaticus*, *C. muytjensii*, *C. condimenti*, *C. turicensis*, and *C. universalis*⁽⁵⁾.

This organism is lactose fermenter bacteria with pink-mucoid colonies on MacConkey agar. It can be

identified with a typical non-diffusible yellow pigment colonies on Tryptic Soy Agar (TSA.) at 25°C and can also be grow on Eosin Methylene Blue (EMB.) and deoxycholate agar.⁽⁶⁾

C. sakazakii can be isolate from different sources such as: environments (e.g., domestic environments and manufacturing plants), clinical sources (e.g., cerebrospinal fluid, blood, and sputum), food (e.g., cheese, meat, and vegetables), and animals (e.g., rats and flies).

C. sakazakii is emerging foodborne pathogen which has been classified as sixth most common cause of nosocomial infections and antibiotic resistant strains.⁽⁷⁾ International Commission of Microbiological Specifications for Foods,⁽⁶⁾ considered *Cronobacter* as pathogenic organisms threatening human live and causing serious diseases,⁽⁶⁾ as well as World Health Organization

(WHO) recognized all *Cronobacter* species a pathogenic microorganisms.⁽¹⁾ The mortality rate with *Cronobacter* infections ranged between 40– 80%. This species is life-threatening for all human age groups (premature neonates, infants and immunocompromised adults) which can cause septicemia, meningitis and necrotizing enterocolitis. Urinary tract infection and diarrhea have also been recorded in addition to neurological sequelae. Patrick *et al.*, (2014).⁽⁸⁾ mentioned that the majority of *Cronobacter* infections are in the adult population, especially those suffering from serious underlying disease or malignancy.

C. sakazakii has a group of virulence factors, but these factors remain poorly studied.⁽⁹⁾ Recent studies by improved DNA-based techniques have identified many virulence factors in *C. sakazakii* such as seven O-serogroups and eleven proteolytic enzymes. Among the virulence-related proteins, outer membrane proteins (*ompA* and *ompX*) are involved in the colonization of the gastrointestinal tract and may have roles in helping the organism penetrate the blood–brain barrier.⁽⁹⁾ *Cronobacter* plasminogen activator (encoded by *cpa*. gene) is an outer membrane protein provides resistance against the bactericidal activity of serum, activates plasminogen, and inactivates alpha2- antiplasmin. Other virulence factor is Zinc-metalloprotease (encoded by *zpx*. gene) which causes cell deformation and cells rounding.

Genes in the area of current study (Thi-Qar province – south of Iraq), though there was a study by.⁽¹⁰⁾ which studied isolation of *C. sakazakii* from different sources and identified by phenotypic methods. Therefore, this work aimed to investigate the incidence of *C. sakazakii* in clinical and hospital environments specimens and detection of *cpa*. and *zpx*. genes.

Methodology

Four hundred specimens (included 100 specimens from each: Burns, Stool with diarrhea, Urine with UTI. and Hospital environment) were collected from Thi-Qar province (south of Iraq) hospitals: Bint-El-Huda Hospital, Al Hussein Educational Hospital and Mohammed Al Moussawi Hospital. The specimens were tacked by media swabs and transported to laboratories of college of sciences- Thi-Qar university in a cool box within 1-2 hours.

Pre-enrichment procedure

The methods of culture and isolation of *C. sakazakii* were done, the specimens were pre-enriched by mixing 25 ml/g sample with Buffered peptone water (BPW). Mixed well and incubated at 37°C for 24.0±2.0 h.

Isolation of *C. sakazakii*

After pre-enriched, all specimens were cultured on MacCokey agar (*C. sakazakii* lactose fermenter) for 37°C for 24 h. Then the pink – mucoid (lactose fermenter colonies) were sub-cultured on Tryptic Soy Agar (TSA) and incubated at 25 °C for 48-72 h. (colonies appeared as yellow pigmented) and chromogenic selective media- *Enterobacter sakazakii* Isolation Agar (ESIA.) was used, *C. sakazakii* appear as green- bright blue colonies.

Identification of *C. sakazakii*

The isolates were tested by microscopic examination under light microscope (which appear gram negative bacilli). Then tested by conventional biochemical methods as Oxidase test, Catalase test, Triple Sugar Iron (TSI. – A/A with gas production and no H₂S), Urease test, IMViC. test (Indole, Methyl-red, Voges-Proskauer and Citrate), Motility test and DNase test. Then this identification was confirmed by API. 20 E. system.

*Note: all used media were Oxiod / England except ESIA. Media.

Detection of *cpa*. and *zpx*. genes

After plasmid extraction, Cpa. and BAM. primers were used to detection of *cpa*. and *zpx*. genes respectively by PCR. technique for all identified isolates. The used primers for this purpose.

The primers were processed according to manufacturing instructions. The total volumes of reagents and premix tubes contents which used in the PCR amplification were 20 µl, included: 1 µl from each forward and reverse primers, 3 µl from DNA. template and 10 µl free water.

The results of virulence genes amplification have been visualized by 1% agarose gel electrophoresis (0.25 gm of Agarose powder in 25 ml of (1x) TBE. buffer) at 70 V. for 45 min, a ladder with 100-2000 bp. Has been used with genes electrophoresis.

Results

Total isolates of *C. sakazakii* were 16 out of 400 (4%) specimens, included : 4/100 burns specimens

(4%), 6/100 stool specimens (6%), 0/100 urine (0%) and 6/100 hospital environments specimens (6%), as shown in table (1):

Table (1): The number and percentages of *C. sakazakii* isolates

Clinical specimens	Number of specimens	Number of <i>C. sakazakii</i> isolates (%)	Percentage / 16
Burn	100	4 (4 %)	25 %
Hospitals environment	100	6 (6 %)	37.5%
Stool	100	6 (6 %)	37.5%
Urine	100	0 (0 %)	0 %
Total	400	16 (4 %)	100%

Phenotypic identification

-Morphological examination:

Isolates of *C. sakazakii* were lactose fermenter, pink color with thick center and mucoid colonies after 24 hrs. of incubation at 37 °C. with MacConkey agar. The isolates showed slight yellow–golden yellow pigmented colonies on TSA. agar and showed two types of colonies with ESIA. agar: typical colonies (small green to blue-green colonies) and non-typical colonies (slightly transparent and violet colonies), as shown in figure (1), The *C. sakazakii* isolates appeared as gram-negative rod shape under light microscope.

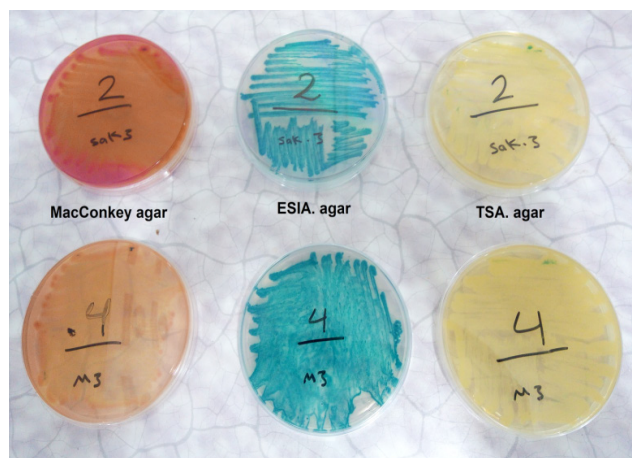


Figure (1): Morphological examination of *C. sakazakii*

Biochemical identification:

Biochemically, *C. sakazakii* isolates have been

identified by a list of testes (TSI., Catalase, Oxidase, Urease, IMViC. & Motility) and confirmed by API. 20E. system. The results of these tests showed in table (2) below:

Table (2): *C. sakazakii* biochemical tests and its results

Tests		Results
TSI.		A/A, G.*
Catalase		+
Oxidase		-
Urease		-
IMViC.	Indole	V*
	Methyl-red	-
	Voges- Proskaur	+
	Citrate	+
Motility		+
DNase		-

*A/A : acidic/acidic, G: gas (O₂). *V: variable.

C. sakazakii is considered a pathogenic bacterium and is necessary to focus on this bacterial species because of their own high virulence factors which constitute a threat to humans and animals. Its diagnosis show high similarity with other Enterobacteriaceae member's (as *Citrobacter* spp. and *Enterobacter* spp.) which lead to difficulty in diagnosis and do not rely on one type of methods; therefore the in present study the identification was done by using of morphological, biochemical and API.20 E..

The current study is the first in the study area, as well as the global studies with such design is very few where most local and global studies have been focused in isolation of the *C. sakazakii* from milk samples and food. There were some local studies isolated these organism from some clinical specimens. The results of current study in comparison with these locally studies indicated to the variation in isolation rates from one region to region and form time to time, where lower than results of study by⁽¹¹⁾ who obtained 16% of *C. sakazakii* isolates from clinical specimens from ALImamain Al-Kadhumain Medical City, Baghdad/Iraq, lower than results of study by⁽¹²⁾ who detected 9% of *C. sakazakii* isolates from clinical specimens from various hospitals of Najaf/Iraq.

The current results slightly higher than⁽¹⁰⁾ in Thi-qar province/Iraq who obtained one isolate (2%) of *C. sakazakii* from 50 specimens from patients stool with diarrhea, other study by⁽¹³⁾ in Thi-qar province reported 2% of *C. sakazakii* from stool of patients and a study by⁽¹⁴⁾ in Al-basrah city obtained 0 % from patients stool. In mexico: 0.33% in Hospitalized Nursing Infants Associated with the Consumption of Powdered Infant Formula (Two Cases of Hemorrhagic Diarrhea Caused by *Cronobacter* .⁽¹⁵⁾

Investigation of *cpa.* and *zpx.* genes :

Figure (2) show the extracted plasmid After DNA, the results of virulence genes investigation by PCR. technique revealed that 13 isolates (81.25) were positive for *cpa.* gene and all 16 isolates (100%) were positive for *zpx.* gene, as shown in figures (3 and 4).

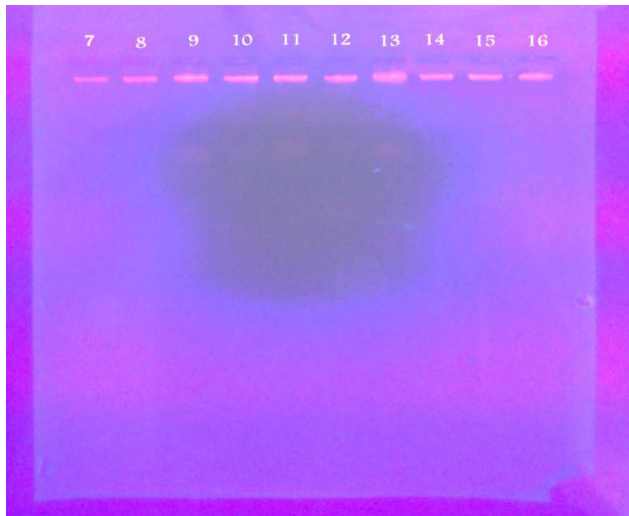


Figure (2): Extracted plasmids DNA.

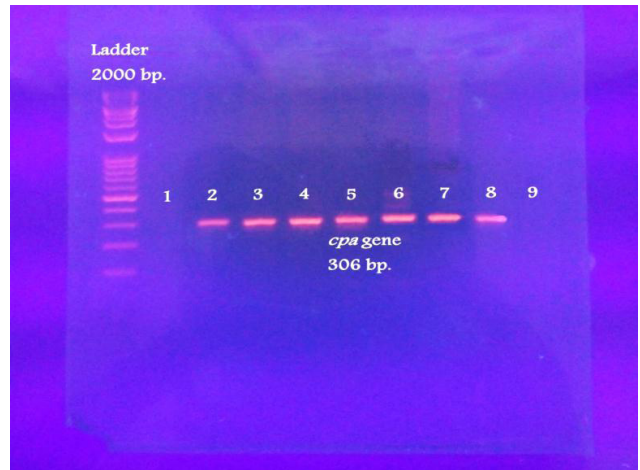


Figure (3): *cpa.* gene amplification from plasmid

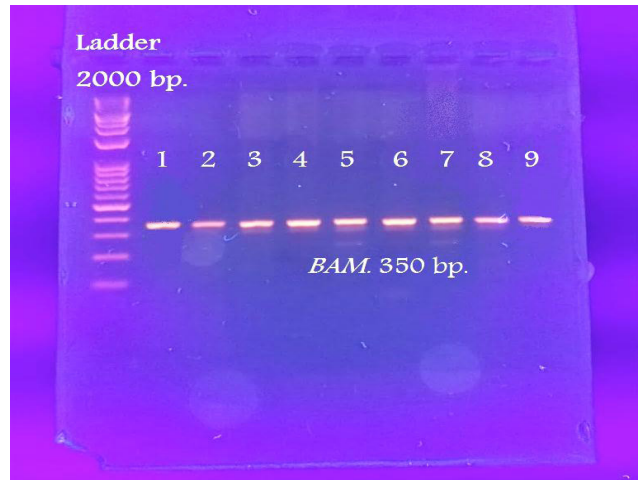


Figure (4): *Zpx.* gene amplification from plasmid

The present study focused on the some important virulence genes which carried on the bacterial plasmids, these are: *cpa.* gene (*Cronobacter* plasminogen activator) and *zpx.* Gene (zinc containing metalloprotease).

A *cpa.* gene encodes by *cpaF* and *cpaR* primer was obtained in 13 (81.25%) of present isolates. This results agree with most previous studies by⁽¹⁶⁾ who recorded 60 % of a novel isolate of *C. sakazakii* have *cpa.* gene using an in vitro blood brain barrier model,⁽¹⁷⁾ 100% of *C. sakazakii* from clinical sample have *cpa.* gene,⁽¹⁸⁾ revealed 100% of *C. sakazakii* from some food and dust samples have *cpa.* gene and Almajed 2015, obtained (85%) of *cpa.* gene in *C. sakazakii* from clinical samples. In contrast disagree with⁽¹⁹⁾ who recorded *cpa.* gene (28%; 12/43) in *C. sakazakii* from different sources.

The *pESA3* encodes for the outer membrane protease *Cpa.* (which is responsible for serum resistance), this protease resistance against complement-dependent killing of serum by cleaving complement components C3. and C4b. This process leads to converting plasminogen

to plasmin, which then activate of other proteolytic enzymes, including matrix metalloproteinases, resulting in degradation of the tight junctions of microvascular endothelial cells. The bacteria will be able to migrate to peripheral tissue and invade the CNS.⁽²⁰⁾ Cpa. help bacteria to avoid serum-mediated killing together with the persistence within macrophages and other phagocytic cells gives the organism an advantage so it can survive in the blood stream, multiply, cause bacteraemia, and potentially reach vital organs such as the brain and the meninges. Degrading the components of the tight junctions resulting in the migration of the bacterial cells leading to more damage to the infected organ or tissue.

Zpx. gene encodes by BAM122 and BAM123 primer was obtained in 16 (100%) of isolates. This result agree with⁽¹⁸⁾ who revealed (100%) of *C. sakazakii* from some food and dust samples have *Zpx*. gene.

Zpx. is one of the important virulence factors that cause and associated with many diseases, In 2007, a study performed by.⁽²¹⁾ discovered a cell-bound zinc-containing metallo-protease (*Zpx*.) and showed that it is interact with the protease substrate azocasein, which led to rounding of Chinese hamster ovary (CHO.) cells in tissue culture.⁽²¹⁾ In addition to its a key role in allowing *Cronobacter* to disrupt the cellular junctions of the GI tract or CNS. leading to either NEC. or meningitis, respectively. In 2008, Hunter *et al.* performed a study using an infant rat model that implicated over-expression of interleukin-6 (IL-6) and the *Zpx* protein to playing a key role in the pathogenicity of *Cronobacter* spp. associated NEC infection.⁽²²⁾

Conclusion

C. sakazakii do exist and can be isolated from clinical sources (from sites of infections such as stool of patients with diarrhea and burns) as well as from the environment of hospitals not just from their natural sources. Difficulty of its diagnosis by the conventional methods due to some variations in the results of some recognized biochemical tests as indole according to its strains. There is no limited age for the patients infected with these organism contrary to most references which confirmed that “these bacteria affect newborns and infants only”. *C. sakazakii* in the present study is human-health thereat due to presence of virulence genes.

Source of Funding- Self

Ethical Clearance – Not required

Conflict of interest: **None**

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Comparison of Hemorrhoidectomy by Ligasure with Conventional Milligan Morgan's Hemorrhoidectomy

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Abstract

Hemorrhoidal disease is one of most common anorectal disease and surgical hemorrhoidectomy remains one of most common operation in general surgery. The aim of the present study is to compare between conventional Milligan-Morgan hemorrhoidectomy and ligasure hemorrhoidectomy in treating patients with 3rd and 4th degree hemorrhoids. This randomized control trial was conducted at Alfayhaa teaching hospital during 2016 to 2018. The 3rd and 4th degree hemorrhoid patients (n=60, age 16-70 years) were randomly divided into two groups based on the surgical procedure, i.e. ligasure hemorrhoidectomy (n=30) and conventional hemorrhoidectomy (n=30). In ligasure hemorrhoidectomy, operative time, pain score on the 1st operative day and 1st week, duration of wound healing were 12.2 ± 03 , 4.1 ± 05 , 5.3 ± 02 min and 3.1 ± 02 , respectively. While in the conventional hemorrhoidectomy, it was 23.3 ± 02 , 6.2 ± 03 , 2.1 ± 09 min and 4.4 ± 07 , respectively. In ligasure hemorrhoidectomy 15 patients didn't have blood loss, 10 patients had a mild blood loss and 5 patients had a moderate blood loss. While, in conventional hemorrhoidectomy all patients suffered from blood loss, i.e. 14 patients have mild blood loss and 11 patients have blood loss. In conventional hemorrhoidectomy postoperative bleeding, necrosis, residual disease and anal _____ stenosis _____ were 19.2 ± 03 (p<0.001); 02.5 ± 01 (p<0.01); 08.9 ± 08 and 01.5 ± 01 , respectively. While, in ligasure hemorrhoidectomy postoperative bleeding, necrosis and residual disease were reduced to 07.3 ± 07 ; 00.0 ± 00 and 04.9 ± 09 , respectively. Anal _____ stenosis _____ was found to be increased to 06.4 ± 06 as compared to the conventional hemorrhoidectomy. Ligasure hemorrhoidectomy is better than conventional hemorrhoidectomy in terms of less operative time, less intraoperative pain and less postoperative complication and earlier wound healing and return to daily work hence higher patient satisfaction.

Keywords: Ligasure hemorrhoidectomy, conventional hemorrhoidectomy, postoperative complication, residual disease

Introduction

The hemorrhoid is a common anorectal disease characterized by distal displacement or enlargement of anal cushion¹⁻³. Abnormal destructive changes and dilated vascular channel in the supporting tissues in the anal cushion are reported by the various authors⁴⁻⁵. Ample of literature available on the association of the tissue inflammation and hyper perfusion state of anorectal region.

Hemorrhoidal disease reported in approximately 5% of the general population, especially after age 40 years of age, due to normal anatomical component of anal canal and the treatment is indicated in symptomatic cases⁶. On the bases of hemorrhoids degree of prolapse and appearance, it can be graded in to four degrees⁷. They are known as Goligher's classification. IN the first-degree hemorrhoids (grade I), the anal cushions are bleed but do not show any sign of prolapse. The second-degree hemorrhoids (grade II) include anal cushions prolapsation through the anus on straining however it reduce spontaneously. In the third-degree hemorrhoids (grade III), anal cushions prolapse through the anus on exertion or straining and it involve manual replacement into the anal canal. In the fourth-degree

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hemorrhoids (grade IV), the formed prolapse remains out at all times and is irreducible. However, the variation in the 4th stages are also seen in many patients. Incarcerated internal hemorrhoids, elevated numbers of incarcerated, thrombosed with or without hemorrhoids involving circumferential rectal mucosal prolapse are a few variations observed among the patients⁸. In the present study we focused on the 3rd and 4th degree of hemorrhoids.

Many surgery options are available for the patients based on the hemorrhoids degree, age, complications etc⁹⁻¹¹. The main and ultimate treatment for 3rd and 4th degree hemorrhoids is hemorrhoidectomy¹². Traditional Milligan Morgan hemorrhoidectomy is open surgical procedure in which the hemorrhoid pedicle is ligated by transfixing suture. This may lead to postoperative complications, mostly pain, bleeding and wound infection¹³. Many surgeon believes that by avoiding vascular pedicle ligation, the chance of secondary bleeding can be decrease⁹⁻¹³. Because it may lead to ischemia and necrosis. Additionally, if sutures are applied deeply, then they can also cause firm scarring at anus later on. To avoid this problem, ligasure are used by the practitioner. In this surgery procedure, the transfix vascular pedicle of hemorrhoids are not used instead they seal them by Ligasure. The Ligasure vessel sealing system is a bipolar electro thermal device which seals blood vessels by a calculated arrangement of pressure and radio frequency. With is background, in the present study, we aim to compare between conventional Milligan-Morgan hemorrhoidectomy and ligasure hemorrhoidectomy in treating patients with 3rd and 4th degree hemorrhoids.

Material and Method

This randomized control clinical study was carried out at the Alfayhaa teaching hospital during a period from may 2017 to may 2018. The study enrolled 60 patients diagnosed with 3rd and 4th degree hemorrhoids. They are randomly divided into two groups i.e. ligasure hemorrhoidectomy treated patients (n=30) and conventional Milligan Morgan hemorrhoidectomy treated patients (n=30).

The inclusion criteria were patients above 16 year age with diagnosed 3rd and 4th degree hemorrhoid. Patients with previous anal surgery, anticoagulant therapy, immunosuppressed patients and under 16 years were excluded from the study. All patients were subjected to

history taking, clinical examination and investigations, including complete blood count, coagulation profile, liver function tests, kidney function test, fasting blood sugar, ECG, anoscopy or sigmoidoscopy. Before the surgical procedure, cefalosporine (1gm) were given intra-venously to the both groups.

Surgery procedure for ligasure hemorrhoidectomy

The hemorrhoidal complex is grasped by Allis clamp with artery forceps. So that skin elevation can be seen at the junction between hemorrhoid and peranal skin. The ligasure device was applied. The dissection was started in this plane, with sparing the sphincter in anal canal till the pedicle of hemorrhoid appear. The pedicle of hemorrhoid can be sealed twice to ensure it is devascularized and reduced postoperative bleeding. A similar procedure was done for 2nd and 3rd hemorrhoids with skin bridges between them. The anal pack was used if needed.

Surgery procedure for conventional (Milligan-Morgan) hemorrhoidectomy

The anal retractor was introduced to visualize the surgical field. Allis artery forceps were placed on the external component at the three main sites. Traction on these prolapse the internal components, relevant two artery forceps were grasped in the palm of left hand and the index finger extended anally to define the triangle of exposure. The mayo scissors were used to incised the skin. The external component was dissected off the underlying superficial external anal sphincter and separated the internal component from underlying internal anal sphincter, continually narrowing down the pedicle, and transfix and ligate the pedicle. The operation then proceed for the another two hemorrhoids. Hemostasis is checked and anal pack is used to ensure hemostasis.

Statistical Analysis

The data were represented as a mean and standard error. The statistical analysis was perform by one way analysis of variance (ANOVA).

Results

The Age of the patients ranged between 16 and 70 years old with a mean 38.9 years. Regarding Sex, male patients in the study were 20 representing 66.66%. Female patients were 10 representing 33.33% of patients

participated the study in the conventional group and male patients were 23 representing 76.66%, and female patients 07 representing 23.33% of patients in Ligasure group (Table 1).

Table 1. Gender wise variation of patients

	Conventional	Ligasure
Male	20 (66.66%)	23 (76.66%)
Female	10 (33.33%)	07 (23.33%)

Table 2 reveals features of hemorrhoids as compared between ligasure and conventional hemorrhoidectomy methods regarding operative time. In ligasure and conventional hemorrhoidectomy the operative time were 12.2 ± 03 and 23.3 ± 02 min. In ligasure and conventional hemorrhoidectomy, the pain score on the 1st operative day were 4.1 ± 05 and 6.2 ± 03 . The pain score on 1st week postoperative were 5.3 ± 02 and 2.1 ± 09 min in ligasure and conventional hemorrhoidectomy. While, duration of wound healing were 3.1 ± 02 and 4.4 ± 07 in ligasure and conventional hemorrhoidectomy.

Table 2. Feature of ligation and conventional hemorrhoidectomy method

	Ligasure hemorrhoidectomy	Conventional hemorrhoidectomy	p value
Operative time (min)	12.2 ± 03	23.3 ± 02	0.001
Pain scores 1st day	4.1 ± 05	6.2 ± 03	--
Pain scores 1st week	5.3 ± 02	2.1 ± 09	--
Duration of wound healing	3.1 ± 02	4.4 ± 07	--

Table 3 shows the variation of intraoperative blood loss in both groups. In ligasure hemorrhoidectomy 15 patients didn't have blood loss, 10 patients had a mild blood loss and 5 patients had a moderate blood loss. While, in conventional hemorrhoidectomy all patients suffered from blood loss, *i.e.* 14 patients have mild blood loss and 11 patients have blood loss.

Table 3. Variation of blood lost during operation

	Ligasure hemorrhoidectomy	Conventional hemorrhoidectomy
No blood loss	15 (50.00%)	00 (00.00%)
Mild blood loss	10 (33.33%)	14 (63.33%)
Moderate blood loss	05 (16.66%)	11 (36.66%)

Table 4 shows complications from hemorrhoidectomy in comparison between two surgery procedure. In conventional hemorrhoidectomy postoperative bleeding, necrosis, residual disease and anal stenosis were 19.2 ± 03 ($p < 0.001$); 02.5 ± 01 ($p < 0.01$); 08.9

± 08 and 01.5 ± 01 , respectively. While, in ligasure hemorrhoidectomy postoperative bleeding, necrosis and residual disease were reduced to 07.3 ± 07 ; 00.0 ± 00 and 04.9 ± 09 , respectively. Anal stenosis was found to be increased to 06.4 ± 06 as compared to the conventional hemorrhoidectomy.

Table 4. Complications

Complication	Ligasure hemorrhoidectomy	Conventional hemorrhoidectomy	P value
Bleeding	07.3 ± 07	19.2 ± 03	0.001
Necrosis	00.0 ± 00	02.5 ± 01	0.01
Residual disease	04.9 ± 09	08.9 ± 08	--
Anal stenosis	06.4 ± 06	01.5 ± 01	--

Discussion

Now a day also conventional hemorrhoidectomy was recommended to many patients showing irreducible and symptomatic piles¹⁴. However, many reports are available about the comparison of conventional hemorrhoidectomy and recent more advance surgery procedure¹⁴⁻¹⁸. The comparison of conventional hemorrhoidectomy with ligasure hemorrhoidectomy were also reported by many researchers¹⁶⁻¹⁸.

In the randomized trials on the 850 patients, significant improvement in wound healing, postoperative pain, and time off work was reported with comparable complications and postoperative bleeding in both ligasure and conventional hemorrhoidectomy¹⁷. However, in the present study no significance improvement was observed in the wound healing as compared to conventional hemorrhoidectomy. Kraemer et al.¹⁹ reported Ligasure haemorrhoidectomy reduces in the postoperative pain and slide improvement in radiofrequency in 4th stage piles patients as compared to stapled haemorrhoidectomy. Our study is accordance with this report.

Mastakov et al.¹⁸ reported that the ligature hemorrhoidectomy was a more effective treatment than other hemorrhoidectomy surgery procedure. The study was based on the eleven trials of 1046 patients and their large meta-analysis. The complication incidence was also reported to be very low¹⁸. In the present study, ligature hemorrhoidectomy found to be reduce operative time, postoperative pain in 1st day and 1st week as compared to hemorrhoidectomy surgery procedure.

In the prospective multicentric randomized trial (n=273), LigaSure treatment showed significant improvement in faster return to work, shorter operating time with reduction in postoperative pain. However, complication occurrence and postoperative bleeding

was non-significant differs¹⁶. About 50% patients did not show any blood loss after surgery. The data is accordance with the previous reports.

Conclusion

Ligasure hemorrhoidectomy is found to be an effective method as compared to conventional hemorrhoidectomy in terms of less intraoperative pain and operative time, and less postoperative complication and earlier wound healing with the maximum frequency of return to daily work.

Ethical Clearance: Ethical clearance taken from Al Fayhaa teaching hospital.

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Women's Reactions and Health Disorders Caused by Abuse During the Pregnancy-Postpartum Period

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Abstract

The purpose of this study was to determine women's reactions to violence, and reproductive health problems as a result of violence, during the pregnancy-puerperal period. The study was conducted in two villages of central Sulawesi: Sunju Village in Sigi Biromaru Regency and Tanjung Batu Town in Donggala Regency. The main population of interest was married women of childbearing age who were pregnant, in the puerperal period, had been pregnant, had given birth a maximum of 2 years previously, or who had experienced violence in the past. The data collection was completed through structured interviews, in-depth interviews, observations, and a Focus Group Discussion (FGD). The results showed that women who are victims of violence generally go to traditional midwives for childbirth, while women in town in general go to rural midwives. The typical response of wives to reproductive health problems is silence, and this is the first choice of reaction for victims of violence in villages and cities. However, if the violence is considered to endanger the health and safety of their lives, women in the village generally report the violence to a customs agency called "Pabisara Ada", while women in town choose to fight or avoid it, rather than to report their husband's actions.

Keywords: reproductive health; responsibility; violence

Introduction

The ideal conditions desired by women for healthy reproduction are liberation from pain and disease, the ability to perform and enjoy safe sex activities, the ability to have descendants and undergo pregnancy and childbirth safely, the ability to regulate fertility without compromising their health, and the ability to go through their pregnancy with a healthy baby and mother¹. The prevalence of violence towards pregnant and nursing women has increased over time. In the study area there were 71 cases of violence in 2010–2012, which increased to 91 cases in 2013–2015³. Pregnancy demands extra attention and awareness by the husband, both physically and mentally; however, many women experience violence during this time. Data shows that in the period from 2010 to 2012, there were 11 cases of violence towards expectant mothers, and this increased to 27 cases in 2013 to 2015³. In this paper, we seek to understand the reaction of women to violence, and the prevalence of health disorders caused by violence during the pregnancy-puerperal period.

Materials and Method

This study was conducted in Sunju Village (rural area) in Sigi Biromaru Regency and Tanjung Batu Town (urban area) in Donggala Regency, Central Sulawesi. When the study was conducted, Sunju Village and Tanjung Batu Town were included in Donggala Regency. Now, they have been separated; Sunju Village is included in Sigi Biromaru Regency and Tanjung Batu Town is included in Donggala Regency. Samples were taken from married women of childbearing age who were pregnant, in the postpartum period, had experienced pregnancy and child birth within the last 2 years, or who were suffering from violence at the time. This study had 94 respondents. Data were collected through interviews, focus group discussions (FGD), and observations.

Results

Responses of Women to Reproductive Health Problems

In Table 1, it can be seen that the total number of

victims seeking care from a midwife was 39.7%.

Table 1. Places where help was sought for reproductive health problems.

Place of Treatment	Sunju		Tanjung Batu		Total	
	n	%	n	%	n	%
	1	2	3	4	3	4
Traditional midwife	16	44.4	8	21.7	24	32.9
Doctor	1	2.8	6	16.2	7	9.6
Village midwife	11	31	18	48.6	29	39.7
Health Center	6	16.2	5	13.5	11	15.1
Not looking for treatment/ Self-treatment	2	5.6	0	0	2	2.7
Total	36	100	37	100.0	73	100

This phenomenon can be understood by that fact that almost all villages have a midwife who can be reached by the public. According to Adrina⁵ and Hakimi et al.⁶ the victims chose a village midwife because of the short distance required to travel to them. In addition, this type of midwife is deemed to meet the needs of pregnant women in terms of having knowledge and equipment that is modern and sophisticated than that of traditional midwives, thereby giving a general feeling of safety. These data are supported by qualitative data, including statements such as the following by Mrs. SW (31 years of age), from interviews and the FGD:

“At that time, I was arguing with my husband. I was heavily pregnant, and then his body banged me against the wall and then he dragged me. I was bleeding at that time. Yes, I was taken by my neighbor to midwife’s house, because I thought the traditional midwife had no medicine to stop the blood. I was given some medications there, then the midwife injected me, she said that it was to strengthen the pregnancy, yeah, thank God the bleeding stopped.”

In addition to the fact that the traditional midwives are able to keep secrets, women generally assumed that the cost of the treatment given by traditional midwives would also be cheaper:

“If we asked for help at the traditional midwife, she just asked to buy cigarettes, sometimes I bring 3 liters of beans or rice, while in the midwife I could pay up to 40,000Rp or more.”

Several other women (Mrs. Ng, Mrs. Dika, and Mrs. HJR) explained that they were

usually assisted by traditional midwives because they offer comfort and advice to them:

“Ina made me comfortable, she first asked, what’s wrong with you my daughter, then we were entertained by her, if we felt pain, or dizziness, she always advised, then she gave therapy as well so we felt calm. She prayed for us.”

Traditional midwives also seem to care about the pregnancy complications experienced by women.

Several advantages of this midwife were noted by the women in this study. Village midwives often provide an opportunity for victims to make several payment installments. Mrs. Neni (26 years old) stated

“Midwife is preferred, although it is a bit pricey. The payment can be repaid at the health center. Midwives can also be approached easily both day and night, while health center services is confined only in the mornings.”

Reproductive health services through midwives not only treat complications of pregnancy or bleeding, but they also help with childbirth and venereal diseases and provide contraceptive services. Some women said that they had a normal childbirth; some had babies born prematurely. Mrs. Sisi (32 years old) stated

“Since my husband had slapped me, I often had a fever. At the time, I returned from the market after

trading. When I arrived home, I washed, mopped, then I cooked. Immediately my body felt limping at all. I took Vitamin C. Not long after that, I felt that there was blood coming out of my womb, then I went to midwife's house. "

In addition to the above forms of help, midwives can treat venereal diseases, as expressed by Mrs. Jm (28 years old). She was reluctant to go to the health center because it was considered disgraceful:

"My genital was swollen. She said that it was like that, genital was swelling and itching. I went to traditional midwife and she fetched the bark of Java, then laced with areca and betel, and cooked it. She then taped it in my genital parts. For one month I treated it regularly and eventually my genital is dry and does not itchy anymore.

Especially for abortion services, it seems that traditional midwives and midwives in the village have the same view. They steadfastly refuse to perform abortions if they are asked for help. Abortions are very difficult to talk about openly. Mrs. An (30 years old) from Tanjung Batu Town, who had an abortion, expressed the following in an interview:

"I aborted my pregnancy in a place that is located quite far from here. Its location is in the Pasang Kayu, North Mamuju, West Sulawesi.

The low control of women over their reproductive rights, especially in terms of the decision to have an abortion, is certainly not new in the community, which embraces the values of the patriarchy¹⁰⁻¹².

Women may be pressured by their husband or the surrounding community, while at the same time the facilities and the support they need is not available. Related to this discourse, although provisions for abortions exist in Clauses 1 and 2 of the Health Act No. 23 of 1992, the opportunity to have an abortion is only available in the case of an emergency, as an attempt to save the lives of pregnant women or their babies. These provisions need to be reviewed. These conditions often mean that women's needs are neglected, as stated by Catherine A. McKinnon:

"Policy on abortion is never explicitly approached contextually, namely by taking into account the circumstances of the time a woman is impregnated by her partner, that is, in the circumstances specified by

gender inequality that, as a result, women are forced to have sexual relationship."

Another place women use for reproductive health services is the health center. An assortment of reasons for this were expressed by the respondents, for example, Mrs. Mila (32 years old) from Sunju Village stated

"If I got sick, I tried to go to traditional midwife first, but if I was not cured, I would go to the health center."

Most respondents said that they rarely go to the health center because of remoteness and limited service time. Mrs. Neni (26 years old) recognized the problem as follows:

"Health center are quite far from here. It is also open only until 11 o'clock, so if we were sick in the evening then the least is we should go to the midwife or call traditional midwife."

Although the respondents tended to have a number of grievances, it seems that not much can be done by health workers in health centers given the limited availability of medicines, the lack of understanding about women's reproductive health, and the tendency to consider the complaints of women as not being important. Often, the answer given to the respondents was, "never mind Ma'am, you will be cured if you have been given a drug". In addition to the services of health workers being less friendly, health center services also tend to be complicated and slow to access.

3.2. Respondent's Responses to Violence

Respondents reported an assortment of reactions to violence. The reactions of victims of violence were classified into four categories: silence, avoid, resist, and report. In general, respondents' reactions to violence were affected by the impact they experienced. If the violence experienced was considered mild, respondents generally tended to be silent or avoid it, whereas when the impact was painful, the victims tended to complain, resist, and report^{19,20}.

This facility has long existed in the village, so the villagers affected by violence are likely to know the details of the reporting procedure or complaint process. Meanwhile, in Tanjung Batu Town, there are no indigenous village councils. In the town, although silence was shown to be the preferred response, the percentage of respondents who reported quite a lot of resistance was 20.7%; however, in the village it was

only 13.1%. This is due to the fact that awareness of respondents of their rights has begun to increase.

Table 2. Respondents' reactions to violence in Sunju Village and Tanjung Batu

Respondents Reaction to Violence	Sunju		Tanjung Batu		Total	
	n	(%)	n	(%)	n	(%)
	1	2	3	4	3	4
Silent	15	41.7	28	48.3	43	45.7
Resist	5	13.9	12	20.7	17	18.1
Report	12	33.3	6	10.3	18	19.1
Avoid	4	11.1	12	20.7	16	17.0
Total	36	100.0	58	100.0	94	100.0

The places to report or complain included the village traditional council, the headman, police, friends, family, and neighbors. Table 3 shows that, in general, the respondents complain to a friend (39.1%). This is because friends can keep conflicts secret and help find a solution before the incident gets worse

Table 3. Places used to report or seek protection by respondents.

The Place to Report for Seek Protection	Sunju		Tanjung Batu		Total	
	n	(%)	n	(%)	n	(%)
	1	2	3	4	3	4
Village Traditional Council	10	27.8	0	0.0	14	14.9
Headman	4	11.1	9	15.5	15	16.0
Police	0	0.0	7	12.1	7	7.4
Neighbors	2	5.6	4	6.9	6	6.4
Friends	14	38.9	23	39.7	33	35.1
Family	6	16.7	15	25.9	19	20.2
Total	36	100.0	58	100.0	94	100.0

In the town, the place used to report or complain tended to be family (25.9%). This was possibly because violence was reported to cause severe problems, such as husbands getting remarried and women getting slapped. In general, this occurred more in the town. A neighbor of a respondent (Mrs. Leni, 42 years old) confirmed that view. She argued that tackling a violent husband could result in major problems, such as the husband remarrying or giving a beating; thus, for minor issues, in general, the woman will just cope herself.

This reinforces the findings of Khaeruddin²¹ and Hayati⁶, that the service of law enforcement officers in the handling of women victims of violence is not adequate, which makes victims reluctant to report

violence to the authorities^{22,23}.

Conclusions

Silence is the common reaction of respondents in both villages and towns to violence. However, if violence is considered to endanger their health and safety, the village respondents generally report it to the customs agency "Pabisara Ada", while respondents in the town prefer to fight or avoid it than report it.

Handling of violence by pregnant women in the two regions remains piecemeal. In the town, the management of violence against pregnant women is done by police. The services provided tend to be convoluted, take a long time, and are costly, with inadequate facilities and

handling by officials who are not sensitive to gender issues.

Conflict of Interest: We declare that this research there is no conflict of interest

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The Culture and Age of First Marriage on Female Teenagers in West Marawola

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Abstract

Age of First Marriage is the age at which a person is legally and biologically married for the first time. According to UNICEF, the percentage of women who decide to get child marriage in the world throughout 2016 is 12 million. Southeast Asia and Asia-Pacific are the highest in the number of child marriage. In Southeast Asia, Indonesia ranks second highest for child marriage. The purpose of the study was to determine the factors associated with the age of first marriage in young women in West Marawola Sub-District. This research was categorized as quantitative research with *cross-sectional* approach. The population was young women aged 10-24 in the West Marawola Sub-District with a percentage of 988 people taken as the sample (*Proportionate Stratified Random Sampling*). The analysis was conducted using univariate and bivariate analysis at a confidence level of 95% (). The chi-square test results showed that Knowledge ($=0,001$), Parental Support ($=0,000$), Culture ($=0,040$), and Family Planning Instructor ($=0,037$) are related to the Age of First Marriage. It is expected that this research is able to socialize the age of marriage, so that young women can delay their marriage.

Keywords: *Age of first marriage, Knowledge, Parental Support, Family Planning Instructor.*

Introduction

Child marriage is a marriage conducted a couple in not ideal age, either men or women, when they are not in ideal age, if a marriage is still held, it can be said as child marriage. The government program, in this case the BKKBN (National Population and Family Planning Board), said that the ideal age for marriage is 21 years old for women, and 25 years old for men.¹

Globally, it is estimated that 12 million women decide to get child marriage in the world. Southeast Asia and Asia-Pacific are the highest in the number of child marriage. In Southeast Asia, Indonesia ranks second highest for child marriage as 1 in 3 children gets child marriage. There is a relationship between child marriage and poverty and the low education opportunities.²

In Indonesia, the average age of first marriage (UKP) is 20 years, and this has not yet reached the targets of the National Population and Family Planning Board (BKKBN) for at least 21 years old for women and 25 years old for men.³

In Central Sulawesi Province, the average Age of First Marriage is 19 years old from the percentages of 459,795 couples of childbearing age in total, with the percentage for married wives <21 years old of 57.29% and the percentage of married husbands <25 years old of 21.34%. Central Sulawesi ranked the second highest for age of first marriage in Indonesia (BPS, 2017). Sigi was one of the highest average age of first marriage of 19.96 years old with a percentage of married wives <21 years old was 59.08% and a percentage of married husbands <25 years old was 25.67%. The age of first marriage in Marawola Barat District was the highest, with a total of 1,427 couples of childbearing age, the percentage of married wives <21 years old was 73.56% and the percentage of married husbands <25 years old

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was 76.45%⁴.

Materials and Method

This research is categorized as an analytical survey research with a quantitative approach. This research used *Cross-Sectional* design, where the cause or risk variables and the consequences or cases that occurred in the research object were measured or collected at the same time.

The population in this study was young women aged 10-24 years, as many as 988 people in Marawola Barat Sub-District, Sigi Regency, Central Sulawesi Province. There were 91 respondents taken as the sample of the research using the Slovin formula. The sampling was conducted using *Proportionate Stratified Random Sampling* or simple random sampling, which used certification technique.

Results

Based on the research conducted in West Marawola Sub-District, the characteristics of respondents can be seen in the following table:

Table 1: Characteristics of Respondents

Characteristics	F	%
Age		
10-12 Years Old	1	1.1
13-15 Years Old	10	11.0
16-18 Years Old	34	37.4
19-21 Years Old	25	27.5
22-24 Years Old	21	23.1
Total	91	100.0
Age of first marriage		
<21 Years Old	78	85.7
≥ 21 Years Old	13	14.3
Total	91	100.0
Educational Background		
Elementary School	11	12.1
Junior High School	45	49.5
Senior High School	33	36.3
University	2	2.2
Total	91	100.0
Parents' Educational Background		
Not Graduated from Elementary School	2	2.2
Elementary School	14	15.4
Junior High School	51	56.0
Senior High School	24	26.4
Total	91	100.0

Most of respondents have Junior High School Education with a percentage of 49.5%, and most of their parents have Junior High School Education with a percentage of 56.0%. Factors related to the age of first marriage in female teenagers in Marawola Sub-District:

Table 2: Factors related to the age of first marriage in female teenagers in Marawola Sub-District

Knowledge	Age of first marriage				Total	P
	<21 Years Old		≥ 21 Years Old			
	F	%	F	%		
Poor	53	96,4%	2	3,6%	55	0,001
Good	25	69,4%	11	30,6%	36	
Total	78	85,7%	13	14,3%	91	
Parental Support						
Good Support	66	94,6%	4	5,7%	70	0,000
Less Support	12	57,1%	9	42,9%	21	
Total	78	85,7%	13	14,3%	91	
Culture						
Good Support	51	92,7%	4	7,3%	55	0,040
Less Support	27	75,0%	9	25,0%	36	
Total	78	85,7%	13	14,3%	91	
Family Planning Instructor						
Bad	61	91,0%	6	3,6%	67	0,037
Good	17	69,4%	7	30,6%	24	
Total	78	85,7%	13	14,3%	91	

Of 36 people who have good knowledge, there are 25 people (69.4%) got married at the age of <21 years. The statistical test resulted in $\rho = 0.001$, so that $\rho < 0.05$, thus, H_0 in this study was rejected, means that there is a relationship between knowledge and Age of First Marriage in West Marawola Sub-District.

The data in table 2 shows that from 70 people who give parental support to their children, there are 66 people (94,6%) have their children married at the age of <21 years. While from 21 people who give less parental support to their children, there are 12 people (69.4%) have their children married at the age of <21 years. The statistical test resulted in $\rho = 0,000$, so that $\rho < 0.05$, thus, H_0 in this study was rejected, means that there is a relationship between Parental Support and Age of First Marriage in West Marawola Sub-District.

The data in table 2 shows that from 55 people (92.7%) who have a good cultural support, there are 51 people (92.7%) got married at the age of <21 years. While from 36 people (75.0%) who have a poor cultural support, there are 27 people (75.0%) got married at the age of <21 years. The statistical test resulted in $\rho = 0.040$, so that $\rho < 0.05$, thus, H_0 in this study was rejected, means that there is a relationship between culture and Age of First Marriage in West Marawola Sub-District.

The data in table 2 shows that 67 people accompanied by the bad PLKB (Family Planning Instructor), there are 61 people (91.0%) got married at the age of <21 years. While from 24 people accompanied by the good PLKB (Family Planning Instructor), there are 17 people (69.4%) got married at the age of <21 years. The statistical test resulted in $\rho = 0.037$, so that $\rho < 0.05$, thus, H_0 in this study was rejected, means that there is a

relationship between PLKB and Age of First Marriage in West Marawola Sub-District. child marriage⁹

Discussion

Knowledge and Age of first marriage

Knowledge is the result of knowing from humans who simply answered the “*what*” questions happen after they conduct imaging on a particular object.⁵

The statistical test resulted in $\rho = 0.001$, so that $\rho < 0.05$, thus, H_0 in this study was rejected, means that there is a relationship between knowledge and Age of First Marriage in West Marawola Sub-District. There were more respondents with the Age of First Marriage < 21 years who have poor knowledge compared to those who have good knowledge.

This research is in line with the research conducted by Priyanti *et al.*⁶ which, based on the results of Chi-Square analysis, found a significance level of $\rho = 0.001 < 0.05$ which statistically proved that there is a relationship between knowledge of respondents and child marriage.

The results of this research are in line with the research conducted by Dwinanda *et al.*⁷. Based on results of the analysis on the analysis on the respondents with poor knowledge, from 55 respondents who have good knowledge, there were 14 respondents (87.5%) got child marriage and 2 respondents (12.5%) did not get child marriage.

From 36 respondents with good knowledge, there were 25 people (69.4%) got married at the age of < 21 years and 11 people (30.0%) got married at the age ≥ 21 years. This is because they already know about the risks of child marriage, which has an impact on their future, now and in the future. The results are in line with the study conducted by Smith *et al.*⁸ that there is no relationship between knowledge and the high rate of child marriage in the Philippines.

Parental Support and Age of first marriage

In society, there are some parents or family members who consider child marriage as a common phenomenon. There are many parents in traditional societies still believe that investing in a girl’s education is wasteful, as she is only going to get married and being a housewife in the future. This concept is strongly influencing the illiterate fathers, fathers with lower level of education have a higher tendency to have their daughters conduct

The statistical test resulted in $\rho = 0,000$, so that $\rho < 0.05$, thus, H_0 in this study was rejected, means that there is a relationship between Parental Support and Age of First Marriage in West Marawola Sub-District. This research is in line with the research conducted by Desiyanti¹⁰, that from 34 respondents (68.0%) stated parental support to their daughters to get child marriage as it will improve their economy and to have the better economy, because their daughters will be supported by their husbands who have great capital that raises an understanding that the marriage of their daughters will improve the economy of the parents.

The results obtained at the location of the study showed that from 70 people who give parental support to their children, there were 66 people (94.6%) have their children get married at the age of < 21 years as it is dominated by economic factors. Parents who cannot afford to pay for their living and school sometimes make their children to decide to get child marriage. This study is also in line with the research conducted by Naveed & Butt¹¹ on poor families with low education level that parents do not have the resources to send their daughters to school. Parents choose to let their daughters get married as early as possible to set free from responsibility.

Culture and Age of first marriage

Child marriage is a behavior learned by adolescents from the environment in which they live. The environmental influence in question is the existence of values and norms that develop in the community related to the existence of a young woman and the concept of marriage¹².

The culture of child marriage is a culture that has become customary law and is still preserved nowadays which is carried out in several ways, such as arranged marriages, spells (witchcraft), and prohibition the younger sibling to get married before the older sibling to avoid the older sibling to be a spinster, as if the younger sibling wants to get married before the older one, there must be dowry offered to the older sibling and so on.¹³

The statistical test resulted in $\rho = 0.040$, so that $\rho < 0.05$, thus, H_0 in this study was rejected, means that there is a relationship between culture and Age of First Marriage in West Marawola Sub-District. It is similar to the research conducted by Desire¹⁴ in Myanmar that support for child marriage is influenced by the

surrounding environment. The environmental influence in question is the existence of values and norms that develop in the community related to the existence of a young woman and the concept of marriage.

From 55 people (92.7%) who have a good cultural support, there were 51 people (92.7%) got married at the age of <21 years. This is predominantly because the customary law is still upheld by the people in West Marawola Sub-District, if there is a couple is dating and tends to do negative things, they will be forced to get married soon and pay fines or customary sanctions apply in accordance with the provisions and the severity of the violation. As stated in the research conducted by Rahardjo & Imron¹⁵, it becomes a culture for young women to get child marriage since the environment and their peers experienced it.

Family Planning Instructor and Age of first marriage

The Family Planning Instructor (PKLB) is the spearhead of the Population, Family Planning and Family Development program that is given full duty, responsibility, authority and rights by authorized officials to carry out counseling, giving service, evaluation and development of the National Family Planning³.

The statistical test resulted in $\rho = 0.037$, so that $\rho < 0.05$, thus, H_0 in this study was rejected, means that there is a relationship between PLKB and Age of First Marriage in West Marawola Sub-District. This research is in line with the research conducted by Astuti, E (2014), The Role of Family Planning Instructor (PLKB) in Population Growth Control in Sungai Dama Village, Samarinda Ilir Sub-District was running poorly because there were still many people who do not understand the importance of KKBPK and the performance of PLKB was not maximal due to the lack of socialization and improvement of skills for the community, especially for adolescents, concerning reproductive health and child marriage.

The results obtained from the location of study showed that 67 people accompanied by the bad PLKB (Family Planning Instructor), there were 61 people (91.0%) got married at the age of <21 years. This is because the PLKB did not socialize the KKBPK programs, especially for the youth-friendly programs, related to reproductive health, preparation of family life, the far distance between each village, and the notion that information is not needed in West Marawola Sub-District.

This research is also in line with the research conducted by Mengistu¹⁶ in Ethiopia, that the Performance of Healthcare Personnel in disseminating information is very important, and it could be measured how many officers reach the goal of changing perspectives and behaviour in the success of Population, Family Planning and Family Development programs especially for the Maturity of Age of Marriage¹⁷.

Conclusions and Suggestions

Knowledge, parental supports, culture, and family planning instructors became the factors related to the age of marriage in young women in West Marawola Sub-District, so that it requires special attention from the government to embrace and provide awareness for young women, to provide opportunities and facilities in accessing information through KIE Maturity of Age of Marriage and to improve coordination related to cooperation with BKKBN in increasing public knowledge about the maturity of age of marriage.

Ethical Clearance- Taken from University Ethical committee

Source of Funding- Self

Conflict of Interest – Nil

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Mother's Behavior in Pregnancy-Puerperal Treatments and Reproductive Health Disorders

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Abstract

Maternal mortality rate in Sigi Regency in Central Sulawesi is quite high at 309 per 100.000 live births. The study aimed to determine the effect of knowledge on Antenatal Care (ANC), early detection of high risk and pregnant women postpartum behavioral care, reproductive health disorders, and to determine which factors are the most salient of these variables. The study was an analytical observational research with a population of 180 pregnant women and a sample of 180 pregnant women. Data was collected from February 2018 to June 2018 by interview using questionnaire, observation and FGD. Data analysis used was *Chi Square* at significance level of $p < 0.05$.

The research results showed that the mother's level of knowledge on *Antenatal Care* was low at 58.88%; the level of knowledge on early detection of high risk pregnancy was low at 56.66%, mother's behavior in pregnancy treatment was also poor at 55.55%, and prevalence of respondents with reproductive health disorders was 57.7%. Knowledge on ANC, early detection of high risk pregnancy, and mother's behavior in prenatal care had significant relations with reproductive health disorders ($p < 0.05$). Maternal knowledge becomes the most influential variable to maternal reproductive health disorder with P value = 0,001. It was found out that lack of mother's knowledge on antenatal care and late detection of high risk pregnancy, as well as behavior during pregnancy-*puerperal* period contributed to adverse reproductive health of women. and led to an increase in maternal and infant mortality rates in Sigi district of Central Sulawesi. As an intervention, the study recommends increased women's literacy in pregnant-*nifas* treatment as a preventive effort in improving women's reproductive health.

Keywords: *Pregnancy-Puerperal Period, Antenatal Care (ANC), Early Detection of High Risk, Healthy Behavior, Reproductive Health*

Introduction

To reduce maternal mortality significantly, early detection and treatment of pregnant women at risk should be improved, especially in primary service facilities. Therefore, early detection by health workers on risk factors and complications, as well as adequate treatment as early as possible, are necessary¹.

Factors causing high mortality rate can be direct and indirect. Direct causes are bleeding, preeclampsia, infection, and pregnancy complication². Indirect causes of MMR and IMR include completeness and accuracy in implementing Antenatal care, poor administration

of iron tablet and examination of hemoglobin which causes anemia in pregnant women³, poor knowledge of symptoms of high risk^{4,5}.

The purpose of the present study was to determine the relation between mother's knowledge on Antenatal Care (ANC), high risk early detection, as well as healthy behavior in pregnancy-*puerperal* treatment, and reproductive health disorders, and which factors are most influential on the three variables.

Materials and Method

This was an analytical observational study. The

research was performed in the working area of Tinggede Public Health Center, which covers 3 villages, i.e. Sunju, Tinggede and South Tinggede Villages from February 2018 to June 2018.

The following information were culled from the participants' medical records available at the Public Health Centers: personal identity, frequency and regularity of prenatal care (antenatal care ANC), immunizations, detection of high risk, number of abortions in the past activities during antenatal care, diet.

Additionally, a questionnaire consisting of 75 questions about knowledge of prenatal care (ANC), high risk pregnancy detection and mother's behavior during pregnancy that impacts reproductive health. Interviews were conducted during the prenatal care of mothers at the Tinggede Public Health Center of the three villages usually at 8:00 am to 12:00 pm. The researcher also observed the pregnant woman's home environment by going to the subjects homes in the afternoon until evening, and during Saturdays and Mondays every week.

Statistical analysis using chi square were performed on the relationship of the variables.

Population and Sample

The population was all pregnant women (second pregnancy) who have a child under two years old totaling 180 subjects. The sampling technique was total sampling.

The data collection was conducted through a series of measurements:

Measurement of knowledge on ANC using questionnaire with the indicators of Pregnancy

examination, Checkup frequency, Height measurement and weight, Blood pressure measurement , Measuring Upper Mid Arm, Measuring Height of Fundus Uteri, and TT Immunization

Measurement of knowledge on **early detection of high risk pregnancy using questionnaire** with the indicators of Too young to be pregnant (≤ 16 years old), Too slow to get pregnant, Too fast to get pregnant again (≤ 2 years), Too old to be pregnant (≥ 35 years old), Too long to be pregnant again (≥ 10 years old), Too many children (4 or more), Too old (≥ 35 years old), Too short (< 145 cm), Previous miscarriage, Previous birth involving (Being pulled by forceps/vacuum, Reaching into placenta, Administration of infusion/transfusion, and breech pregnancy).

Measurement of **healthy behavior in pregnancy treatment** using questionnaire with the indicators of Balanced daily menu, Favorite dishes and fruits, Hand washing habit, Bathing habit, Habit of wearing footwear, length of working hour and rest.

Measurement of **Reproductive health disorders using questionnaire with the indicators of** Bleeding, Infection, Miscarriage, Pregnancy complication, Fever/seizure, Premature birth, Low birth weight, Infant mortality.

Data Analysis

Univariate data analysis were performed for all study variables. Chi-square test was used to examine the correlation between independent variables and dependent variables (bivariate and multivariate). The level of significance was $p < 0.05$.

Results

Table 1. The relation between knowledge on ANC, early detection and high risk pregnancy, Healthy behavior in pregnancy treatment and reproductive health disorders

Variable	Reproductive health disorders				Total		P value
	Experienced		Not Experienced		N (180)	% (100)	
	n (104)	% (57.7)	n (76)	% (42.3)			
Knowledge on ANC							
Low	72	67.9	34	32,1	106	58.88	0.001
High	32	43.2	42	56.8	74	42.12	

Knowledge on early detection and high risk pregnancy							
Low	68	66.6	34	33.4	102	56.66	0.015
High	36	46.1	42	53.9	78	43.34	
Healthy behavior in pregnancy treatment							
Not healthy	68	68.0	32	32.0	100	55.55	0.015
Healthy	36	45.0	44	55.0	80	44.45	

Pregnant women who had unhealthy/poor behavior in pregnancy and puerperal treatment and reproductive health disorders were 68% and those who had healthy behavior in pregnancy and puerperal treatment and reproductive health disorders were 45%. Meanwhile, those who had no reproductive disease and had unhealthy/poor behavior were 32% and those who had healthy behavior were 55%.

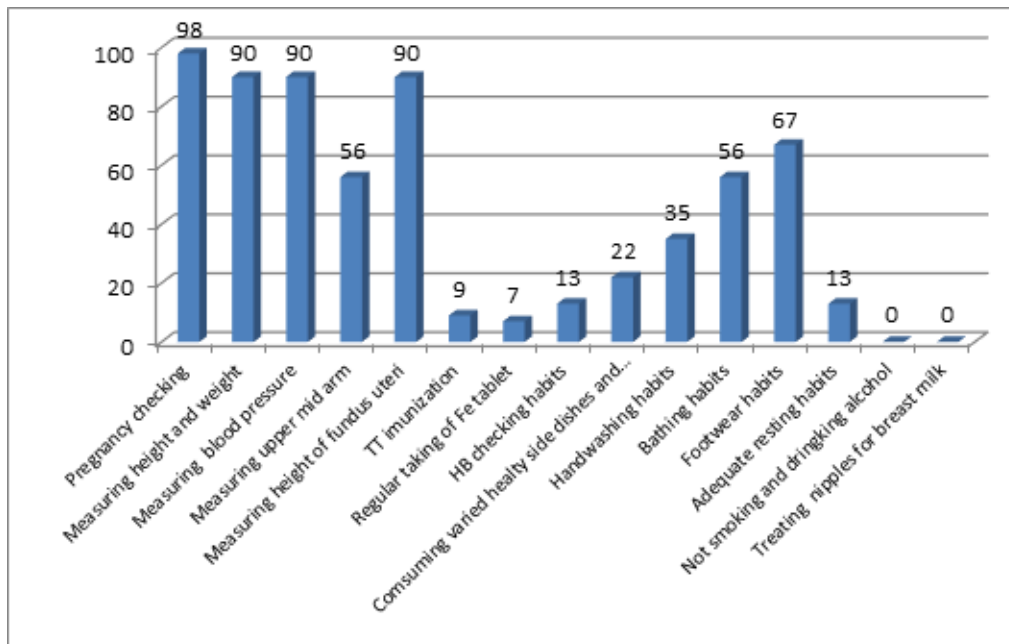


Figure 1.. Distribution of Mother's Behavior In Pregnancy-Postnatal Care Percentage

Table 2 shows maternal behaviors in prenatal care of pregnant women. Checking for pregnancy is highest (measuring height and weight, and measuring the height of the uterine fundus, which is a component of the examination performed at the first visit) with a value

of more than 90%. The lowest was treating nipples for breast milk (0%), resting habits (0%), regular taking of iron tablets (7%), tetanus toxoid immunization (9%) and Hb checking habit (13%).

Multivariate Data**Table 2. ANC Multivariate Test Results, Early Detection of High Risk, Mother Behavior, and Reproductive Health Disorders**

No	Variables	Model 1			
		P	B	OR	95% CI
1	ANC Knowledge	0.002	1.024	2.785	1.478 – 5.249
2	Early Detection Knowledge	0.535	0.574	0.563	0.092 – 3.458
3	Healthy Behaviour	0.111	1.474	4.369	0.714 – 26.731

The results of multivariate analysis showed that the most influencing variables of reproductive disorder were knowledge of ANC. Mothers who had knowledge of ANC had 2 times less higher risk for having reproductive disorder compared to mothers who had no good ANC knowledge.

Discussion

Table 1 shows that pregnant women with poor knowledge generally had reproductive health disorders (bleeding, infection, seizure, hypertension, low birth weight (LBW) and miscarriage) at 67.7%. Their low knowledge affected their health behavior, especially in the utilization of antenatal care, i.e. pregnancy examination, compliance in drinking Fe tablet, HB examination, counseling, etc.. This research indicated the importance of iron supplement during pregnancy, knowledge about anemia and iron-rich food during pregnancy. Educating antenatal women on the importance of consuming Fe tablet and regular taking of the iron supplement will help prevent bleeding⁶.

Moreover, there are many factors causing low knowledge on the importance of ANC services, including low level of education^{7,8}. Mother's level of knowledge affects information acceptance and attitude change, thus enhancing or lacking knowledge on nutrition for both women and fetus. Knowledge and access to antenatal care can lead to healthy condition of the mothers and healthy fetal growth. Educational attainment factor had significant relation with reproductive health of pregnant women and ability to look for knowledge on pregnancy-periperal treatments.

Further, the research results also showed that knowledge on early detection of high risk pregnancy

had significant relation with reproductive disorders with $p = 0.015$ ($p < 0.05$). Low knowledge level on early detection of high risk pregnancy made pregnant women and their families unaware of the symptoms of high risk pregnancy. This finding is consistent with Risk,⁹ study found that knowledge on preeclampsia affects maternal and infant mortalities. Women with high risk pregnancy require closer attention from their families and health care providers because they may not be able to distinguish these symptoms.

Table 1 shows that low knowledge of pregnant women led to risk of reproductive health disorders (bleeding, infection, seizure, hypertension, low birth weight (LBW) and miscarriage) at 66.6%. One's level of education is related to knowledge on many things, e.g. rationality in thinking, attitude and consideration of different factors, including early detection of high risk and their own high risk Rosmala-Nur¹⁰, and Abdullah¹¹ found that one's knowledge impacts the economic, social cultural, and political activities, as well as asserting women's rights to reproductive health in a patriarchal society.

Education level also determined how readily a pregnant woman absorbs and understands knowledge on early detection of high risk. Low education leads to limited knowledge on early detection, e.g. too young, too old for birth, too many children, short body height, etc., leading to pregnancy complication, bleeding, anemia, premature birth and even infant death. These findings were similar with the study of¹² which shows significant relation between low knowledge and reproductive health (e.g., bleeding) in pregnant women.

Anemia prevention affects incidence of postpartum bleeding according to Sulastri, Arina Maliya and Maliya study¹³. Education and socialization on health by health workers to get optimal level of health are still very necessary, especially in developing countries such as Indonesia as found by Mubasyiroh R, Tejayanti T¹⁴, and Rosmala-Nur and Mallongi¹⁵.

Another factor which affected low healthy behavior among pregnant women was husband's lack of support to the wife during pregnancy and puerperal periods. Rosmala-Nur¹⁰ found that low husband's participation among pregnant women whose reproductive rights weren't met were due to husband's domination in decision making in the family.

Furthermore, in Table 2 vividly shows that healthy behaviors during pregnancy such as pregnancy checking, measuring height and weight, measuring blood pressure, Measuring Upper Mid Arm, measuring height of fundus uteri, TT immunization, regular taking of Fe tablets, HB checking habits, consuming varied healthy side dishes and fruits, hand washing habits, bathing habits, footwear habits, adequate resting habits, not smoking and drinking alcohol, and treating nipples for breast milk impacted healthy outcome for both mother and child. Among the different healthy practices, the lowest behaviors were treating nipples for breast milk (0%), resting habits (0%), regular taking of Fe tablets (7%), TT immunization (9%), and HB checking habits (13%). All of these factors impacted maternal reproductive health. Pregnant women who do not have time to rest, work hard during pregnancy accompanied by not regularly taking Fe tablets were at risk for bleeding which affects the incidence of maternal deaths.

Routinely performed ANC are also useful for facilitating the passage of mutual trust between pregnant women and health workers, thereby cultivating a shared sense of responsibility for keeping pregnancy healthy until the birth process¹⁶. Thus if the expectant mother has no knowledge of ANC, it will affect her behavior during pregnancy and utilizing the pregnancy related services. The results of this study were in accordance with study revealed that one of the risk factors of maternal mortality is incomplete implementation of ANC among pregnant women because of lack of knowledge in the utilization of ANC services.

Pregnant women should have knowledge that high-risk pregnancies can be detected if they routinely submit

to prenatal care and check-ups. Included in this service is early detection of danger signs, as well as providing information about efforts to maintain pregnancy and prepare for the birthing process. High risk pregnant women are among those who suffer maternal deaths if not detected at the outset¹⁷⁻¹⁹. Thus it can be concluded that lack of knowledge of Antenatal Care (ANC) is a variable that greatly impacts the occurrence of reproductive health disorders in the regency of Sigi Biromaru, Central Sulawesi.

Conclusion

Pregnant women's level of knowledge on ANC and early detection of high risk and pregnant women's behavior in pregnancy-puerperal treatment affected reproductive health disorders such as bleeding, infection, seizure, hypertension, low birth weight (LBW)) and led to increased mortality and infant mortality rates in the research areas of Tinggede Public Health Center, Sigi Regency, Central Sulawesi.

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Ethical Clearance- Taken from university Ethical committee

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The Influence of Wedge Sea Hare (*Dolabella auricularia*) Extract and Papaya Juice on Hemoglobin (Hb) and Ferritin Levels of Mice Strain (Balb / C) with Anemia

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Abstract

The aim was to see the effect of wedge sea hare extract and papaya juice, on Hemoglobin and Ferritin levels of Mice Strain (BALB / c).

Method, True Design Experiment with Control Group, has been used. Mice were divided into 5 groups, each group 5 tails, reserves 5 tails. Intervention of mice was given a solution of collaborative compounds (a mixture of sea rabbit extract with papaya juice) for 21 days, with the distribution of the following doses: Group A, Control (-), Group B, Control (+), Fe tablets 0.65 mg / kg BW, Group C, dose treatment = 100 mg / kg BW of mice / day, Group D, dose treatment = 150 mg / kg BW of mice / day, Group E, dose treatment = 250 mg / kg BW mice / day. Blood is taken before and after treatment 21 days. Data Analysis using a Paired t-test and ANOVA statistical tests.

The results, statistical tests showed a significant difference in hemoglobin levels that were significant in the three treatments, between before and after treatment, with $P < 0.05$. This means that the administration of wedge sea hare extract and papaya juice can increase Hemoglobin levels in anemia mice, where there is a tendency to increase the average hemoglobin level along with the large dose of treatment given. Besides, it is also due to the presence of primer metabolic substances in papaya juice, such as vitamin C, Beta carotene, Calcium, Potassium, and Phosphorus.

Conclusion, there is a different increase in hemoglobin levels in the three forms of treatment between before and after treatment. This means that there is a significant effect of giving collaborative compounds to Hemoglobin levels in mice.

Keywords : *Wedge sea hare, Hemoglobin, Ferritin, Wedge Sea Hare extract, Papaya Juice.*

Introduction

The Basic Health Research in 2007 showed that the national prevalence of anemia (in urban areas) was 12.8%, of which 70.1% were IDA. This number increased to 21.7% in 2013,¹⁴. This showed that the biggest proportion of anemia is IDA. IDA, in general, may not be known and felt by children or parents, but its effect causes a decrease in aerobic endurance which will have a decreased physical ability to disrupt the child's growth and development itself,²⁰.

Wedge sea hare is a food source of animal protein that is not widely known by the public. Recent research has found that wedge sea hare is very rich in amino acids such as aspartic acid, glutamate, and glycine, moreover, the amino acid arginine which is an essential amino acid for growing children,^{8,17}. Providing food sources of vitamin C and β -Carotene greatly influences the mechanism of action of Fe in forming hemoglobin,²¹.

Hb is an element that contains Fe Fero (Fe 2+) as the main element of Hb. This Hb is present in erythrocytes, where each Hb is bound to one protein (globin) and four molecules of heme. Hb levels are often used as

indicators of anemia,⁶. Ferritin is an intact form of Fe deposits. Serum ferritin is an excellent indicator of iron reserves unless there are symptoms of inflammation and malignancy,². The objective of this research was knowing the effect of giving wedge sea hare extract, papaya juice, on Hb and Ferritin levels in Mice Strains (BALB / c) with anemia.

Materials and Method

Pre-clinical study research design, True Experiments with Control Group Design. Mice divided into 5 groups, each group of 5 animals, reserve 5 animals. The total number of samples was 30. The following groups of procedures form the treatment:

Group A = Control (-) given aquades

Group B = Control (+), Fe tablets 0.65 mg / kg BW / day,¹⁵

Group C = Treatment I, Collaborative fluid of wedge sea hares, papaya juice, dose = 100 mg / kg BW of mice / head / day = 0.75 mg / day

Group D = Treatment II Dose = 150 mg / kg BW = 2.25 mg / day

Group E = Treatment III Dose = 250 mg / kg BW / mice / day = 3.25 mg / day,

Experimental Animals (Mice strain BALB / c):

Mice weighing 25-35 grams/head, aged 8-12 weeks, healthy and free of pathogens, obtained from mice experimental animal farmers in the city of Kendari. Implementation of this research trial as a basis using the “Research Guidelines for Evaluating the Safety and Efficacy of Herbal Medicines” according to WHO standards.

Adaptation of Experimental Animals

Mice before being treated were acclimatized for 1 week. This process was carried out indoors with sufficient air circulation, the room temperature was maintained at standard conditions, ie 28 ± 2 °C, and humidity of 50 ± 10 % with a room lamp that has a cycle of 12 hours on and 12 hours off.

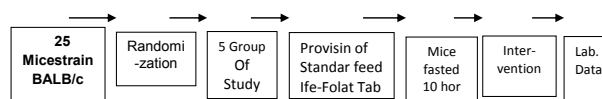
Sample size

The sample size was calculated using a modification of the Federer formula: 45 each test group consisted of

6 mice,¹¹.

Federer’s formula:	3n	≥ 18
(t-1) (n-1)	≥ 15	n
(4-1)(n-1)	≥ 15	≥ 6
3 (n-1)	≥ 15	Information :
3n-3	≥ 15	t = number of test groups
		n = sample size per group

The ideal sample size according to the Federer formula above was 6 or more mice. Thus, the total number of mice in all 5 test groups was 25.



Research design: *The pretest and posttest control group design*

The Making of wedge sea hare extract and papaya Juice

1. The making process of wedge sea hare extract

Wedge sea hare is gastropods living in shallow areas where there are algae. Wedge sea hares were taken from the coast of Toronipa, Soropia District, Konawe Regency. Wedge sea extract before being made, first rinsed 5-7 times to reduce salt levels, then dried without direct sunlight.

2. Making Papaya Juice

Papaya was taken from the Mandonga Mall market, Kendari City. Both papaya juice and wedge sea hare extracts were made in the Biopharmaca laboratory, Faculty of Pharmacy, Haluoleo University, Kendari. Thickening papaya was washed, peeled, cut into 10 x 7 cm sizes and blended until crushed, then filtered.

3. Making Combined Extracts (Collaborative Fluids)

After wedge sea hare and papaya extract were obtained, then preparations were made. The extract was then made into 4 comparisons between wedge sea hare and papaya juice, as followed :

1. 1.5 grams: 40 grams

- 2. 2.0 grams: 30 grams
- 3. 2.5 grams: 20 grams
- 4. 3.0 grams: 10 grams.

Then each of these comparisons was dissolved in Na-CMC until the volume became 100 mL.

Intervention Implementation (Provision of wedge sea hare extract and papaya juice)

1. Pathological Treatment of Anemia

The pathological treatment was through the administration of NaNO₂ with a dose used in each mice that is 3.75 mg dissolved in 1 ml of distilled water. The dose given was 0.3 ml/mice/ day,²⁰. This was done for all groups of mice.

2. Treatment (wedge sea hare extract and papaya juice)

Feeding mice must be careful because they must meet their nutritional needs and fluids. The need for food for mice ranges from 2-4 grams/day of dry matter or approximately 20% of body weight, while the water needs are only 3 ml/day. Collaborative fluids in this study were given orally using a gavage needle through a sonde⁵.

3. Initial and final blood sampling/examination:

Taking too much blood in small animals, causing hypovolemic shock, stress and even death. Blood sampling that was not according to the rules, caused anemia in experimental animals.

Results

a. Homogeneity Test

Table 1: Description of Homogeneity Test from the results of initial blood tests of mice (before treatment).

Variables	Number of samples	Mean Hb level (mg / dl)	Standard Deviation
Control (+)	5	5.88	3,7
Control (-)	5	3.90	0.88
Treatment-1	5	4.70	0.15
Treatment-2	5	4.60	0.34
Treatment-3	5	4.80	2.02

P-Value = 0,421

ANOVA statistical test showed a significance level $\alpha > 0.05$, H_0 was accepted, there was no difference in mean Hb levels between groups.

b. Hemoglobin levels before and after the intervention

Table 2: Mean Hb levels before and after treatment

Group	Hb Level	
	Before	After
Control (-)	7,42 + 3,39	8,30 + 2,22
Control (+)	4,00 + 0,83	11,76 + 2,67
Treatment-1	5,90 + 3,16	13,10 + 1,45
Treatment -2	6,00 + 3,30	13,06 + 1,39
Treatment -3	6,22 + 5,02	14,40 + 1,68

Table 2, there was a mean increase in Hb levels before and after treatment. In the treatment group, both treatments one, two and three increased Hb levels, compared with negative controls ($P < 0.05$). The mean increased in the three treatments was higher than the increase in positive controls (given iron folate capsules).

Table 3: Mean difference in hemoglobin levels before and after treatment

Group	Mean difference in Hb level	
	Difference	Standard Deviation
Control (-)	0,88	+ 3,25
Control (+)	7,76	+ 1,37
Treatment-1	7,20	+ 1,39
Treatment -2	7,06	+ 1,49
Treatment -3	8,18	+ 1,68

Table 3 showed the difference in Hb levels before and after treatment, where treatment groups one and treatment two had a difference in Hb levels that almost resembled positive control (iron-folat etablets) of 7.76 gr/dL, while in treatment three, instead, it exceeds positive control, which is 8.18 gr /dL.

4. Ferritin Levels

The results of the laboratory examination of Ferritin levels in this study could not be displayed as Hb levels, because the results of the examination showed un iformity among all groups, namely with a value < 0.500 µg/L.

Inferential Analysis

Paired t-test

Table 4: Paired t-test statistical test results:

Group	Mean	t – test	Sig (2-tailed)
Control (-)	-4,02	-1,74	0,155
Control (+)	-7,76	-6,45	0,003
Treatment-1	-7,20	-3,65	0,022
Treatment-2	-7,66	-12,38	0,000
Treatment-3	-8,66	-7,78	0,001

Table 4 showed the mean difference between the treatment group and the control group, both in treatments one, two and three ($P < 0.05$).

Discussion

Wedge sea hares are gastropods that are incorporated into the genus *Dolabella*, living in shallow areas where there are algae. Stated that wedgesea hares favor *Cladophora* green algae, *Cymodocearotunseagrass* data, and *Sargassumcristaefolium* brown algae species,²². The characteristics of this animal have a pair of tentacles found in the dorsal part. The ventral part of the wedge sea hare has a shell that covers the purple ink glands. Purple ink glands in wedge sea hares are used to protect against danger.

The compound in Rabbit Sea Extract

Phytochemical examination results prove that rabbit sea hare extract in this study contained several secondary metabolic active compounds, such as Saponin Flavonoids and Tannins. Research by Uffelle S.A. reported that active phytochemical compounds, namely flavonoids and tannins were very involved in hematological processes,²⁰.

Compounds in Papaya juice

In the Indonesian Food Composition Table-(2018), fresh papaya contains several primary metabolic nutrients such as vitamin C, Beta carotene, Thiamin, and the minerals Ferum, Calcium, and Potassium. A study explained that Fe absorption is strongly influenced by things such as the level of Fe deficiency, the level of body Fe availability, gastric acidity, the availability of vitamin C, the presence of Phosphate and Fitat,¹⁹. Hoffbrand & Moss explained that for the formation of hemoglobin, iron is transported by transferrin proteins to erythroblasts in the bone marrow, bound to globin proteins, assisted by vitamin B6 which is a coenzyme and vitamin C which plays a role in reducing ferric iron (Fe^{3+}) to ferrous (Fe^{2+}) in the small intestine,⁷. This reduction process causes iron to be easily absorbed for hemoglobin synthesis,¹⁵.

The collaborative compound of hemoglobin formation

This was likely the effect of the collaboration compound in three doses which can increase the Hb level, which exceeds the effect of the iron folate capsule, ie at a dose of three (250 mg/kg BW). The protein of wedge sea hare did not differ much in the research of Abdullah et al, which stated that the protein content of *Anadara antiquate* is 12.89%,¹. The protein content of wedge sea hare is greater than *Pleuroploca trapezium* 10.348%,⁴. The high protein content of wedge sea hare showed that wedge sea hare can be used as an alternative food source of beneficial animal protein.

Hemoglobin level difference

Table 2 showed that there was an increase in the average Hb level in mice in the treatment group, both one, two and three treatments, especially when compared to negative controls ($P < 0.05$). The mean increase in the three treatments was higher than the increase in positive controls (given iron folate). This proved that the treatment of wedge sea hare extract and papaya juice (collaboration fluid) influences the formation of Hb levels. Purwaningsih S reported that these wedge sea hare, besides containing several nutrients as primary metabolic sources such as amino acids, fatty acids, and minerals, also contained many secondary metabolic substances such as Flavonoids, Saponins, and Tannins, through the results of phytochemical tests,¹¹.

Foods that contain iron and protein are needed for the formation of hemoglobin, including consuming food sources of animal protein from the sea such as fish, shellfish and wedge sea hare. Consumption of wedge sea hare is highly recommended because in addition to being a source of animal protein is also a source of minerals such as Fe, Cu, and Zn. Purwaningsih S stated that wedge sea hares contained 12.49 + 0.34% protein, mineral 23.02 + 3.23%, fat 0.87 + 0.55%, where the amino acid value of wedgesea hare is very good from other sea animals,^{13,19}

Results of statistical tests Table (5-4) in which there were significant differences in mean Hb levels in the three treatments, $P < 0.05$. This means that the administration of collaborative fluids can increase hemoglobin levels in anemic mice, there is a tendency to increase the mean hemoglobin level along with the large dose of treatment given. The formation of Hb will run smoothly if a sufficient number of triggers is available, the absorption rate of Fe,³. The availability of Fe in the body will greatly affect the formation rate of Hb and Erythrocytes. Hb is a protein with a molecular weight of 64,450 is a red pigment, which functions to carry globular oxygen, where each molecule contains 5% heme-containing iron and 95% globular polypeptides. This pigment is a chromogen which has 4 metal pyrrole groups¹⁶.

Conclusion

Giving several doses (100 mg / kg body weight, 150 mg / kg body weight, and 250 mg / kg body weight) of wedge sea hare extract on hemoglobin levels in mice (BALB / c) that have anemia showed an increase in the mean level of hemoglobin along with the magnitude the dose given. This is because the collaboration of many secondary metabolic phytochemical compounds from wedge sea hares that work together with the primary metabolic compounds of papaya extract can synthesize the formation of heme which can stimulate hemoglobin levels.

Ethical Clearance- Taken from faculty ethical committee

Source of Funding- Self

Conflict of Interest –Nil

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The Relation between Psychological Empowerment and Job Satisfaction among Nurses

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Abstract

Background- Empowering employees is an essential factor to reduce workplace stress, whereas its role in enhancing job satisfaction among employees is through perceived job obligation, and reducing stress. Aim- The present study endeavored to determine the relationship between Psychological Empowerment and Job Satisfaction among nurses. Methods and Materials- Cross-sectional, descriptive and correlational study design carried out for a period from 5th of September/2017 till 30th of May/2018 at five hospitals in Mosul/Iraq. Non-probability sampling technique and accidental sampling method were depended to select (317) nurse as a sample of the study. An interview was the method through which data were gathered. Two instruments were used to collect data; Psychological Empowerment questionnaire “PE”, and Minnesota Job Satisfaction questionnaire “JS”. Mean, Standard deviation and stepwise regression analysis were used to present the findings of the study. Findings- Total Psychological Empowerment and Total Job Satisfaction and their domains had an acceptable level, from another side, Total Psychological Empowerment and its domains had significant relations with Total Job Satisfaction and its domains.

Keywords: *Psychological Empowerment, Job Satisfaction, Nurse.*

Introduction

Nurses consider a vital part in the health care system, play a profound role in its efficacy, effectiveness, and promotion of patient health, whereas, any health agency can't dispense his/her⁽¹⁾.

Empowerment can be seen as an organizational initiative to grant staff an autonomy in order to reduce the sense of helplessness and remove the formal obstacles in the regulatory environment⁽²⁾, while the person's experience of self-motivation that forms the point of view of his/her is known as psychological empowerment⁽³⁾, it motivates employees to do well⁽⁴⁾, and composes of many domains; mean, competence, self-determination, and impact⁽⁵⁾.

The individual's cognitive attitude or affective reaction toward job is known as job satisfaction, it is

the extent of love and belonging the employees have to their work, the increased sense of importance of work and improvement of achievements⁽⁶⁾, the perceptions in regard to job performance, the contribution of positive meaning values and positive consequences for the organization, the desire to develop work personalities and skills⁽⁷⁾, and they tend to be high self-confidence⁽⁸⁾.

However, scholars recognize that job performance enhances employee empowerment that can encourage employees to operate beyond the norm and achieve jobs in an accommodating manner. Empowering employees is an essential factor to reduce workplace stress^(2,9), while its role in enhancing job satisfaction among employees is through perceived job obligation, and reducing stress⁽⁷⁾.

The present study endeavored to determine the relationship between Psychological Empowerment and Job Satisfaction among nurses.

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Material and Method

Cross-sectional, descriptive and correlational study design carried out for a period from 5th of

September/2017 till 30th of May/2018 at five hospitals in Mosul/Iraq. Non-probability sampling technique and accidental sampling method were depended to select (317) nurse as a sample of the study depending on such criteria (providing bedside nursing care, having a tenure in the current place ≥ 5 years, presenting at work during gathering data and didn't engage in management or leadership position at the study period). An interview was the method through which data were gathered; each interview lasted 20-30 minutes. Two instruments were used to collect data; Psychological Empowerment questionnaire "PE" which is used to measure the level of four dimensions; (Meaning= 3 items, Competence=3 items, Self-determination=3 items, and Impact=3 items), the scores of each item had five options ranged from (strongly disagree=1 to strongly agree=5) ⁽⁵⁾, and Minnesota Job Satisfaction questionnaire "JS" which is used to measure respondent's level of satisfaction at their job, it consists of (20) items categorizes as two dimensions, Intrinsic Job Satisfaction "IJS" (12 items) and Extrinsic Job Satisfaction "EJS" (8 items), the scores

of each item had five option ranged from (strongly dissatisfied=to strongly satisfied=5) ⁽¹⁰⁾.

The means of scales and their domains had been calculated by summation of their items and divided by the number of items. A higher score (mean) means a higher degree of each of them. Content validity of scales was measured by exposing them to five experts in the nursing field, whereas, their few essential corrections were undertaken in the final drafts, while reliability analysis for the scales yielded a Cronbach's alpha of 0.79 for Psychological Empowerment scale and 0.83 for Job Satisfaction. Mean and Standard deviation as a descriptive statistic was used to review the levels of measured variables (PE, and JS), while stepwise regression analysis was used to evaluate the impact of criteria variable on multiple prediction variables.

According to the administrative rules, informal permission was obtained from the respondents prior to starting data collection.

Findings

Table (1): Descriptive statistics of PE, and JS and their domains:

Variable	Mean of Scores	Minimum	Maximum	Mean	Standard Deviation
PE (Total);	36	32	60	47.59	6.58
Meaning	9	8	15	12.47	1.87
Competence	9	6	15	12.68	2.07
Self-Determination	9	4	15	10.97	2.92
Impact	9	4	15	11.47	2.41
JS (Total);	60	40	80	61.93	8.47
Intrinsic	36	26	50	38.14	5.31
Extrinsic	24	13	34	23.79	4.06

Table (1) demonstrates that the means of Total Psychological empowerment and its dimensions were above the means of scores of the scale, while the total means of JS and their aspects were around the means of scores of the scale.

Table (2): Regression Findings for Job Satisfaction (JS)with respect to Psychological Empowerment (PE)

Model ⁽¹⁾	Adj. R ²	B	t. Value	F.	β
Meaning	.196	1.172	8.065	65.049**	.414
Competence	.189	1.118	8.628	74.437**	.437
Self Determination	.321	1.035	12.254	150.173**	.568
Impact	.081	.635	5.359	28.722**	.289
<i>(1) Predictors (Constant)=PE Domains DV=IJS **P. ≤ 0.001</i>					
Model⁽²⁾					
Meaning	.115	.745	6.498	42.224**	.344
Competence	.058	.485	4.538	20.594**	.248
Self Determination	.128	.505	6.897	47.575**	.362
Impact	.034	.324	3.481	12.117**	.192
<i>(2) Predictors (Constant)=PE Domains DV=EJS **P. ≤ 0.001</i>					
Model⁽³⁾					
Meaning	.177	.231	8.309	69.041**	.424
Competence	.151	1.603	7.578	57.421**	.393
Self Determination	.278	1.539	11.082	122.801**	.530
Impact	.072	.959	5.044	25.441**	.273
<i>(3)Predictors (Constant)=PE Domains DV=TJS **P. ≤ 0.001</i>					
Model⁽⁴⁾					
Total Psychological Empowerment	.333	.748	12.61	159.011**	.579
<i>(4)Predictor (Constant)=TPE DV=TJS **P. ≤ 0.001</i>					
Model⁽⁵⁾					
Total Psychological Empowerment	.374	.494	13.775	189.753**	.613
<i>(5)Predictor (Constant)=TPE DV=IJS **P. ≤ 0.001</i>					
Model⁽⁶⁾					
Total Psychological Empowerment	.163	.251	7.906	62.5**	.407
<i>(6)Predictor (Constant)=TPE DV=EJS **P. ≤ 0.001</i>					
PE=Psychological Empowerment; DV= Dependent Variable; IJS=Intrinsic Job Satisfaction; EJS=Extrinsic Job Satisfaction; TJS=Total Job Satisfaction; TPE=Total Psychological Empowerment					

Table (2) reveals that Psychological Empowerment as a total and its dimensions are highly significantly correlated with Job Satisfaction and its dimensions.

Discussion

Empowerment gives a power of decision-making to employees, making employees own their work and thus increase commitment. When employees have high levels of perceived Psychological Empowerment, view their work as meaningful, acquire skills and competencies needed, have the impact on actions in their work environment, provide a high level of autonomy, feel to influence the work outcomes, they perceive themselves as effective, see their work as important, and be more attached to their organizations⁽¹¹⁾. In line with many previous studies^(5,7,12,13,14,15,16), and inconsistent with another study⁽¹⁷⁾ were the results of the present study, while other studies agreed partially, for, they found that nurse's competencies had the most importance, and self-determination and impact dimensions had the lowest^(7,18,19,20). Nurses' Psychological Empowerment means as a total and as all dimensions in the present study were higher than means of scores of the scale (Table-1) which indicates that nurses' values and behaviors were, to some extent, in accordance with the work goals and nurses' capabilities and requirements of work.

Job Satisfaction means in the present study has been around the means of scores of the scale, whereas Intrinsic Job Satisfaction is best than Extrinsic Job Satisfaction (Table-1). A previous study found that the respondents of their study had moderate positive perceptions of job satisfaction⁽⁷⁾, while another study pointed low job satisfaction among their respondents⁽²⁾. If nurses are satisfied with intrinsic factors more than extrinsic factors, they can satisfy themselves interiorly more than the satisfaction promote from their environment and supervisors. This finding is in agreement with the view of many previous studies^(6,21). This is an important issue for any organization, for individuals who have a high level of Job Satisfaction generally have a positive attitude towards their work and vice versa⁽²²⁾, in another word, if employees are dissatisfied and they see a chance to work in other organization, they will leave an organization without a sense of guilt⁽²³⁾.

The empowerment of employees increases the effectiveness and satisfaction of employees, reduce job-related strain^(18,24,25,26), shapes employees' perceptions of their jobs, and eventually leads to high job satisfaction⁽²⁾. Total Psychological Empowerment is significant and

positively correlated with TJS and its dimensions IJS and EJS as 0.579, 0.613 and 0.407 respectively. The coefficient of determination (R^2) presents that TPE predicted the variation of TJS, IJS, and EJS as 33.3%, 37.4%, and 16.3% respectively. From another hand, all PE dimensions present significant and positively correlated with TJS and with its dimensions, while self-determination was the best one in predicting TJS, IJS, and EJS as 27.8%, 32.1% and 12.8% respectively (Table-2). In line with these results were the results of previous studies^(2,27,28,29,30,31,32,33,34,35), on the other hand, another study found that Psychological Empowerment explains about 33.5% of the variation in Job Satisfaction⁽³⁶⁾, also it concluded that Meaning, Competence, and Impact were positively related and significant in predicting Job Satisfaction, while, regarding Self-determination, it is suggested that satisfying a psychological need will lead to Job Satisfaction, also he found that Psychological Empowerment explains about 33.5% of the variation in the Job Satisfaction. A previous study found that when employees feel active in their work, they build a sense of job satisfaction. From another side, when individuals feel that they are highly competent to carry out their tasks, their job satisfaction will be better. Individuals are empowered when they have a tendency to attach more value and importance to their work, their Job Satisfaction level is increased, their success and contribution to work will be greater⁽³⁷⁾. As a result for their study, they found that all dimensions of Psychological Empowerment explained 42% of the variance in the Intrinsic aspect of Job Satisfaction, and 30% of the variance in the Extrinsic aspect of Job Satisfaction, Meaning significantly influenced the Intrinsic Job Satisfaction " $\beta=.25, p=.01$ ", Self-Determination and Impact had a significant effect on Intrinsic Job Satisfaction " $\beta=.28; p=.01; \beta=.22, p=.01$ ", and Extrinsic Job Satisfaction " $\beta=.23; p=.01; \beta=.26, p=.01$ ". Meaning relatively had the greatest relationship " $r=0.451; p<0.01$ " with satisfaction. The weakest correlation was between Impact and Job Satisfaction " $r = 0.285; p<0.01$ ". Previous study results indicated that overall Psychological Empowerment comprising Meaning, Competence, Self-determination, and Impact explained 22% of the variance in Job Satisfaction. The Beta calculations showed the highest variation as explained by Meaning " $\beta=0.436$ " and the next as explained by Self-determination " $\beta=0.183$ ". The next relatively lowest ones were Competence and Impact having the same beta scores " $\beta=0.102$ ". The coefficient of determination R^2 was calculated as 0.41, which means that 41% of the variation in Job Satisfaction

was explained by the variation in overall Psychological Empowerment^(26,38).

Conclusions

The study concluded that;

* Total Psychological Empowerment and Total Job Satisfaction and their domains had an acceptable level.

* Total Psychological Empowerment and its domains had significant relations with Total Job Satisfaction and its domains.

Recommendations :

* Staying away from centralism in the formulation and decision-making in regard to patient care and giving priority to the nurse and supporting his/her decisions.

* Creating a therapeutic environment that balance between the nurse's habits, traditions, and values with the patient's needs and care, improving the nurse experience, performance and expertise and fostering his / her authority, power and self-worth.

Conflict of Interest: Non

Source of Findings: Non

Ethical Clearance: This research was carried out with the patient's verbal and analytical approval before the sample was taken.

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Estimation the Level of Follicular Fluid Follistatin in Women Undergoing Intracytoplasmic Sperm Injection

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Abstract

Objectives: A prospective study carried out in Kirkuk city from 15th of January 2019 to 10th of April 2019, included 45 women who were enrolled in assisted reproductive technology (ART) programs in infertility Centre /Kirkuk, Iraq. **Patients and method:** All women were subjected to the basic fertility work-up at the infertility center which consists of history taking, physical examination, ovulation detection, evaluation of tubal patency and uterine cavity. The average age of the included women ranged between 20 and 42 years old. All women were enrolled in short protocol type of IVF/ICSI cycle and they had normal menstrual cycles. Nearly 5 ml of follicular fluid was obtained from all women undergoing ICSI for estimation of follistatin level by ELISA technique. **Results :** The present study showed that 31.1% (14 of 45) of women underwent ISCI technique became pregnant and 68.9% were non-pregnant (31 of 45). The highest mean of age were recorded among pregnant women compared with non-pregnant women (32.21 ± 6.68 v.s 31.80 ± 5.38 year) although the result was non-significant ($P > 0.05$). The highest mean of BMI were recorded among non-pregnant women compared with pregnant women (23.92 ± 1.55 v.s 25.36 ± 1.99 kg/m²), the result was significant. The highest mean level of follicular fluid follistatin evaluated in pregnant compared with non pregnant (10.20 ± 0.30 v.s 9.83 ± 0.58 ng/ml) although the result was high significant difference ($p < 0.05$). The study showed that there was negative correlation of follicular fluid follistatin level with age in pregnant women ($r = -0.3$), with positive correlation of with age in non-pregnant women. **Conclusions:** There was a highly significant relation of follicular fluid follistatin with pregnancy outcomes after ICSI.

Keyword: Follistatin; Follicular Fluid; ICSI; Infertility; Pregnancy

Introduction

Infertility is a disease of the reproductive system. According to the World Health Organization definition, it is defined as the failure to achieve a clinical pregnancy after two years of regular unprotected sexual intercourse without contraception, the woman has not become pregnant (there is no other reason, such as breastfeeding or postpartum amenorrhea) ⁽¹⁾. The chance of having a baby is 85%-90% in a year and the rest(10-15)% is infertile because it depends on the length of sexual exposure, frequency of coitus, and couple's age ⁽²⁾. Nowadays, progress in assisted reproductive technology (ART) has enabled the clinicians to treat many types of infertility. Assisted reproduction is a complicated process involving multiple stages like ovarian stimulation, ovum

pick up, then fertilization of these oocytes, embryo cleavage and implantation⁽³⁾. Intra-cytoplasmic sperm injection (ICSI) refers to the technique of assisted reproduction, include injecting a single sperm into the center (cytoplasm) of the egg ⁽⁴⁾. ICSI is a well-established treatment for most types of infertility, including long-standing infertility due to tubal disease, endometriosis, unexplained infertility, and even some mild forms of male factor infertility and cases of failure with respect to in-vitro fertilization (IVF) cycles^(5,6). Follistatin (FSH-suppressing protein) is a cysteine-rich monomeric (single chain) glycoprotein with molecular weight of 39-kDa and is an important binding protein for inhibins and activins⁽⁷⁾. For this reason the activities of follistatin on the oocyte maturation depend on their

autocrine and paracrine effects in follicular fluid than their serum levels⁽⁸⁾. Follistatin not only worked as an activin binding protein but also regulator of hormone secretion from the pituitary gland and degraded the activin from the circulation⁽⁹⁾. Because it localized within the human fallopian tube, endometrium and placental tissues, Therefore this proteins have been proposed as potential sensitive and specific markers to monitor the progress and outcome of pregnancy⁽¹⁰⁾. Follistatin levels increased during the course of pregnancy and decreased rapidly postpartum this mean increasing maternal serum FST levels are associated with healthy pregnancies and It could be altered in a status of failed pregnancy^(11,12). The aim of the study was to evaluate follistatin level in follicular fluid and correlate the results with pregnancy outcome in women undergoing intra cytoplasmic sperm injection (ICSI).

Material and Method

A prospective study carried out in Kirkuk city from 15th of January 2019 to 10th of April 2019, included 45 women who were enrolled in assisted reproductive technology (ART) programs in infertility Centre for IVF in International center/Kirkuk, Iraq. All women were subjected to the basic fertility work-up at the infertility center which consists of history taking, physical examination, ovulation detection, evaluation of tubal patency and uterine cavity. The average age of the included women ranged between 20 and 42 years old. All women were enrolled in short protocol type of IVF/ICSI cycle and they had normal menstrual cycles.

Nearly, 5 ml of follicular fluid was obtained during ovum pick up from all women undergoing ICSI, Follicular fluid was collected from the dominant follicles (>18 mm) after(34 to 36) hr. of HCG hormone administration. The samples were placed into sterile test tubes, centrifuged at 3000 rpm for 15_20 minute and the obtained follicular fluid was aspirated using mechanical micropipette and transferred into clean test tubes which labeled and stored in deep freeze at -20 c for biochemical measurement. After approximately two weeks of embryo implantation 2ml of blood sample was taken to assess pregnancy status.

Statistical Analysis

Computerized statistically analysis was performed using Mintab ver 18.0 statistic program. Comparison was carried out using Chi-square (X²)and T test for determination of the P. value (P<0.05: significant).

Findings

The present study showed that 31.1% (14 of 45) of women underwent ICSI technique became pregnant and 68.9% were non-pregnant (31 of 45), Table 1.

Table 1: Distribution of women in the study according to pregnancy after ICSI

	All patients	Pregnant	Non pregnant
Number	45	14	31
Frequency	100%	31.1%	68.9%

Figure 1 shows that the highest mean of age were recorded among pregnant women compared with non-pregnant women (32.21± 6.68 v.s 31.80±5.38 year) although the result was non-significant (P: > 0.05). The highest mean of BMI were recorded among non-pregnant women compared with pregnant women (23.92 ± 1.55 v.s 25.36±1.99 kg/m²), the result was significant.

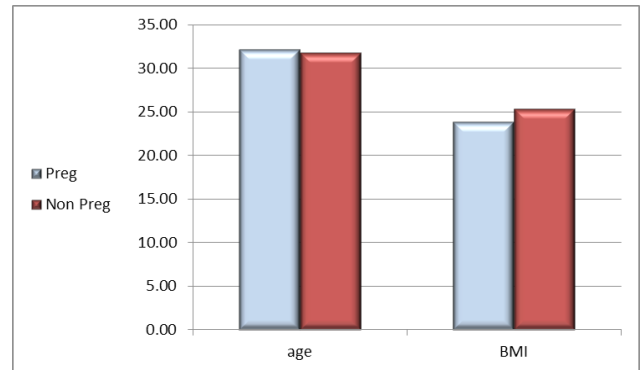


Figure 1: The mean of age and BMI of pregnant and non-pregnant women.

The study showed that the highest mean level of follicular fluid follistatin was found in pregnant compared with non-pregnant (10.20±0.30 v.s 9.83±0.58 ng/ml), the result was high significant difference (p: < 0.05). Table 2.

Table 2: The level of follicular fluid follistatin in pregnant and non-pregnant women.

Follistatin level (ng/ml)	Pregnant	Non pregnant	P. value
In follicular fluid	10.20±0.30	9.83±0.58	< 0.05

The study showed that there was negative correlation of follicular fluid follistatin level with age in pregnant women, with positive correlation of follicular fluid follistatin level with age in non-pregnant women, Figure 2 and Figure 3.

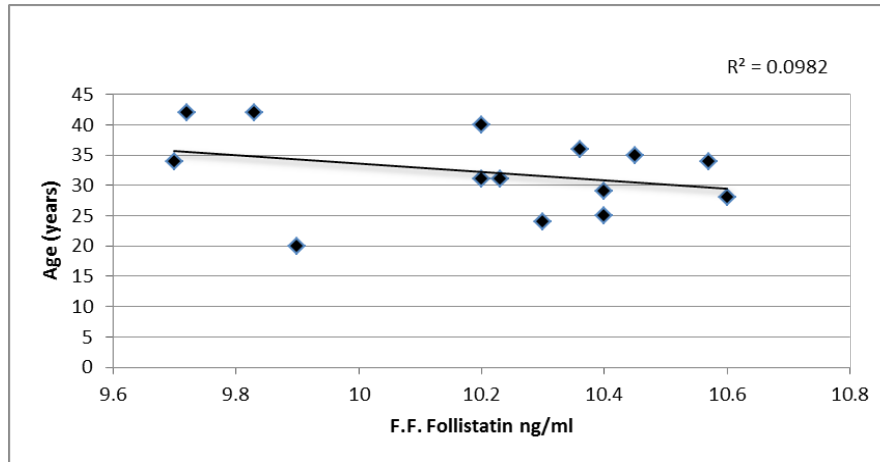


Figure 2: Correlation between follicular fluid follistatin level and age in pregnant women.

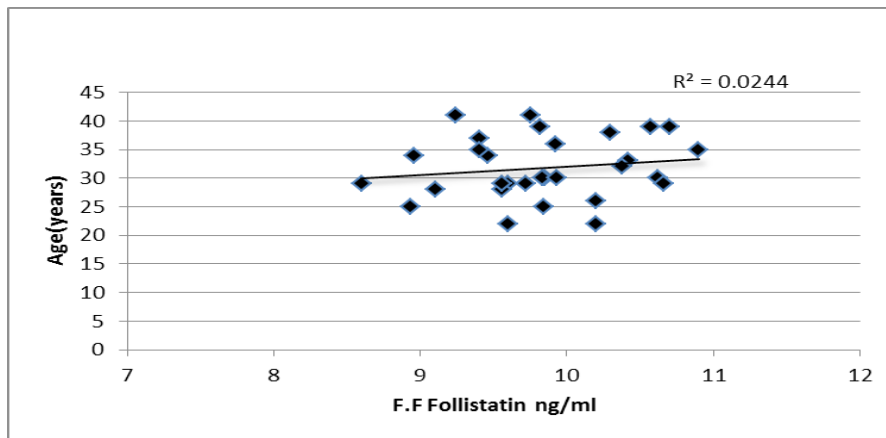


Figure 3: Correlation between follicular fluid follistatin level and age in non-pregnant women.

Discussion

Data presented in this study included 45 women under IVF process and yield two groups (successful and non-successful pregnancy). The overall pregnancy rate for all patients of current study was 31.1%. in International IVF center in kirkuk. In consistent with our result, Al-Ubodi *et al* ⁽¹³⁾ found that the pregnancy rate of women after ICSI was 28.89%. several study also indicated that pregnancy rates were only 30%–40% ⁽¹⁴⁻¹⁶⁾. Also the pregnancy rate by Orvieto *et al* ⁽¹⁷⁾ was 31.25%. This difference between these findings may be related to the environmental condition such as the level of air pollution ⁽¹⁸⁾.

In the current study, the highest mean of age were recorded among pregnant women compared with non-pregnant women (unsuccessful ICSI) (32.21± 6.68 v.s

31.80±5.38 year) although the result was non-significant (P: > 0.05) and the highest mean of BMI were recorded among non-pregnant women compared with pregnant women (23.92 ± 1.55 v.s 25.36±1.99 kg/m²). These findings were close to that reported Ahmeid (5), who found that mean age of pregnant women was 32.18 year and 30.36 year for non pregnant women, his study also found that the mean of BMI was 22.9 (kg/m²) for non-pregnant and for the pregnant group was 22.55 (kg/m²). Al-Dujaily et al (7) also found that there was no significant statistical difference between the mean age of pregnant (31.5 yeas) and non-pregnant women (31.0 year). Additionally, Gultekin (19) showed that the mean age women under IVF a was 31.3 year. Many women choose to get pregnant later in life, waiting until their mid-30 or later to begin trying(4). The younger age of women seeking IVF in developing countries, including

Iraq, could be explained in the context of social habits where most families have the desire to have children immediately after marriage (8).

Most studies to date report decreased pregnancy success in obese patients treated with in vitro fertilization (IVF). In agreement with our findings, Hussein et al (20) found that IVF results showed that positive pregnancy occurred in women BMI 22.55 (kg/m²) whereas negative pregnancy was 22.9 (kg/m²) with a significant differences between pregnant and non-pregnant women (P <0.05). Sarais et al (21) showed that overweight and obese BMI women have a statistically significant lower live birth rate. Lauritsen et al (22) showed that obese women had a significantly longer mean period of infertility and more an ovulatory infertility (P<0.01) compared to normal weight women. Our findings were disagree with Rhodes et al (23) who revealed that pregnant group mean BMI was 25.1 (kg/m²) and non-pregnant group was 25.0 (kg/m²) with no significant difference (P >0.05). Due to body mass index (BMI) has an adverse effect on reproduction, overweight women have a higher incidence of menstrual dysfunction and anovulation, possibly because of altered secretion of gonadotropin releasing hormone, sex hormone binding globulin, ovarian and adrenal androgen, and luteinizing hormone and also because of altered insulin resistance (24). In assisted reproduction, however, there are many reports on the effect of obesity on oocyte quality, embryo development, lower number of mature oocytes, lower implantation and pregnancy rate (25) .

In agreement with the current results, studies done by Gultekin (19) and Köninger et al (26) found that the level of intrafollicular follistatin was higher pregnant women rather than non pregnant women after ICSI process. As well as, Lau (27) and Jeppesen et al (28) revealed that follistatin showed highly significant elevation in follicular fluid of pregnant women. Chang et al (29) showed that follistatin levels increase in the follicular fluid with the increasing growth of the follicle, a mechanism for decreasing activin activity. Level of FST increased in good quality oocyte compared with poor quality due to follistatin play role in folliculogenesis, oocyte maturation and embryogenesis(embryo development to oocyte) (30). The follistatin had a role on the oocyte grade and it was necessary for the oocyte maturation. As a result, the level of the follistatin directly affected the oocyte and embryo quality(31). In vitro study done by Jorgez et al (32) on the mouse showed that the foliculogenesis was paused and the infertility was appeared by the lack

of follistatin. Wakatsuki et al (33) found that porcine follicular fluid contained extremely high follistatin level (5.6 mg/L) due to follistatin originally isolated from porcine ovarian follicular fluid.

Conclusions

There was a highly significant relation of follicular follistatin and pregnancy after ICSI.

Conflict of Interest: Nil

Source of Findings: Self

Ethical Clearance: This research was carried out with the patient's verbal and analytical approval before the sample was taken. According to this approval, all the samples were collected and the tests were carried out. A copy of the results of the tests was then given to the patients

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Serum α -Klotho Level in the Patients Subjected to Hemodialysis in Association with Lipid Profile

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Abstract

Background: Klotho, is a protein associated with life extension plays a important role in kidney disease progression, anti-aging, anti-oxidation, modulation of ion transport, and development of disturbed mineral metabolism. The aim of the study was to measure Soluble α -Klotho(SAKL) levels in chronic kidney disease(CKD) patients before and after dialysis in relation with Lipid profile. Methods: This short-prospective hospital-based study was done in the Department of Chemistry and Biochemistry, College of medicine, Tikrit University, Tikrit, Iraq. The study was carried out for 30 patients subjected to Hemodialysis recruited from Tikrit Teaching Hospital, hemodialysis unit between 1st December,2018 and 1st April,2019. The study also included 30 adult persons looks healthy with no prior medical or family history of CKD as a control participated in this study.The levels of SAKL and lipid profile were measured in the serum of 30 patients, before and after Hemodialysis and compared with controls. Results: The study revealed increased in the SAKL level in CKD patients before dialysis compared to healthy control group, and decreased in group of CKD after dialysis compared to control group. Furthermore, there was a significant positive correlation of SAKL level with serum Triglyceride and Very low density lipoprotein cholesterol(VLDL-C) in CKD patients before dialysis. Conclusions: There was a highly significant relation of SAKL with lipid abnormality in CKD patients under hemodialysis.

Keyword: Soluble α -Klotho; chronic kidney disease; hemodialysis; Lipid profile.

Introduction

Chronic kidney disease (CKD) describes abnormal kidney function and/or structure. It is common, frequently unrecognized and often exists together with other conditions such as cardiovascular disease(CVD) and diabetes (1). CKD is a global health burden estimated to affect up to 15% of adult populations and is independently associated with increased CVD risk similar to the risk of diabetes mellitus or coronary heart disease(2). This risk increases as CKD advances and is evidenced by worsening excretory function, usually manifest as declining glomerular filtration rate, and increasing proteinuria(3). The increased cardiovascular risk associated with end-stage renal disease(ESRD) has been well established, and estimated cardiovascular mortality rates are 10- to 100-fold higher among dialysis patients than age- and sex-matched individuals in

the general population. Hemodialysis(HD) should be starting when indicated by the impact of symptoms of uraemia on daily living, or biochemical measures or uncontrollable fluid overload, or at glomerular filtration rate (GFR) of around 5-7 mL/min/1.73 m² if there are no symptoms.This syndrome leads to death unless the toxins are removed by renal replacement therapy, using dialysis or kidney transplantation(2,4).

Dyslipidemia is a major risk factor for cardiovascular morbidity and mortality and is common among patients with CKD. Lipid profiles vary widely in these patients, reflecting the level of kidney function and the degree of proteinuria. Several factors contribute to the development dyslipidemia associated with chronic renal impairment(5).Patients with CKD have a reduction in the activity of lipoprotein lipase and hepatic triglyceride lipase. Hypercholesterolemia in nephrotic syndrome

is thought to be a result of increased production and decreased catabolism of lipoproteins(6).

Klotho exists in both membrane-bound and secreted(S.Klotho) forms, the latter of which may exert vasculoprotective effects. It enhances endothelial nitric oxide production and thereby improves endothelium-dependent vasodilatation and it is an endogenous inhibitor of vascular calcification, as shown in recent studies in vitro and in CKD mice in vivo(7). So, the aim of the study was to measure SAKL level in CKD patients before and after dialysis in relation with Lipid profile.

Patients and Method

This short-prospective hospital-based study was done in Tikrit city-Iraq between 1st December,2018 and 1st April,2019. The study included 30 adult patients with chronic kidney disease who underwent Kidney dialysis unit at Tikrit Teaching Hospital and their age range were between 18-80 years. They were clinically diagnosed by nephrologist as ESRD patients (on hemodialysis), based on their history, clinical examination, renal function tests and other laboratory tests, undergoing hemodialysis twice weekly. The study also included 30 adult persons looks healthy with no prior medical or family history of CKD as a control participated in this study. Blood samples were collected from CKD patients before dialysis and 4 hours after dialysis. All blood samples were centrifuged and the obtained sera were aspirated and labeled for determination of serum Klotho were measured by enzyme-linked immunosorbent assay (ELISA) kit supplied by (MYBIOSOURCE, USA), and lipid profile including Total cholesterol, Triglyceride, High density lipoprotein cholesterol(HDL) were measured by colorimetric method using kits provided by Biolabo (France) according to the manufacturer manual instruction. Furthermore, Very low density lipoprotein(VLDL) and LDL levels were assessed using the following equation:

$$\text{VLDL-C (mg/dl)} = (\text{Triglycerides} / 5)$$

$$\text{LDL-C (mg/dl)} = [\text{Total cholesterol}] - [\text{HDL-C}] + [\text{TG}]/5$$

Statistical Analysis

Computerized statistically analysis was performed using SPSS Software version 23.3 statistic program. Comparison was carried out for determination of the P. value (P<0.05: significant).

Finding

Relation of SAKL and lipid profile in CKD patients before and after hemodialysis and control group.

Results presented in Table 1 shows increased in the SAKL (pg/ml) level in CKD patients before dialysis compared to healthy control group. While the decrease in SAKL level was recorded in group of CKD after dialysis compared to control group, although the result was non-significant (p>0.05). Our study showed that the higher mean level of Total cholesterol was recorded in the control group (168.60±46.03 mg/dl), followed by CKD patients before dialysis and patients after dialysis (131.94±75.44 and 98.23±54.25 mg/dl) respectively with significant differences among the groups, Also the higher mean level of TG was documented in the control group (158.50±74.92 mg/dl), followed by CKD patients before dialysis and patients after dialysis (95.43±50.48 and 87.77±44.51 mg/dl) respectively with significant differences among the groups.

The study showed that the higher mean level of HDL-cholesterol was recorded in the control group (65.60±34.16 mg/dl), followed by CKD patients after dialysis and patients before dialysis (33.80±19.93 and 31.87±11.67 mg/dl) respectively with significant differences among the groups, Also the higher mean level of VLDL-cholesterol was recorded in the control group (31.70±15.05 mg/dl), followed by CKD patients before dialysis and patients after dialysis (19.13±10.12 and 16.97±8.89mg/dl) respectively with significant differences among the groups (P<0.05).Furthermore current study showed that the higher mean level of LDL-cholesterol was found in CKD patients before dialysis (81.93±73.41mg/dl), followed by the control group (74.63±48.25 mg/dl) and the lowest mean level was in patients after dialysis (54.23±51.06 mg/dl). Although there were no significant differences among the groups (P>0.05).

			Good	Poor		
Age	<30	Count	3	43	46	0.24
		%	6.5%	93.5%	100.0%	
	≥30	Count	2	9	11	
		%	18.2%	81.8%	100.0%	
Residence	Urban	Count	2	44	46	0.04
		%	4.3	95.7%	100.0%	
	Rural	Count	3	8	11	
		%	27.3	72.7%	100.0%	
Marital status	Single	Count	0	22	22	0.35
		%	.0%	100.0%	100.0%	
	Married	Count	4	26	30	
		%	13.3%	86.7%	100.0%	
	Others	Count	1	4	5	
		%	20.0%	80.0%	100.0%	
Length of experience	≤5	Count	4	30	34	0.63

Pa: P value between control group and before dialysis, Pb : p value between control group and after dialysis. SAKL: Soluble α -klotho, T.Ch: Total cholesterol, TG: Triglycerides, HDL: High-density lipoprotein cholesterol, VLDL: Very low-density lipoprotein cholesterol, LDL: Low-density lipoprotein cholesterol, SD: Standard deviation.

Correlation between SAKL and parameters of CKD patients before and after hemodialysis

The study showed no correlation between SAKL

and cholesterol in CKD patients before dialysis (Figure 1) and no correlation with cholesterol after dialysis.

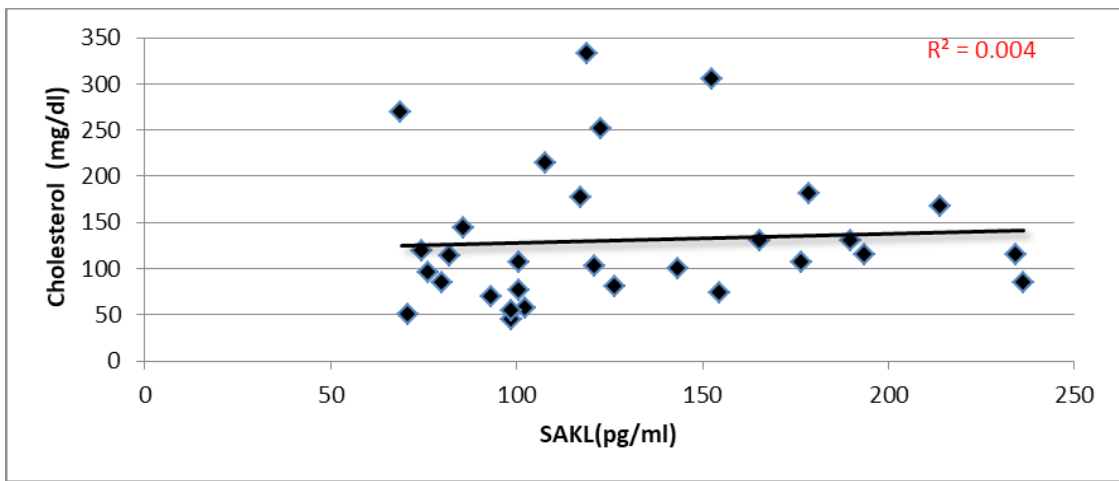


Figure 1: Correlation between SAKL and Total cholesterol in CKD patients before hemodialysis.

Current study showed a positive correlation of SAKL with S. TG in CKD patients before dialysis (Figure 2) and negative correlation with TG after dialysis.

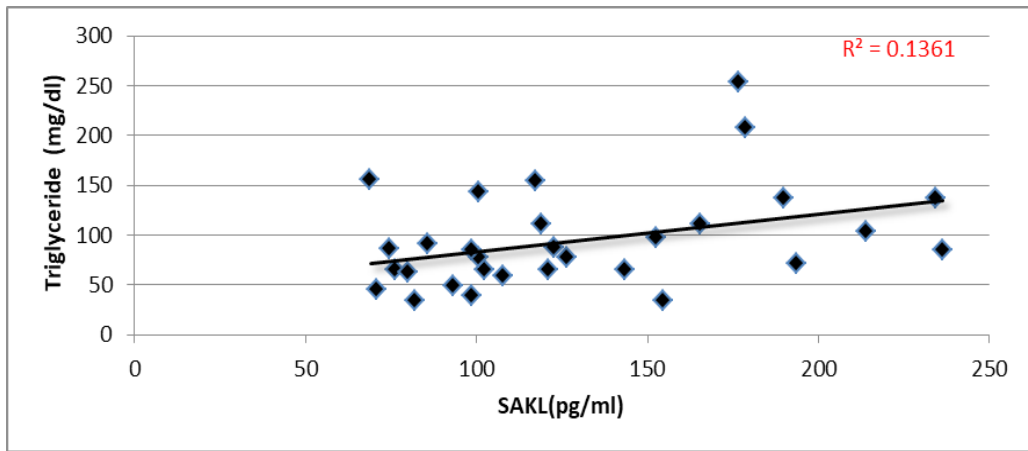


Figure 2: Correlation between SAKL and S. TG in CKD patients before dialysis.

The study showed a negative correlation of SAKL with HDL-C in CKD patients before dialysis and no correlation with HDL-C after dialysis .

Our study showed a positive correlation of SAKL with VLDL-C in CKD patients before dialysis (Figure 3) and negative correlation with VLDL-C after dialysis.

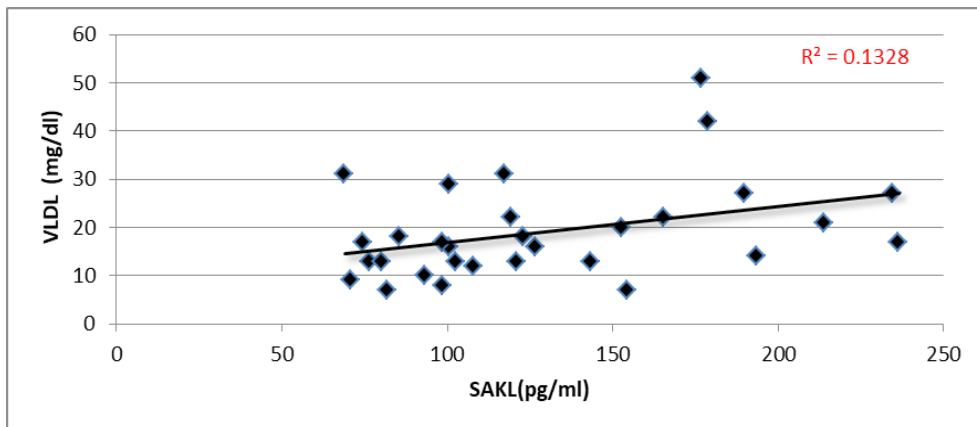


Figure 3: Correlation between SAKL and VLDL-C in CKD patients before dialysis.

The study showed no correlation of SAKL with LDL-C in CKD patients before and after dialysis.

Discussion

Soluble α -Klotho

In recent years, emerging evidence suggests that the SAKL could serve as an early biomarker for CKD (8). In agreement with our findings in studying the elevation of SAKL in CKD patients before dialysis, Devaraj et al (9) registered an elevated level of SAKL in patients with CKD before dialysis when comparing with control group. Also, Shimamura et al (10) reported higher levels of SAKL in stage 5 CKD compared with healthy individuals. Akimoto et al (11) and Hage et al (12) also agreed with our current findings and reported that SAKL level was significantly higher in patients with CKD as comparing with healthy control.

The study was disagreed with studies done earlier by Seiler et al (13) and Hu et al (14), who indicated that SAKL levels had no elevation in pre-hemodialysis CKD patients. Although this difference from our results may be due to the difference in the stage of CKD which showed a different levels of SAKL (low level in 1st stage and high level in the 5th stage of CKD) (9). The decreased level of klotho may be due to its downregulated after kidney injury and intensive renal damage (12).

In the present study, reduction in SAKL level was recorded in group of CKD after hemodialysis compared to control group. In agreement with this findings, study done by Asai et al (15) demonstrated that SAKL was reduced in CKD patient after dialysis. Also, Shimamura et al (10), Koh et al (16) and Sakan et al (17) agreed with our result, they revealed a reduced α -Klotho in CKD patients specially after dialysis, and indicated a reduced production of klotho in human chronic renal failure kidney patients with CKD after hemodialysis. Furthermore, Golembiewska et al (18) and other studies agreed with our findings, reported that reduced SAKL in plasma of CKD and ESRD patients on hemodialysis when comparing with elevated SAKL in pre-dialysis patients.

On the other hand, the current result was disagreed with some studies with contradictory results showed that soluble α -Klotho levels were not differed in CKD patients (12,13).

The decreased of SAKL in CKD patients after dialysis have some explanations. Kidney is a major organ to maintain soluble Klotho homeostasis by two ways, One is to cleavage membrane-bound α -Klotho

in the renal tubular epithelial cells and release into circulation and the second is to eliminate redundant and unnecessary soluble α -Klotho from circulations into the urinary lumen through renal proximal tubules by transcytosis (16). This mechanism clarify the reduction of SAKL after HD in same patients who have elevated SAKL before HD. In addition, there are indications that urinary Klotho measurement is more closely linked to residual renal nephrons and that the significance of serum and urine measurement should be investigated. Therefore, there are still few reports indicating whether Klotho levels can be used as prognostic factors for CKD (19).

Correlation of SAKL with Lipid Profile

It is well known that patients with impaired renal function exhibit significant alterations in lipoprotein metabolism resulting in the development of severe dyslipidemia and this is attributed to the non-traditional risk factors in patients with ESRD, such as, inflammation, oxidative stress, anemia, malnutrition and endothelial dysfunction that have been proposed to play a central role in lipid metabolism abnormalities. The lipid abnormalities often accompany and aggravate the renal disease, thereby favoring the acceleration of atherogenesis and progression of cardiovascular disease (1,6).

The study showed that there was positive correlation of SAKL with Triglyceride and VLDL-C in CKD patients before dialysis and negative correlation with HDL-C in CKD patients before dialysis. Furthermore a negative correlation of SAKL with TG and HDL-C in CKD patients after dialysis and no correlation of SAKL with cholesterol and LDL-C after dialysis. There were very few studies on the relation between SAKL and lipid profile. From these studies, Seiler et al (13) studied that the level of SAKL in patients with chronic kidney disease and found that there was positive correlation of SAKL with LDL-C. Yu et al (20), showed that no correlation occurred of α -Klotho with Total cholesterol and LDL-C in CKD patients. In pathological conditions, including CKD, renal tubular epithelial cells may be exposed to ox-LDL. Oxidized modified lipoproteins have been identified in human kidney tissues, injurious actions of ox-LDL include induction of inflammation, oxidation and apoptosis, all of them processes associated with progression of renal disease. Studies in hypercholesterolemic animal models showed that renal injury was accompanied by increased oxidative

stress and inflammation, changes that may decrease Klotho expression, as previously reported(21). On the other hand, Pan et al (22) showed positive correlation of SAKL with LDL and negative correlation with HDL in patients with diabetes mellitus.

Conclusions

There was a highly significant relation of SAKL with lipid abnormality in CKD patients under hemodialysis.

Conflict of Interest: None

Source of Findings: Self

Ethical Clearance: Nil

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Molecular Detection of Some Antibiotic Resistant Genes of Bacteria Isolated from Bloodstream Infections of Hemodialysis Patients

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Abstract

A cross-sectional hospital based study was done from November 2017 to February 2019 including 240 patients with chronic renal disease (168 males and 72 females) whose ages were between 15-75 years and they admitted to hemodialysis unit of Kirkuk general hospital. The study also included 50 individuals of blood donors as control group. Ten ml of blood were collected by vein puncture each patient and control enrolled in this study, blood were injected in blood culture bottle sterilely for isolation of bacteria causing bacteremia, with detection of CTX-M-G2 and Van A genes by real time PCR. The study showed that 32.25% of HD patients have positive blood culture while no one of blood donors have a positive blood culture. The highest rate of isolated bacteria from HD patients (51.28%) was G-ve bacteria comparing with G+ve bacteria, while 42.86% of isolated bacteria from patients with UTI was G+ve bacteria. although the result was non-significant relation. The highest rate of bacteria isolated from HD patients (25.65%) was *S. aureus* followed by *E. faecalis* (17.95%). The study showed that 80% of *S. aureus* isolates who were resistant to ceftriaxone were positive for CTX-M-G2 gene comparing with 20% haven't CTX-M-G2 A gene. The highest rate of ceftriaxone resistant *S. faecalis* (77.78%) were positive for CTX-M-G2 gene comparing with 22.22% haven't the gene, although the results was non-significant. The study showed that the highest rate of ceftriaxone resistant *K. pneumoniae* (63.64%) were positive for CTX-M-G2 gene comparing with 36.36% haven't the gene. The study showed that 77.78% of *S. aureus* were positive for Van A gene comparing with 22.22% haven't Van A gene. The highest rate of vancomycin resistant *S. faecalis* (69.23%) were positive for Van A gene comparing with 30.77% haven't the gene. The study showed that all vancomycin resistant *K. pneumoniae* were negative for Van A gene. It was concluded that Most *S. aureus* and *E. faecalis* isolates were positive for CTX-M-G2 and vanA gene and most *Klebsiella* spp. isolates were harbored CTX-M-G2 gene.

Keyword: Bacteremia;; hemodialysis, Blood culture; CTX-M-G2; Van A

Introduction

Chronic kidney disease is a worldwide public health problem with an increasing incidence and prevalence, poor outcomes, and high cost. Outcomes of chronic kidney disease include not only kidney failure but also complications of decreased kidney function and cardiovascular disease(1). Current evidence suggests that some of these adverse outcomes can be prevented or delayed by early detection and treatment(2). The major outcomes of chronic kidney disease, regardless of cause, include progression to kidney failure, complications of decreased kidney function, and cardiovascular disease(CVD) (3). Increasing antimicrobial resistance

is a worldwide concern. The prevalence of resistance of blood borne isolates is increasing and it also varies in accordance with geographical and regional location(4). The infection caused by multidrug resistance (MDR) organisms is more likely to prolong the hospital stay, increase the risk of death, and require treatment with more expensive antibiotics(5). The widespread use of vancomycin has led to increased number of infections by vancomycin resistant enterococci, which could transfer via plasmids the above resistance to *S. aureus*(6,7). The aim of the study was to isolate bacteria casing bacteremia in hemodialysis patients and molecular detection of CTX-M-G2 and Van A genes by real time PCR

Material and Method

A cross-sectional hospital based study was done from November 2017 to February 2019 including 240 patients with chronic renal disease (168 males and 72 females) whose ages were between 15-75 years and they admitted to hemodialysis unit of Kirkuk general hospital. The study also included the control group who were matched to the patients, included 50 individuals (blood donors). Ten ml of blood were collected by vein puncture using vacutainer syringe from each patient and control enrolled in this study, 10 ml of blood were injected in two 5 ml blood culture bottle sterilely (5 ml for aerobic and the other was for anaerobic culture) for isolation of bacteria causing bacteremia, blood is sampled directly into two aerobic and one anaerobic blood culture bottles containing culture broth.

Bacterial susceptibility test to antimicrobial agents.

Disk diffusion test were employed in the present study and it was carried out according to the modified Kirby-Bauer method. Pure inoculum were obtained by selecting pure colony from an agar plate and suspended in broth to achieve a turbid suspension, and allowing the culture to achieve good active growth, as indicated by observable turbidity in the broth.

Extraction of bacterial DNA

In this study, to view and determine the gene expression of isolated bacteria from HD patients responsible for resistance to ceftriaxone and vancomycin. The isolated bacteria (*S. aureus*, *E. faecalis* and *K.*

pneumonia) which represent examples to most resistant bacteria, these bacteria were cultured separately on the Muller-Hinton agar with and without ceftriaxone and vancomycin for quantitative and qaulitative detection of CTX-M-G2 and Van A genes. According to manufacture instructions of ZR Fungal/Bacterial DNA MiniPrep™ kit (Zymoresearch, California- USA). The DNA is isolated and purified and then detected by using real-time PCR (Sacace Biotechnology-Italy) through out detection of the following primers:

A. CTX-M-G2 gene:

CGTTAACGGCACGATGAC
CGATATCGTTGGTGGTRCCA

B. VAN A gene:

CTACTCCCGCCTTTTGGGTT
TTCACACCGAAGGATGAGCC

Statistical analysis

Computerized statistically analysis was performed using Mintab ver 18.0 statistic program for determination of the P. value (P<0.05: significant).

Findings

The study showed that 32.25% of HD patients have positive blood culture while no one of blood donors have a positive blood culture. The study was highly significant (P :0.00001), (Table 1)

Table 1: Results of blood culture among the study groups.

Results of blood culture	HD patients		Blood donors	
	No.	%	No.	%
Positive	78	32.5	0	0
Negative	162	67.5	50	100
Total	240	100	50	100

P<0.05

The study demonstrated that the highest rate of isolated bacteria from HD patients (51.28%) was G-ve bacteria comparing with G+ve bacteria (Table 2).

Table 2: Types of isolated bacteria among study groups.

Results of blood culture	HD patients	
	No.	%
Gram positive	38	48.72
Gram negative	40	51.28
Total	78	100

The study showed that the highest rate of bacteria isolated from HD patients (25.65%) was *S. aureus* followed by *E. faecalis* (17.95%) and the lowest rates was 2.56% for each of *S. warneri*, *S. hominis* and *A. cloaca*. (Table 3).

Table 3: Distribution of isolated bacteria among study groups.

Isolated bacteria from blood culture	HD patients	
	No.	%
<i>Staphylococcus aureus</i>	20	25.65
<i>Enterococcus faecalis</i>	14	17.95
<i>Klebsiella</i> spp.	13	16.67
<i>Escherichia coli</i>	10	12.82
<i>Pseudomonas aeruginosa</i>	6	7.69
<i>Salmonella typhi</i>	6	7.69
<i>Proteus mirabilis</i>	3	3.85
<i>Staphylococcus warneri</i>	2	2.56
<i>Staphylococcus hominis</i>	2	2.56
<i>Acinetobacter cloaca</i>	2	2.56
Total	78	100

The study showed that 80% (16 of 20) of *S. aureus* isolated from HD patients were positive for CTX-M-G2 gene (gene responsible for ceftriaxone resistance) comparing with 20% haven't CTX-M-G2 gene, the result was highly significant ($p < 0.1$), the highest rate of *S. faecalis* (77.78%) were positive for CTX-M-G2 gene comparing with 22.22% haven't the gene, although the results was non-significant ($P > 0.05$), the highest rate of *K. pneumoniae* (63.64%) were positive for CTX-M-G2 gene comparing with 36.36% haven't the gene, although the result was non-significant (Table 4).

Table 4: Molecular detection of CTX-M-G2 gene resistance to ceftriaxone.

Bacteria	Total No.	No. of resistant isolate	CTX-M-G2				P. value
			Present		Absent		
			No.	%	No.	%	
<i>S. aureus</i>	20	20	16	80	2	20	0.001
<i>S. faecalis</i>	14	9	7	77.78	6	22.22	0.08
<i>K. pneumoniae</i>	13	11	7	63.64	4	36.36	0.15

The study showed that 77.78% of *S. aureus* isolated from HD patients were positive for Van A gene (one of the genes responsible for vancomycin resistance) comparing with 22.22% haven't Van A gene, the result was significant ($P < 0.05$), the highest rate *S. faecalis*

(69.23%) were positive for Van A gene comparing with 30.77% haven't the gene although the result was non-significant ($P > 0.05$), The study showed that all vancomycin resistant *K. pneumoniae* were negative for Van A gene, (Table 7).

Table 5: Molecular detection of Van A gene resistance to vancomycin.

Bacteria	Total No.	No. of resistant isolates	Van A gene				P. value
			Present		Absent		
			No.	%	No.	%	
<i>S. aureus</i>	20	18	14	77.78	4	22.22	0.018
<i>E. faecalis</i>	14	13	9	69.23	4	30.77	0.16
<i>K. pneumoniae</i>	13	6	0	0	6	100	0.014

Discussion

The study showed that 32.25% of HD patients have positive blood culture while no one of blood donors have a positive blood culture. The study was highly significant. In agreement with this result, Hassoon et al (1) demonstrated that 40% of the blood samples of patients under hemodialysis was positive for blood culture. In agreement with the current results, Villalon et al (2) demonstrated that non significant difference was occurred in positive blood cultures of HD patients regarding G+ve and G+ve isolated bacteria and the main microorganisms isolated in blood culture were *Staphylococcus aureus* and *Pseudomonas aeruginosa*. Additionally, Mohsin (3) found that Gram negative microorganisms accounted for 61.5% of the events and Gram positive microorganism accounted for 38.5% and *Staphylococcus aureus* was the most common microorganism. In the study of Parameswaran et al (4), 64% of the pathogens causing CRBSI were Gram-positive and 36% were Gram negative and the commonest pathogen causing bacteremia in HD patients was *S. aureus* 40%, *Pseudomonas aeruginosa* 16%, coagulase negative staphylococci 8%, *E. coli* 8%, *Klebsiellapneumoniae* 8%, and *Acinetobacterbaumannii* 4%. Dalgaard et al (5) identified that the most common causative microorganisms in hemodialysis patients, were *Staphylococcus aureus* (43.8%) and *Escherichia coli* (12.6%). The most common isolates reported in

other studies vary from *S. aureus*, *E.coli*, *Pseudomonas* and *Klebsiella* and *Salmonella* and *Enterobacter cloacae* bacteremia and the source of this bacteria was contaminated saline (6,7). While, Gauna et al (8) found Gram-positive cocci formed 27.7% of blood culture positive of patients with ESRD, also revealed that *Staphylococcus aureus* accounted for most of the gram-positive infections. Other studies indicated that bacteremia due to hemodialysis caused mostly by Gram positive *S. aureus* and non-fermenting Gram-negative bacilli, such as *Acinetobacter baumannii* and *Pseudomonas aeruginosa*, which are difficult to treat because they are highly resistant, can cause outbreaks of nosocomial infection, and are often associated with high mortality rates (9,10). Hassan et al (11) indicated that most *S. aureus* isolates harbor CTX-M antibiotic resistance gene and PCR technique is a fast, practical and appropriate method for determining the presence of antibiotic-resistance genes. Al-Marzooq et al (12) reported that, CTX-M genes was detected in 91.3% Malaysian multidrug-resistant *K. pneumoniae* isolates. Our finding was in agreement with most recent studies in Asia and worldwide(13,14). Moreover, Kpoda et al (15) reported a dissemination of CTX-M genes in ESBL producing Enterobacteriaceae and 58% of *Klebsiella* had CTX-M- gene. Mathlouthi et al (16) reported the distribution of CTX-M gene was 51.7% in *Klebsiella* isolated from hospitals in Tunisia and Libya. In a similar study in Burkina Faso Ouedraogo

et al (17) reported CTX-M-1 and 2 groups as dominant in hospitals acquired infection. This is in line with the reports of Ibrahim et al (18). In regard of vancomycin resistance, several studies reported that The most common isolated *E. faecalis* was with *vanA* genes (19). Most VRE outbreaks in human populations are attributed to the *vanA* and *vanB* gene clusters (20). Saadat et al (21) demonstrated that 82.53% of VRSA *S. aureus* isolates were detected with *vanA* gene. Banerjee et al (22) also found a high rate of *vanA*-VRSA strains *S. aureus* isolated from post operative pus sample. In June 2002, the World's first reported clinical infection due to *S. aureus* with high resistance to vancomycin (VRSA) (vancomycin MIC>128 µg /ml) was diagnosed in a patient in the USA, this isolate contain the *vanA* genes from enterococci and the methicillin-resistance gene *mecA*(23). Bamigboye et al (24) also demonstrated that, significant rate of *S. aureus* VRSA isolated from different clinical samples were contain the *vanA* genes. The responsible mechanism for vancomycin resistance in these strains has been found to be the acquisition of resistance plasmids carrying *vanA* or *vanB* operon. The similar VRSA isolate in Europe was reported from Portugal in 2013, and this isolate carried *mecA* and *vanA* genes probably acquired from VRE that coinfecting the patient from whom the isolate was recovered(25). During the past decade VRSA did not spread rapidly and there were only a few reports of this superbug. Until the end of 2012, 33 cases of *vanA*-type VRSA have been reported worldwide: 13 from the United States, 16 from India, 3 from Iran (2 from Tehran, 1 from Mashhad) and 1 from Pakistan(26). Limited spread of VRSA is attributed to the highly-costly *vanA* operon for *S. aureus*, which can be acquired from enterococcal conjugation(27,28,29).

Conclusion: Most *S. aureus* and *E. faecalis* isolates were positive for CTX-M-G2 and *vanA* gene and most *Klebsiella* spp. isolates were harbored CTX-M-G2 gene.

Conflict of Interest: Non

Source of Findings: Self

Ethical Clearance: Non

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Assessment of Butchers Attitudes and Practices Toward Food Safety in Thi-Qar governorate in Iraq

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Abstract

Objectives: To assess of attitudes and practice of butchers in Thi-Qar governorate regarding food safety and to find out any association of different variables with practices and attitudes. **Methodology:** A descriptive cross – sectional study to assess the attitudes and practices of butchers. The data collection extended from the February 2018 and April 2018. each. The sample of (57) butchers was selected from (26) small slaughter houses in Thi-Qar governorate who agreed to participate were included in this study. **Results:** A total of fifty seven (57) butchers were selected as a sample size for this study. 46(80.7%) were in the age of <30 and from the urban area. Most of butchers interviewed were married (52.6%). Based on length of experience of butchers, The highest proportion of them (59.6%) were in the length of experience (≤ 5) and the highest percentage of butchers were in the level of intermediate (31.6%). The overall attitudes and practices on food safety was poor, (67%) and (91%) respectively. **Conclusions:** There was high poor attitudes of food safety in of butchers. As an overall, nearly three quarters of the butchers having poor practice scores relating to food safety.

Key words: food safety, personal hygiene, butchers , practices , attitudes .

Introduction

Although food is indispensable for maintaining the life on the earth(1), it can also cause food borne diseases(2) which are important public health issues worldwide(3), such diseases cause about 2.2 million human deaths annually(2,4). In this respect, meat is a major component of the food and therefore, is the important animal protein resource which is essential for life and health (5). Notwithstanding the slaughtering of animals is typically considered to be economic activity which increasing meat supply, and others products such as skin and leather, there is an increasing enteric pathogens and contaminate environment also(6,7). As one indication of the force of the hitch, it is approximated that about 27 to 38% of foodborne diseases outbreaks contribute to poor personal hygiene (8). Food safety is a social responsibility (9) and a basic need for public health in developing countries in the twenty first century (10). as well as developed world (11). Moreover, it plays numerous, critical roles to in maintaining a human's overall health (9). It has been defined as science and an international concern that is prevents from unsafe food and food borne diseases (12,13). Different factors within the poor hygiene practices such as do not washing hand

(14), do not wearing of protective clothing, unclean of butchery equipment, as well as transporting the meat in unclean container and others factors can lead to meat contamination (15) and these factors are considered to be the major risk factors to increase foodborne illness (16). More specifically, good personal hygiene and food handlers training are prerequisites for food safety. In addition it can play an important role in the effective prevention contaminated of food . (17,18,10). All of the above mentioned issues that relate to pollute the environment are common among Abattoirs (19). These conditions are better enhanced when butchers consistently pay attention to promoting personal hygiene. Hence literature regarding attitude and practice of hygiene and food safety among abattoir workers is limited (20), the present study aimed at assessing attitude and practice of food safety among butchers in Thi-Qar governorate.

Material and Method

Place of study : The study was conducted in Thi-Qar governorate. Twenty six small slaughter houses

Study sample: The sample selection was convenient sample. Butchers present in the small slaughter houses at the time of conducting the study. The sample of (57)

butchers was selected from (26) small slaughter houses in Thi-Qar governorate who agreed to participate were included in this study.

Design&time of Study:A descriptive cross – sectional study to assess the attitudes and practices of butchers .The data collection extended from the February to April 2018.

The data collection: The data collection was by interview of a previously designed questionnaire constructed by the investigator after intensive review of relevant literatures and evaluated by a panel of experts. The items of questionnaire included 28 close ended questions, including different statements concerning the attitudes and practices of various aspect of food safety arranged in the following parts:

Part I: Demographic information sheet; four items, included demographic characteristics like age, gender, marital status, occupation, residence,experiences years.

Part II: practices on food safety (12 question) : Butchers were required to respond with yes or no , for practices, scores which were assigned for response in practices as related to 2- point type likert scale and scored as (2) for yes, (1) for no. The potential range of general questionsscores was12-24; Poor practice was defined as scores of 12-17, and good practice as 18 and more

Part III: Attitude towards food safety(16 question): Butchers were required to respond with agree or disagree , for attitudes, scores which were assigned for response in attitudes as related to 2- point type likert scale and scored as (2) for yes, (1) for no..The potential range of general questionsscores was16-48; Poor attitude was defined as scores of 16-23, and good attitude as 24 and more.The subjects were informed about the study objectives during the face to face interview, the subjects responses through the employment of the application of the constructed interview as mean of data collection.

Statistical Analysis

The approach to data consisted of two steps (descriptive and analytic statistic). Tables (Frequencies, and Percents), arithmetic mean, and standard deviation were used in order to analyze . Fisher exact test was

used to determine the significant statistical association between qualitative and quantities demographic characteristics that include age group gender, education level, marital status and practices and attitudes towards food safety and assess the results of the study under application of the statistical package (SPSS) ver. (24.0). P value was used as ≤ 0.05 as the level of significance for the test of significance.

Findings

The result of this study as explained above is presented in three forms, thus, Demographic characteristic, practices and attitudes. Therefore, the result and analysis are as follows;A total of fifty seven (57) butchers were selected as a sample size for this study The demographic information of butchers as presented in Table 1 below. Based on the age of butchers , 46(80.7%) were in the age of <30 while 11(19.3%) were in the age of ≥ 30 . However, study published from Nigeria done by O. A. Olowoporoku (2016) show a prominent age groups of study were age group <40years (93.3%)(21). Concerning the residenceof butchers , 46(80.7%) were from the urban area while 11(19.3%) were from the rural area.Similar findings were seen in study of Junaidu Yakubu M et al (2013). in Nigeria. It was noticed that about eighty of the butchers interviewed were residence in urban area (20). Most of the butchers interviewed were married (52.6%), followed by single (38.6%), and the lower percentage was others (8.8%). Based on length of experienceof butchers , The highest proportion of butchers) 59.6%) were in the length of experience(≤ 5) and this is in accordance with other study done by Mirembe BB et al (2015) in Uganda(22). In regard to education level, the highest percentage of butchers were in the level of intermediate (31.6%) followed by primary level)26.3%) and secondary level (14%). While both illiterate and institute and more education level was 10.3%. Very few of butchers were reading and writing (7%).This finding is contrary to the study of KhelkarTuneer and TiwariMadhavi (2015), which found the majority of butchers were illiterate (76%)(23).

Table 1: Distribution of butchers by Demographic characteristic.

Variable		Frequency	Percent
Age	<30	46	80.7
	≥30	11	19.3
Residence	Urban	46	80.7
	Rural	11	19.3
Marital	single	22	38.6
	Married	30	52.6
	others	5	8.8
Length of Experience	≤5 years	34	59.6
	>5 years	23	40.4
Education level	Illiterate	6	10.5
	Read and write	4	7.0
	Primary	15	26.3
	Intermediate	18	31.6
	Secondary	8	14.0
	Institute & Higher	6	10.5

The figure (1) represent the practices of butchers regarding food safety , The overall practices on food safety was poor. (67%) had poor practices of food safety while (33%) had good practices.This finding is supported by Magda A. Latif et al (2014), who found the generally poor practices on food safety has been demonstrated in their study(17).



Figure 1 : Distribution of butchers by practices of food safety

The figure (2) represent the attitudes of butchers regarding food safety , The overall attitudes on food safety was poor.(91%) had poor attitudes toward food safety while only (9%) had good attitudes.This finding is contrary to the study of Magda A. Latif et al (2014)

who evaluated of food safety knowledge, attitudes and practices among Abattoir Workers’ in Khartoum State in Sudan and concluded that the overall attitudes were well (17).

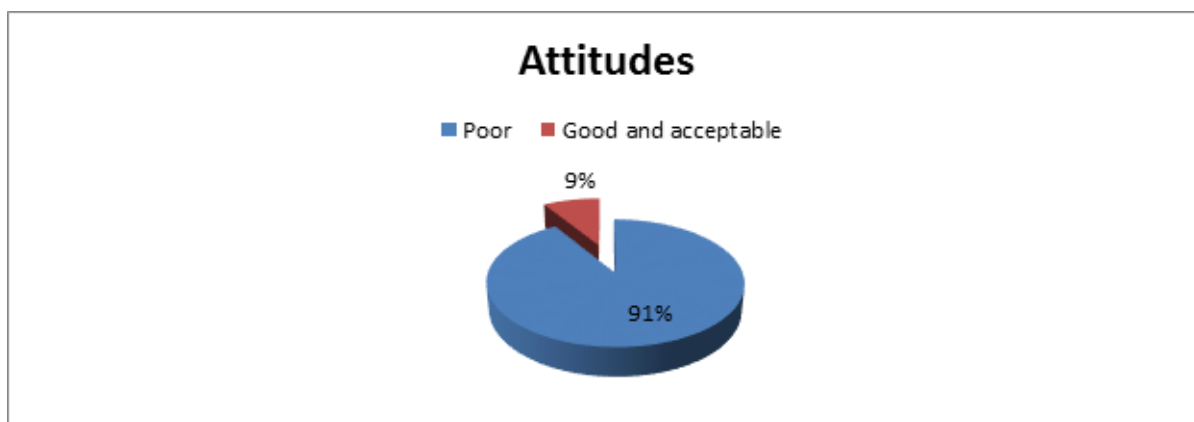


Figure 2 : Distribution of butchers by attitudes toward food safety

Table 3 shows the association between the socio-demographic characteristics, and practices levels of butchers involved in the study, with their reported involvement in food safety. As shown in Table 3, marital status and age were found to be statistically significantly associated with practice. It is also observed that residence, length of experience and education level were found to be not statistically significantly associated with practice .

Table 3 : Distribution socio-demographic characteristics and practices levels of butchers

Variable Good			practice			Total	
			Poor				
Age	<30	Count	12	34	46	0.0305	
		%	26.1%	73.9%	100.0%		
	≥30	Count	7	4	11		
		%	63.6%	36.4%	100.0%		
Residence	Urban	Count	13	33	46	0.1530	
		%	28.3%	71.7%	100.0%		
	Rural	Count	6	5	11		
		%	54.5%	45.5%	100.0%		
Marital status	Single	Count	2	20	22	0.0008	
		%	9.1%	90.9%	100.0%		
	Married	Count	16	14	30		
		%	53.3%	46.7%	100.0%		
	Others	Count	1	4	5		
		%	20.0%	80.0%	100.0%		
Length of experience	≤5	Count	8	26	34	0.0857	
		%	23.5%	76.5%	100.0%		
	>5	Count	11	12	23		
		%	47.8%	52.2%	100.0%		

Cont... Table 3 : Distribution socio-demographic characteristics and practices levels of butchers

Education level	Illiterate	Count	0	6	6	1.0000
		%	.0%	100.0%	100.0%	
	Read and write	Count	3	1	4	
		%	75.0%	25.0%	100.0%	
	Primary	Count	4	11	15	
		%	26.7%	73.3%	100.0%	
	Secondary	Count	7	11	18	
		%	38.9%	61.1%	100.0%	
	Intermediate	Count	3	5	8	
		%	37.5%	62.5%	100.0%	
	Institute or more	Count	2	4	6	
		%	33.3%	66.7%	100.0%	

Table 4 shows the association between the socio-demographic characteristics, and attitudes levels of butchers involved in the study, with their reported involvement in food safety. As shown in Table 4, residence and education level were found to be statistically significantly associated with attitudes. It is also observed that age, length of experience and marital status were found to be not statistically significantly associated with attitudes .

Table 4 : Distribution socio-demographic characteristics and attitudes levels of butchers

Variable			Attitude		Total	
			Good	Poor		
Age	<30	Count	3	43	46	0.243
		%	6.5%	93.5%	100.0%	
	≥30	Count	2	9	11	
		%	18.2%	81.8%	100.0%	
Residence	Urban	Count	2	44	46	0.044
		%	4.3	95.7%	100.0%	
	Rural	Count	3	8	11	
		%	27.3	72.7%	100.0%	
Marital status	Single	Count	0	22	22	0.355
		%	.0%	100.0%	100.0%	
	Married	Count	4	26	30	
		%	13.3%	86.7%	100.0%	
	Others	Count	1	4	5	
		%	20.0%	80.0%	100.0%	
Length of experience	≤5	Count	4	30	34	0.638

Conclusion

There was high poor attitudes of food safety in butchers. As an overall, nearly three quarters of the butchers having poor practice scores relating to food safety. There was significant relation between practice of food safety with age and marital status of butchers. Residence and education level were found to be statistically significantly associated with attitudes. The findings should be used for further strengthening food safety programs to help butchers be healthier and to enhance their educational outcomes.

Ethical Clearance: Before collecting data, necessary approvals and official permissions were obtained from butchers in The-Qar governorate. The purpose of the study was clearly explained to the butchers before filling the questionnaire.

Conflict of Interest: Nil

Source of Funding : Nil

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Nutritional Status for Patients with Hypertension in Hemodialysis Units at Baghdad Teaching Hospital

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Abstract

Millions of people are affected by chronic kidney disease (CKD) every year, as a result of various health conditions and diseases. The poor nutritional status considered communal among the dialysis patients and lead to opposed consequences, patients who have diabetes or hypertension often go without diagnosis by kidney disease due to poor medical follow-up. This study aims to assessing the socio-demographic data and the nutritional status for patients with hypertensive who undergone hemodialysis, in which an approach of assessment was applied to achieve the mentioned objectives. A descriptive (cross-sectional) design study was conducted during November 15th, 2018 to May 9th, 2019. A purposive (non-probability) sample of 100 patients with hypertension were selected. Data were collected through the use of the questionnaire format by recording the data from patients' charts and dialysis machine. Data were analyzed through the application of descriptive and inferential statistical approaches by using Statistical Package for Social Science (SPSS) version 20.0. The most patients were old age (≥ 62 years); they're evenly distributed for male and female. The highest percentages of the study sample have low educational attainment; almost patients have normal body mass index, and the highest percentage of them have stage 2 hypertension. The major percentage of patients have anemia, an elevated level of serum phosphors, blood urea and serum creatinine, respectively. Finally, the study results revealed the patients weren't smoking and they weren't having DM. Based on this, Establishing of nutritional health style for patients with hypertension on hemodialysis and activate the dieticians' role in hemodialysis units.

Keywords: *Nutritional status, Hypertension, Hemodialysis.*

Introduction

Millions of people are affected by chronic kidney disease (CKD) every year, as a result of various health conditions and diseases, It also can occur when patients fail to take prescribed medications for chronic diseases or because of a poor financial situation that prevents patients from seeking treatment^[1]. The National Kidney and Urologic Diseases Information Clearinghouse stated in 2010, that more than twenty millions of Americans had CKD^[2]. By the US Renal Data System in 2009, data were collected on patients with kidney diseases recorded that there was a 3.3% increase in the treatment of kidney diseases by hemodialysis, peritoneal dialysis, transplants, and other approaches yearly. The incidence of kidney diseases increased among Asians by 8.3%, African Americans by 1.1%, Native Americans by 9.9%, and Caucasians by 3.5% during 2008 to 2009,^[3]. This study aims to assessing the socio-demographic data and

the nutritional status for patients with hypertensive who undergone hemodialysis.

Material and Method

A descriptive (cross-sectional) design study was conducted to achieve the study objectives. The study was carried out during November 15th, 2018 to May 9th, 2019. The study was conducted at Baghdad teaching hospital. A purposive (non-probability) samples of 100 adults with hypertension were selected, those patients undergone thrice weekly treatment at hemodialysis units. A questionnaire designed and constructed to achieve the study objectives. The validity was determined through the use of panel of (6) experts, they were faculty members from College of Nursing\ University of Baghdad, to investigate the clarity, relevancy, and adequacy of the questionnaire. The experts' suggestions were taken into consideration and modifications were employed

and the final constructed instrument was completed for conducting study. The reliability was determined through the use of Test- retest through the computation of Pearson Correlation Coefficient ($r = 0.86$). The questionnaire consisted of three parts: the first contained socio- demographic characteristics: age, gender, educational attainment, marital status, occupation, financial status, and residence; the second part contained clinical data: BMI, blood pressure)BP(, Hb, PCV, S. Potassium, S. Phosphor, B.urea, S.creatinine, and S.Albumine; the third part contained the medical history such as: smoking, suffering from diabetes, heart and coronary arteries diseases, intestinal disorders, taking anti-hypertensive medications and food limitations due

to the disease. The data have been collected through utilizing the direct interviewing approach. Time from 10 – 15 minutes for each patient was taken to accomplish the questionnaire. The data were collected when the patients on the dialysis machine, the readings of BP was obtained from the machine monitor. The latest date of diagnostic tests results were obtained from the patients' charts, the patients' height and weight were measured through the tool in the dialysis units used for this purpose. The BMI calculated through an equilibrium $BMI = \frac{Weight}{Height^2}$. Data analysis was employed through the application of descriptive and inferential statistical approaches by using statistical package of social science (SPSS) version 20.0.

Findings and Discussion

Table1. Socio-demographic Characteristics of the study sample

Variables	Frequency	Percent
1. Gender		
Male	50	50.0
Female	50	50.0
Total	100	100.0
2. Age group (year)		
20-25	6	6.0
26-31	10	10.0
32-37	12	12.0
38-43	9	9.0
44-49	11	11.0
50-55	12	12.0
56-61	11	11.0
62 and above	29	29.0
Total	100	100.0
Mean \pm standard deviation (49.4 \pm 15.5)		
3. Educational attainment		
No read and write	8	8.0
Read and write	18	18.0
Primary school	22	22.0
Intermediate school	21	21.0
Secondary school	19	19.0
College	9	9.0
Others	3	3.0
Total	100	100.0
4. Marital status		
Single	10	10.0
Married	89	89.0
Widowed	1	1.0

Cont ... Table1. Socio-demographic Characteristics of the study sample

Total	100	100.0
5. Financial Status		
Sufficient	57	57.0
Barely sufficient	42	42.0
Not sufficient	1	1.0
Total	100	100.0
6. Occupation		
Housewife	40	40.0
Free job	49	49.0
Student	1	1.0
Employee	8	8.0
Retired	2	2.0
Total	100	100.0
7. Residence		
Urban	94	94.0
Rural	6	6.0
Total	100	100.0

As presented in table (1), in term to the age and gender the results revealed that the patients were fifty percent for each male and female. These findings go along with the study [4] that stated the gender were male and female evenly distributed in their study.

A twenty nine percent of them were aged (62) years and more, with a mean age of forty nine years old and four months, which reflect that the older adults have been affected with kidney disorders more than young people regardless if they were being male or female. This result of old age go along with two studies[5],[6] which stated that the age of the patients were older than fifty five years old. In regard to the mean age, a study [4] that reported the mean age was (47.4) years for the patients which considered near to this study outcome. The samples of the study were equally distributed (50%) for each males and females. These findings reflect the effect of HD on the nutritional status for both males and females patients equally.

A highest rate (22%) of the patients were primary school graduated, this reflect they have low educational

level. This study outcomes go along with two another studies[7],[8] that reported the patients have lack of education who attending in the dialysis centers.

The majority (89%) of the patients were married; these findings opposed to the study results [9] that reported majority (74%) of the samples were single.

More than half of the study samples have sufficient monthly income; this perhaps indicates that the poor financial status hasn't an effect on the patients' health-related condition. While the study results [1] has been showed that un sufficient financial status has an effect on patients condition and leads to failure of taking prescribed medications and prevent patients from seeking treatment for chronic diseases.

A forty nine percent of the patients were free job; these results showed there is no effect of occupation on nutritional status. A major (94%) were lived in urban areas, this may refer to the people who lived in urban more prone to be affected with renal diseases and hypertension.

Table 2. Biochemistry Characteristics of the Study Sample

Variables	Frequency	Percent	Mean
1- Body Mass Index			
Less than 20 (low weight)	6	6.0	26.4
20-25 (normal)	39	39.0	
26-30 (over weight)	35	35.0	
more than 30 (obese)	20	20.0	
Total	100	100.0	
2- Systolic blood pressure			
< 120 (normal)	5	5.0	152.3
120-139 (prehypertension)	14	14.0	
140-159 (stage 1 hypertension)	36	36.0	
> 160 (stage 2 hypertension)	45	45.0	
Total	100	100.0	
3- Diastolic blood pressure			
< 80 (normal)	13	13.0	93.3
80-89 (prehypertension)	31	31.0	
90-99 (stage1hypertension)	22	22.0	
> 100 (stage 2 hypertension)	34	34.0	
Total	100	100.0	
4- Hemoglobin (Hb)			
Less than normal range	89	89.0	9.1
Normal range	11	11.0	
Total	100	100.0	
5- Packed Cell Volume (PCV)			
Less normal range	97	97.0	27.3
Normal range	3	3.0	
Total	100	100.0	
6- S. Potassium (K)			
Less than normal	8	8.0	4.8
Normal range	65	65.0	
More than normal range	27	27.0	
Total	100	100.0	
7- S. Phosphors (P)			
Normal range	37	37.0	5.5
More than normal range	63	63.0	
Total	100	100.0	
8- Blood urea			
Normal range	3	3.0	123.7
More than normal range	97	97.0	
Total	100	100.0	
9- S.creatinine			
Normal range	1	1.0	8.4
More than normal range	99	99.0	
Total	100	100.0	
10- S. Albumin			
Less than normal	27	27.0	4.040
Normal range	66	66.0	
More than normal range	7	7.0	
Total	100	100.0	

In term to BMI, table (2) showed that (39%) have normal BMI, this result are opposite to the another studies results [10],[11] which stated that the patients have low BMI and this is considered a risk factors for death in kidney diseases. Another study [12] reported that the patients have high level of MBI (>22 kg/m²) and this is associated with increased the morbidity.

The results of patients reveal they have a stage 2 systolic hypertension which formed a (45%). A (34%) were stage 2 diastolic BP readings also, a study [13] revealed that increasing frequency of hypertension lead to increasing the epidemic of cerebrovascular diseases. This study results opposite with study [14] that reported a temporary reduction in BP during the dialysis nutritional examination for patients with hemodialysis.

In relation to Hb and PCV for the study sample, less than normal value formed the majorities (89% and 97%) respectively; this indicates the reduction in kidney functions of erythropoietin secretion by the adrenal glands. This study results corresponds with systematic review, carried out in the United States [15] presented that patients on dialysis having anemia and it should be treated.

In regard to the potassium level, it was within the normal level for more than half (65%) of the study sample. A study [16] stated that as the potassium acceptable upper limit is (5.3 mmole/l) and potassium level (6.0 mmole/l) is considered hyperkalemia and responsible for (3%- 5%) deaths in hemodialysis patients.

The study results show that a (63%) have had elevated level of phosphors due to disturbance in the kidney functions.

In this study the B.urea and S.creatinine levels were elevated for the patients (97% and 99%) for each, respectively, these outcomes go along with a study [9] that mentioned the elevated B.urea and S.creatinine levels for patients on hemodialysis.

In relation to the S.Albumin level, a (66%) of the samples have normal values. The study results [17] revealed that patients in dialysis having hypoalbuminemia due decrease protein intake or due to inflammation process. While another study [18] revealed that a higher levels of S.Albumin is due to an increase in protein intake over time or higher dietary protein intake, also study [19] shown the elevated albumin level in hemodialysis patients due to oral nutritional intake and parenteral nutrition during dialysis.

Table 3. Clinical Characteristics of the Study Sample

Variables	Frequency	Percent
1- Smoking		
Yes	14	14.0
No	86	86.0
Total	100	100.0
2- Having Diabetes Mellitus (DM)		
Yes	25	25.0
No	75	75.0
Total	100	100.0
3- Having Heart Diseases		
Didn't have	88	88.0
Angina	1	1.0
MI	1	1.0
Atherosclerosis	2	2.0
Heart Failure	8	8.0
Total	100	100.0
4- Hypertension Medications		
Yes	90	90.0
No	10	10.0
Total	100	100.0
5- Having an Intestinal Diseases		
Didn't have	85	85.0
Cereal Diseases	1	1.0
Irritable Bowel Syndrome	14	14.0
Total	100	100.0
6- Limitations of Food		
Yes	85	85.0
No	15	15.5
Total	100	100.0

Table (3) presented that the majority (86%) weren't smoking; these findings indicate that smoking may not disrupting the kidney functions and doesn't matter whether the patients on hemodialysis were being smoking or not.

In relation to having DM, the findings revealed that (75%) weren't have DM, a study results [20] weren't resemble to this study results; which stated that a lot of hemodialysis patients have DM.

The results showed (88% and 90%) haven't heart diseases and they're taking hypertension medications regularly, respectively. The results of Epidemiology of Diabetes Intervention and Complications/ Diabetes Control and Complications Trial study[21]indicated that reduced use and reduced antihypertensive drugs prescription can lead to reduction in cardiovascular likelihoods and reduce hypotension for patients during hemodialysis.

In regard to food limitations that lead to decrease the elevated BP, the majority (85%) were followed food limitation, this results go along with study results [22] that implemented different dietary approaches included low and limiting total dairy fatty foods, saturated fat, and cholesterol to stop hypertension. These approaches lead to decrease BP.

Conclusions

1. The study findings showed male and female evenly distributed, and the most patients were old age.

2. The study findings reflecting the patients have low educational attainment; they're a primary school education,

3. The results showed that more than half having sufficient financial status, and the majority of the samples were lived in urban areas, this may refer to living in urban areas may be more prone to hypertension.

4. The highest percentage have normal BMI, and most of them have stage 2 hypertension.

5. The major percentage of the patients have anemia, this is appear through the findings of low Hb and PCV value as a result of disturbed kidney functions.

6. The study results reflecting an elevated level of S.phosphors, B.urea and S.creatinine, respectively due to disturbance in normal kidney functions.

7. The major percentage of the samples weren't smoking and they weren't have DM, this may be a good sign for patients with hypertension who undergoing hemodialysis.

Recommendations

1. Establishing of nutritional health style for patients with hypertension on hemodialysis.

2. Activate the dieticians' role in hemodialysis units.

Ethical Clearance: No

Source of Findings: Self

Conflict of Interest: Nil

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Relation of Epstein Barr virus with Interleukin-6 Level among Women with Breast Cancer in Ramadi City

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Abstract

The study aimed at evaluating the relation of Epstein Barr virus (EBV) with level of interleukin-6 (IL-6) in women with breast cancer. The study was carried out in Ramadi city from 12th of January to 12th of September 2018, and included a total of 95 breast cancer women who admitted to oncology clinic of Ramadi Teaching Hospital whose ages were between 25-70 years. Patients were investigated for detection of EBV by using Real Time PCR and interleukin-6 (IL-6) by ELISA technique. The rate of breast cancer women with EBV was 29.47%. The highest rate of breast cancer women was within the age group 40-49 years with no significant relation between breast cancer and age. The study showed that the highest means of IL-6 level (151.50 pg/ml) were found in breast cancer women without EBV. The highest rate of breast cancer women was from rural areas.

Keywords: Breast cancer, EBV, IL-6, Ramadi.

Introduction

Breast Cancer (BC) is one of the most important neoplasia among women. It was recently suggested that biological agents could be the etiological cause (1). Epstein-Barr virus (EBV) is a ubiquitous in that infecting more than 90% of adult population worldwide. Epstein-Barr virus has been linked to the development of variety of human malignancies. Epstein-Barr virus and human papilloma virus (HPV), which are DNA viruses, were reported to be linked with 38% of all virus-associated cancers (2). A viral etiology for several malignancies has been suggested. One of the risk factors for development of breast carcinoma, which is the leading malignancy in women all over the world, is proposed to be a viral infection; hence recognition of the causative issues is essential for proper management (3).

Elevated interleukin 6 (IL-6) and interleukin 10 (IL-10) serum concentration, are strongly associated with breast cancer and correlate with clinical stage of disease. Interleukins may stimulate cancer cells growth and contribute to locoregional relapse as well as metastasis (4). Interleukin-6 plays an important role in the process of inflammation, particularly in the transition from acute to chronic inflammation. In breast cancer, IL-6 has been shown to inhibit the growth of cancer cells but promote the development of metastases (5,6).

Material and Method

Across-sectional study was carried out in Ramadi city from 12th of January to 12th of September 2018, and included 95 women with breast cancer whose ages were between 25-70 years old. These patients admitted to oncology clinic of Ramadi Teaching Hospital.

Blood samples were taken from breast cancer women. Samples were examined by immunological methods, enzyme linked immuno sorbent assay (ELISA) for detection interleukin-6 (IL-6) and molecular technique (Real time PCR) which included DNA amplification of Epstein Barr virus based on the specific primers.

Seven and half ml of blood was collected by vein puncture using vacutainer tubes from each patient enrolled in this study. Blood samples were placed into two sterile test tubes, in one of them 2.5 ml of blood was put in test tube containing anticoagulant ethylene diamine tetra acetic acid (EDTA) and used for DNA extraction of EBV. The second part of sample (5ml) was placed in plain tubes left for 30 minutes at 37 °C then was centrifuged at 3000 round per minute (rpm) for 15 minutes then the clot was removed and the remain re-centrifuged at 3000 rpm for 10 min and the obtained sera were then aspirated using automatic micropipette and transferred into two clean test tubes, for serological

tests. Label was fixed on each test tube which then stored in deep freeze at -20°C for late serological testing for determination the level of IL-6 by using ELISA technique.

For DNA extraction, kit was purchased from Gene Aid(USA) company for molecular detection of EBV by Real Time PCR using Anatolia Gene Works(Turkey). Detection of IL-6 was done by using ELISA kit Elabscience (China), which depends on the Sandwich-ELISA principle.

Statistical Analysis

Computerized statistically analysis was performed using T-Test probability. The P value >0.05 was

considered statistically significant, and for result which its P value was less than 0.01 was considered highly significant, while for those which its P value greater than 0.05 was considered statistically non-significant.

Finding

A total of 95 breast cancer women, their age ranged between 20-89 years old, were investigated for detection of EBV by using real time PCR and estimation the level of IL-6. The present study revealed that EBV was found in 29.47% of women with breast cancer, as shown in Table 1.

Table 1: Frequency of EBV in women with breast cancer.

EBV	Breast Cancer Women	
	No.	%
Positive	28	29.47
Negative	67	70.53
Total	95	100

The current study showed that the highest rate of EBV infections (12.63 %) was found in women with breast cancer within the age group 40-49 years, as shown in Table 2.

Table 2: Distribution of EBV infection in women with breast cancer according to their age.

Age Group (Years)	No. of Women with Breast Cancer Patients	EBV Infection	
		No.	%
20-29 (No:0)	2	0	0
30-39 (No:3)	19	5	5.26
40-49 (No:15)	43	12	12.63
50-59 (No:38)	23	9	9.47
60-69 (No:27)	5	1	1.05
70-79 (No:6)	1	0	0
80-89 (No:6)	2	1	1.06
Total (No:95)		28	29.47

The present study revealed that there was a negative correlation between EBV infection and age of women with breast cancer, but the difference was statistically non-significant (R value: -0.132), as shown in Figure 1.

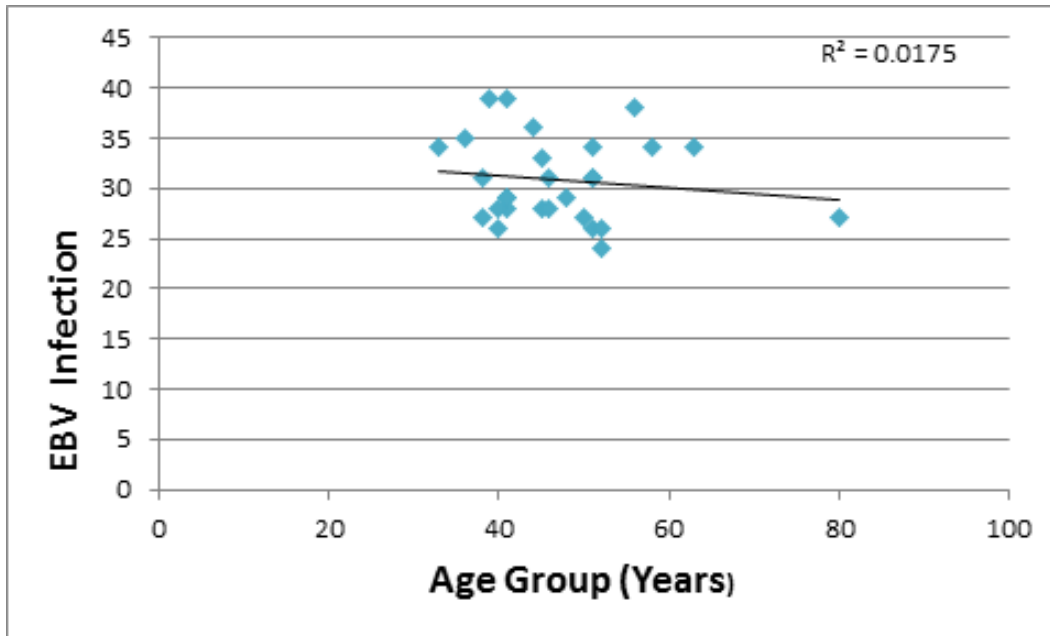


Figure 1: Negative correlation between EBV infection and age of women with breast cancer.

The present study revealed that the highest rate of women with breast cancer and EBV infection was from rural areas, as shown in Table 3.

Table 3: Distribution of EBV infection according to residence of women with breast cancer.

Residence	No. of Patients	EBV Infection	
		No.	%
Rural	51	14	14.73
Urban	44	14	14.74
Total	95	28	29.47

The present study revealed that the mean of IL-6 was higher in women with breast cancer without EBV infection as compared with those infected with EBV, as shown in Table 4.

Table 4: Relation of EBV infection with level of IL-6 among women with breast cancer.

EBV Infection	No. of Women with Breast Cancer	IL-6		P value
		Mean	SD	
+ve	28	76.46	±70.71	0.74
-ve	67	81.61	±62.69	

The present study revealed that there was a positive correlation between EBV infection with IL-6 among women with breast cancer but the difference was statistically non-significant between them (R value: 0.084).. Figure 2.

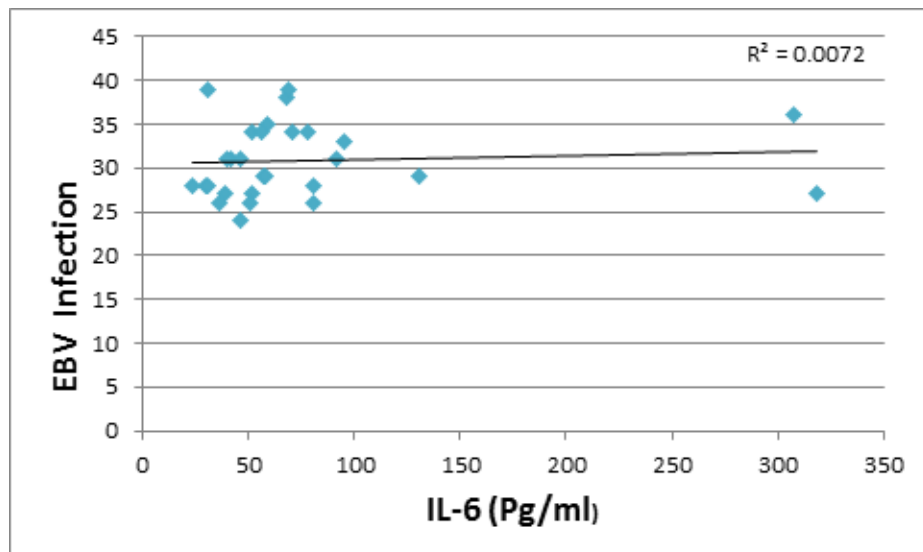


Figure 2: Positive correlation between EBV infection with IL-6 among women with breast cancer.

Discussion

Breast cancer is a public malignancy and a major cause of morbidity in women. The present study revealed that EBV was detected in 29.47% of women with breast cancer. Numerous studies have reported a relationship between EBV and breast cancer. Zekri et al (7) revealed that EBV was found in 28% of Iraqi women with breast cancer and 45% of Egyptian. Lorenzetti et al (8) indicated that 31% was positive for EBV and in agreement with 31% to 52% EBV association which described in several geographic locations (9,10,11,12,13,14,15). Preciado et al (10) revealed that EBV was detected in 31% of tumor samples analyzed. No EBNA-1 labeling was obtained from samples without tumor. Fawzi et al (11), reported that EBV-DNA has been detected in 20% of breast cancer samples, using PCR targeting sequences specific for the Bam HI-W region of EB and refutes all studies that deny the relationship between breast cancer and Epstein-Barr virus infection (16,17).

The current study showed that the highest rate of EBV infections (12.63 %) was detected in those within the age group 40-49 years. Richardson et al (18), showed that the mean age of breast cancer women was 48 years with most in the 40-54 year age-group. It has been reported that the rate of EBV infection was higher in women less than 50 years than those older (19). According to American Cancer Society, age of the patient is an important factor both for the occurrence and management of the cancer with 95% of all new breast cancer cases occur in women aged 40 years (20). Al-Khafaji (21) revealed that the peak frequency was

recorded in the age of 50 years. The results reported that risk of breast cancer increases with age (22). Epstein – Barr virus [EBV] in Arab countries including Iraq was with high rate of infection (23). Epstein –Barr virus infection was linked with the development of breast cancer (24). However, other study was carried out in Taiwan detected EBV in 6.5% to 35.25% in breast cancer tissue (25). In addition, EBV detection rate in breast cancer tissue was the lowest in USA (18.27%) and the highest in Asia (35.25%) (26).

The current study revealed that the highest rate of women with breast cancer was from rural areas. The study of epidemiology of breast cancer in Indian women showed that the higher breast cancer is the major cause of morbidity and mortality among females ranking number one among females in Indian metropolitan cities like Delhi, Kolkata, Pune and Thi'puram, Bangalore and Mumbai and in Northeast. Factors as marital status, location (urban/rural), BMI, breast feeding, waist to hip ratio, low parity, obesity, alcohol consumption, tobacco chewing, smoking, lack of exercise, diet and environmental factors were major risk factors in India leading to increasing incidence cancer. Activities play a role among urban and rural women in the development of breast cancer. The more time spent on household activities further reduced the breast cancer risk (27).

The present work revealed that the means of IL-6 level was higher in women with breast cancer without EBV infection than those with EBV infection. Cytokines may play a role in pathophysiology of neuropsychiatric of the immune and neuro-endocrine

system. Pro-inflammatory cytokines have been associated with depression in persons with cancer during treatment and fatigue in survivors of breast cancer (28,29). Victoret al(30) confirm the association of levels IL-6, and IL-10 in breast cancer patients with or without receiving chemotherapy. In breast cancer, high levels of the inflammatory cytokine IL-6 have been associated with disease survival and treatment resistance (31,32). A study on interleukin-6 gene promoter and influence of -174G/C polymorphism on breast cancer revealed that there was no association or trend of association between -174G/C polymorphism of IL-6 promoter gene and breast cancer diagnosis or prognosis(33).

Conclusions

The study concluded EBV may play a role in the development of breast cancer and may be an etiology or it may induce immunosuppression that enhance the development of breast cancer. The mean age of breast cancer women was 54.5 years, The highest rate of breast cancer women was within the age group 40-49 years, with no significant relation among breast cancer patients and their age concerning EBV infection. There was a highest rate of rural than urban residence among breast cancer women, concerning EBV infection. The mean of IL-6 level was higher in women with breast cancer without EBV than those with EBV infection.

Ethical Clearance: taken from hospital and patients.

Conflict of Interest: Nil

Source of Funding : Nil

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Assessment of Nutritional Status of Under Five Years Children in Relation to Their Birth Space in Shirqat City

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Abstract

Background: Nutritional status of children who are less than 5 years old is of significant regard as the beginning years of life are important for best development. Childhood malnutrition occurs due to several reasons, but spacing of birth is frequently unnoted even if it is accompanied with stunting which reflect chronic malnutrition. **Aims:** To assess the nutritional status of children less than 5 years old, and its relationship with birth interval, and associated factors. **Materials and Methods:** It was a cross sectional study was carried on children of 0-5 years age groups of both sexes. Data was collected using predesigned and pretested questionnaire, face to face interview with the mothers and anthropometric measurements of children were performed. **Results:** Most of undernourished children were with birth space less than 24 months. The frequency of stunting and wasting was the highest among children with birth interval less than 24 months, it was (14.5%) and (6.8%) respectively as compared to those with birth interval 24-59 months were frequency of stunting and wasting was found to be the lowest, it was (11.2%) and (2.2%) respectively. **Conclusion:** This paper draws attention to significant linkages between birth spacing and child nutritional status. Most of undernourished children were with birth space less than 24 months.

Keywords: birth interval, nutritional status, under five.

Introduction

Nutritional status and the health of child population is a true indicator of the overall health and economic development of the community. Children that are under 5 years old are considered the most vulnerable sector of the community, and malnutrition among this sector is one of the important health problems in developing countries(1) ,Birth spacing might have an impact on the nutritional status of the child as it leads to preterm delivery. Mothers cannot easily regain their nutritional stores if a pregnancy occurs early after the previous birth, that leads to low birth weight and preterm birth. Birth spacing effects on the nutritional status of the child extend after pregnancy and to infancy as a result of early weaning and insufficient practices of alternative feeding, usually because of a new siblings birth in a short interval. Mothers who have adequate spacing for their

pregnancies are capable to give their children essential nutrition for development success.(2)Interpregnancy interval (IPI) or birth to pregnancy interval(BTP), is defined as the period between a live childbirth and the beginning of the next pregnancy. (3) The World Health Organization (WHO) recommended that couples should rest for at least (2-3 years) between births in order to lower adverse maternal and child health outcome. Some studies found positive relationship, some negative, and some display no effect at all(4)

Material and Method

It was a cross sectional study conducted in the period from the first of November 2018 to the end of April 2019. Simple random sampling was used to choose the study subjects if he/she met the inclusion criteria. Verbal permission was obtained from Al-Shirqat primary health care sector before dealing with the children and their caregivers and from parents of the study subjects after explaining the aim of the study and procedures. In this study anthropometric measurements were used to assess nutritional status because they provide satisfactory results within the available resources. Data management

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and analysis were done using manual statistical method. Chi-square test was used to test the significance in this study. The level of significance was estimated with 95% confidence interval and p value <0.05.

Findings

Out of 339 study subjects 131 (38.6%) had birth space of less than 24 months, majority of children 133 (39.2%) had birth interval of 24-59 months, and 75 (22.1%) children had birth space of more than 59 months (Table 1).

Table(1) :Distribution of children according to their birth interval.

Birth interval	Male(175)	Female(164)	Total(339)
>24 months	68(38.85%)	63(38.41%)	131(38.64%)
24-59 months	69(39.42%)	64(39.02%)	133(39.23%)
>59 months	38(21.71%)	37(22.12%)	75(22.12%)

Most of undernourished children were with birth space less than 24 months. (Figure1).

Chi-square=1.3 df=2 p-value=0.5

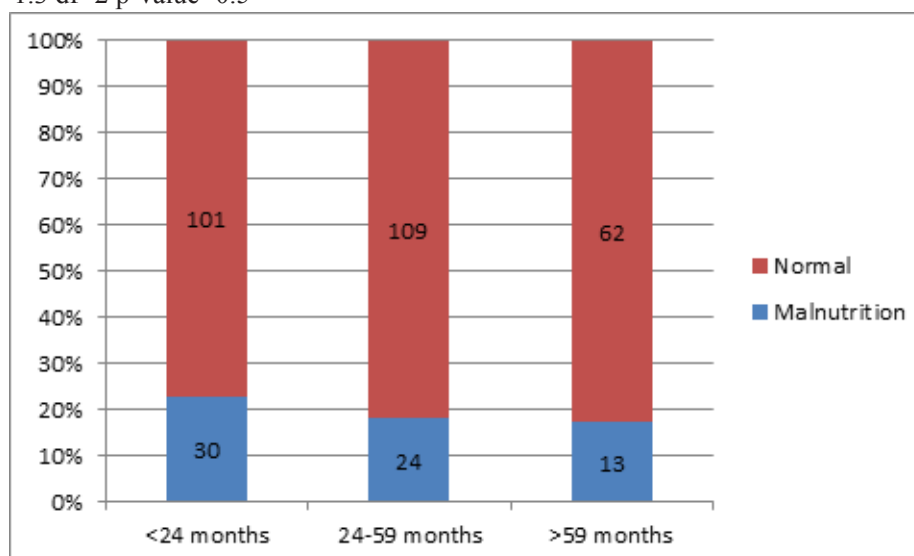


Figure (1): Association between child nutritional status and birth interval

Some children who are stunted could be also underweight and/or wasted at the same time. Similarly, children who are wasted and/or underweight may be stunted also. A child either stunted, underweight or wasted or any combination of the three was considered as having malnutrition which comes to be 67 (19.7%). The frequency of stunting and wasting was the highest among children with birth interval less than 24 months, it was (14.5%) and (6.8%) respectively as compared to

those with birth interval 24-59 months were frequency of stunting and wasting was found to be the lowest, it was (11.2%) and (2.2%) respectively. The frequency of underweight was the highest among children with birth interval 24-59 months, it was (9.7%) compared to those with more than 59 months birth interval. This finding was statistically insignificant. (Table 2).

Table (2) : Association between child nutritional status and birth interval.

Birth interval	Total children	Height for Age		Weight for Age		Weight for Height	
		Stunted Normal		Underweight Normal		Wasted Normal	
<24months	131(38.64%)	19(14.50%)	112(85.49%)	12(9.16%)	119(90.83%)	9(6.87%)	122(93.12%)
24-59months	133(39.23%)	15(11.27%)	118(88.72%)	13(9.77%)	120(90.22%)	3(2.25%)	130(97.74%)
>59months	75(22.12%)	10(13.33%)	65(86.66%)	4(5.33%)	71(94.66%)	2(2.66%)	73(97.33%)
Total	339(100%)	44(12.97%)	295(87.02%)	29(8.55%)	310(91.44%)	14(4.12%)	325(95.87%)

Chi-square=0.59 chi-square=1.03 chi-square=4.03 ;

Df=2 df=2 df=2; p-value=0.744 p-value=0.59 p-value=0.133

Among 339 children, 44 (12.97%) were stunted,29 (8.55%) children were underweight and 14 (4.12%) children were wasted. Males were comparatively more malnourished than females. (Table 3).

Table(3) :Distribution of study population According to Nutritional Indicators.

indicators	Male No. (%)	Female No. (%)	Total No. (%)
Stunting	24 (54.54%)	20 (45.45%)	44 (12.97%)
Underweight	18 (62.06%)	11 (37.93%)	29 (8.55%)
Wasting	8 (57.14%)	6 (42.85%)	14 (4.12%)

As per WHO chart: Cut-off is considered as <2 sd

In the study sample, the result of malnutrition by the combinations of birth interval with birth order indicate that the predominance of being malnourished were higher in the combination of birth order 2-3 and <24 months of birth interval (57.5%) in comparison to combination of birth order 2-3 and >59 months (5%) in particular. There were significant differences in the association of birth spacing with malnutrition by birth order (p- value <0.05). (Table 4).

Table (4): The relationship of birth spacing with malnutrition according to birth order.

Birth order	Malnutrition by birth interval (in months)			Total Malnutrition
	<24	24-59	>59	
2-3	23 (57.5%)	15 (37.5%)	2 (5%)	40 (59.70%)
4-5	5 (25%)	6 (30%)	9 (45%)	20 (29.85%)
≥6	2 (28.5%)	3 (42.85%)	2 (28.57%)	7 (10.44%)
Total	30 (44.77%)	24 (35.82%)	13 (19.40%)	67 (100%)

Chi-square=16.22 Df=4 P-value= 0.002

Discussion

The current study found increased frequency of stunting and wasting among children with birth interval less than 24 months as compared to those with birth interval >24 months. The association between birth interval and stunting, underweight and wasting was found to be statistically insignificant (p -value > 0.05). These results correspond with similar findings from other studies which found increased odds of stunting among children with birth interval less than 24 months as compared to children with birth interval 36-59 months(2) Other study conducted in Bangladesh revealed increase prevalence of stunting among children of birth interval less than two years, the study found significant association between birth interval and stunting. Also the study shows a negative relation between intervals more than 48 months and stunting(5) ,Study from India, Shahjada et al (2014) found that the majority of malnourished children were with birth space less than 24 months. It observed that the prevalence of stunting, underweight and wasting was the highest among children with birth interval less than 24 months and this study showed a positive association between the length of birth interval and child nutritional status(6) ,The current study found that the frequency of stunted children, underweight and wasting was higher in male children than females. This finding was studied and explored by researchers who suggested some explanations. It is expected that male children are more affected by environmental strains than females(7,8).This finding also agrees with a study conducted in Somalia, where it was found that more males had malnutrition than females as their numbers are very in the community(1)

A possible explanation for this result could be due to the fact that males have a tendency to be actively playing outside the house as compared to girls who are always at home spending most of their time eating. The current study found that children with birth interval less than 24 months were more likely to be malnourished in the birth order 2-3 than those with \geq 24 months of birth interval. The result of the present study shows that the children of lower birth order and longer birth interval were less malnourished than those with higher birth order and shorter birth interval. Birth spacing comes to be less effective on a higher birth order to reduce childhood malnutrition. This finding is supported by a similar result from previous study (9) ,Overall, our results suggest that high percentage of malnutrition among low birth order children could be avoided with the improvement of

birth spacing as better nutritional outcome seen among children with lower birth order and longer birth interval. Zajonc (1976) revealed that the negative effect of birth order can be reversed by longer birth interval (10). Although, the finding suggest that the combination of lower birth order(2-3) and lesser birth interval (<24) that often considered as a result of lack of family planning, adversely affects child's nutritional status.

Conclusions

1. This paper draws attention to significant linkages between birth spacing and child nutritional status. Most of undernourished children were with birth space less than 24 months.
2. Males are comparatively more malnourished than females.
3. The predominance of being malnourished were higher in the combination of birth order 2-3 and less than 24 months birth interval.

Recommendation

- Community and health facility-based birth spacing educational programs are required to enhance birth spacing and encourage post-partum birth control use.
- Health providers and health workers should be educated about informing and counseling women on birth spacing.
- For women who want to get a next pregnancy after a live birth, wait at least 2 years before attempting to become pregnant.
- Strengthening and improve quality of prenatal care services and intensive awareness programs has to be arranged to increase its utilization.

Conflict of Interest: None

Source of Findings: Self

Ethical Clearance: Nil

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Detection of blaCTX-M gene in Klebsiella sp. Causing UTIs in Al-Yarmouk Teaching Hospital

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Abstract

Background : Klebsiella sp. causes a wide range of bacterial diseases like pneumonia, UTI and sepsis. Therefore, this study was done to assess the prevalence and molecular characteristics of Klebsiella sp. in 50 samples of men and women isolated from Iraqi patients which was suffering from urinary tract infection (UTI) compared with (10) of healthy individuals. All samples were collected from Al-Yarmouk teaching hospital/Baghdad during January – March 2019. Identification of bacterial isolated were done by using manual cultural procedures and VITEK 2 automated (bioMérieux, France) system, while antibiotic sensitivity test of Klebsiella sp. was achieved by Kirby-Bauer and MIC testing was made by VITEK 2. The creation of ESBL was phenotypically distinguished by twofold plate cooperative energy test as assigned by to the CLSI rules. Location of bla-quality encoded CTX-M was seen by customary P.C.R system. Out of fifty separates of K. Pneumonia, 26% were planted generation of ESBL utilizing CDT, the MIC utilized with diverse anti-infection agents in this investigation, 13 (26%) of secludes by utilizing VITEK2 AST-GN30 which exhibited that, all disconnects were totally impervious to every one of ceftazidime, cefepime and ceftriaxone with MIC (≥ 16 - ≥ 64) $\mu\text{g/ml}$, and the outcome demonstrated that 61.53% separated of ESBL production were delicate carbapenem with MIC (≤ 0.25) $\mu\text{g/ml}$. Furthermore, PCR examine uncovered that 4 (30.76)% of the ESBL creating isolates harboured blaCTX-M gene.

Keyword : Molecular study ; virulence genes ; Klebsiella sp.; urinary tract infections (UTIs)

Introduction

In human body, the urinary system is a usually sterile and far from the colonization of normal by innate epithelial barrier and the antibacterial action of the bladder mucosa and the excretion of urine. However, urinary tract infections (UTIs) are represent principal infectious diseases, occurred in all individuals and all age groups (1).

Globally, more than 6 million physician clinics were visits in year due to UTI by two-thirds by women (2). Numerous revision submitted that daily sexual relation have a role in occurrence of bacterial vaginosis. this might be sexually transmitted by sex or by therapeutic routs especially when males suffered from these infection though they applied to heavy program of treatment (3,4).

Urinary tract infections are an important health problem for millions of individuals each year (5). Notwithstanding the common obtainability of antibiotics, it stills the second most public bacterial infection in the population, and not forget that in women more frequent infected with UTI than men (6,7).

The majority of UTI infection occurs with exposure to Klebsiella, it account about 6 to 17% of all nosocomial UTIs and reveal high occurrence in patients with risk, e.g., DM patients. Klebsiella causing UTIs are clinically can not be distinguished from UTIs of other origins. So, the aim of this work was to study the role of virulence gene associated with Klebsiella sp. causing UTI in Baghdad hospital (8).

Material and Method

Collection of samples:

Sample of urine were gathered as aseptically as conceivable in sterile holders (general containers or pee packs). mid-stream examples were gathered from the UTIs patients and the control person. All examples were gathered from Al-Yarmouk showing emergency clinic/ Baghdad during January – March 2019. The gathered examples were moved to the research center inside 20 minutes of accumulation.

Cultivation

A calibrated loop measures 0.01ml of urine, using one plate of each a MacConkey and blood agar, the loop touched to center of plate in such a manner and as mentioned in in standard bacterial cultivation procedures in order to produce isolation colonies. “The plates were incubated at 37oC overnight” and examined on the following day for growth. Colonies were counted on each plate. Colonies were morphologically studied on MacConkey agar and blood agar by using a magnifying lens, As well as biochemical tests.

Sensitivity Test To Antimicrobial Agents:

Disc diffusion test (Kirby-Bauer) was used as initial susceptibility test because of its ease of performance, reproducibility and proven values as a guide to antimicrobials therapy. All *Klebsiella* sp. secludes were societies on MacConkey agar. The antimicrobial helplessness of these detaches was finished by Kirby-Bauer technique and VITEK 2 framework as indicated by the Clinical and Laboratory Standards Institute (CLSI) rules. CLSI guidelines (9). The MIC for phenotypically ESBL creating segregates was gotten.

ESBL Production

Emulsions that are potential ESBL producers were isolated by preliminary examination using a nutrient broth to adjust the density of the vaccine equal to the density of the McFarland sour criteria 0.5 was performed in all isolates presumed to be an ESBL. In this test, Ceftazidime tablets alone and in combination with clavulanic acid (10)

Extraction of DNA

Beta-mercaptoethanol was added to the DNA restricting support to a last weakening of 0.5% (v/v) i.e., 500 µl/100 ml (2).

1. A measure of 100 mg (wet weight) bacterial cells that resuspended was included up to two hundred µl of

water or isotonic cushion, added (750) µl of this Lysis Solution to the cylinder 2 (Figure 3.4).

2. Secure in a dot blender fitted with a 2 ml cylinder holder gathering and procedure at 10,000 x g for five minutes.

3. The ZR BashingBead™ Lysis Tube was centrifuged in a microcentrifuge at 10,000 x g for 1 minute.

4. 400 µl supernatant was moved to a Zymo-Spin™ IV turn channel (orange top) in a gathering tube and centrifuged at 7,000 x g for 1 minute.

5. A measure of 1,200 µl of bacterial DNA restricting cushion was added to the filtrate in the accumulation tube from Step (4).

6. A measure of 800 µl of the blend from Step (5) was moved to a Zymo-Spin™ IIC Column 3 in an accumulation cylinder and axis at (10,000) x g for one minute.

7. Dispose of the move through from the Collection Tube and rehash Step (6).

8. 200 µl of DNA pre-wash cushion was added to the Zymo-Spin™ IIC segment in another accumulation tube, then centrifuged at (10,000 x g) for 1 minute.

9. 500 µl DNA wash support was added to the Zymo-Spin™ IIC section and axis at 10,000 x g for 1 minute.

10. The Zymo-Spin™ IIC segment was moved to a clean 1.5 ml microcentrifuge cylinder and include 100 µl DNA elution cradle legitimately to the segment lattice, centrifuged at 10,000 x g for 30 seconds to elute the DNA.

Detection of CTX-M genes :

identified phenotypically in resistant isolates of *Klebsiella* sp. by CTX-M genes by used primers targeting blaCTX-M gene. amplification mixture of PCR was prepared according to manufacturer's instructions (Intron, Korea).

A- Primers:

In amplification CTX-M gene, used primers which listed in Table- 1, below:

Table 1: primersequences for detection of blaCTX-M genes(14)

CTX-M gene	Sequence(5'-3')	product Size (b.p)
F R	CGCTTTGCGATGTGCAG ACCGCGATATCGTTGGT	550

Statistical Analysis

Statistical tables including observed frequencies with their percentages and Graphical presentation by (bar - charts) as well as Chi-Square (χ^2) for calculation of P. value ($P < 0.05$: significant).

Finding

In this study, 26% of Klebsiella isolates were ESBL producers as used by CDT methods. Number 13 of Klebsiella sp. Isolate was differed from other isolates in view of cephalosporin resistance. 100% of Klebsiella spp were with MIC above 16 for CFT and more than 64 MIC for the both antibiotics. Some of Klebsiella sp. Isolates with MDR were resistant to imipenem & meropenem with level of 16Mg of MIC/



Figure 1: Typical combination disk method with +ve result.

In this work, all Klebsiella isolates were non-susceptible to CAZ accompanied with increasing in clear zone around CZC. Additionally, majority of isolates extended antibiotic betalactames processing were recovered from urine samples and lowest rate of them were considered MDR due to stability against 10 discs and as mentioned in Table below.

Table 2:Antibiotic susceptibility of ESBL producing Klebsiella sp. isolates

Isolate number	VITEK 2 system result of MIC									
	Imepenem	ciproloxacin	gentamycin	Ceftaz	Amp.	ceftriaxone	tobramycin	meropenem	FEP	LEVO
1	R*1	R*4	R*1	R*2	R*3	R*1	R*1	R*1	R*2	R*1
2	S*1	R*4	R*1	R*3	R*3	R*2	R*1	S*1	R*2	S*1
3	S*1	R*4	R*1	R*2	S*1	R*2	R*1	S*1	R*2	S*1
4	R*1	R*4	R*1	R*2	R*3	R*2	R*1	R*1	R*2	R*1

R*1*: MIC equal or more 16 Mg/ml

R*2: MIC equal or more 64 Mg/ml

R*3 : MIC equal or more 32Mg/ml

R*4: MIC equal or more 4 Mg/ml

S*1 : MIC equal or lese that 0.25 Mg/ml

Additionally, CEF resistant Klebsiella isolates were further underwent molecular evaluation for ESBL pheonotype using specific procedure for detection of blaCTX-M and according to manufacture instructions. It was observed by above PCR technique that 30.76% of Klebsiella isolates (the 4 MDR isolates) were virtually harboured blaCTX-M genes.

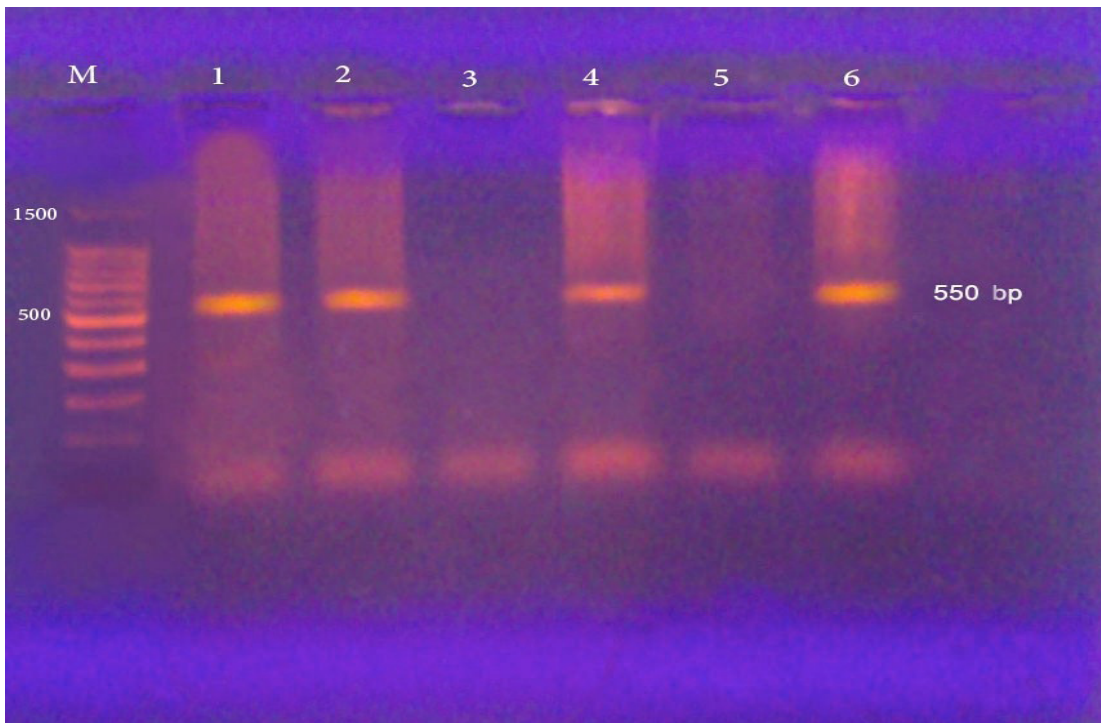


Figure 2: Agarose gel was stained by Ethidium bromide to show amplification of PCR out product with blaCTX-M gene (550 bp) primers for Klebsiella sp. extracted DNA.M: 100 bp average size reference marker. Lane 1: K1 shows positive result with blaCTX-M gene Lane 2: K2 shows positive result with blaCTX-M gene. Lane 3: K3 shows negative result with blaCTX-M gene. Lane 4: K4 shows positive result with blaCTX-M gene. Lane 5: K5 shows negative result with blaCTX-M gene. Lane 6: K6 shows positive result with blaCTX-M gene.

Discussion

The vast majority of the diseases are procured in clinic setting therefore, it is accounted for to be the among the 10 most normal nosocomial pathogen in different examinations(9). Nowadays, Klebsiella pneumoniae diseases are entangled by increment in Extended Spectrum Beta Lactamase (ESBL) producing segregates(10,11). Subsequently, this examination is being led with the target to find out the commonness of ESBL delivering Klebsiella pneumoniae in different clinical examples and to find out their affectability design(12). Flare-ups of ESBL-delivering living beings have been depicted. Asymptomatic patients colonized with ESBL-delivering K. pneumoniae can fill in as stores for this pathogen with resulting persistent to-tolerant spread through the hands of medicinal services laborers. What's more, sullied persistent consideration things and fake fingernails worn by human services laborers have been involved in transmission(9). Most examinations have exhibited a poor adherence to contamination control strategies as a significant factor. Flare-ups of ESBL-delivering K. pneumoniae in NICUs have been outstanding for high assault rates and huge quantities of colonized infants(1,2). The neonates at most serious hazard for colonization are those with a more extended length of remain, a lower evaluated gestational age and additionally a lower birth weight.(11,13). Studies directed in Ghana have announced K. pneumoniae as a noteworthy pathogen in charge of UTI (14). A research center based across the nation reconnaissance of antimicrobial obstruction in Ghana by Opintan and collaborators announced that K. pneumoniae spoke to 1.06% of every bacterial disease and 1.4% of Gram-negative bacilli (11). Another study showed an expanded K. pneumoniae opposition of 118.9% of Gram-negative microscopic organisms in their investigation on MDR bacterial diseases in a showing medical clinic(15). Notwithstanding the risk presented by multidrug safe Gram-negative microscopic organisms in social insurance, there is lack of sub-atomic the study of disease transmission ponders. This examination, which structures some portion of a more extensive investigation on the atomic profile of Gram-negative ESBL pathogens in a patient of private clinic, portrays the clonal genealogies, anti-infection resistome and plasmid replicons of a sub-set of K. pneumoniae with protection from the second and third-age cephalosporins utilizing entire genome sequencing (14).

Ceftazidime is one of type of 3rd generation cephalosporin used commonly for the treatment K. pneumoniae related infections. Nevertheless, high rate of resistance toward ceftazidime is occurred continuously in clinical managing of infection with these isolates. In the current study, an elevated rate of ceftazidime resistance was detected in patients infected with Klebsiella sp. , This result similar to results obtained by Aheret al(4) showed ceftazidime resistant Klebsiella. additionally, isolates producing ESBL were with high rate of resistance to all antibiotics tested as compared with non- ESBL producer, other revealed a resistance to aminoglycosides fluoroquinolones, and methoprim in organisms producing ESBL(5). The development and polyclonal spread of CTX-M-delivering K. pneumoniae as happened among detaches with various hereditary foundations. This speculation appears differently in relation to discoveries with respect to KPC-delivering K. pneumoniae: clonal spread of KPC-delivering (K. Pneumoniae) segregates having a place with the ST258 heredity was seen by Zachar Czuket al(7).

In clinical strains, the CTX-M-encoding qualities has normally been situated on plasmids that differ in size from (7 -160) kb(2). Plasmid-intervened transmission of CTX-M qualities in Enterobacteriaceae that includes a few motile hereditary components has portrayed (7,9). given strength of CTX-M-15 genotype, among hereditarily heterogeneous (K. Pneumoniae) secludes, the examination additionally suggests the same level exchange of a hereditary component conveying blaCTX-M among K. pneumoniae disconnects. Second, the CTX-M-delivering K. pneumoniae study disconnects displayed high paces of protection from gentamicin and trimethoprim-sulfamethoxazole as percentage (68 and 96%) respectively , so antibiotic medication as 80%, notwithstanding protection from ciprofloxacin (88%) and piperacillin-tazobactam (64%) as portrayed beforehand (16).

Conclusion

In this study, the high rate of beta lactamases production of Klebsiella sp. is necessary to avoid treatment failure condition and need to adopt appropriate control measures to reduce the ESBL. Also, usefulness of PCR technique for detection ESBLs and their effect on antimicrobial resistance. Remarkably, 41.67% of bacterial isolates have three of cephalosporine β -lactamase genes and this could be due to the common used of cephalosporine for treatment.

Conflict of Interest: Non

Source of Findings: Self

Ethical Clearance: Nil

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Alterations in Antioxidants and Trace Element with Interleukin 6 Level in β Thalassemia Major Patients

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Abstract

β -Thalassemia major is an inherited blood disorder caused by drop or total absence of beta globin chains. Patients with this blood disorder are repeatedly needed to blood transfusion to survive. There are many experimental and clinical evidence that suggested that the oxidative stress and free radical plays an important role in thalassemia. The aim of the present study was to investigate the level of antioxidant enzymes and trace element with interleukin 6 in β thalassemia major patients. The blood samples were obtained from 50 patients (30 with β -thalassemia major and 20 healthy controls). The serum levels of MDA, GSH, Vitamin (E, C), trace element (Fe, Zn, Cu, Se) and antioxidant enzymes (SOD, CAT, GPx) and interleukin 6 were analysed using conventional methods. The results showed that the level of MDA, Fe, Cu and interleukin 6 were significantly increased ($P < 0.05$), whereas the activities of GSH, Vitamin (E, C), trace element (Zn, Se) and antioxidant enzymes (CAT, GPx) were decreased significantly ($P < 0.05$) in β -thalassemia major patients compared with healthy control. This results suggested that the β thalassemia patients disease activity and progress could be investigated by determining the oxidative stress marker, trace element and interleukin 6 levels.

Key words: *Thalassemia major, Oxidative stress, Trace element, Interleukin 6, Vitamins.*

Introduction

Alpha and beta thalassemia are known to be the most common types of thalassemia disease. The beta thalassemia major is found the very severe form that is required a repeated blood transfusions and treatment by desferrioxamine injections (1), Despite a such treatments could increase the patients' life span, however, it is related with a variety of complications, such as endocrine, skeletal metabolic, immunity, growth disorders. The trace elements and oxidative stress are detected as a consequence of high level of iron storage in the body and that might cause an oxidative stress. Though, some studies were suggested the damage caused by the endogenous free radical in thalassemia (2), the oxidative stress is the balance interruption among oxidants and reluctant in the body due to excessive production of both peroxides and free radicals caused cellular and tissue damage in the body, and this damage caused an oxidative stress and decrease the total antioxidant capacity (3). The production of the reactive oxygen species (ROS) that has the ability to react with all biological molecules such as lipids, proteins, carbohydrates and DNA, and exert a cytotoxic effects on

cellular components. Hence, increase ROS and impaired antioxidant defense are contributed for the initiation and progression of Beta thalassemia major disorder. The ROS activates is also diverse the damaging processes in cells, including oxidation of intracellular and surface components of the red blood cells in β thalassemia major patients (4). The antioxidants complex is Enzymatic antioxidants including catalase, superoxide dismutase and glutathione peroxidase, Superoxide dismutase and non-enzymatic antioxidants including glutathione vitamin A, C and E), and all are protect the key biological sites from oxidative damage and scavenge free radicals and other reactive oxygen species (ROS) (5). The trace elements play an important role in building of proteins, enzymes and complex carbohydrates to contribute in the biochemical reactions. Additionally, trace elements such as Zinc, Selenium, Magnesium, Manganese, and Copper are cofactors or structural components of antioxidant enzymes (6). In Beta thalassemia patients, the selenium element and glutathione peroxidase enzyme are observe an important protecting role of cell membranes from oxidative damage (7). Interleukin 6 (IL-6) it has a broad effect on immune and non-immune system related cells

and is often exhibit hormone-like characteristics that affect the homeostatic processes (8), and it has context-dependent pro- and anti-inflammatory properties. Several cytokines have been found at the chronic inflammatory sites, such as periodontitis autoimmune diseases, thyroiditis and arthritis. Also, there is an suggestion IL-6 is overproduced in thalassemia diseases (9).

Material and Method

This study was conducted in Al-Mosul governorate, a 50 patients (30 with β -thalassemia and 20 were healthy controls) with age range (10-15) years old. The serums were collected by incubation the blood sample tubes in a water path at 37°C for 10 minutes, and then centrifuged at 13000xg using cooling centrifuge for 10 minutes. The supernatants were then collected and stored at -20 freezer (10).

serum Interleukin 6: The Interleukin 6 was analyzed by using ELISA technique (Eagle Biosciences, USA Kit) (11)

serum Malondialdehyde: The malondialdehyde levels was analyzed by method described by Yao-Yuan (12) .

serum Glutathione: The GSH concentration in serum was analyzed according to (13).

serum Vitamin C: The Ascorbic acid is oxidized by copper to form a dehydroascorbic acid and

diketogulonic acid. These products were treated with 2,4-dinitrophenylhydrazine (2,4-DNPH) to form the derivative bis-2,4- dinitrophenylhydrazone.(14).

serum Vitamin E: The Vit E was analyzed according to Emmerie-Engel reaction in which the tocopherols reduce ferric ion to ferrous ion, then it reacted with α, α' -dipyridyl give a red-orange color with absorbance at 520 nm.(15)

serum Superoxide dismutase activity: (SOD) activity was measured by colorimetric assay (16). We used commercially available colorimetric method (Randox Laboratories Ltd, UK).

serum Catalase activity: Catalase activity was estimated by the method of Aebi (17). Catalase can degrade hydrogen peroxide which can be measured directly by the decrease in the absorbance at 240 nm.

serum Glutathione peroxidase activity: Gpx activity was measured by the method (18).

serum trace elements: Zinc, Selenium and Copper were analyzed by atomic absorption spectrometry.

Statistical analysis: All data were reported as mean and \pm SEM. The statistical significance was assessed using Student's t-test. The P value less than 0.05 was accepted as the data were significantly different.

Finding

Table1: Descriptive data of studied for β -thalassemia patients and control individuals.

Parameters	Control N=20	β -thalassemia patients N=30
Age (Years)	11 \pm 2.3	12 \pm 4.4
Sex (Male/Female)	10/10	15/15
BMI (Kg/m ²)	15.51 \pm 1.23	16.1 \pm 1.45
Duration of β -thalassemia (years)	--	7.4 \pm 2.4

Serum levels of MDA showed significant difference between β -thalassemia and control group ($p < 0.05$). It was significantly increased in the β -thalassemia group when compared with control group. Per oxidative damage of lipids is indicated by the increase in serum MDA and significant decreased antioxidant defiance GSH & Vitamin when compared with control group ($p < 0.05$) are shown in Table-2.

Table 2: The levels of serum oxidative stress marker in β -thalassemia patients and control groups.

Parameters	Control N=20	β -thalassemia patients N=30
MDA (μ mole/L)	2.66 \pm 0.32	5.43 \pm 1.2*
GSH (μ mole/L)	12.95 \pm 0.56	7.31 \pm 1.1*
Vitamin C (μ mole/L)	44 \pm 2. 17	31 \pm 2.2*
Vitamin E (μ mole/L)	21.4 \pm 1.5	13.2 \pm 1.4*

Data are reported as mean \pm SD. *P<0.05 compared to control (Student t-test).* significant.

Table-3 showed that β -thalassemia patients significantly decrease significantly in glutathione peroxidase (GPx) and Catalase (CAT) level in serum compared with control groups (p<0.05). While superoxide dismutase (SOD) no significantly increase compared with control groups (p<0.05).

Table 3: The levels of serum Activity enzymes and Interleukin 6 in β -thalassemia patients and control groups

Parameters	Control N=20	β -thalassemia patients N=30
CAT (U/ML)	3.1 \pm 0.64	2.7 \pm 0.7*
GPx(U/ML)	0.67 \pm 0.11	0.55 \pm 0.09*
SOD (U/ML)	6.82 \pm 2.1	7.14 \pm 1.7
Interleukin 6 (pg/ml)	1.99 \pm 0.12	2.5 \pm 0.13*

Data are reported as mean \pm SD. *P<0.05 compared to control (Student t-test).* significant.

The mean serum trace element (Zn , Cu , Se) levels are shown in β -thalassemia patients were significantly lower than control group, while (Fe) was significantly higher in serum than control group (Table-4).

Table 4: The levels of serum trace element in β -thalassemia patients and control groups.

Parameters	Control N=20	β -thalassemia patients N=30
Zn (μ g/dl)	107 \pm 5.2	69 \pm 1.4*
Cu (μ g/dl)	107 \pm 3.3	173 \pm 2.4*
Se (μ g/dl)	82 \pm 2.2	69 \pm 1.3*
Fe (μ g/dl)	89 \pm 4.3	163 \pm 2.9*

Data are reported as mean \pm SD. *P<0.05 compared to control (Student t-test).* significant.

Discussion

A significant increase serum iron proves patients have severe anemia due to ineffective erythropoiesis which is primary reason for iron overload and blood transfusion is secondary to it ⁽¹⁹⁾. The results showed a significant lowering in Serum GSH levels in patients which was in agreement with many studies in normal and human diseases individuals ⁽²⁰⁾. Shekhar study showed a significant decrease of antioxidants, GSH in patients of low level of hemoglobin in red blood cells in beta thalassemia ⁽²¹⁾. GSH is an essential antioxidant for recycling of vitamin E and C and is very powerful in helping the body fight against the free radicals ⁽²²⁾. GSH also participates in the cellular defense system against oxidative stress by scavenging free radicals and reactive oxygen intermediates. Decrease in GSH level in patients increases the sensitivity of cells to oxidative stresses ⁽²³⁾. Patne et al., found a significantly increasing of MDA in serum in β -thalassemia patients compared to healthy control ⁽²⁴⁾. MDA and acrolein ($\text{CH}_2=\text{CHCHO}$), potentially toxic agents which spontaneously formed from aminoaldehydes, and induce oxidative stress in mammalian cells ⁽²⁵⁾. In β -thalassemia syndromes, decreased or impaired biosynthesis of beta-globin leads to accumulation of unpaired alpha-globin chains. Moreover, the iron overload in β -thalassemia patients generates oxygen-free radicals and peroxidative tissue injury and elevated MDA ⁽²⁶⁾. Vitamin C and E were significantly decreased in patients with β -thalassemia compared to healthy subjects. similar result was obtained by Dissayabutra et al. (2005), who showed a significantly lower in vitamin C and E levels in patients. This decrease may be due to multiple blood transfusion are at risk in iron overload and high oxidative. GPx This antioxidant enzyme belongs to a group of antioxidant selenoenzymes that protects the cells from damage by catalyzing the reduction of lipid hydro peroxides ⁽²⁸⁾. The reduction in GPx activity associated with enhanced oxidative stress in β -thalassemia may be related to increased H_2O_2 levels ⁽²⁹⁾. The present study indicates a significant decreasing of CAT activity. The activity levels of CAT were significantly decreased in β -thalassemia males and females patients than in healthy subjects ⁽³⁰⁾. Therefore, a significant decrease in the levels of CAT indicated protection against oxidative stress ⁽²¹⁾. Also no significant increase in SOD activity in patients compared with healthy subjects. In the present study, the activity of Erythrocyte SOD was no significantly ($P>0.05$) increased as compared to controls. Erythrocyte SOD scavenges superoxide radicals to form

hydrogen peroxide and protects the cell membrane from its damage. Increased Erythrocyte SOD activity may be due to blood transfusion and increase in the proportion of younger erythrocytes, as a compensatory mechanism after increased oxidative stress ⁽³¹⁾. A significant increase ($p<0.001$) in serum iron was observed in beta thalassemia major when compared with controls. The patients have severe anemia due to ineffective erythropoiesis which is primary reason for iron overload and blood transfusion is secondary to it. Thus, increased iron may increase the potential of oxidative injury to erythrocytes and cell organelles ⁽³²⁾. Interleukin 6 (IL-6) is an interleukin that acts as both a pro-inflammatory cytokine and an anti-inflammatory myokine. In humans, it is encoded by the IL6 gene ⁽³³⁾. In addition, osteoblasts secrete IL-6 to stimulate osteoclast formation. Smooth muscle cells in the tunica media of many blood vessels also produce IL-6 as a pro-inflammatory cytokine. IL-6's role as an anti-inflammatory myokine is mediated through its inhibitory effects on TNF-alpha and IL-1, and activation of IL-1ra and IL-10 ⁽³⁴⁾. IL-6 stimulates the inflammatory and auto-immune processes in many diseases such as β -thalassemia ⁽³⁵⁾. Diabetes ⁽³⁶⁾ atherosclerosis ⁽³⁷⁾ and multiple myeloma ⁽³⁷⁾. Thus, IL-6 concomitantly regulates proinflammatory and antiinflammatory activities and contributes to both the development and the resolution of the acute inflammatory response ⁽³⁵⁾. Tabatabaei et al reported that 84.8% of thalassemia major patients had zinc deficiency. They emphasized that the cause of zinc deficiency in these patients was due to insufficient zinc of dietary intake ⁽³⁷⁾. Yazdih et al showed that the serum concentration level of zinc in thalassemia patients ($37\pm 1.9\text{mg/dl}$) was lower than in control group and there was significant difference statistically. They recommended zinc supplement for thalassemia patients ⁽³⁵⁾. They suggested that the etiology of zinc deficiency is malnutrition and inadequate zinc intake. They advise administration of zinc supplement ⁽³⁶⁾. In this study, the β -thalassemia major patients showed low levels of serum Se in comparison with the control group. These findings are comparable to the results reported by other studies ⁽⁷⁾.

Conclusion

This study indicates that in patients with β -thalassemia impairment of the antioxidant enzymes (GPx, CAT, SOD) along with essential trace elements (Se, Cu, Zn) minerals in order to reduce the extent of oxidative damage and the related complications in β -thalassemia major associated with elevated iron and

plasma levels of lipid peroxidation.

Ethical Clearance: taken from hospital and patients.

Conflict of Interest: Nil

Source of Funding : Nil

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Overweight BMI with and without Regular Exercise in Secondary School Students in Tikrit City

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Abstract

Background: Currently, obesity affects almost a third of the world's population. Traditionally, anthropometric measures such as waist circumference or body mass index (BMI) were used to quantify total obesity. aim of this study to estimation the relation between Overweight BMI with and without regular exercise among secondary school students in Tikrit City. **Patients and methods:** cross-sectional descriptive epidemiological study was carried out to estimate the relation between Overweight BMI with and without regular exercise in secondary school students in Tikrit city among 153 students (80 girls and 73 boys) and study the relationships between them. **Results:** In current study, male who doing exercise 1-2 times weekly 44.83% less than non- doing as percentage 55.17% ,so 11/23(47.83%) from female do exercise 1-2 times weekly, while in male 13/29(44.83%) do exercise 1-2 times weekly.as well as 8/23(34.78%) from female do exercise 3-4 times weekly, while 9/29(30.03%) in male do exercise regularly, In male 7/29(24.14%) do exercise more than 4 times weekly, while 4/23(17.39%) from female do exercise more than 4 times weekly.and female 16/23(69.57%) do exercise for 0-30mins, while in male 15/29(51.72%) do exercise for 0-30mins. also 6/29(20.69%) in male do exercise for 30-60mins, In male 8/29(27.59%) do exercise for more than 60mins, also 16/49(32.66%) had a overweight BMI and 22/49(44.9%) had a central obesity. **Conclusion :** Most of the students have a normal BMI and a normal waist-to-height ratio and among secondary school students (34%) only have regular exercise, from them (46.15%) doing exercise 1-2 times weekly.

Keywords: Overweight; BMI ; regular exercise ; secondary school students ; Tikrit city

Introduction

The obesity and overweight prevalence in both children and adolescents is considered as pandemic problem worldwide⁽¹⁾. By participating in regular exercise programs, can estimated that about approximately (22.0 million) overweight and obese people worldwide may reduced BMI⁽¹⁾, So According to WHO about three hundred million are defined as obese (BMI>30kg/m²) and one billion are overweight (BMI >25kg/m²)⁽²⁾.

Obesity is causing by an imbalance in the consumption of calories that derived from food comparing to the expenditures via exercise and body activity⁽¹⁾. About 5% of the world's deaths caused by overweight and obesity ,so the Physical inactivity concenter as fourth leading risk factor for mortality in the world and (6%) of deaths globally⁽³⁾, as well as low in movement behavior, there are indications of a significant increase in youth with weight concerns and an increased in negative body image as adolescents progress⁽⁴⁾.

Exercise recipes for obese people follow the same framework for the condition; intensity; forever; and the frequency has been explained. The amount of exercise which needed to lose weight is too large to be increased⁽⁵⁾.

Patients and Methods

Cross-sectional study was used to assess Overweight BMI with and without regular exercise in secondary school students in Tikrit city, collected 153 cases of both gender from secondary school students (Ibn-almotam ,Al-Khansaa and Al-Mustansrya), during the 1st of November to the 1st of January.

Finding

In figure-1 illustrates that male who doing exercise 1-2 times weekly 44.83% less than non- doing as percentage 55.17% .

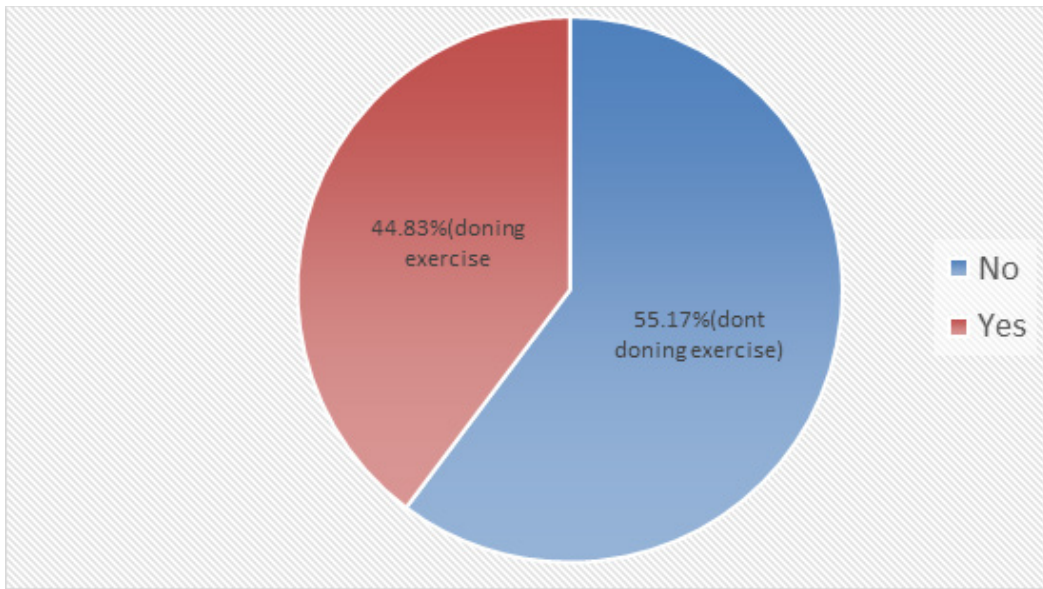


Figure (1): - Illustrates secondary school student (male gender) who are doing regular exercise weekly

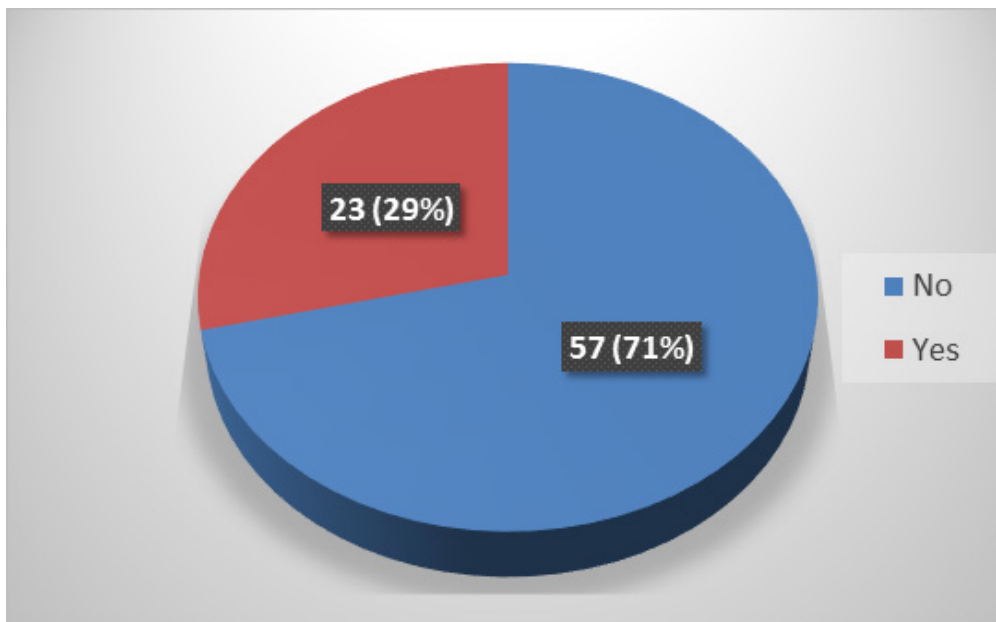


Figure (2): - Illustrates secondary school student (female gender) with who are doing regular exercise weekly

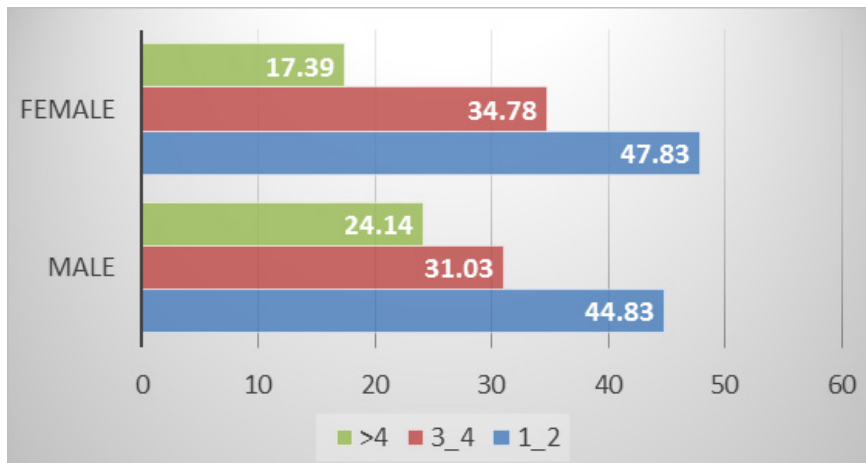


Figure (3): - Illustrates secondary school student (both gender) with their percent of how many times they do exercise weekly

This figure illustrates that 11/23(47.83%) from female do exercise 1-2 times weekly, while in male 13/29(44.83%) do exercise 1-2 times weekly.

Also 8/23(34.78%) from female do exercise 3-4 times weekly, while 9/29(30.03%) in male do exercise regularly, In male 7/29(24.14%) do exercise more than 4 times weekly, while 4/23(17.39%) from female do exercise more than 4 times weekly.

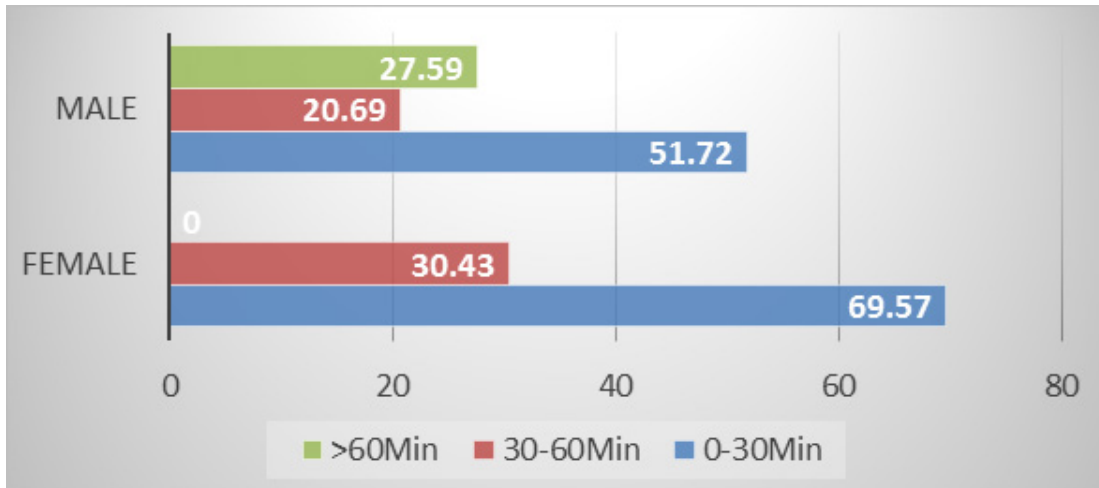


Figure (4): - Illustrates secondary school student (both gender) with their percent of duration taken to complete exercise

This figure illustrates that female 16/23(69.57%) do exercise for 0-30mins, while in male 15/29(51.72%) do exercise for 0-30mins. Also 7/23(30.43%) from female do exercise for 30-60mins, while 6/29(20.69%) in male do exercise for 30-60mins, In male 8/29(27.59%) do exercise for more than 60mins.

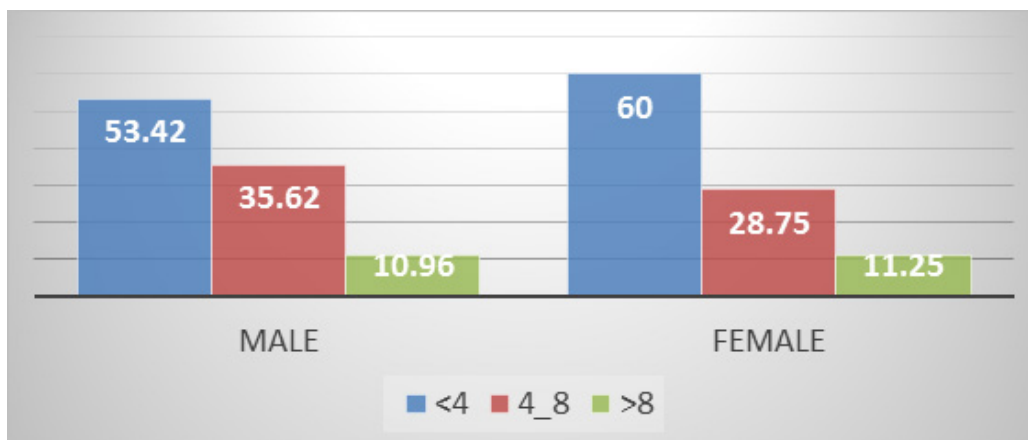


Figure (5): Illustrates secondary school student (both gender) with their percent of daily drinking glasses of water.

This figure shows that 48/80(60%) of females drinking less than 4 glasses of water, while in male 39/73(53.42%)

Table (1): - Body mass index (BMI) score of the secondary school students involved in the study with a positive family history.

BMI	Male		Female		Total
	Number	Percents	Number	percents	Number(%)
18.5>	4	17.39	1	3.85	5 (10.2%)
18.5-25	5	21.74	9	34.62	14 (28.57%)
25-30	8	34.78	8	30.77	16 (32.66%)
>30	6	20.09	8	30.77	14 (28.57%)

This table shows that 16/49(32.66%) had a overweight BMI.

Table (2): - waist-to-height ratio of secondary school students involved in the study with a positive family history

waist-to-height ratio	Male		Female		Total
	Number	Percents	Number	percents	
>0.5	7	30.34	6	23.08	13 (26.53%)
0.5-0.6	9	39.13	13	50	22 (44.9%)
0.6<	7	30.34	7	26.92	14 (28.57%)

This table shows that 22/49(44.9%) had a central obesity.

Discussion

Current study showed that male who doing exercise 1-2 times weekly 44.83% less than non- doing as percentage 55.17% ,regular exercise can lead to noticeable changes in BMI for overweight and obese people ⁽¹⁾, Sherwood, 2001 are recommended the sport is in individual who are overweight and obese ,this type of sport is highly recommended ⁽⁶⁾.

It has been associated with increased symptoms of depression and anxiety in college students and adolescents⁽⁷⁾.

As well as about (47.83%) from female do exercise 1-2 times weekly, while in male (44.83%) do exercise 1-2 times weekly, but this results disagreement with Hassan et al., who showed, only(1%)has a good level of daily physical activity , whilst 86.7% has low daily physical activity⁽⁸⁾.

Man students had higher physical activity than women students,the results indicate that this variable is associated with BMI among man participants, While these aren't the case with women, although it is believed that normal weight are more active than overweight or obese participants,whilst not the case with women, Although this is not the case in women, it is believed that normal weight are more active than obese participants ⁽⁹⁾.

So Otomo explained to lose weight, exercise more effective than other interventions⁽¹⁰⁾.Proven aerobic weight loss(66.78)%, so percentage the Cholesterol as(27.67%) and fat(86.42%),therefore significant effect of low impact aerobics, weight loss, fat percentage

and levels of cholesterol in women with obesity. This study also reveal that male (40%) doing exercise more than female (29%) and this is agree with another study occurred in Al-Najaf Al-Ashraf City⁽⁸⁾.

Conclusion

- Most of the students have a normal BMI (55.56%) and a normal waist-to-height ratio (67.32).
- Among secondary school students (34%) only have regular exercise, from them (46.15%) doing exercise 1-2 times weekly.

Conflict of Interest : None.

Source of Funding: Self funding.

Ethical Clearance: Taken from student and college.

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Genotyping Diversity of *Escherichia coli* isolated from UTI in Iraqi Patients

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Abstract

Background *Escherichia coli* (*E. coli*) is the predominant uropathogen isolated in acute, community-acquired uncomplicated UTIs in adults and children. **Pateints and Methods:** A total of (150) clinical samples (Urine) where collected from the patients at admission to the hospital in a sterile container. A loopful of uncentrifuged urine samples was cultured onto blood agar, MacConkey agar, HiCrome UTI Agar and EMB media, the diagnosis of *E.coli* bacteria was confirmed by using VITEK 2 system. Antimicrobial susceptibility testing of *E. coli* isolates was carried out against the antibiotics by Disc Diffusion Method ,ERIC PCR used for determined genotyping diversity. **Results:** *E.coli* showed antibiotic resistant to Garamycine (86%), Ciproflaxcin (66%), Ceftriaxone (46%) and Rifampcine (100%). The biofilm formation result showed out of 50 *E. coli* isolate (12%) were weak biofilm formation, (72%) were moderate biofilm formation and (16%) were strong biofilm formation. Genotyping by ERIC-PCR (Enterobacterial Repetitive Intergenic Consensus) of 50 *E.coli* isolates subjected to ERIC-PCR, 47 isolates have amplications ranging from 700 to < 3000bp The generated banding profile showed highly polymorphic DNA fragments in these 47 isolates **Conclusion** : : *E.coli* resistance to Garamycine (86%), Ciproflaxcin (66%), Ceftriaxone (46%) and Rifampcine (100%). The biofilm formation result 50 *E. coli* isolate (12%) were weak biofilm formation, (72%) were moderate biofilm formation. Genotyping by ERIC-PCR (Enterobacterial Repetitive Intergenic Consensus) of *E.coli* isolates subjected to ERIC-PCR, 47 isolates have amplications ranging from 700 to < 3000bp The generated banding profile was highly polymorphic DNA fragments in these isolates.

Key Words: *E.coli* ,UTI , ERIC PCR, Biofilm, genotype

Introduction

E. coli is a gram negative bacilli of the Enterobacteriaceae family, and it is commonly found in the intestines of warm-blooded animals. Most strains of *E. coli* are harmless, but some strains cause food poisoning, diarrhea, and urinary tract infections . Many bacteria can cause infection in the urinary tract. In fact, 80 to 90% of urinary tract infections in the world are caused by *E. coli* Extraintestinal pathogenic strains of *E. coli* that cause urinary tract infections in humans are known as uropathogenic *E.coli*¹. Urinary tract infections (UTI) are the most common bacterial infections which are characterized by bacterial colonization of the urinary system and often occur in women of all age groups. The strains of uropathogenic *E. coli* are the most common pathogens isolated from UTI patients and often originate from the intestinal flora. The most common UTI symptom is dysuria which may be moderate or severe . In addition to common symptoms of the lower UTI, patients with the

upper UTI or pyelonephritis may experience flank pain, fever, or nausea and vomiting . *E. coli* is responsible for 80–90% of UTIs; the remaining UTIs are caused by *Staphylococcus saprophyticus*, *Citrobacter*, *Klebsiella*, and *Enterobacter*². In various human diseases induced by *E. coli*, pathogenic *E. coli* is generally divided into two main categories: diarrheagenic *E. coli* and extraintestinal pathogenic *E. coli* which have two major pathotypes, uropathogenic *E. coli* and neonatal meningitis *E. coli* Extraintestinal bacteria can colonize different sites and cause various infections outside the gastrointestinal tract, with the urinary tract being most commonly affected³. Knowledge of the epidemiology of microbial populations is important in the field of medical microbiology. It is possible to identify infection reservoirs, examine the prevalence of hospitalization infections, and identify the type of microbial pathogenic agents via molecular typing¹. Molecular typing can be used to identify nosocomial infections and infection

reservoirs and also to isolate specific genotypes in conjugation with a specific bacterium. Besides, it gives us more knowledge about the principles of epidemiology, evolution, and spread of many bacterial diseases⁴. With the development of molecular biology techniques, We believe that Enterobacterial repetitive intergenic consensus-polymerase chain reaction (ERIC-PCR) methods could resolve the genotypes of the large number of O antigen serotypes, thereby enabling identification of an appropriate immunogenic strain. These researchers determined the sequence distribution and copy numbers on chromosomes for ERICs and showed interspecies specificity. This technique can be used in strain typing of ETECs based on their unique numbers and sizes of pattern⁵.

Patients and Methods

A total of (150) clinical samples (Urine) were collected from the patients at admission to the hospital in a sterile container. A loopful of uncentrifuged urine samples was cultured onto blood agar, MacConkey agar, HiCrome UTI Agar and EMB media, the diagnosis of *E.coli* bacteria was confirmed by using VITEK 2 system (Biomérieux, France). Disc Diffusion Method (Kirby-Bauer Method) used to determine AB sensitivity test⁶. Biofilm assay using (microtiter plate method)⁷. The oligonucleotide primers supplied by Integrated DNA Technologies Company (IDT) / USA. PCR using ERIC primers ERIC-IR CATTAGGGGTCCTCGAATGTA ERIC-2 AGTAAGTGACTGGGGTGAGCG was used to identify strains⁸. The PCR tubes were transferred to the

thermal cycler to start the amplification reaction according to specific program for the gene. PCR amplification programs were Initial Denaturation 94°C 3 min, Denaturation 94°C 1 min 40, Annealing 55°C 1 min, Extension 72°C 5 min, Final Extension 72°C 10 min.

Finding

Distribution of *E. coli* Isolates According to Gender:

According to the gender, the incidence of *E. coli* isolates among patients with UTI showed a remarkable difference in percentage of *E. coli* isolation. It was noticed that the percentage of *E. coli* isolation was high in females (90%) in comparison with males (10%), as shown in table (1). This result agrees with many studies as well as with local study by Basima⁹ in Baghdad City, who recorded that *E. coli* was isolated with a percentage of (81.8%) from female with UTI and (18.2%) from male. This higher frequency of UTI caused by *E. coli* in females than males is due to several causes, such as the shortness of the female urethra and close proximity of the perianal region of the urethral meatus to the vagina and anus and alternations in vaginal microflora that play a critical role in encouraging vaginal colonization with coliforms which may lead to UTI¹⁰. On the other side, this study disagrees with Tawfiq¹¹, that showed the bacterial cultivation had revealed positive results in (54.5%) of males and (45.5%) in females¹². The UTI in female is influenced by several risk factors such as; marital status, number of child, operation history, delivery methods and other factors¹³.

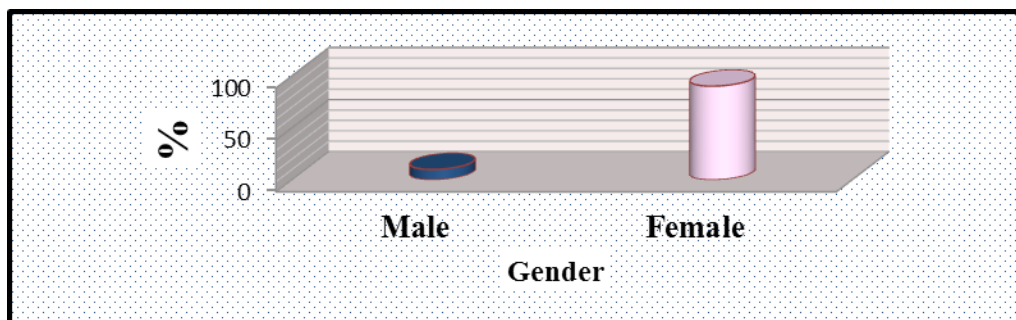


Figure (1): The isolation of *Escherichia coli* according to the gender.

Distribution of clinical states with *Escherichia coli* according to age groups:

The clinical samples of present study were recovered from patients their age ranged from 17 to 64 years.

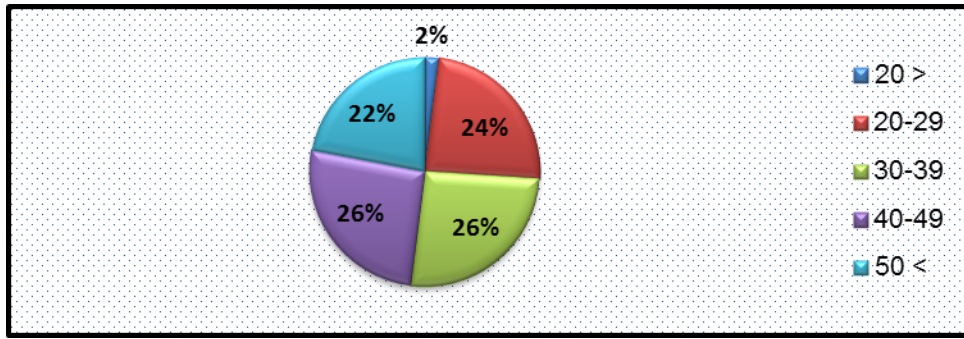


Figure (2): The isolation of *Escherichia coli* according to the age group.

The study recorded more than half of the isolation rate in UTI state was among the age (30-39) years and (40-49) years with (26%), while other local study have reported (30.51%) with age (>35 years) with UTI caused by *E. coli*¹³. And other study in Nigeria have reported (22.4%) with age (>45) years with UTI caused by *E. coli*¹⁴. Other study in Ethiopia have reported (20.6%) with age (36-45) years with UTI caused by *E. coli*¹⁵.

Disc Diffusion Test (DDT):

Antimicrobial susceptibility tests were done for all *E. coli* isolates (50 isolates) by using the disk diffusion method (Kirby-Bauer Method) against 4 different clinically important antimicrobials (Ceftriaxone, Ciprofloxacin, Gentamicin, Rifampicine) (Appendix III). These isolates showed different susceptibility toward antimicrobials used in this study. The susceptibility to different antimicrobials was determined depending on¹⁶.

The result illustrated in Figure (3) show a high resistance level of *E. coli* isolates to most of the antimicrobials. The present study showed a highest resistance to Rifampicine (100%) and Garamycine (86%). Other findings revealed that *E. coli* isolates had resistance to Ciproflaxcine (66%) and The lower percentage of resistance was recorded to Ceftraxone (46%). All isolated *E. coli* show resistance to one or more antimicrobial agents.

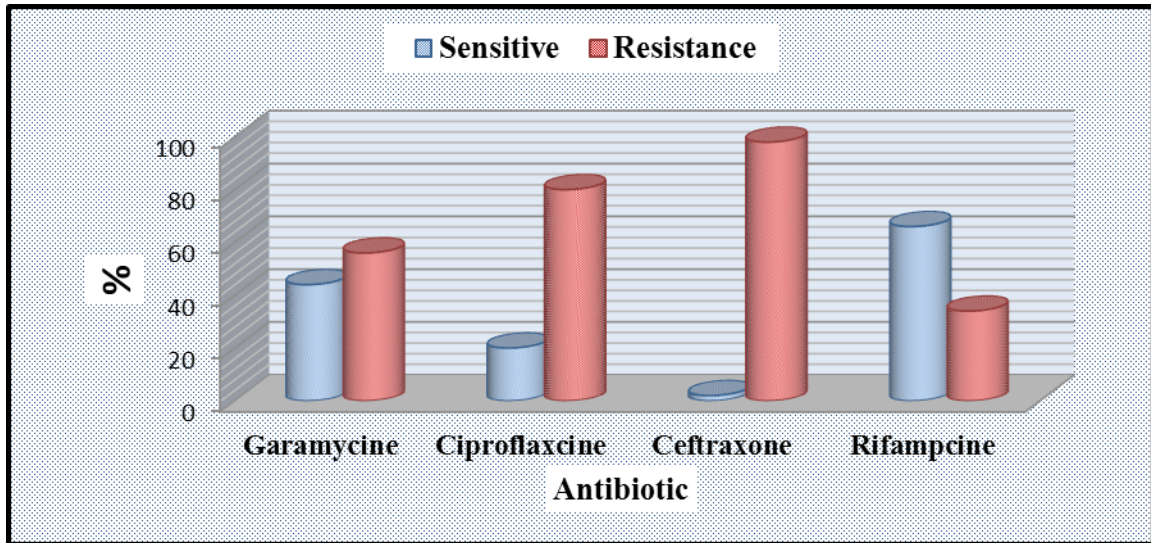


Figure (3): Percentage of resistant *E. coli* isolates against some antibiotics.

Rifampicine is the first “broad spectrum” Rifampicine are components in the first-line treatment of bacterial infections, As with many antibiotics, the clinical utility of these therapeutics has declined due to the increased incidence of antibiotic resistant bacterial pathogens, Resistance to the rifamycin family of antibiotics commonly occurs in clinical isolates as a result of point mutations in the antibiotic’s target¹⁷. The study findings showed that all *E. coli* isolates were resistant to Rifampicine with percentage (100%).The resistance level of *E. coli* against gentamicin was obtained in this study (86%). while the result of present study is lower than the result obtained by¹².

in Ethiopia have reported that resistance was (67.7%). And other study in Mexico have reported (50%) done by¹⁷. Another study obtained by ¹⁸. in Mongolia, who found that resistance was (44%).The study showed resistance to Ciproflaxcine with percentage (66%) other study in Ethiopia have reported (57.7%) done by ¹⁰. while the result of present study is lower than the result obtained by ¹⁹. in Mongolia, who found that resistance was (42%).The ciprofloxacin are an important class of antibiotics prized for their large spectrum of activity and ease of use in oral versus parental forms, but emerging resistance to these antibiotics is limiting their usefulness ²⁰. Ceftriaxone is a third-generation cephalosporin class used to treat infections caused by Gram negative bacilli especially *E. coli* ²¹. The low resistance level of *E. coli* against Ceftraxone was obtained in this study (46%) other local study in Zakho have reported (52%) done by ²².

Biofilm-forming ability of 50 *E. coli* isolate

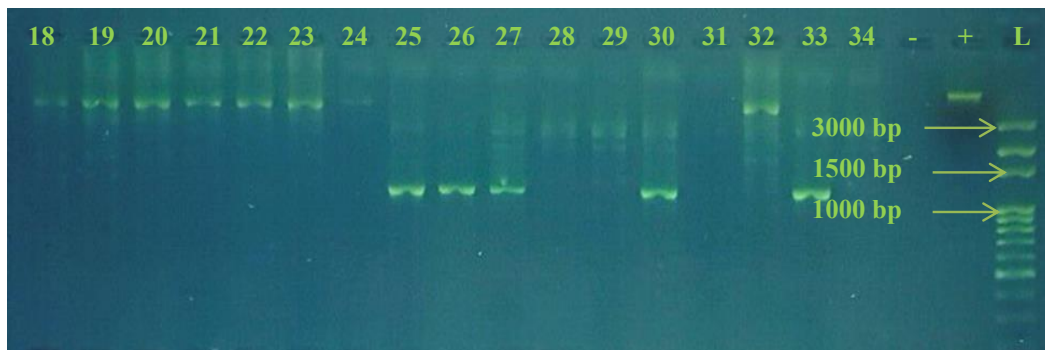
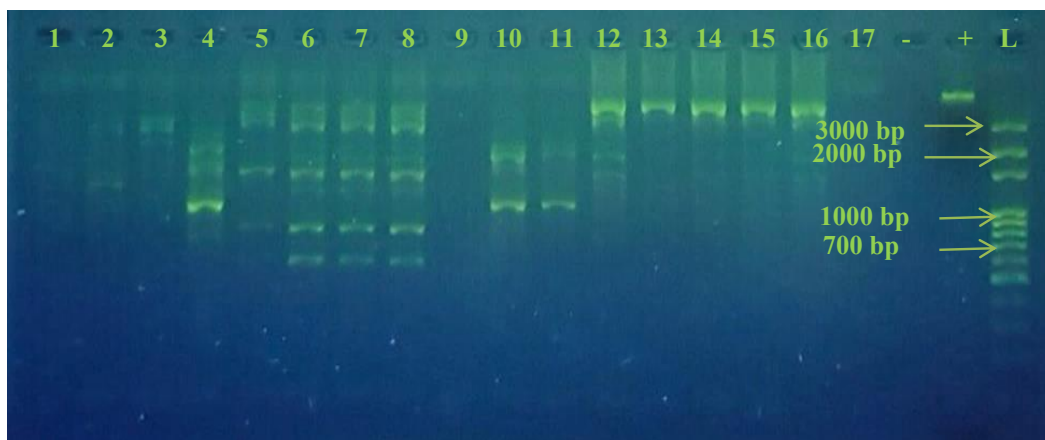
Biofilm formation has been described as an important virulence factor in various pathogenic bacteria causing human UTI.A total 50 *E. coli* isolated from UTI were divided into three groups : weak, moderate, strong biofilm formation(figure 4).The result showed out of 50 *E. coli* isolate (12%) were weak biofilm formation, (72%) were moderate biofilm formation and (16%) were strong biofilm formation, This study disagree with ²³. in Iran who found the biofilm formation was seen in 100% of isolates, of which (48.6%) were strong, (11.4%) were moderate .

Table (1): Biofilm Formation results using plate method depending on OD Value.

Biofilm -forming ability	Mean (%)	Percentage%
weak	0.0985	(12%)
Moderate	0.1623	(72%)
strong	0.3017	(16%)

<0.120 Weak biofilm producer ; 0.120-0.240 Moderate biofilm producer; >0.240 Strong biofilm producer

Genotyping by ERIC-PCR of *Escherichia coli* isolate from UTI cases:



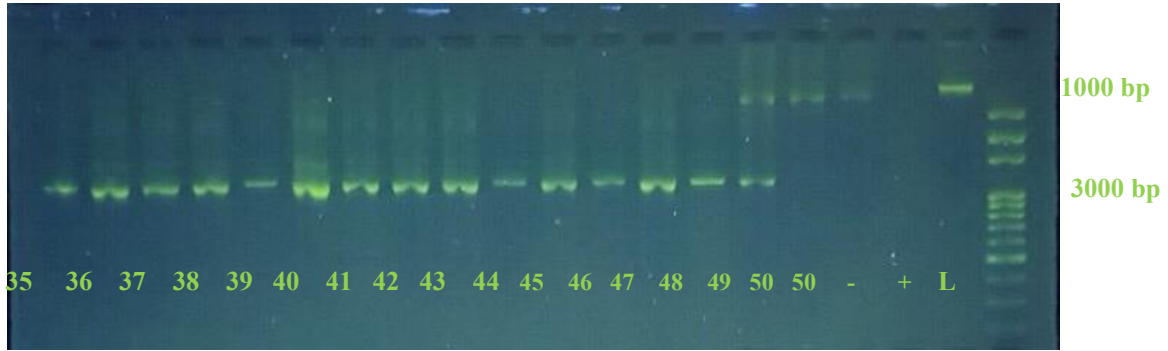


Figure (4): Analysis of ERIC genotyping of *E. coli* isolates on agarose gel (1%) at 5 V/cm for 1 hour. Lane(L): 3000bp DNA Marker. A - Lane(+,-):control isolates from the present study isolates. Lane (1-17) showing ERIC-PCR fingerprint of *E.coli* isolates; B- Lane (18-34) showing ERIC-PCR fingerprint of *E.coli* isolates; C- Lane(L): 3000bp DNA Marker. Lane(+,-):control isolates from the present study isolates. Lane (35-50) showing ERIC-PCR fingerprint of *E.coli* isolates.

Of 50 *E.coli* isolates subjected to ERIC-PCR, 47 isolates have amplications ranging from 700 to < 3000bp (figure 4). The generated banding profile showed highly polymorphic DNA fragments in these 47 isolates (4, 12, 13, 14, 15, 16,17).ERIC-PCR was formerly reported in clinical isolates of *E. coli* in India by ²⁴,and by have been recorded in ¹. ERIC was also recorded in other type of *E.coli* such as enterotoxigenic *Escherichia coli* (ETEC) ⁵.

Phylogenetic Analysis:

In molecular typing phylogenetic tree, there were 100% matching in several strains as showing in figure

(5), such as (9&16) who both showed moderate biofilm production, while in antibiotic strain number 9 was moderate to Ciproflaxcine, while strain 16 was resistant to all antibiotics.Strain number (43&49) also where identical, strain 43 showed strong biofilm production while 49 showed weak biofilm production, strain 43 was resistant to all antibiotics and strain 49 was moderate to Ciproflaxcine and Ceftraxone.Strain number (40&47) both where moderate biofilm production, strain 40 was resistant to all antibiotics, while 47 was moderate to Ciproflaxcine and Ceftraxone.Strain number (41&44) both where moderate biofilm production, and both were resistant to all antibiotics.

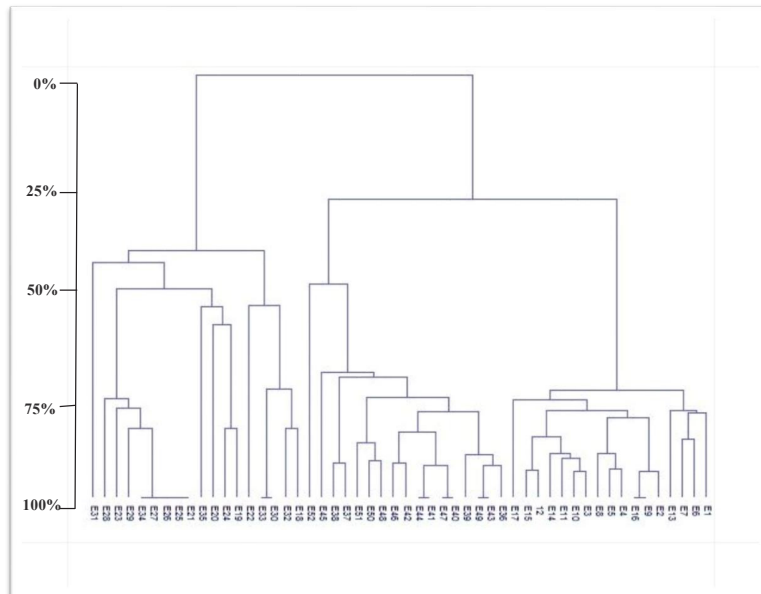


Figure (5): Neighbor-joining trees based on ERICgene molecular typing .

Conclusion

1- *E. coli* isolation was high in females than with males and more than half of the isolation rate in UTI state was among the age (30-39) years and (40-49) years.

2- High resistance level of *E. coli* isolates to most of the antimicrobials and highest resistance to Rifampicine and Garamycine .

3- *E. coli* isolate (12%) were weak biofilm formation, and (72%) were moderate biofilm formation and Of 50 *E. coli* isolates subjected to ERIC-PCR, 47 isolates have amplications ranging from 700 to < 3000bp .

4- In molecular typing phylogenetic tree, there were 100% matching in several strains , such as (9&16) who both showed moderate biofilm production, while in antibiotic strain number 9 was moderate to Ciproflaxcine, while strain 16 was resistant to all antibiotics. Strain number (43&49) also where identical, strain 43 showed strong biofilm production while 49 showed weak biofilm production, strain 43 was resistant to all antibiotics and strain 49 was moderate to Ciproflaxcine and Ceftraxone..

Conflict of Interest: Non

Source of Findings: Self findings.

Ethical Clearance: Non

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Evaluation of the use of HbA1c in the Diagnosis of Impaired Fasting Glucose

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Abstract

Diabetes mellitus is a progressive catastrophic medical condition, associated with serious acute and chronic complications. Despite the significant improvement in the diagnostic techniques, it is estimated that up to 50% of diabetic patients are unaware of their disease, especially those with type 2 diabetes mellitus. The impaired fasting glucose, defined as fasting blood glucose 70-100 mg/dl, has been recognized as a major risk factor for the development of type 2 diabetes mellitus. Aim of the study: To investigate the use of HbA1c as an alternative to fasting blood glucose (FBG) in the diagnosis of impaired fasting glucose. Materials and methods: The study involved apparently healthy individuals, attended a private medical laboratory for routine medical checking. Two aspects were followed, dividing participants into 4 groups, group 1 with normal FBG, group 2 with FBS 100-125 mg/dl, group 3 with HbA1c < 5.7%, and group 4 with HbA1c of 5.7%-6.4 %. Group 1 and 2 were investigated for FBS, while group 3 and 4 were investigated for HbA1c. Results: A total number of 312 subjects were included in the current study, with a variable number of individuals in each group. The results of HbA1c were statistically compared with the results of FBG. The sensitivity of HbA1c in the diagnosis of impaired fasting glucose was 80%, and the specificity was 66.4% only while the positive and negative predictive values were 81.4% and 64.6% respectively.

Conclusion: HbA1c should be used with caution in the diagnosis of impaired fasting glucose.

Keywords: prediabetes; HbA1c; IFG; sensitivity; specificity.

Introduction

Diabetes mellitus represents a major global health problem of increasing prevalence. It is associated with a high incidence of morbidity and mortality due to its both acute and chronic complications. Many conditions are known to increase the risk of development of diabetes mellitus, primarily type 2, the most important of which is the presence of impaired fasting glucose (IFG)⁽¹⁾. Prediabetes represents an intermediate state between normal hemostasis of glucose and frank diabetes mellitus; it is classified into two primary forms, impaired glucose tolerance (IGT) and the impaired fasting glucose. According to the American Diabetes Association (ADA), IFG is defined as fasting blood glucose (FBG) 100-125 mg/dl while IGT is defined as a blood glucose of 140-199 mg/dl 2 hours after a 75 g oral glucose⁽²⁾. The prevalence of prediabetes is widely variable with an expected increasing prevalence in the

foreseeable future. It is estimated that the prevalence of prediabetes is within the range of 9-40%⁽³⁾. Many factors are claimed to affect the distribution of prediabetes including age, sex, and ethnic group; for example, IGT is more frequent in women than in men whereas IFG is more prevalent in men⁽⁴⁾. The progression of prediabetes into frank diabetes mellitus remains a universal concern regardless the exact definition of prediabetes, 5-10% is the annual incidence of development of diabetes mellitus in subjects with prediabetes, and within 10 years, 70% of them will develop diabetes mellitus⁽⁵⁾. To some extent, prediabetes can be considered as a discreet medical condition that is associated with specific physiological changes and specific complications⁽⁶⁾ including retinopathy, nephropathy, neuropathy, and cardiovascular complications⁽⁷⁾.

Diagnosis of prediabetes is not uniform until the time being, the World Health Organization (WHO) defines

prediabetes as either:

- IFG: when FBG \geq 110 mg/dl and $<$ 126 mg/dl, with 2h post-load glucose of $<$ 140 mg/dl (if measured).
- IGT: when FBG $<$ 110 mg/dl, and 2h post-load glucose \geq 140 mg/dl and $<$ 200 mg/dl.

The ADA has applied slightly different criteria; for IGT, the same cut-off has been applied, while for IFG, a lower cut-off has been used (100-125 mg/dl). Furthermore, ADA has added HbA1c for the definition where a level between 5.7%-6.4% will indicate prediabetes⁽⁹⁾. Many disadvantages are present with applying these criteria for the diagnosis of prediabetes, of these disadvantages is the poor reproducibility of the results with day to day variation of 15% in respect to FBG and up to 46% in respect to 2-hour post-load glucose concentration making misclassification relatively common⁽¹⁰⁾. Besides, the progression to diabetes mellitus has been observed in subjects with levels of blood glucose concentration of less than the prediabetes level, making the full benefit of the prediabetes concept under the current definition questionable⁽¹¹⁾. Furthermore, the addition of HbA1c to the definition of prediabetes has its own disadvantage due to the so many factors that might affect the measured level of HbA1c.

Modalities of treatment of prediabetes include lifestyle modification, bariatric surgery, and pharmacological therapy, including various groups of antidiabetic drugs, where metformin has been intensively used for this purpose⁽¹²⁾.

Materials and Method

The current study was performed at a private clinical laboratory during the period between 20th October 2018 to 15th April 2019. It involved the estimation of FBS and HbA1c for adult individuals who attended the laboratory for routine checking. A total number of 312 apparently healthy adults were randomly selected after applying the exclusion criteria. All participants have been questioned about any current or previous diseases or any current medications. Other information included age, weight, and height.

Informed consent was obtained from all individual participant included in the study.

For each participant, BMI was calculated; FBS, HbA1c, complete blood count, blood urea, serum creatinine, and serum ALT were estimated.

The exclusion criteria were:

1. Patients with diabetes mellitus of any type, regardless of his treatment.
2. Patients on drugs that might affect blood glucose level, emphasizing on steroid, and thiazide.
3. Patients with endocrinal disorders, with or without treatment.
4. Patients with anemia of any type.
5. Patients with acute illness, including a psychiatric one.
6. Pregnant females.

The history and laboratory results were used to apply these criteria.

FBG of 70-99 mg/dl was regarded as normal.

Impaired fasting glucose was defined as FBS 100-125 mg/dL.

Reference range of HbA1c was 4.8 - 5.6 %.

The participants were grouped according to their sex, BMI, FBS, and HbA1c, followed by statistical evaluation of these groups.

The main laboratory devices used were:

Tosoh G7 for assessment of HbA1c using HPLC technique.

SelectraproS for biochemical tests.

finding :

A total number of 312 subjects were involved in the current study fulfilled the selective criteria. Sex distribution of the studied group was as follows:

- Male: 121
- Female: 183

BMI was calculated according to the following equation:

BMI=

Table 1: The distribution of BMI of the studied group.

BMI	Number	Percentage
<25	119	38%
25-30	112	36%
30-35	81	26%

Mean BMI was 27.3 kg/m²; the distribution of individuals according to BMI is shown in table 1.

Table 2: Number and percentage of participants according to their FBG and HbA1c.

FBS (mg/dl)	Number	Percentage
<100	110	35
100-125	202	65
HbA1c (%)		
<5.7	218	73
5.7-6.4	94	27

The participants were classified according to their FBS and HbA1c into further groups as shown in table 2.

Table 3: Groups of participants according to their combined results of FBG and HbA1c.

Result	Number	Percentage
FBS 100-125 with HbA1c >5.7%	162	80
FBS 100-125 with HbA1c <5.7%	40	20
FBS <100 with HbA1c >5.7%	37	33.6
FBS <100 with HbA1c <5.7%	73	66.4

The results of the current study have shown that only 162 individuals with FBS of 100-125 mg/dl had HbA1c 5.7-6.4%, while the other 40 individuals with FBS of 100-125 mg/dl had HbA1c <5.7%. At the same time, the results of the current study have shown that only 73 individuals with FBS <100 mg/dl have HbA1c <5.7%, while the other 37 individuals with FBS <100 mg/dl have HbA1c >5.7%, as shown in table 3.

Accordingly, and using FBS as a reference, the sensitivity and specificity of HbA1c in the diagnosis of IFG will be as follows:

Sensitivity =

= 80%

Specificity =

= 66.4%

Positive predictive value =

= 81.4%

Negative predictive value =

= 64.6%

In the estimation of the effect of BMI on HbA1c and IFG, the results of the current study have shown that individuals with BMI >25, and HbA1c >5.7% were 61 of 94 (65%), while individuals with BMI ≥25 and FBS >100 were 141 of 202 (70%), but despite the percentage of these two groups are very close, the individuals are not the same in the two groups.

At the same time, the results of the current study have shown that individuals with BMI ≥25 and HbA1c <5.7% were 143 of 218 (66%) while individuals with BMI >25 and FBS < 100 were 80/110 (73%), again, the individuals are not the same in these two groups as might be expected.

For those with a BMI of < 25, and in the scope of their blood levels of FBG and HbA1c, it was noticed that individuals with BMI <25 and HbA1c ≥5.7% were 33 of 94 (35%) while individuals with BMI <25 and FBS ≥100 were 61 (30%).

Likewise, individuals with BMI <25 and HbA1c <5.7% were 75 (34%) while individuals with BMI <25 + FBS < 100 were 30 (27%). Using SPSS version 21, there was a significant correlation between BMI and HbA1c level, while there was no significant correlation between BMI and FBG.

Discussion

Evaluation of glycated hemoglobin (HbA1c) in blood represents evidence about the individual’s mean blood glucose levels during the previous two to three months, which represents the expected half-life of red blood cells (RBCs). Logically, HbA1c level should be directly related to the mean glucose level in healthy individuals, diabetic patients, and in our case, individuals with IFG, but in fact, this is not always the

rule especially in individuals with IFG as we will discuss here.

The increasing evidence about the poor reproducibility of both FBG and HbA1c necessitate a persistent evaluation of their use in the diagnosis of IFG; furthermore, the comparison between these two markers has not reached the final destination; this is why searching for a new biomarker is persistent.

Taking the result of FBG as a reference, the current study has shown that the sensitivity of HbA1c in the diagnosis of IFG is 80% and the specificity of it is 66.4%. Accordingly, It is obvious that HbA1c carries an accepted sensitivity rate in the diagnosis of IFG, but unfortunately, a relatively low specificity. At the same time, the positive and negative predictive value of HbA1c in the diagnosis of IFG were 81.4% and 64.6% respectively. The vast number of studies that thoroughly investigated this subject have shown a significant variation, although most of them have suggested a precaution with the use of HbA1c for this purpose. Fangjian Guo, in his large study that has included 5359 individuals between 2005 and 2010, has shown a poor sensitivity of HbA1c for detection of IFG (35.4%) with better specificity (64.9%)⁽¹³⁾.

A much higher result has been revealed by Pedapati Radhakrishna and his group, where the sensitivity was 81%, and the specificity was 80%⁽¹⁴⁾. Another similar study has shown a sensitivity of 62% and specificity of 77%⁽¹⁵⁾. The most surprising results have been demonstrated by Nicole R. Pinelli, and his colleagues where the sensitivity was extremely low (14%), while the specificity was extremely higher (91%)⁽¹⁶⁾.

A summary of other similar studies is shown in table 4 with mentioning of positive and negative predictive value when available.

Table 4: Examples of similar studies with the sensitivity and specificity of each one.

Study	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Current study	80	66.4	81.4	64.6
Fangjian Guo et al(13)	35.4	64.9		
Pedapati Radhakrishna et al(14)	81	80		
A. Bhansali et al(15)	62	77	57	55

Cont... Table 4: Examples of similar studies with the sensitivity and specificity of each one.

Nicole R. Pinelli(16)	14	91		
M. Norberg et al(17)	90	42	8	
Arnold M. et al(18)	40-58	73-84		
Zhang Y et al(19)	35.2	86.4		

Despite the significant variation in the results of these studies, and many others as well, nearly all the results are pointing to a common conclusion which suggests a relatively poor correlation between HbA1c level and diagnosis of IFG.

Conclusion

The results of the current study suggest that:

1. HbA1c should be used with caution in the diagnosis or exclusion of IFG.
2. There is a significant impact of obesity on the level of HbA1c.

Conflict of Interest: Non

Source of Findings: Self

Ethical clearance: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

This article does not contain any studies involving animals performed by any of the authors.

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Evaluation the Serum Level of Melatonin in Iraqi Patients with Polycystic Ovarian Syndrome

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Abstract

Background: Polycystic Ovarian Syndrome(PCOS) is one of the most frequent gynecological endocrinopathy that occur in premenopausal females, with a predominance range from 6%to10% among women of reproductive age.Melatonin (N-acetyl-5-methoxytryptamine), an neurohormone synthesized from the aromatic amino acid tryptophan mainly by the pineal gland of humans.The important of melatonin in human reproduction is still unidentified. A numerous study suggests that melatonin and reproductive hormones are closely related. This concept is based on observation of influence melatonin on sex steroid production at different stages of ovarian follicular maturation as melatonin receptors have been demonstrated at multiple sites in ovary and in intrafollicular fluid. **Aim :**The study aim to evaluate the role of melatonin in women with polycystic ovarian syndrome. **Materials and Methods:**A prospective cross-sectional study was designed taking 60 PCOS patients and 30 controls women whose ages were between 15-35 years old, from beginning of January 2019 to ending of April 2019. These patients admitted to obstetrics and gynecology unit at Babylon teaching hospital. And Five ml of blood sample was taken on day 2 of menstrual cycle by vein puncture from each subject enrolled in this study .Blood samples were collected between 07:00am – 08:00 am, and placed into sterile test tubes to serum melatonin estimation.**Result:** The study showed that there is the significant difference betweenPCOS women and the control group concerning melatonin level,and the highest mean of melatonin was occurred in PCOS women (61.21 ± 13.78 vs. 28.61 ± 6.73). And also This study showed that there were the higher means of melatonin in PCOS women with positive family history than PCOS women with negative family history (66.56 ± 11.25 vs. 59.26 ± 14.21) with significant relation. **Conclusions:** Women with PCOS have significant increase of serum melatonin in PCOS women. And also thisstudy could open the way for therapeutic role of melatonin in treatment of PCOS women.

Keyword : Melatonin ; Iraqi patients ;Polycystic Ovarian Syndrome

Introduction

Polycystic Ovarian Syndrome(PCOS) is one of the most frequent gynecological endocrinopathy that occur in premenopausal females⁽¹⁾, with a predominance range from 6%to10% among women of reproductive age⁽²⁾. It is characterized by hyperandrogenism (male hormone in female), menstrual disturbance, excess body and facial hair (hirsutism), acne, temperament disorder, endometrial cancer in addition, severe physiological disturbance are commonly detected among women with PCOS; for example, abdominal adiposity, inflammation, and infertility^(3,4,5). Polycystic ovarian syndrome diagnosis is based on two of the following three findings: Oligo- or anovulation, polycystic ovaries under ultrasonography,

and clinical or biochemical signs of hyperandrogenism⁽⁶⁾. Polycystic ovarian syndrome etiology and pathogenesis is still unknown, but some causative factors play important role in this syndrome such as hormonal disorders, adipose tissue dysfunction, oxidative stress have been blamed, but definitive consensus has not been reached⁽⁷⁾. However, in recent years, insulin resistance (IR) has been reported to play an important role in the progression of PCOS^(8,9,10). PCOS may present with metabolic abnormalities such as insulin resistance (IR) and visceral obesity at a young age. Long-term exposure to these abnormalities during fertile life may increase the reverse impacts and expose these women to higher risks of metabolic syndrome (MetS), cardiovascular diseases (CVDs) and type II diabetes mellitus (T2DM)

(11). While, melatonin (N-acetyl-5-methoxytryptamine), an neurohormone synthesized from the aromatic amino acid tryptophan mainly by the pineal gland of humans⁽¹²⁾. As a neurohormone, melatonin has numerous important physiological function and regulates varieties of central and peripheral actions related to circadian rhythms and reproduction. It act as a broad-spectrum antioxidant, powerful free radical scavenger, anti-inflammatory agent, potential immunoregulator, anticarcinogenic effector, sleep inducer, and regulator of the circadian rhythm in the body⁽¹³⁾. The important of melatonin in human reproduction is still unidentified. A numerous study suggests that melatonin and reproductive hormones are closely related⁽¹⁴⁾. This concept is based on observation of influence melatonin on sex steroid production at different stages of ovarian follicular maturation as melatonin receptors have been demonstrated at multiple sites in ovary and in intrafollicular fluid. Also several studies found that increased of melatonin concentration in serum of women with PCOS, and also indicating a feedback mechanism due to reduced melatonin concentration at the level of ovarian follicles. This could interpretation role of melatonin in the pathogenesis of PCOS⁽¹⁵⁾. The study aim to assess the role of melatonin in women with polycystic ovarian syndrome. Objectives: Clarify the relation of serum melatonin in PCOS women and the control group and Evaluate the association some clinical symptoms in PCOS women.

Materials and Method

Study design: A prospective cross-sectional study was designed taking 60 PCOS patients and 30 controls women whose ages were between 15-35 years old, from beginning of January 2019 to ending of April 2019. These patients admitted to obstetrics and gynecology unit at Babylon teaching hospital. An interview was carried out with these patients using questionnaire form designed by the investigator including their demographic characteristics, age, weight, length, BMI... etc.

Study population:

Inclusion criteria for selection of cases women:

The Rotterdam European Society for Human Reproduction and Embryology/American Society for Reproductive Medicine (ESHRE/ASRM) this criteria was used to diagnose PCOS and women with presence of any two of the following three features were included in the study:

- Menstrual disturbance or irregular.
- Clinical and/ or biochemical hyperandrogenism (hirsutism, acne, and alopecia)
- Polycystic ovaries morphology under ultrasound (more than 12 follicles in one or both ovaries, 2-9mm in diameter and/ or increased ovarian volume more than 10 ml).

Inclusion criteria for selection of controls women:

- Regular menstrual cycle
- Normal androgen, without (hirsutism, alopecia, and acne)
- Absence of polycystic ovary morphology under ultrasound
- Normal biochemical parameters including (S.Melatonin).

Exclusion criteria: All patients with metabolic or endocrinology disorders including thyroid disorder, diabetes mellitus, hypertension, Cushing's syndrome, acromegaly, premature ovarian failure, virilising adrenal or ovarian tumors, and history of using contraceptive through last of sex months were excluded from this study.

Sampling: Five ml of blood sample was taken on day 2 of menstrual cycle by vein puncture from each subject enrolled in this study .Blood samples were collected between 07:00am – 08:00 am, and placed into sterile test tubes, after blood clotting, centrifuged at 2500 RPM for 15 minute then clot removed and remain re-centrifuged at 2500 RPM for 10 minute and the obtained serum were aspirated using mechanical micropipette and transferred into clean test tubes which labeled and stored in deep freeze at -20 c for serum melatonin measurement.

Statistical Analysis

Computerized statistically analysis was performed using SPSS statistic program version 16.1. Comparison was carried out using; Chi-square(X^2) and T-Test probability (P value).

Finding

Comparison of age in PCOS and Control women.

A total of 60 PCOS women and 30 non PCOS women (control group) were examined for (melatonin).

Their age range group were between (15-35) years, showed in Table 1.

Table 1: Comparison of age in PCOS and Control women.

Age	PCOS group	Control group
No.	60	30
Mean	24.25	23.63
SD	5.12	4.06
P- Value	NS	

Comparison of melatonin level with PCOS women.

The study showed that there is the significant difference between PCOS women and the control group concerning melatonin level, and the highest mean of melatonin was occurred in PCOS women (61.21 ± 13.78 vs. 28.61 ± 6.73), showed in Table 2.

Table 2: Comparison of melatonin and PCOS.

Serum Melatonin (ng/ml)	PCOS group	Control group
No.	60	30
Mean	61.21	28.61
SD	13.78	6.73
P- Value	< 0.05	

Comparison of Melatonin with Family History in PCOS women.

This study showed that there were the higher means of melatonin in PCOS women with positive family history than PCOS women with negative family history (66.56 ± 11.25 vs. 59.26 ± 14.21) with significant relation, showed in Table 3.

Table 3: Comparison of melatonin and family history in PCOS.

Melatonin	Negative family history	Positive family History
No.	44	16
Mean	59.26	66.56
SD	14.21	11.25
P- Value	< 0.05	

Discussion

PCOS with Age :

Our study it was found that there was no significant difference between PCOS women and control group concerning age (24.25 ± 5.12 vs. 23.63 ± 4.06), Table 3.1, and Figure 3.1. This agreement with (Guilherme

Barbosa, *et al.*)⁽¹⁶⁾ study, that found PCOS affects women of childbearing age without higher prevalence by ethnic groups, but the signs and symptoms may differ by ethnicity. And disagreement with (Chhabra,*et al.*)⁽¹⁷⁾ who reported that PCOS varies with age but continues to be more common among women aged less than 35 years than in those above 35 years, this finding could be

attributed to that the women in that age are physiological active concerning the fertility and ovulation.

Melatonin level with PCOS.

The study showed that there is the significant difference between PCOS women and the control group concerning melatonin level and the highest mean of melatonin was occurred in PCOS women compared with control group (61.21 ± 13.78 vs. 28.61 ± 6.73), Table 3.2, and Figure 3.2.

Melatonin is normally synthesized in the ovary, as both melatonin synthesizing enzymes AANAT (arylalkylamine N-acetyltransferase) and HIOMT (hydroxyindole-O-methyl transferase) are present in ovarian tissue⁽¹⁸⁾. The study by (Tenorio,*et al.*)⁽¹⁹⁾ found that, the presence of melatonin receptors in the follicular cells of rats and mice, suggests possible melatonin production in the ovary. Its well-documented role as an antioxidant may be associated with follicular development and oocyte quality, interfering in processes such as oocyte maturation and ovulation⁽²⁰⁾. Melatonin, synthesized by the ovary, may be released into the follicular fluid. However, the capacity of melatonin detected in the ovary and preovulatory follicular fluid is derived from the circulation. There may be a reduction in the uptake of melatonin from circulation into the ovarian follicles of PCOS cases due to anovulation and increased number of atretic follicles and consequently serum melatonin concentration may increase in PCOS as a feedback response to decreased follicular concentration⁽¹⁵⁾. This study agreement with (Murcia-García,*et al.*)⁽²¹⁾, Experimental studies with female rats and hamsters reported that removal of the pineal gland leads to a decrease in melatonin levels with consequent premature vaginal opening, ovarian hypertrophy, increased cornification of vaginal cells and chronic anovulation, effect that can be reversed after administration of melatonin⁽²²⁾. The reduction of melatonin ovary can decrease embryo implantation, as well as interfere with pregnancy when rats are subjected to short photoperiods, showing an increase in melatonin levels accompanied by depressions in follicle stimulating hormone (FSH) and reduction in follicle development, becoming anestrous⁽¹⁹⁾. And also with (Woo,*et al.*)⁽²³⁾ study, found the expression of receptors for melatonin MT1 and MT2 has been identified in human reproductive tissues, including the mammary epithelium, myometrium, ovary and granulosa-luteal cells. In females, the influence of melatonin on the reproductive

function can be inferred from studies that indicate that high levels of melatonin cause amenorrhea⁽²⁴⁾, disturbance in gonadotropin secretion and the secretion of prolactin in response to the photoperiod⁽²⁵⁾. Studies have suggested that melatonin has a role in ovarian physiology, given that high concentrations of melatonin have been detected in follicular fluid⁽¹⁹⁾.

Melatonin and Family History in PCOS women.

The study showed that there is the significant difference between positive family history and negative family history concerning melatonin level and the highest mean of melatonin was occurred in positive family history compared with negative family history in PCOS women (66.56 ± 11.25 vs. 59.26 ± 14.21), Table 3.3 and Figure 3.3.

Our result agreement with (Sirmans,*et al.*)⁽²⁶⁾ study, that found family history of PCOS is a risk factor for PCO. Based on the clustering of cases in families, PCOS is considered to be a heritable disorder. A high prevalence of PCOS or its feature among first-degree relatives is suggestive of genetic influences. A increased prevalence of PCOS is associated with a number of condition. A history of weight gain often precedes the development of the clinical features of PCOS, and following healthy lifestyle has been shown to reduce body weight, abdominal fat, reduce testosterone, improve insulin resistance, and decrease hirsutism in women with PCOS. And also with (Begum,*et al.*)⁽²⁷⁾ study, that found The presence of a genetic component to PCOS and familial clustering of reproductive and metabolic abnormalities results in increased risk of PCOS among first-degree relatives of PCOS patients. This is evident agree with our study results where participants with a positive family history of PCOS carried little higher risk of development of PCOS.

Conclusions

- 1- There was significant increase of melatonin in PCOS women.
- 2- There was significant increase of melatonin with positive family history in PCOS women.

Conflict of Interest: Non

Source of Findings: Non

Ethical Clearance: Non

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Relation of Some Heavy Metals with Male Infertility

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Summary

Background: Infertility is defined as a failure of achieve a pregnancy after one year and more of regular unprotected sexual intercourse. The exposure of reproductive system especially the testis to heavy metals has also been associated with male infertility. A large number of metals are toxicants to the reproductive system. **Patients and methods:** Study was performed at the high institute of infertility diagnosis and assisted reproductive technologies in Al-Nahrain University and the Poisoning consultation center / specialized surgeries hospital in the Medical city during the period from November 2018 to April 2019. A total number of 150 men were enrolled in this study who were divided into two groups, the patient and the normal control groups. The patient group included 100 men aged between 20-50 years. The second group included 50 healthy men who have at least two children without any previous history of systemic diseases as a control group. Heavy metals and trace element concentrations were estimated for all the study groups in this study. The aim of current study are evaluation of some trace element concentrations, in serum and whole blood of infertile men and healthy controls. **Results:** The heavy metals Cu, Pb and Cd showed a highly significant increase ($p < 0.01$) in the serum and blood of infertile men ($159.77 \pm 8.49 \mu\text{g/dl}$, $24.18 \pm 4.30 \mu\text{g/dl}$, $0.31 \pm 0.10 \mu\text{g/dl}$) respectively when compared with their concentrations in healthy control men ($125.14 \pm 10.12 \mu\text{g/dl}$, $15.74 \pm 2.69 \mu\text{g/dl}$, $0.16 \pm 0.03 \mu\text{g/dl}$) respectively. The mean levels of Zn showed a highly significant decrease ($p < 0.01$) in the serum of infertile men ($70.82 \pm 9.48 \mu\text{g/dl}$) compared to its mean level in the healthy control group ($95.70 \pm 11.41 \mu\text{g/dl}$). **Conclusions:** this study concluded that some heavy metals were shown to be an indicators for men infertility.

Keywords: heavy metals infertility male reproductive.

Introduction

Infertility was defined as inability to conceive after one year of regular unprotected intercourse⁽¹⁾. Infertility is an ever increasing phenomenon in the modern urban societies⁽²⁾, and generally, infertility affects about (10-15%) of the couples in the world. The cause of infertility in about (10%) of cases remains unexplained, and the couples are designated as normal infertile couples⁽³⁾. Male infertility is a common disorder that affects approximately (50%) of infertility cases in the world⁽⁴⁾. Male fertility depends upon the coordination between neural and hormonal mechanisms or between male reproductive system and these mechanisms. Thus, any hindering of at least one of these mechanisms will result in infertility⁽⁵⁾. The trace elements are micro nutritive elements that exist in minute quantities within the body mass and they are either important via playing different functional roles in the body or non-essential

elements with negative effect on the human body even at very low concentrations⁽⁶⁾. Heavy metals are usually dense elements with potential toxicity, especially in environmental context⁽⁷⁾. They can be naturally obtained from the earth crust, and became concentrated because human activities. Heavy metals can enter human tissues via food, inhalation and manual handling⁽⁸⁾. Skin contact absorption, for instance soil contact, is another possible source of body contamination by heavy metals⁽⁹⁾. Because they are difficultly metabolized, toxic heavy metals can bioaccumulate in human's body⁽¹⁰⁾. Those heavy metals may combine with and interfere with the vital cellular element functions⁽¹¹⁾. Because of sperm's oxidative damage and testicular apoptosis, exposure to heavy metals has also been associated with male infertility⁽¹²⁾. Increase in fertility associated with higher miscarriage rates have been noted in the partners of men working in lead battery factories, indicating harmful effects of heavy metals on reproductive success⁽¹³⁾.

Materials and methods:

Study was performed at the high institute of infertility diagnosis and assisted reproductive technologies in Al-Nahrain University and the Poisoning consultation center / specialized surgeries hospital in the Medical city during the period from November 2018 to April 2019. A total number of 150 men were enrolled in this study who were divided into two groups, the patient and the normal control groups. The patient group included 100 men aged between 20-50 years. The second group included 50 healthy men who have at least two children without any previous history of systemic diseases as a control group. Heavy metals and trace element concentrations were estimated for all the study groups

in this study. Frozen serum was allowed to thaw at room temperature, and assessment of inorganic elements Zn and Cu was performed by Flame atomic absorption spectrophotometry, while Cd was measured by graphite furnace atomic absorption spectrophotometry.

Finding

results indicated that 78 (78%) of the 100 cases had abnormal zinc levels, while 22 (22%) of them had normal zinc levels in comparison with the control group which showed that 46(92%) had normal zinc levels and only 4 (8%) had abnormal zinc levels, with a highly significant difference using the Monte Carlo test MCP < 0.01. As shown in table (1).

Table (1) Descriptive statistic & MCP test between cases and control of serum zinc

Zn Level	Cases		Control	
	No.	percentage%	No.	percentage%
Normal	22	22	46	92
Abnormal	78	78	4	8
Total	100		50	100

Cu Level	Cases		Control	
	No.	percentage%	No.	percentage%
Normal	20	20	50	100
Abnormal	80	80	0	0.0
Total	100	100	50	100

Table (2) Descriptive statistic & MCP test between cases and control of serum copper

While results in table (2) demonstrated that 80 (80%) of the 100 cases had abnormal copper levels, and 20 (20%) of them had normal copper levels when compared with the control group which showed that all the 50(100%) control group had normal copper levels, with a highly significant difference using the Monte

Carlo test MCP < 0.01.

Results of blood lead level estimation in table 3 showed that 33 (33%) of the 100 infertile patients had abnormal lead levels, and 67 (67%) of them had normal leadlevels, while all the control group 50 (100%) had normal lead levels, with a highly significant variation

using the Monte Carlo statistical test $MCP < 0.01$.

Table (3) Descriptive statistic & MCP test between cases and control of blood lead

Cd Level	Cases		Control	
	No.	percentage%	No.	percentage%
Normal	49	49	50	100
Abnormal	51	51	0	0.0
Total	100	100	50	100

Results of blood cadmium level estimation showed that 51(51%) of the 100 infertile patients had abnormal cadmium levels, and 49 (49%) of them had normal cadmium levels, while all the control group 50 (100%) had normal cadmium levels, with a highly significant difference using the Monte Carlo statistical test $MCP < 0.01$ as illustrated in table 4.

Table (4) Descriptive statistic & MCP test between cases and control of blood cadmium

Pb Level	Cases		Control	
	No.	percentage%	No.	percentage%
Normal	67	67	50	100
Abnormal	33	33	0	0.0
Total	100	100	50	100

Table (5): Descriptive statistics and t-test between patient group and control group regarding (Zn µg/dl, Cu µg/dl, Pb mg/dl, Cd µg/dl).

	Groups	N	Mean ±Std.	t-test	P-Value	C.S
Cu	Cases	100	159.77±8.49	22.065	.000	P<0.01(HS)
	Control	50	125.14±10.12			
Zn	Cases	100	70.82±9.48	14.140	.000	P<0.01(HS)
	Control	50	95.70±11.41			
Pb	Cases	100	24.18±4.30	12.684	.000	P<0.01(HS)
	Control	50	15.74±2.69			
Cd	Cases	100	0.31±0.10	10.478	.000	P<0.01(HS)
	Control	50	0.16±0.03			
	Control	50	450.35±131.27			

All the above results discern great variation in levels of heavy metals between the infertile male group and the control group suggesting that heavy metals have effect on male infertility. Results agreed with⁽¹⁴⁾who mentioned in a scientific literature a lot of data on the negative influences of the toxic metals on the human body⁽¹⁴⁾.⁽¹⁵⁾found increase in Cd and Cu concentrations in the serum of infertile men comparison with the control group⁽¹⁵⁾. Inhalation or dermal absorption of heavy metals can significantly increase blood heavy metal levels⁽¹⁶⁾. These findings were consistent with the other studies conducted in Baghdad, Beirut and Al-Najaf which demonstrated that the blood levels of lead, cadmium & other heavy metals were increased among many workers^(17&18&19).as depicted in table 5, the mean serum copper concentration in infertile men group was 159.77 ± 8.49 $\mu\text{g/dl}$, which was significantly higher than the mean serum copper concentration of the healthy control group 125.14 ± 10.12 ($p < 0.01$). Results agreed with⁽¹⁵⁾ who found a significant increase ($p \leq 0.05$) in the concentration of Cd and Cu in the serum of infertile men in comparison with the control group. However, many human studies found negative correlations between Cu quantified in the body and spermatozoa quality parameters such as morphology, motility and viability⁽²⁰⁾.⁽²¹⁾Indicated that high doses of Cu had negative effects on sperm motility⁽²¹⁾. Similar results were reported by⁽²²⁾ in human spermatozoa in Cu accumulation⁽²²⁾. Also showed that serum zinc concentration in infertile men group was 70.82 ± 9.48 $\mu\text{g/dl}$ which was a highly significantly lower than serum zinc of the healthy group 95.70 ± 11.41 ($p < 0.01$). This result was compatible with⁽²³⁾ who showed that serum zinc levels of patients with abnormal seminal fluid parameters were lower than those who have normal seminal fluid parameters⁽²³⁾, and similar to the results of⁽²⁴⁾ who showed significant variation between serum zinc of infertile group & fertile group⁽²⁴⁾. The most rapidly growing organs in the body are the gonads, and zinc metallo-enzymes are the vital enzymes involved in protein and nucleic acid synthesis, therefore, zinc deficiency can result in severe testicular damage, decreases of testicular weight, gonads dysfunction and seminiferous tubule shrinkage⁽²⁵⁾.Data demonstrated in table 5 showed that the mean blood lead concentration in infertile men was 24.18 ± 4.30 $\mu\text{g/dl}$, which was significantly higher than its concentration in the healthy control group 15.74 ± 2.69 ($p < 0.01$). These results were compatible with a study of⁽²⁶⁾ who found a highly significant variation between their study groups⁽²⁶⁾.And with⁽²⁷⁾ who found high levels of lead in the

infertile men in comparison with the controls⁽²⁷⁾. And also with⁽²⁸⁾ who found that Pb levels were significantly higher in infertile males ($p=0.001$) when compared with the control group⁽²⁸⁾. Our results were also compatible with the results of⁽²⁹⁾ which showed that seminal and blood plasma cadmium as well as blood plasma lead levels were significantly higher ($p < 0.01$) in azospermic and oligospermic men in comparison with normospermic men⁽²⁹⁾. Results shown in table 5 indicated that mean blood cadmium concentration in the infertile male group was $(0.31 \pm 0.10$ $\mu\text{g/dl}$), which was significantly higher than its mean concentration in the healthy control group $(0.16 \pm 0.03$ ($p < 0.01$). Our results were compatible with⁽²⁹⁾ who reported that seminal and blood plasma cadmium as well as blood plasma lead were significantly higher ($p < 0.01$) in azospermic and oligospermic men when compared with normospermic men⁽²⁹⁾. However,⁽³⁰⁾ observed significant correlations between blood cadmium levels, volume of semen and immature forms of spermatozoa suggesting the need of further studies on blood and semen cadmium levels⁽³⁰⁾. These results were in agreement with⁽¹⁵⁾ who showed a significant increase ($p \leq 0.05$) in the serum concentration of Cd and Cu in infertile group which included azospermia & oligospermia in comparison with the control group⁽¹⁵⁾.

Conclusions

The heavy metals Cu, Pb and Cd showed a highly significant difference in the serum and blood of infertile men compared to the healthy control men, indicating that the alteration in heavy metal metabolism may be related to the development and even progress of infertility among men. The mean levels of Zn showed a highly significant decrease in the serum of infertile men compared to the healthy control group, indicating that the alteration in zinc metabolism may be related to the development of infertility among men. Concentrations of heavy metals during the progress of life of infertile men were higher than those in healthy men. According to the results of the present study, all heavy metals were shown to be indicators for men infertility. The heavy metals should be monitored routinely in male infertility, which could be helpful in improving the general health conditions and reducing progression of the disease.

Conflict of Interest: Non

Source of Findings: Non

Ethical Clearance: Non

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Immunological role of TLR-7 , IL-17A and IL-10 In a Sample of Iraqi Chronic Renal Failure Patients

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Abstract

Objectives: The present study designed to investigate the Immunological role of toll-like receptor-7,IL-17A and IL-10 in sera of 66 Chronic Renal Failure CRF patients at IBN-SINA center for Dialysis in Diyala governorate - Iraq.**Methods:** Sandwich Enzyme Linked Immuno-Sorbent Assay(ELISA) technique were used in this study to evaluate concentration of TLR-7 ,IL-17A and IL-10 between study groups.**Results:** The findings of the present study demonstrated that significantly increased level of TLR-7 in the CRF group (0.24±0.05 ng/ml) compared to controls (0.02 ±0.08 ng/ml), the findings revealed a significant association between CRF and IL-17A serum level in the studied groups,There was a significantly increased level of IL-17A in the CRF group (6.50±1.37 pg/ml) compared to controls (2.19±0.32 pg/ml) also decreased level of IL-10 in the CRF group (26.20 ±5.16 pg/ml) compared to controls (79.27±23.44 pg/ml).**Conclusion:** These findings concluded that TLR-7 , IL-17A and IL-10 might have a role in CRF pathogenesis.

Keywords: Chronic Renal Failure, TLR-7, IL-17A, IL-10, Pro-inflammatory cytokines.

Introduction

The kidneys are paired organs that lie on the posterior wall of the abdomen behind the peritoneum on either side of the vertebral column ^[1] . The kidneys are able to maintain Fluids, electrolytes, and regulate blood pressure ^[2] . Renal failure (RF) is the condition in which the kidney is unable to remove the final metabolites from the blood and regulate fluids, electrolytes, and acid balance in extracellular fluid ^[3].(CRF) occurs when the kidneys are destroyed or decreased functions for at least 3 months (Glomerular Filtration Rate (GFR) <60 ml / min / 1.73 m ² ^[4] .The severity of CRF is directly proportional to diabetic disease and hypertension, and the most serious complication of chronic renal insufficiency is the risk of cardiovascular disease (CVD), as the blockage of the arteries, which has a negative effect on the kidney, leads to further deterioration of kidney function ^[5] . many pathogens in patients with CRF

include: Immune disorders such as glomerulonephritis , Metabolic Disorders such as diabetes, Renal vascular disorders such as atherosclerosis, Injuries Infections such as tuberculosis, Urinary Tract Obstruction such as Renal Calculi and Congenital and hereditary disorders such as polycystic disease and congenital nephropathy ^[6] .Toll-like receptors (TLRs) have recently emerged as a key component of the innate immune system that detect microbial infection and trigger antimicrobial host defense responses, TLRs activate multiple steps in the inflammatory reactions that help to eliminate the invading pathogens and coordinate systemic defenses In addition, TLRs control multiple dendritic cell functions and activate signals that are critically involved in the initiation of adaptive immune responses ^[7] . When triggering TLR, signals are generated transcription factors that stimulate expression of genes that encode cytokines, enzymes, antimicrobial, and phagocytes^[8] . Acute Renal Failure (ARF) caused by Injuries, drug interactions or toxicity is identified and generated by biological memory. This process is not simple and may take several weeks. Pro-inflammatory cytokines are generated with an increase in the circulatory flow , (TLR-7 and TLR-9) play a role in increasing the severity

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of the injury and if this continues to progressively lead to the chronic stage of this disease [9]. (IL-17A) is a pro-inflammatory cytokine produced by natural killer cells (NK cell), neutrophils, macrophages, dendritic cells (DCs), mast cells plasma cells and Thelper17 (Th17) [10]. IL-17A has is pleiotropic cytokine which play a role in development of atherosclerosis, hypertension, diabetic nephropathy, ischemia-reperfusion injury, fibrosis, glomerulonephritis, nephrotic syndrome and acute renal rejection [11].(IL-10) is an important Homodimer anti-inflammatory agent known as the human Cytokine Synthesis Inhibitory Factor (CSIF), the length of each subunit 178 amino acid [12].(IL-10) is a pleopetric multifunctional cytokine that affects the immune response and inflammation, It also reduces the expression of T Helper(Th1) and Major Histocompatibility Complex Antigens (MHC II) and enhances the survival and proliferation of B cells and production of antibodies , also inhibits cell differentiation and(DCs) maturation [13]. Renal failure may increase inflammatory responses through a number of mechanisms, including immune response, which include increased concentration of pro-inflammatory cytokines and reduced levels of anti-inflammatory cytokines, as well as antioxidants and increased acute phase proteins [14]. Therefore, the aim of the present study is to assess the presence of innate immunity represented by TLR-7 serum level and cytokines (IL-17A and IL-10) in the pathogenesis of CRF patients.

Materials and Methods

Patients

Sixty-six Iraqi CRF patients (24 females and 46 males) were enrolled in this study with age mean ± standard deviation (SD)(48.1 ± 14.3years). They referred to Ibn-Sina center for dialysis, Baqubaa Teaching

Hospital. during the period beginning of October 2018 to end of March 2019 for treatment after diagnosis by the specialist physician in Ibn-Sina Center . In addition to patients, 22 apparently healthy individuals (11 females and 11 males) with no clinical symptoms or a family history for CRF were enrolled in the study as a control group with the age mean ± SD (37.1 ± 12.6 years). The study was permitted by the local ethics committee of the Health ministry, Baqubaa Teaching Hospital. In addition to the informed permission that was obtained from the study volunteers.

Methods

Five milliliters of venous blood was dropped from all the study volunteer groups. The withdrawn blood amount was separated in test tubes to collect serum for immunological examination, the blood left to clot at room temperature(25°C), then the tubes were centrifuged for 10 minutes, and the sera were separated in Eppendorf tubes. The sera of studied groups were tested to assess the level of TLR-7 (ABBEXA company, UK), IL-17A and IL-10 (PEPPROTECH Company/ UK), by using Sandwich ELISA technique.

Statistical Analysis

The data were analyzed by using the IBM SPSS computer program version 24 and expressed as mean ± SD, one-way ANOVA table, and Pearson’s two-tailed. The statistical significance level was set at (P < 0.05),(P≤ 0.01),(P≤ 0.001).

Finding

In the present study, Table 1 showed the level of TLR-7 in the sera of CRF patients and healthy control groups.

Table 1: Toll-like receptors7 level in the studied groups

TLR-7 Level ng/ml (mean±SD)	
CRF Patients	Healthy Control
0.248±0.057***	0.08±0.021***

*** significant differences (P ≤ 0.001).

When comparing (TLR7) with sex for CRF patients, we found that the level in males was higher than in females with significant difference between the two groups (P≤ 0.01), Table 2 showed the levels of TLR-7 in the sera of patients .

Table 2: Toll-like receptors7 level in CRF patients

TLR-7 Level ng/ml in CRF patients (mean±SD)	
Males (42)	Females (24)
0.528±0.264**	0.219± 0.351**

** significant differences (P ≤ 0.01).

The results of the present study showed a significant increase in the level of the IL-17A in people with CRF comparing with control group ,Table 3 showed the level of IL-17A in the sera of CRF patients and healthy control groups.alsoresults showed a significant decreased in levels of IL-10 for patients with CRF compared to healthy control group where we found an increase in the concentration of this cytokine ,Table 3 showed the level of IL-10 in the sera of CRF patients and healthy control groups.

Table 3: Interleukin-17 A and 10 level and in the studied groups

IL-17 A Level pg/ml (mean±SD)	
CRF Patients	Healthy Control
6.50±1.37*	2.19±0.32*
IL-10 Level pg/ml (mean±SD)	
26.20 ±5.16***	79.27 ±23.44***

* significant differences (P ≤ 0.05). *** significant differences (P ≤ 0.001).

When comparing IL-17A with sex, the level in males was decreased compared with females with no statistically significant difference (P>0.05), as shown in Table 4.

Table 4: IL-17A level in CRF patients

IL-17A Level pg/ml in CRF patients (mean ± SD)	
Males (42)	Females (24)
5.75 ± 9.43NS	7.81± 13.79NS

NS No significant differences (P > 0.05).

When compared with the sex of the infected, IL-10 was found to be higher in males than in females and no significant difference between the two groups (P >0.05) As shown in Table 5 .

Table 5: IL-10 level in CRF patients

IL-10 Level pg/ml in CRF patients (mean ± SD)	
Males (42)	Females (24)
27.56 ± 49.87NS	23.91±23.03NS

NS No Significant differences (P>0.05)

The Relationship between TLR-7,IL-17A, IL-10 and Age in CRF patients showed in Table 6.

Table 6: showing levels of (TLR-7, IL-17A and IL-10) in age group of CRF patients

Age Group (year)	NO.	TLR-7ng/ml (mean±SD)	IL-17A pg/ml (mean±SD)	IL-10 pg/ml (mean±SD)
20-29	8	0.216±0.415	3.93±2.80	16.92±17.49
30-39	14	0.554±0.305	11.48±17.47	19.52±15.13
40-49	12	0.399±0.307	4.88±7.67	42.62±92.56
50-59	15	0.502±0.184	6.25±10.92	26.89±33.30
Over 60	17	0.477±0.232	4.98±8.93	29.30±50.37
Total	66			
P Value		0.185NS	0.316NS	0.715NS

NS No Significant differences ($P>0.05$)

Discussion

The results of TLR-7 level in the studied groups showed that there was a significantly increased level ($P \leq 0.001$) in CRF group compared to healthy control group (0.248 ± 0.057 ng/ml vs. 0.08 ± 0.021 ng/ml, respectively). This finding matched the findings of other studies that referred to high levels of TLR7 in sera of patients with CRF compared to healthy control is clearly indicative of presence infections due to the vulnerability of the immune system as they have increased chances of Bacterial infection are identified by cells of the immune system that are derived by the secretion of TLR-7,9,4,2 receptors that stimulate the phagocytosis and secretion of inflammatory cytokines [15]. Elevated levels of TLR-7 in sera may indicate the immune system's response to inflammation and kidneys damage in patients with CRF who are constantly dialysis.

The level of TLR-7 may be associated with age, This finding matched the findings of other studies [16]. showing a high level of this receptor in the younger and middle age groups and generally decrease in aging. This high level may be associated with other diseases such as rheumatoid arthritis (RA), hepatitis C [17], immunodeficiencies, atherosclerosis and asthma [18]. The reason for decreasing level of this receptor may be attributed to the weakness of immunological mechanisms as a result of aging or may be affected by patterns and methods of life and smoking in addition to the duration of the incidence of kidney failure, where it is noted in

young groups that the incidence of kidney failure and the number of dialysis that was conducted less than age groups over 50 years.

The results of the present study showed a significant increase in the level of the IL-17A in people with CRF comparing with control group , The results were agreed with other study [19] as one of the pro-inflammatory cytokines, the reason for its rising is due to the higher frequency of the allele in the group of patients than the control group ,that the genetic differences of IL-17A may thus have an effect in The development of renal failure and its increased secretion by T cells due to inflammation[20,21].

These findings were agreed with previous studies indicated increased IL-17A concentration with age, showing that IL-17A was involved in the inflammatory process as a causative agent for aging diseases, and recent studies have enhanced the association of Th17 with age, These cells may contribute to significant changes in immune function [22].

The results of our study were agreed with [23] showed a significant decreased in levels of IL-10 for patients with CRF who are constantly undergoing dialysis compared to healthy control group. The absence of significant difference in level of IL-17A and IL-10 in CRF patients for both sexes may be due to immune defense mechanisms may be somewhat similar regardless of sex as the interaction within the body activates the

immune cells responsible for the immune response in the sera of patients, and the sex is not affected by the level of cytokines in the body [24,25].

Conclusion

TLR-7, IL-17A and IL-10 might have a role in CRF pathogenesis.

Conflict of Interest: Non

Source of Findings: Non

Ethical Clearance: Non

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Protective Immunity against Virulence Uropathogenic Escherichia Coli in Mice

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Abstract

Infection in the urine tract is more dominant as a medical condition around the world in the hospital and society, especially from young women and pregnant women. The reason for disease the first is uropathogenic Escherichia coli, which has several agents that help in the development that disease in addition to its the capability to stick on a host epithelial cell in urine tract with an assembly the biofilm, which is the most important factor for the disease. Therefore, a vaccine was made for these local isolates to avoid recurrent urinary tract infection and to obtain protective immunity by a laboratory mouse model. After isolation and diagnosis of 90 positive isolates using chrome agar diagnostic from women with urinary tract infection from hospitals in middle Iraq to Wasit province for the period from Jan. 2019 to Apr. 2019. All isolates were tested to detect virulence factors. One isolate was chosen for the determine LD50, immunization and vaccine model, then to estimate the antibody (IgG) level during immunization in the serum of mice at 6 weeks. Results proved that isolates showed positive (71.11%) biofilm, (23.33%) α -hemolysin, (31.11%) serum resistance, and (41.11%) MRHA and (5.55%) MSHA, while LD50=(1×10^{10}). There are highly significant differences when using isolate in the level of IgG reaches the high peak ranged (749.1 \pm 20.4) in 6 weeks as compared with control. The results showed that the local vaccine for this isolation provided preventive protection by inducing a protective immune response in mice to protect against infection.

Keywords: humoral immune response, E.coli, Virulence factors, LD50.

Introduction

When uropathogenic E. coli (UPEC) have the capability to step inside the host urine tract with reaches to 10^6 colonies per ml urinary tract infection occurs, and As a result of the infection, several diseases may develop, including acute, chronic, recurrent and bacteriuria infection⁽¹⁾. After a period of urinary tract infection, the bacteria begin to enter the latency state, which will be the future and express recurrent urinary tract infection resulting from the reactivation of the bacteria to have factors that help it in addition to that the lack of correct diagnosis of this infection will expose the patient to a serious medical condition⁽²⁾. UPEC characterized by the possession of several virulent factors have a close role in the continuation of colonization and the occurrence

of the pathogenesis of the urinary tract, and the biggest remarkable agents are biofilm, hemolysin, and fimbriae⁽³⁾. Fimbriae There are two types according to immune classification through special receptors which are mannose resistance hemagglutination (MRHA) and mannose sensitive (MSHA)⁽⁴⁾. The multiple virulence factors of the E. coli strains shown during the urinary tract infection are dangerous to the patients' lives. It is therefore necessary to develop a protective immune response by a vaccine against these bacteria and their virulent agents⁽⁵⁾. Therefore, the research aims to provide a suitable vaccine for local isolates from hospitals in middle Iraq to the E. coli bacteria which have harmful factors and reduce the cost of importing ineffective vaccines and avoid the side effects of antibiotics for pregnant women. .

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Materials and Method

Collect and diagnose bacteria:

Period from Jan. 2019. Until Apr. 2019 Urine samples were collected from women with urinary tract infection at AlAziziyah, AlEssaouira, and Al Karama hospitals with about 205 samples. Following the method (6) all isolates were obtained using conventional tests and confirmed by using (Chrome-Agar™ Orientation / France) diagnostic for E. coli. (7).

Detection of virulence factors for E.coli:

Phenotypic detection for 90 E.coli isolates from urine was done to detect the ability of Hemolysin production, Hemagglutination method, and biofilm formation (8), Serum resistance by (9).

Preparation of the vaccine for virulent bacteria:

The most ferocious and positive local isolates were selected for all virulence factors using the main method for prepare vaccine which depends on (10).

Immunization schedule:

White mice weighing 25 grams aged 62 to 96 days were purchased from the University of Baghdad College of Science / Animal Branch and under microbial-free conditions and pressed in cages for Feeding for 5 days without giving them fat in food and then placed under control in cages and divided into three groups for the purpose of giving the vaccine prepared in advance

1- The first and the second group dose were 0.5 ml of colony 1×10^8 cfu/ml injects subcutaneously twice in two weeks.

2-The third group (control) was given the solution in the same manner and a dose of 0.5ml from PBS pH = 7.2±2

Where the serum was collected during the immunization period from 2 to 6 weeks at the end of each immunization time and stored at -18C° until used in the verification of the quantity of antibody (11).

Estimated LD50 and challenge test:

According to the following equation, the lethal dose 50 was estimated by counting dead and live mice in each

group for one month, which was injected subcutaneously with bacteria Choose most vicious local isolate E. coli. The live bacterium takes to make gradient dilution from 10^{-1} to 10^{-8} according to (12). Also, lethal dose 50 worked dependent on the method mention in (13). 48 normal animal separate to 8 cages, then groups injected by the subcutaneous method with use 0.5ml of diluents except one group the control that gives 0.5 ml from PBS pH=7.2±2 by the same method for challenge test, totally cages watch for one month to detect lethal and survival mice.

$$\% \text{ of Mortality} = \frac{\text{Total Dead}}{\text{Sum of (Total live + Total Dead)}}$$

Determination (IgG) quantification in mice serum during immunization:

From 2 to 6 weeks of administering the vaccine, then was used (Mouse IgG Elisa kit) to quantify of antibody, and to investigate humoral immune response in mice during immunization.

Data Analysis

Program IBM spss ver.22 Used to analysis data to obtained significant different between groups of mice

Results and Discussion

Isolation and Diagnosis:

In our examination from 1/1/2019 until 30/4/2019, an aggregate of 200 urine tests was gotten and refined. Out of 205 samples of urine, results demonstrated 140 (68.29 %) were positive culture and 45 (21.95 %) were negative culture while 20 (9.75%) were indicated contaminate urine culture Table (1). The conveyance of confined relies upon the age of (20 to 62) years old, for female patients, the age went from (20 to 29) was 40 (28.75%) and this is the most overwhelming ages contaminated with gram-negative microorganisms. The age were Showed in (Table 2)

Table 1. The Distribution percentage of isolated depends on age from (20 to 62) years old.

Age group (years)	No. of isolating	%
20 - 29	40	28.75
30 – 39	24	17.14
40 – 49	21	15
50 – 59	26	18.57
60 – 62	29	20.7
Total of isolate	140	100

Table 2. Results of the biochemical test and CHROM-agar.

Bacteria	Biochemical Test						
	%	Gram stain	Indole	Citrate	Urease	Motility	Color on Chrom-agar
E. coli	64.28	G-ve	+	—	—	+	Dark- violet
K. pneumonia	19.28	G-ve	—	+	+	—	Metallic- blue
P. mirabilis	9.28	G-ve	—	—	+	+	Brown

Results showed the percentages of all isolates taken from urine using biochemical tests and chrome agar was as follows: E. coli 64.28%, Klebsiella spp. 19.28%, and P. mirabilis 9.28%. In another study, the highest percentage of our study results was about 83.3% (14) in the (Table 3). Therefore, the results appeared E.coli dominates in infection of urine tract. Shown in (Fig.1) color of isolates on chrome- agar



Figure1. (A)E.coliDark- violet, (B)K. Pneumonia Metallic-blue ,and(C) P. mirabilisBrown.

Virulence factors:

The result of our study to detect Heamolysin produce by 21(23.33%) isolate ofE.coli from UTI that identical to outcome obtained by (15). α- hemolysis target erythrocyte of patient, also, cause an effect on it to lead inflaming, damage, and weak patient resist. Also provoke Release Superoxide, H2O2 and O2 consuming by cells renal, consist of sensitizing by immune cell (16).Out of the total 90 isolates we tested 37 isolate shows Mannose resistance hemagglutination as percent (41.11%) and mannose sensitive hemagglutination in percent (05.55%) this result very close to result of the study done in India (17). While inconsistent with another study included low percent in (MRHA) Mannose resistance hemagglutination (28.09%) and high percent in (MSHA) mannose sensitive hemagglutination (8.5%) (18). Hemagglutination is mediated by fimbriae. The ferocity is determined for UPEC type 1- fimbriae connection with mannose element including of receptor on host cell in a urinary tract, and play important role in first step of biofilm by attachment to the epithelial cell

of a host ⁽¹⁹⁾. In our study, a total of 90 isolates detected to biofilm formation, 64 isolates Strong biofilm produce was (71.11%), percent of moderate biofilm produce was 18 (20%), and weak biofilm produce was 8 (8.88%) that result agreement with study conducted in West Africa ⁽²⁰⁾. However, our results differ from the results of the study carried out by ⁽²¹⁾ that showed (45%) weak biofilm produce, (49%) moderate biofilm produce, (5%) strong

biofilm produce. The present study result about virulence factor Serum resistance showed 28 isolates of E.coli in percent (31.11%) positive that are in close with the results of the study achieved by ⁽²²⁾. As compared with another study ⁽²³⁾ the result was a higher (90%). Serum of human reluctance by E.coli is a critical ferocity factor. All outcomes showed in (Table3) with (Fig.2)..

Table 3. Percentage of ferocity agents for E.coli from urine.

V. Factor Result	Heamolysin	Biofilm	MRHA	MSHA	Serum resistance
Positive	21(23.33%)	S 64 (71.11%) M 18(20%) W 8 (8.88%)	37(41.11%)	5(5.55%)	28(31.11%)
Negative	78(86.66%)	0 (0%)	53(58.88%)	85(94.44%)	62(68.88%)
Total	90(100%)	90(100%)	90(100%)	90(100%)	90 (100%)

S=Strong biofilm, M=Moderate, W=Weak.

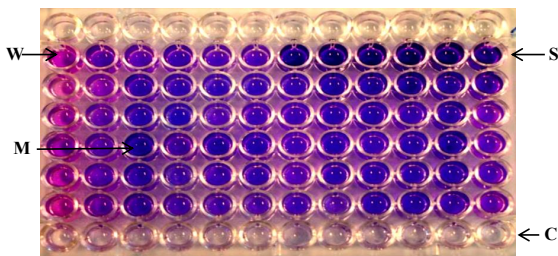


Figure2 . biofilm forming test by microtiter plate (U shape)

(S)Strong biofilm, (M) Moderate, (W) Weak, (C) Control

LD50:

According to the dose used to calculate the lethal dose 50 (1X10¹⁰) as show in (Table 6) The experimental challenge test was performed for all groups in intraperitoneally injection 4 LD50 (4 X 10¹⁰) method for

the virulent E. coli. The results showed that the fortified mice showed mild signs within 2 days and return to normal within a week. The control group showed death within 3 days our result came very close to study (24), and In this search discover the prepared vaccine (whole-cell bacteria) protected animal (mice) against infection by the intraperitoneal route, In a above study showed incompatibility immunization was used in several ways where the mice were fortified by the intraperitoneally but did not survive when using the intranasal method. Where the survival rate of the protected mice was better than the control group, UPEC bacteria its first reason in infection of urine tract in a host. In our experiment, we tested the vaccine susceptibility to provide protection against severe isolates and explained that immunized mice are better to survive compared to the control group. Table (4).

Table 4. Calculation of the lethal dose 50 of E. coli in mice

Group	Dose	Live	Dead	Total live	Total dead	%
1	1x10 ¹³	0	6	0	21	100
2	1x10 ¹²	0	6	0	15	100
3	1x10 ¹¹	2	4	2	9	81
4	1x10 ¹⁰	3	3	5	5	50
5	1x10 ⁹	4	2	9	2	18
6	1x10 ⁸	6	0	15	0	0
7	1x10 ⁷	6	0	21	0	0
Control	PBS	6	-	-	-	0

Determine IgG quantity:

The results reported in a (Table5) to detect Antibody quantity with a mean was (192±11.2) at zero weeks from the injection. Then reaches to the middle value of mean (405.3 ±16.1) in 2 weeks .then reach to a high value at 4 weeks (749.1 ±20.4) The result of values showed a significant increase of IgG quantity at the p-value of least of (0.05 value) from 2 to 6 weeks when compared with the control group, In general, the UPEC strain contains several virulence factors, so the vaccine used from this local strain must capable of stimulating humoral immunity representing by antibody(IgG)antagonistic effect to virulent agents , which appear at varying phases of urine tract infection. So the local vaccine is promising and efficient to protect against virulence factor of UropathogenicE.coli and infection, as mentioned in a study ⁽²⁵⁾.

Table 5. Antibody (IgG) quantity in serum of mice by Elisa during 6 weeks

Treatment (weeks)	Immunized group with UPEC vaccine Mean ± SE	Control group Mean ± SE
0	192±11.2 A	195.9 ±8.3 A
2	405.3 ±16.1 A	202 ±12.3 B
4	749.1 ±20.4 A	188.9 ±11.9 B
6	660 ±22 A	190 ±10.9 B

Conclusion

After assessment virulence factors for all isolate then using fierce local isolation from 90 isolate which that gave protective immunity against virulence factors and infection of UPEC in immunized mice compared with control mice with use an important parameter is determined the quantity of antibodies (IgG) in the mice serum during immunization 6 weeks to monitor and investigate the vaccine activity to stimulate the humoral immune response, and immune system. .

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Conflict of Interest: Non

Source of Findings: Non

Ethical Clearance: Non

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Serological and Immunological Determination of Auto-Antibodies Against Myositis-Associated Antigens in Systemic Lupus Erythematosus Patients Using A Novel Immunoblot Assay

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Abstract

Jo-1, anti-Mi-2, anti-Ro52, anti-PM/Scl-100 and -75, anti-Ku, anti-SRP, anti-anti-PL-7, anti-PL-12, anti-EJ, and anti-OJ are associated with myositis and are also found in systemic lupus erythematosus. **Materials & methods:** We studied serum of 170 patients with systemic lupus erythematosus (97 females & 63 males) had definite or probable myositis according to physicians, the clinical status of patients was determined from their medical records and 20 adults' healthy controls. Sera were screened for anti-ANA IgG antibodies and Anti-dsDNA IgG antibodies by using ELISA kits obtained from AESKU Diagnostics. also 11 autoantibodies were detected by using IgG immunoblot kit were used (EUROLINE Myositis Profile3, Euroimmun AG, Germany). **Results:** The analysis revealed that Jo-1 were more frequencies were present in 76 patients with SE followed by Mi2 were present in 59 patients., Ku, SRP, PM-Scl75, PM-Scl100, Ro-52, PL-7, PL-12, EJ, and OJ were present in 46, 38, 34, 28, 28, 22, 19, 11 and 5 patients respectively. The immunoblot results showed the highest intensity of anti-Mi-2, anti-Ku, anti-PM/Scl-100, anti-SRP, anti-PL-12, anti-OJ in females more than males with rheumatoid arthritis diseases, while the anti-EJ, anti-PL-7, anti-Jo-1, and anti-PM-Scl75 showed lowest intensity was +/17, ++/48, ++/33, and ++/29 respectively in females. **Conclusion:** The level of these autoantibodies associated with myositis were detected in 170 patients with SLE. The present results indicate that it is clinically useful to determine the serum levels of myositis-associated autoantibodies in patients with SLE even when their underlying diseases are not myositis.

Key words: auto-antibodies, myositis, Systemic Lupus Erythematosus, Immunoblot

Introduction

The systemic lupus erythematosus (SLE) is an autoimmune disease characterized by the presence of autoreactive B and T cells, responsible for the aberrant production of a broad and heterogeneous group of autoantibodies. Shereret al. in 2004 documented that more than a hundred sixteen different antibodies found in SLE patients¹. The Specific detection of autoantibodies in systemic autoimmune diseases same as the myositis, either systemic or organ specific, can have both diagnostic and prognostic importance. Some autoantibodies have a clear pathogenic role such as anti-Jo-1 in polymyositis². Among the myositis-specific autoantibodies reported to date, are directed against cytoplasmic antigens, such as

tRNAsynthetase (Jo-1 or PL-1, PL-7, PL-12, EJ, OJ, JS, and KS), signal-recognition particle (SRP), Mas, KJ, and Wa. Also antibodies to nuclear antigens include anti-Mi-2, anti-PMS (PMS1, and PMS2), PM-Scl, Ku, RNP (U1-RNP and U2-RNP, U4/U6-RNP, and U5-RNP), Ro 52 kDa and, more rarely, Ro 60 kDa³. Auto-antibodies in myositis are very different in antigen specificity and characteristics. thus, different in-house laboratory methods for their detection have been used to date. Recently, a single multi-analytic line blot assay has been developed representing a promising methodological approach for testing⁴.

Immunoblotting with positively sera of antibodies has been previously reported. So in this study, used

the diagnostic performance of a novel, commercially available immunoblot technician for the standardized detection of several autoantibodies was evaluated at reference laboratories using serum panels from clinically patients with SLE and various controls.

Materials and Method

Samples

A Total of 170 serum samples has been collected from SLE patients whom suffering from myositis as (97 females and 73 males) and 20 healthy controls, which were pay a visit and residence in hospitals from date of 15\9\2017 to 15\6\2019 and diagnosed by the treating physicians and confirm the diagnosis by specific tests for each one. Their ages are ranging from 9- 61 years.

Methods

Laboratory investigation for the detection of anti-dsDNA and anti- ANA IgG antibodies

Anti-dsDNA IgG antibodies and anti- ANA IgG antibodies were determined by using commercial ELISA kits obtained from AESKU Diagnostics. All test items were operated strictly in accordance with the manufacturer’s instructions.

Measurement of myositis-specific autoantibodies and myositis-associated autoantibodies

The recruited patients were evaluated for a myositis-associated autoantibody antibodies or myositis specific autoantibodies. For the detection, IgG immunoblot kit were used (EUROLINE Myositis Profile3, Euroimmun AG, Germany), this provides a qualitative in-vitro assay for human antibodies to 11 different myositis antigens includes: anti-Ro52, anti-PM/Scl-100 and -75, anti-Ku, anti-Mi-2, anti-SRP, anti-Jo-1(histidyl-), anti-PL-7 (threonyl-), anti-PL-12 (alanyl-), anti-EJ(glycol-), and antiOJ(isoleucyl-tRNA synthetase). The manufacturer’s instructions were followed while carrying out the assay. After the membrane strips were dried and automated evaluations of these strips for the analysis of different bands and examined with EUROLineScan system provided by the manufacturer, the reading was taken by keeping the strips on a flatbed scanner (Canon) which enables the EUROLineScan to recognizes the position of the strips, identify the bands and measure its intensity. The results were defined as positive when

the signal intensity was more than 11. The intensity of autoantibodies is graded according to the signal intensity into weakly 11–25 (+), moderately 26–50 (++) and strong more 50 (+++).

Findings

Among 170 onset SLE patients, 119 (70%) were ANA seropositive apportioned as 80 (67.22 %) at females and 39 (32.78%) at males. One hundred and sixty SLE patients (94.17%) showed a positivity for anti-dsDNA apportioned as 91(56.88%) and 69 (43.12%) at females and males respectively (Table 1).

Table(1): Percentage seropositive of ANA, anti-dsDNA and ANCA associated with SLE patients (n=170)

Genders Test	SLE patients		
	Females	Males	Total
	No. (%)		
ANA (n=119)	80 (67.22)	39 (32.78)	119 (100)
Anti-dsDNA (n=160)	91(56.88)	69 (43.12)	160(100)

ANA: Antinuclear antibody, Anti- dsDNA: Anti-double-stranded DNA

Univariate analysis (Table 2) showed that SLE patients with positive antibodies for ANA and anti-dsDNA according to age groups and gender. The results of ANA showed the highest percentage of ANA is in the females within the age group (31- 40) years followed by the patients within the age group (41- 50) years (24.37%, 17.65%) respectively, while the lowest percentage was shown in males within age group (10-20) years and females patients within the age group (> 50) years. Anti-dsDNA analysis showed the highest percentage of anti-dsDNA is in females within the age group (41- 50) years followed by the patients within the age group (21- 30) years (21.25%, 17.5%) respectively, whilst the anti-dsDNA result has lowest percentage in females (2.5 %). See (Table 2). The results of the statistical analysis showed significant differences $P \leq 0.05$.

Table (2): Percentage seropositive of ANA, anti-dsDNA and ANCA in relation to age groups and genders associated SLE

Genders Age group	SLE patients					
	ANA (n=119)			anti-dsDNA (n=160)		
	Females	Males	Total	Females	Males	Total
	No. (%)			No. (%)		
10 – 20	7(5.88)	4(3.36)	11(9.24)	7(4.37)	8(5.0)	15(9.37)
21 -30	18(15.13)	9(7.56)	27(22.69)	28(17.5)	12(7.5)	40(25.0)
31- 40	29(24.37)	12(10.09)	41(34.46)	18(11.25)	23(14.38)	41(25.63)
41 – 50	21(17.65)	8(6.72)	29(24.37)	34(21.25)	19(11.88)	53(33.13)
> 51	5(4.2)	6(5.04)	11(9.24)	4(2.5)	7(4.37)	11(6.87)
Total	80(67.23)	39(32.77)	119(100)	91(56.87)	69(43.13)	160(100)

ANA:Antinuclear antibody, Anti- dsDNA: Anti–double-stranded DNA,

Table 3 shows percentage of seropositive of myositis antigens in patients with systemic lupus erythematosus relation to age groups and genders. According to data in this study, the results of SLE patients showed the highest percentage of the diseases under study is in the females within the age group (31- 40) years followed by the patients within the age group (21 -30) years (17.65%, 15.30%) respectively, while the lowest percentage was showed within age group (10-20) years and males patients within the age group (> 50) years. See (Table 3). The results of the statistical analysis showed significant differences $P \leq 0.05$.

Table (3) Percentage seropositive of myositis antigens in relation to age groups and genders associated SLE

Genders Age groups (years)	SLE patients(n =170)		
	Females	Males	Total
	No. (%)		
10 – 20	9(5.29)	10(5.88)	19(11.17)
21 -30	26(15.30)	23(13.53)	49(28.83)
31- 40	30(17.65)	18(10.59)	48(28.24)
41 – 50	21(12.35)	13(7.65)	34(20.00)
<51	11(6.47)	9(5.29)	20(11.76)
Total	97(57.06)	73(42.94)	170(100)

In present study, the Jo-1 and Mi2 were observed more frequently in patients with SLE were present as 76, 59 respectively. Ku, SRP, PM-Scl75, PM-Scl100, PL-7 and PL-12 were present in patients as 46, 38, 34, 28, 22, 19 respectively while the lowest frequently were OJ which present in 5 patient. According to genders, the results showed that Jo-1 and Mi2 were recorded more frequently in females patients as 41, 38 respectively while the lowest frequently were OJ recorded in 1 female patient. Moreover, we did not observe patients with positivity to EJ in females with SLE (Table 4).

Table (4) Frequency of myositis-specific and myositis associated autoantibodies in patients with SLE

Markers Study groups		Mi2	Ku	PM-Scl100	PM-Scl75	Jo-1	SRP	PL-7	PL-12	EJ	OJ	Ro-52
	No. / 170											
SLE	Males	21/170	18/170	16/170	21/170	35/170	20/170	6/170	8/170	11/170	4/170	7/170
	Females	38/170	28/170	12/170	13/170	41/170	18/170	16/170	11/170	-/170	1/170	21/170
Total		59/170	46/170	28/170	34/170	76/170	38/170	22/170	19/170	11/170	5/170	28/170

The overall immunoblot results with the classical serological markers of anti-PM/Scl-100 and -75, anti-Ku, anti-Mi-2, anti-SRP, anti-Jo-1, anti-PL-7, anti-PL-12, anti-EJ, and anti-OJ showed the highest intensity of anti-Mi-2, anti-Ku, anti-SRP, anti-PL-12, anti-PM/Scl-100, and anti-OJ in females more than males in patients with SLE, while the Ro-52, PL-7, Jo-1, anti-PM/Scl -75 and anti-EJ showed lowest intensity in females than males were +++/53, ++/50, ++/47, ++/41 and +/21 respectively in SLE patients (Table 5).

Table (5) Maker of IgG antibodies associated with SLE patient's group under study

Markers Study groups	Mi2	Ku	PM-Scl100	PM-Scl75	Jo-1	SRP	PL-7	PL-12	EJ	OJ	Ro-52
Males	++/45	+/21	+/22	++/41	++/47	+/17	++/50	++/42	+/21	+/21	+++/53
Females	+++/67	++/39	++/38	++/29	++/33	++/42	++/48	+++/61	+/17	++/41	-
Controls	-	-	-	-	-	-	-	-	-	-	-

SLE = Systemic Lupus Erythematosus

(No.) indicate mean of intensity

- (less than 10), + (10-25), ++ (26-50), and +++ (\geq 51) indicate class

Discussion

To our knowledge, this is the first report that evaluates the presence of various myositis autoantibodies in patients with Systemic Lupus Erythematosus in Mosul city. Anti-nuclear antibodies (ANA), a heterogeneous group of autoantibodies against nuclear antigens, are

often tested as a rapid screening tool in patients with suspected systemic lupus erythematosus (SLE) or other connective tissue diseases⁵. Multiple studies show ANA positivity to be highly prevalent in various patient populations. In this study, the prevalence of positive ANA in SLE patients was 70%, which was lower than previous reports (90-100%)⁶. A different genetic background could explain these differences. SLE is a multifactorial disease in which genetic and environmental factors interplay, determining disease development⁷. The genetic background could explain not only the disease susceptibility but also the autoantibodies production. On other hand, some of patients received much medication for treating their underlying diseases. Many drugs are reported to produce ANA and have been reviewed extensively such as Hydralazine, procainamide, chlorpromazine and quinidine⁸.

In the present study, we registered a frequency of anti-dsDNA greater than 90% that is similar to the data reported in the literature for SLE populations⁹. Antibodies to dsDNA are of great importance in SLE, It is known that anti-dsDNA antibodies are present in 70–90% of SLE patients and in less than 0.5% of the controls. The majority of SLE patients are found to have anti-dsDNA antibodies at some time during their illness. The presence of anti-dsDNA has been found to precede the onset of lupus symptoms by up to 5 years and have been correlated with SLE activity¹⁰. In discrete study, Chung and colleagues published that many previously identified SLE-associated genes are more strongly associated with the production of anti-dsDNA than with disease susceptibility¹¹. The authors demonstrated the association between polymorphisms (SNPs) located in the MHC, STAT4, IRF5, and ITGAM regions and the positivity for anti-dsDNA antibodies. Conversely, only SNPs in the MHC and IRF5 regions have been identified in negative patients¹¹.

We used in this study the Euroline blot immunoassay technique which is the diagnostic method, also seemed to detect a higher proportion of myositis autoantibodies among SLE patients compared to other studies. Our study showed that the systemic lupus erythematosus patients have a variety of autoantibodies which acceptable with previous studies have reported that were detected in patients with SLE^{12,13}. Also, in agreement with the data from the literature, we found a predominance of Anti-Ro52, Anti-Ku in SLE patients, compared to other of myositis autoantibodies¹⁴.

Previous studies reported that Anti-EJ antibody and anti-Jo-1 antibody were also detected frequently in SLE and another non-myositis CTD and as for other myositis-associated autoantibodies, anti-PM-Scl75 antibody was detected in 7 patients with SLE while anti-Ku antibody was demonstrated in 3 patients with PM/DM, 4 patients with SLE and 3 patients with MCTD¹⁵. However, our study revealed that anti Jo-1 is more common in females, with a approximately female-to-male ratio of 2:3 which confirmed with Cavagna et al. who documented in an international retrospective multicenter study that anti Jo-1 is more common in females¹⁶.

The role of anti-Ku in the pathophysiology of autoimmune diseases is not entirely understood. However, the present study showed the high incidence of Anti-Ku autoantibodies with SLE patients were 27.06% different with previous studies which revealed that Anti-Ku autoantibodies have been identified in 7-18% of the patients with overlap syndromes such as SLE¹⁷. Suggested that may be due to limitation in a cohort number of patients in this study.

The most important finding of previous studies has been reported the presence of anti-Ro52 antibodies in different systemic autoimmune rheumatic diseases¹⁸. Our findings are similar to those previously reported¹⁹ that showed the presence of anti-Ro52 in SLE patients were 16.47% and showed the high incidence in males more than females. However, In previous studies patients with SLE had higher frequency of anti-Ro52 in a prevalence between 36 and 64%²⁰. Ro52 is a member of the tripartite motif (TRIM) family of single-protein E3 ligases and is known to be a target for autoantibody production in systemic autoimmune rheumatic diseases. Ro52 function is still unknown²¹.

In summary, These results indicate that anti-Ro52, anti-PM/Scl-100 and -75, anti-Ku, anti-Mi-2, anti-SRP, anti-Jo-1 (histidyl-), anti-PL-7 (threonyl-), anti-PL-12 (alanyl-), anti-EJ (glycol-), and anti-OJ (isoleucyl-tRNA synthetase) autoantibodies are closely associated with myositis as well as Systemic Lupus Erythematosus were detected in our series of Iraqi patients. Also, The present results indicate that it is clinically useful to determine the serum levels of myositis-associated autoantibodies in patients with SLE even when their underlying diseases are not myositis. This study is the first report in Mosul/ Iraq that evaluates myositis autoantibodies among SLE patients, so further studies in a larger number of Iraq patients may be

warranted.

Conflict of Interest: Non

Source of Findings: Self

Ethical Clearance: This research was carried out with the patients .

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The Effects of HIV/AIDS Education on Knowledge, Attitude, and Satisfaction for AIDS Prevention Self Massage on College Students in Korea

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Abstract

Background/Objectives: It is important to provide education for university students about HIV/AIDS. This study was to evaluate the effects of HIV/AIDS education program in knowledge, attitudes of HIV/AIDS, and satisfaction of education.

Methods/Statistical analysis: The research design was a nonequivalent control group pretest-posttest design. The participants were comprised of 102 students (experimental group=50, control group=52) in Korea. A self-questionnaire knowledge and attitudes about HIV/AIDS were administered before, and after 180 minutes of HIV/AIDS education. The collected data was analysed descriptive statistics, Chi-square test, and t-test.

Findings: There were significant differences in the mean scores of knowledge, and attitude of HIV/AIDS and were significant differences satisfaction of education between two groups.

Improvements/Applications: HIV/AIDS education including multimedia was found to be an effective method for increasing knowledge, and attitudes of AIDS/HIV. The results suggest that customized educational programs with methods and contents should be developed to improve knowledge, exciting and participation of the learners.

Keywords: HIV/AIDS, Education, Knowledge, Attitudes, Satisfaction

Introduction

HIV/AIDS is one of the most destructive diseases and has become an even more significant international health issue^[1]. Since the first case were reported 1980s in the U. S, the disease has spread to virtually every country. In 2017, UNAIDS estimated that 33.7 million people were infected with HIV/AIDS^[2] and 29 million people died HIV globally^[1]. The total number of Koreans diagnosed with HIV have been increased since 2000 in Korea^[3]. As of 2016, there have been 15,208 cumulative reported cases of HIV/AIDS^[4]. Of those, approximately half all HIV-infected people are age 15-29 years^[5]. Therefore, it

is necessary to provide education about HIV/AIDS for young people.

However, Koreans hold strong stigmatizing attitudes about HIV/AIDS and people living with HIV/AIDS. Because of the social discrimination and stigma attached to homosexuality in Korea, it is culturally reluctant to discuss these sexually topics. Furthermore, people living with HIV/AIDS are mostly away from their work, family and intimated persons, and even religious groups^[6-7]. Discussion on the subjects of homosexuality and HIV/ AIDS is thought sensitive and uncomfortable with the Korean culture. People who are infected HIV/AIDS chance on taboo, bias, and discrimination. This fact can sometimes be the negative effect of living with HIV/AIDS. Fear of this happening can lead to people being sensitive about telling others that they have HIV/AIDS or avoiding contact altogether with other people.

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AIDS phobia, prejudice, and discrimination began with the introduction of HIV/AIDS to Korea because the mass media was reporting it as a contagious disease. Many people were under the wrong information that only contact with an HIV positive individual would cause HIV infection^[8]. Regrettably, information about HIV/AIDS in South Korea is not accurate even though many research have been studied and published within South Korea^[9]. People with HIV/AIDS may end up suffering in silence due to the social stigma put on by society and may not seek out for help or treatment that is needed. Therefore, it is important to ask a way for active treatment and live actively in society for people of infected with HIV/AIDS, they need to be supported physically and psychosocially as well as being accepted as a valuable member of the community. Previous studies have reported that knowledge of HIV/AIDS is important determinant for prevention of HIV and the pathways to changing attitudes of HIV. Furthermore, knowledge reduce the stigma against people with HIV/AIDS.

Newly, the results of many research found the results of effect of HIV/AIDS educational program on knowledge, attitudes, and stigma et al^[9-11]. However, many research were confined, their outlines were on easily providing or determining knowledge utilizing one way teaching method. Therefore, developing new tools to use students increase knowledge and attitudes have become an important part of education. The video learning methods is reported to improve learner attention, explanation, and memory^[12]. And the video learning method can add to images and sound stimuli more the using paper material or other method for education, multimedia allows students actively participate in their learning process, which resulted in higher knowledge gain, improve attitude, and decreased fear or phobias of persons with HIV/AIDS^[13]. Through this education method, students can be encouraged to practice infection prevention activities while actively engaging in social interactions with people with HIV/AIDS without prejudice towards those with it. The purpose of this study is to identify the effects of HIV/AIDS education on knowledge, attitude, and satisfaction for prevention in University students.

Method

This study was nonequivalent control group pretest-posttest design to evaluate the effects of HIV/AIDS education program on knowledge, attitude, and satisfaction for education in University students.

The participants for this study were senior university students who (a) volunteered to participate in the research and (b) were enrolled in the Health and Well-being course. Sample size was based on previous study examining the effect of educational interventions using multimedia^[14]. Using the statistical software G*Power V.3 at a statistical power of 0.80, effect size 0.27, and statistical significance 0.025, the estimated sample size required to perform 2 sample t tests was 92(46 students in the experimental group and 46 in the control group).

The study was conducted among university students at S university in Korea, who receive their health and well-being course. Participants were senior students who were enrolled in S University, in J city, South Korea, from September 1st to December 31st, 2016. Each participants signed a written consent from that specified the purpose of this study and the rights of the participants and voluntarily agreed to participate.

The instrument of this study were as follows. HIV-related knowledge was assessed using a 19-item questionnaire^[5-6]. The ranges of the scores are from score of zero (0) to score of 19 on the composite index, which means the higher the score, the higher knowledge level of HIV/AIDS. The Cronbach's α **α** was .78 in this study. To measure attitudes towards HIV/AIDS, 17 questions were taken from the tool developed by the Center for Disease Control and the department of academic research of the Korean Association for AIDS Prevention in 2013^[7]. Students' attitudes were measured using the 5-point Likert scale ranging from one (1): Strongly disagree to five (5): strongly agree. The Cronbach's α **α** of this tool was .81 in this study.

Satisfaction of the education was measured using the 5-point Likert scale ranging from 3 questions (1): strongly disagree to five (5): strongly agree. The results indicated that the higher the score, the higher the satisfaction with the education by the students.

The educational program was developed after reviewing literature, research articles, and video presentations. This program was reviewed by content experts in HIV/AIDS. This education program consisted of six sessions totaling 180 minutes that are required to run all six sessions. These educational sessions are (a) Understandings of AIDS, (b) Summary and understanding of AIDS, Definition of AIDS and natural death Characteristics of HIV infection, Diagnosis of

AIDS, Confirmation system of diagnostic examination, Sexually transmitted diseases, (c) Policy of AIDS and human rights, support services, AIDS-related laws and regulations, (d) Sexuality of human and sexual culture, Sexural counseling, Sexuality and understanding of sexual minority (e) Understanding of people living with HIV/AIDS, social understanding of people living with HIV/AIDS and disease, and follow up of people living with HIV/AIDS, and (f) Discussion on phobia toward AIDS and intent for AIDS prevention.

Statistical analyses were done utilizing SPSS, version 25.0 (IBM Corporation, USA). The homogeneity of subjects' characteristics and variables were used

to descriptive statistics, t-test, and chi-square. The differences in knowledge, attitudes, and satisfaction among two groups was used to t test.

Result and Discussion

1. General characteristics of the subjects

There were no significant difference between the two groups at baseline for general characteristics of the subjects [Table 1]. The mean age of 20.9 years was the experimental group and, and the mean age of 20.8 years was the control group. The majority of subjects were female (82.0% in the experimental group versus 86.5% in control group).

Table 1. Homogeneity of General Characteristics and Dependent Variables (N=102)

Characteristics	Exp. (n=50) n(%) or M±SD	Con. (n=52) n(%) or M±SD	t/χ ²	p
Age	20.9± 1.56	20.8±1.45	3.631	.481
Gender				
Male	9 (18.0)	7(13.5)	.397	.593
Female	41(82.0)	45(86.5)		
GPA	2.78±1.54	3.15±2.12	1.016	.312
AIDS Education experience				
Yes	12(24.0)	13(25.0)	.014	.907
No	38(76.0)	39(75.0)		
Knowledge	8.52±.87	8.72±.86	1.156	.251
Attitude	3.26±.53	3.35±.48	.890	.376

Exp: Experimental group

Con: Control group

GPA: Grade point average

There was demonstrated no statistically significant differences between the two groups on the total mean scores for knowledge ($p = .251$), and attitude ($p = .376$) at baseline. There was no statistically significant difference in demographic characteristics (gender, age, GPA, and education experience and independent variables (knowledge, and attitude of HIV/AIDS before education) between the experimental and control groups [Table 1].

2. Comparison knowledge, attitudes and education satisfaction between two groups after intervention

The mean score of knowledge before education (total score =19) in the experimental group was 8.52 ($\pm .87$), and this changed to 22.18 (± 0.76) after education.

In the control group, the mean baseline knowledge score was 8.72 ($\pm .86$), and this changed to 11.03 (± 1.21) after education. The mean score of attitudes before education in the experimental group was 3.26(.53), and this changed to 4.21 ($\pm .78$) after education. In the control group, the mean baseline attitudes score was 3.35 ($\pm .48$), and this changed to 3.87 ($\pm .90$) after education. There were found statistically significant better knowledge in the experimental groups after education ($p < .001$) and attitudes ($p < .05$). And there were statistically significant difference for knowledge ($p < .001$) and attitudes ($p < .001$) between the pretest and posttest in the two groups. There were statistically significant difference for satisfaction of education ($t=3.911, p < .001$) [Table 2].

Table 2. Knowledge, Attitudes and Education Satisfaction between two groups (N=102)

Variables	Group	Pre	Post	Difference	t
Knowledge	Exp. (n=50) M±SD	8.52± .87	13.73±1.12 11.03±1.21	5.22±.25 2.31±.35	48.151***
	Con. (n=52) M±SD	8.72±.86			
t		1.156	11.266***		
Attitudes	Exp. (n=50) M±SD	3.26± .53	4.21± .78 3.87± .90	0.95± .25 0.62± .42	4.798***
	Con. (n=52) M±SD	3.25± .48			
t		.890	2.036**		
Satisfaction	Exp. (n=50) M±SD		4.52± .60		3.911***
	Con. (n=52) M±SD		4.10± .48		

*: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$

Exp: Experimental group

Con: Control group

Discussion

This study was conducted to evaluate the effects of HIV/AIDS education on knowledge, attitude, and satisfaction for education in university students. To establish the basis for applying education methods to improve the knowledge and attitudes to increase preventive behavior while reducing prejudice and fear towards individuals with HIV/AIDS. In this study, the educational program had a positive impact on increasing the knowledge level of university students and improving their attitudes toward HIV/AIDS. This findings were similar to studies of the previous research [1][13]. The results of these studies also stated that using discussion, audiovisual presentation, or quiz types of the educational methods allows students actively participate in their learning process, which resulted in higher knowledge gain, improve attitude, and decreased fear or phobias of persons with HIV/AIDS when compared to the traditional lecture. Like these studies, in this study, the educational programs provided with audiovisual aids had improved knowledge and attitudes more than other instructional methods, thereby enhancing preventive measures against the disease^[12] [15-16]. Literature supports that using the audiovisual improves students' concentration due to an audio/visual stimulus; the scenes are often self-explanatory, thus enhances longer retention of the knowledge^[17]. Therefore, HIV / AIDS education using audiovisual material is encouraged because it promotes a better understanding of health and motivates learners to participate in health promotion activities, which in the long run, results in better health outcomes. Previous studies suggested that combining PowerPoint slides, audiovisual materials, and question and answer sessions helped to change prejudice about HIV/AIDS and argued the need for ongoing small group discussion sessions to change the attitude toward people with HIV/AIDS. It is believed that the educational program used in this study allowed students the opportunity to freely express and share their thoughts and ideas with team members that positively influenced the attitude changes toward HIV/AIDS. Therefore, changing attitudes based on sociocultural values may require a special program as it is difficult by simple knowledge-based education^[18]. Including individual or small-group discussions in an educational program that allows students to share their ideas may be more effective in changing attitudes. The educational program used in this study included a lecture using audiovisual aids, and small group discussions provided in the experimental group while the control group received a traditional

lecture using only PowerPoint Slides. The results of compared to the control group, the experimental groups' learner satisfaction was significantly higher. Also, it is confirmed that students in the experimental group actively provided feedback on the educational program and made broad recommendations as well. It is believed that in addition to textbooks, a realistic educational program reflecting social and cultural realities heightened students awareness and lessened anxiety towards HIV/AIDS through discussions. The limitation of this study was that there was no group who received a single lecture as an educational program, and the long-term effects of the educational program used in this study were not confirmed.

Conclusion

The purpose of this study was to evaluate the effects of HIV/AIDS education on knowledge, attitude, and satisfaction for AIDS prevention in college students. In this study, a new multimodal HIV/AIDS education was provided to the college students to identify the effects of this educational program on the knowledge and attitude towards HIV/AIDS. The results of this study revealed that multimodal educational programs provided in this study were found to be helpful in improving college students knowledge and attitude toward HIV/AIDS. This study provided a foundation to develop effective HIV/AIDS educational programs. Based on the results of this study, it is necessary to develop a variety of customized educational programs with their methods and contents that are exciting and promotes the active participation of the learners. Further ongoing research is recommended to confirm the effects of the educational program used in this as well as its impact on students majoring in health sciences and non-health sciences in other universities in different geographical locations.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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The Study on the Empathy of Nurses and the Quality of Nursing Provided to Hospitalized Children Perceived by Nursing Students

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Abstract

Background/Objectives: This study was conducted for the nursing students with the experience of pediatric ward clinical practice to grasp the degree of the quality of children and families-centered nursing and further to provide the basic data which can improve the quality of nursing by evaluating the empathy of nurses and the content of the quality of children and families-centered nursing which was performed in the ward where children were hospitalized perceived. This study is a descriptive survey study for identifying the empathy of nurses and the degree of the quality of nursing provided to hospitalized children perceived by nursing students.

Methods/Statistical analysis: The subjects of this study were 119 nursing students in the 3rd and 4th grade with an experience of pediatric ward clinical practice among the students in nursing department of the university located at M city. Data was collected from Oct 15, 2017 to Oct 30, 2017. The SPSS 21.0 Program was used in data analysis.

Findings: As a Result, the difference in the empathy of nurses and the quality of nursing provided to hospitalized children according to the general characteristics of the subjects had a statistically significant difference in the empathy and clinical practice period of nurses($p=.009$), the performance in the quality of nursing, and clinical practice period($p=.042$).

Improvements/Applications: In conclusion, it is thought that it is necessary to review the clinical practice period.

Keywords: Empathy, Quality of Nursing, Hospitalized Children, Nursing Students, Clinical Practice

Introduction

Hospitalization of a child is a crisis situation which arouses ennui, boredom, anxiety and fear to a child patient, and does stress and burden about the disease process to a family which changes the structure and function of a family^[1]. A family is a main element which affects the growth, development and health of a child, and as it has health problem itself, the subjects of child care should include the family as well as the child^[2]. Therefore, it can be said that patients and a family-

centered nursing that the focus of nursing should be on children and a family, not a nurse, is a basic philosophy of child care^[3]. A nurse who takes care of a child should not only have the expertise and skills of a child care but also empathize, respect and give a sense of trust to children and their parents^[4], and child care should support the growth and development of children as well as be safe and comfortable to children emotionally^[5]. That is, for the successful child care, a nurse's competence is needed along with the creation of the atmosphere where a nurse, a patient and a family depend on each other^[6]. A nurse should possess the ability for communication, conflict management, and a professional attitude as well as the theoretical knowledge of child care and family dynamics, and proficient nursing skills^[7].

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Above all, the empathy is an important factor that has an effect on forming, maintaining and developing the emotional bond with a healer with which a nurse can stand on the patient's side and look at the world from the patient's point of view^[8]. The empathy, a positive emotion, is the ability to understand the world that the other party understands. As the true value of empathy is not only to understand the physical demands of the patient but also to usefully work such as psychologically reacting to them, it can be said that it is very important to child nurses who should care in a special environment, and child nurses who care for children should continuously develop and utilize their internal resources^[9].

Professional nursing is a practical study which is applied to the nursing field based on the theoretical knowledge of nursing^[10], and nursing education is a process where nursing students acquire all the theoretical knowledge which is necessary to perform the role of nurses, explore how to apply the acquired knowledge to an actual nursing situation, and acquire practical skills through a clinical practice^[11]. Especially, clinical practice is an essential element in nursing education as well as theoretical education^[12], and through this clinical practice, nursing students experience various nursing fields and prepare to play a role which meets the social concerns and demands of health^[13]. That is, nursing students learn nursing skills, time management, and professional socialization through clinical practice education, reinforce learning with the behaviors of clinical field leaders during clinical practice education, and have an opportunity to acquire the role of nursing profession and socialization by discovering a role model from them^[14]. It is important to improve the clinical performance ability of nursing students through clinical practice education, and considering that clinical practice is important to nursing students in the process of becoming professional nurses, it is thought that nursing skills and knowledge of a child care which they experience through pediatric ward clinical practice can improve clinical performance ability as pediatric ward nurses when they become new nurses, and play an important role in having knowledge and attitude as pediatric ward nurses in the future.

Therefore, this study was conducted for the nursing students with the experience of pediatric ward clinical practice to grasp the degree of the quality of children

and families-centered nursing and further to provide the basic data which can improve the quality of nursing by evaluating the empathy of nurses and the content of the quality of children and families-centered nursing which was performed in the ward where children were hospitalized perceived.

Method

The subjects of this study were 119 nursing students in the 3rd and 4th grade with an experience of pediatric ward clinical practice among the students in nursing department of the university located at M city. The responses of 116 students except those of 3 ones who responded insufficiently were analyzed.

Data was collected from Oct 15, 2017 to Oct 30, 2017. As for the method of data collection, the researcher visited subjects, explained the purpose and method of the study, distributed a questionnaire to those who agreed to participate in the study, and explained precautions and how to respond. Before collecting data, the purpose of the study, personal confidentiality, and that it will not be used for purposes other than the research were explained to the subjects. Those who agreed on it participated in the survey.

With the collected data, using SPSS 21.0 Program, the general characteristics of the subjects were analyzed with real number and percentage, the empathy of nurses and the degree of the quality of nursing provided to hospitalized children perceived were done with mean and standard deviation, the relationship between the empathy of nurses and the quality of nursing provided to hospitalized children perceived was done with Pearson's correlation coefficient, the difference in the empathy of nurses and the quality of nursing perceived by nursing students according to the general characteristics of the subjects was done with T-test.

Results and Discussion

1. General Characteristics of Subjects

Characteristics of Subjects are shown in [Table 1].

Table 1. General Characteristics of Subjects**N=116**

Variables	Categories	No. (%) or Mean±SD
Age	20~24	103(88.8)
	25~29	10(8.6)
	Over 30	3(2.6)
	23.01± 3.44	
Gender	Male	3(2.6)
	Female	113(97.4)
Major Satisfaction	Very Unsatisfied	5(4.3)
	Unsatisfied	3(2.6)
	Moderate	45(38.8)
	Satisfied	51(44.0)
	Very Satisfied	12(10.3)
Pediatric Ward Practice Experience	No	70(60.3)
	Yes	45(38.8)
Clinical Practice Period	< 3 months	17(14.7)
	3 ~ 6 months	40(34.5)
	> 6 months	59(50.9)
Duration of practice at Pediatric Ward	1 week	9(7.8)
	2 weeks	12(10.3)
	3 weeks	94(81.0)
Practice Institution	Advanced General Hospital	9(7.8)
	University Hospital	36(31.0)
	General Hospital	25(21.6)
	Hospital	36(31.0)
	Specialized Hospital	9(7.8)

2. The Empathy of Nurses and the Degree of the Quality of Nursing Provided to Hospitalized Children Perceived by Nursing Students

The empathy of nurses and the degree of the quality of nursing provided to hospitalized children perceived by nursing students are like [Table 2].

3. Relationship between the Empathy of Nurses and the Quality of Nursing Provided to Hospitalized

Children Perceived by Nursing Students

The relationship between the empathy of nurses and the quality of nursing provided to hospitalized children perceived by nursing students is like [Table 3].

Table 2. The Empathy of Nurses and the Degree of Quality of Nursing Provided to Hospitalized Children Perceived by Nursing Students N=116

Variables		Mean±SD	Range
Empathy		3.40±0.35	1-5
Importance in Nursing Quality	Total	3.34±0.48	1-4
	Dignity and Respect	3.29±0.49	1-4
	Explanation	3.41±0.50	1-4
	Participation and Cooperation	3.29±0.60	1-4
	Nursing Activity	3.34±0.58	1-4
Performance in Nursing Quality	Total	3.13±0.42	1-4
	Dignity and Respect	3.08±0.44	1-4
	Explanation	3.19±0.46	1-4
	Participation and Cooperation	3.01±0.55	1-4
	Nursing Activity	3.19±0.52	1-4

Table 3. Relationship between the Empathy of Nurses and the Quality of Nursing Provided to Hospitalized Children Perceived by Nursing Students

Variables	Categories	Empathy r(p)	Importance in Nursing Quality r(p)				Performance in Nursing Quality r(p)			
			Dignity and Respect	Explanation	Participation and Cooperation	Nursing Activity	Dignity and Respect	Explanation	Participation and Cooperation	Nursing Activity
Empathy		1								
Importance in Nursing Quality	Dignity and Respect	.282**	1							
	Explanation	.313**	.842**	1						
	Participation and Cooperation	.314**	.783**	.723**	1					
	Nursing Activity	.344**	.779**	.792**	.708**	1				
Performance in Nursing Quality	Dignity and Respect	.299**	.533**	.456**	.443**	.398**	1			
	Explanation	.321**	.500**	.526**	.464**	.427**	.794**	1		
	Participation and Cooperation	.281**	.420**	.342**	.558**	.288**	.633**	.686**	1	
	Nursing Activity	.426**	.389**	.369**	.301**	.470**	.624**	.691**	.491**	1

*p<.05 **p<.01

Discussion

The main results are discussed as follows. First, the empathy of nurses perceived by nursing students was average rating 3.60 points out of 5. As there are no preceding researches, the direct comparison with them is difficult, however, the result of this study was higher than that(2.99) of Lee Hyun Jeong^[15] for nurses. It is thought that this result appeared because the nursing intervention such as communication and explanation is done for protectors as clinical practice place is a pediatric ward and its subjects are children, and because the communication technique is differently applied to the children by their developmental stage even if it is possible to communicate with them. The importance in the quality of nursing provided to hospitalized children is average rating 3.34 points out of 4, and the performance in it was average rating 3.12 points out of 4. As there are no preceding researches which have measured the quality of nursing provided to hospitalized children, the direct comparison with them is difficult, however, in this study, the degree of the quality of nursing provided to hospitalized children perceived by nursing students was over average. It is thought that this result appeared because nursing students are well aware of the characteristics of child care that nurses should not only have the expertise and skills of child care but also empathize, respect and give confidence to children and their parents, and that child care should not only be safe and comfortable to children emotionally but also support the growth and development of children, and because they observed the nursing behaviors of pediatric ward nurses which reflected the characteristics of child care.

Second, the empathy perceived by nursing students had a positive correlation with dignity and respect($r=.282$, $p<.01$), explanation($r=.313$, $p<.01$), participation and cooperation($r=.214$, $p<.01$), and nursing activity($r=.344$, $p<.01$), which are the subregions of the importance in the quality of nursing provided to hospitalized children, and with the dignity and respect($r=.299$, $p<.01$), explanation($r=.321$, $p<.01$), participation and cooperation($r=.281$, $p<.01$), and nursing activity ($r=.426$, $p<.01$), which are the subregions of the performance in the quality of nursing.. As there are no preceding researches which have identified the relationship between empathy and the quality of nursing provided to hospitalized children, the direct comparison with them is difficult. It is thought that this result appeared because the empathy is an important factor that has an effect on forming, maintaining, and developing the emotional bond with a healer with which

a nurse can stand on the patient's side, and look at the world from the patient's point of view^[9], and because the empathy, a positive emotion, is an ability to understand the world that the other party understands, and the true value of empathy is not only to understand the physical demands of the patient but also to usefully work such as psychologically reacting to them.

Third, the difference in the empathy of nurses and the quality of nursing provided to hospitalized children according to the general characteristics of the subjects had a statistically significant difference in the empathy and clinical practice period of nurses($p=.009$), the performance in the quality of nursing, and clinical practice period($p=.042$), however, it had no statistically significant difference with the importance in the quality of nursing. It is thought that this result appeared because the more the clinical practice period increases, the more the opportunity to observe the empathy of nurses and the performance of nursing provided to hospitalized children perceived by nursing students increases. The hospitalization of children is a stressful event which causes the change in the role of family members and the function of a family as a crisis situation of a family^[16], and it is actually impossible for nurses alone to provide all nursing which patients need, and for quality nursing, it is efficient for the family to provide a care together^[17]. Nurses and parents should take care of children through interaction where they share the information and responsibility of child care based on clear communication on an equal footing(Lee, 2007), and nurses should provide patients and families with the information completely and unbiasedly, and help them understand it completely^[18]. For these processes, as the clinical practice period gets increased, the opportunity to experience can increase, so in order to observe the interaction of nurses, hospitalized children, and families and the performance of nursing which is provided, it is thought that it is necessary to consider the increase in the clinical practice period at a pediatric ward.

In conclusion, it is thought that it is necessary to review the clinical practice period, and further, and to develop the programs which can enhance the empathy for improving the smooth communication with children and families so that nursing students may understand the role as pediatric ward nurses during clinical practice period, and improve clinical performance ability.

Conclusion

As the suggestions based on the result of this study, it is thought that it is necessary to prepare the systematic plans in the educational process for improving the understanding of child and family care, and that based on the understanding of child and family care, it is necessary to expand the opportunity that nursing students can experience the child and family care during a clinical practice period. The suggestions for the follow-up studies are as follows: the results of this study have a limit to generalization, as this study was conducted only for nursing students in a city, so the comparison study and the systematic analysis study for nursing students with a variety of characteristics and local nursing students are necessary. Second, as it is thought that there will be difference according to the types of clinical practice institutions, the follow-up studies by the types of them are suggested.

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Relationship between Attitudes to Child Nursing College Students Perceived Punishment, Child Abuse Awareness and Knowledge

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Abstract

Background/Objectives: This study was conducted to present the basic data for developing education programs for nursing students through correlation research between the awareness and knowledge of child abuse and the attitude toward child corporal punishment for nursing students, and to contribute to the development of customized education programs by grade.

Methods/Statistical analysis: The subjects of this study were 200 nursing students in first and second grade of a university located in D city. Data collection was conducted from Oct 1 to Oct 30, 2018. With the collected data, using SPSS Program.

Findings: As a result, the awareness of child abuse had a statistically significant difference in grade, completion of child abuse prevention education, and completion of education related to child abuse after entrance.

Improvements/Applications: In conclusion, in order to increase the awareness and knowledge of child abuse of nursing students and to cultivate their attitude toward child corporal punishment which is unallowable, it is thought that the indirect experience through the curriculum and non-curriculum of child nursing science of department of nursing will be helpful.

Keywords: *Child Abuse, Awareness, knowledge, Nursing Students, Child Corporal Punishment*

Introduction

Child abuse has often occurred at home under the name of discipline from long ago. Especially in Korea, as the tendency of thinking highly of the value of a family and parents is strong due to the influence of Confucian culture, corporal punishment has been widely found at home, and educational scenes with a permissive attitude as discipline. However, since child abuse negatively affects the physical, emotional, and social development and adaptation of children and adolescents, and can have a negative effect on the growth and development of them as a crime which can lead to various after-effects up to adulthood in the long run, the attention of people who

are around is necessary to find the abuse early^[1]. while the number of cases of child abuse increases and the severity of its symptoms has been revealed, the children who are victims don't protect themselves, and do not express the abused situation or ask for help because they don't have an ability to solve the problem by judging the situation on their own. On the other hand, perpetrators don't report their mistakes themselves, so child abuse is easily concealed if someone who is a third person doesn't inform the world of it with responsibility^[4]. Therefore, in order to find and treat the abused children as well as to prevent child abuse, it must be preceded to know what abuse is and to perceive its dangers^[5]. In the developed countries, nurses are legally designated as a mandated reporter to play an important role in selecting and preventing child abuse, and are requested to have a heavier sense of responsibility as experts^[6]. The reason why mandated reporters are designated by a law like

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this is that it is more important to find and report child abuse early than any other thing. However, in Korea, the number of child abuse reported by mandated reporters accounted for only 32%(8,288) of the total number of reported cases in 2016(25,878). It's a very low figure compared to the cases that child abuse is reported by non-mandated reporters(68% of all child abuse report rate)^[7]. It is reported that the disturbance factors that hinder the reports of child abuse are a lack of knowledge of the symptoms and signs of abuse, report procedure, and legal process^[2,3], the attitude that child abuse is not serious enough to report, and that it will not be helpful even to report^[4, 5], and a thought that the report may have a negative effect on parents and children, and that rearing can't be interfered as it is parents' right^[5,6]. A nurse is in a position to observe the interaction between children and parents, to provide child care, and to play an important role in reporting, mediating and preventing child abuse when finding child abuse. This early involvement of nurses may be the basis for providing information and support for child rearing to parents who have difficulty in forming the attachment to the child in a preventive way or to pregnant women who are relatively at risk of child abuse. Nursing students as well as nurses should be the subjects of systematic education of child abuse as well. Nursing students will be the first to encounter children in various environments such as hospitals and community health centers after graduating from the university, and perform a role which quickly finds and takes care of abused children. If nursing students who will perform these roles are to be educated and acquainted with the exact definition of child abuse, the selection of abused child and how to report it, it is thought that the sensitivity and knowledge of child abuse of nurses can be improved in the long run, which will be a future-oriented strategy for reducing the rate of child abuse occurrence. Thus, it is thought that it is important to establish a correct attitude by grasping the awareness and knowledge of child abuse of nursing students, and by identifying their attitude toward corporal punishment. However, it was investigated that nursing students didn't know much about the law though they had an interest in child abuse, and that they had very little experience in education or training^[8]. Therefore, this study was conducted to present the basic data for

developing education programs for nursing students through correlation research between the awareness and knowledge of child abuse and the attitude toward child corporal punishment for nursing students, the future caregivers or prospective mandated reporters, and to contribute to the development of customized education programs by grade.

Method

For this study, data from 200 nursing students at K university in Daejeon Metropolitan City was collected, and 193 questionnaires excluding 7 ones whose response was insufficient were finally analyzed.

Data was collected from Oct 1, 2018 to Oct 30, 2018. As for the method of data collection, the researcher visited subjects, explained the purpose and method of the study, distributed a questionnaire to those who agreed to participate in it, and after explaining precautions and how to respond, data collection was conducted. Before collecting data, according to research ethics, the purpose of the study, personal confidentiality, and that it will not be used for purposes other than research were explained to the subjects. Those who agreed on it participated in the survey.

With collected data, using SPSS Program, the general characteristics of the subjects were analyzed with real number and percentage, The knowledge and awareness of child abuse of nursing students and their attitude toward child corporal punishment were done with mean and standard deviation, the relationship between the knowledge and awareness of child abuse of nursing students and their attitude toward child corporal punishment was done with Pearson's correlation coefficient and the difference in the awareness and knowledge of child abuse of nursing students and their attitude toward child corporal punishment was done with ANOVA.

Results and Discussion

1. General Characteristics of Subjects

Characteristics of Subjects are shown in [Table 1].

Table 1. General Characteristics of Subjects N=200

Variables	Categories	No(%)
Gender	Male	27(13.5)
	Female	173(86.5)
Grade	1st grade	50(25.0)
	2nd grade	50(25.0)
	3rd grade	50(25.0)
	4th grade	50(25.0)
Completion of child abuse prevention education	Yes	90(45.0)
	No	110(55.0)
Completion of child abuse related education after entrance	Yes	149(74.5)
	No	51(25.5)

2. Degree of The Awareness and Knowledge of Child Abuse of Nursing Students and Their Attitude Toward Child Corporal Punishment

It was revealed that the awareness of child abuse of nursing students was average rating 3.04 points out of 4, the knowledge of child abuse was average rating 6.8 points out of 17, and the attitude toward child corporal punishment was average rating 2.37 points out of 6.

3. Relationship Between The Awareness and Knowledge of Child Abuse of Nursing Students

and Their Attitude Toward Child Corporal Punishment

The relationship between child abuse awareness, knowledge, and attitudes toward child punishment is shown in [Table 2].

Table 2. Relationship between variables

Variables	Awareness of Child Abuse	Knowledge of Child Abuse r(p)	Attitude Toward Child Corporal Punishment r(p)
Awareness of Child Abuse	1		
Knowledge of Child Abuse r(p)	.190**	1	
Attitude Toward Child Corporal Punishment	-.237**	-.161**	1

*p<.05 **p<.01

4. Difference in The Awareness and Knowledge of Child Abuse, and the Attitude toward Child Corporal Punishment According to General Characteristics.

As a result of examining the difference in the awareness and knowledge of child abuse and the attitude

toward child corporal punishment according to general characteristics of the subjects, the awareness of child abuse showed a statistically significant difference in grade, the completion of child abuse prevention education, and the completion of education related to child abuse, the knowledge of child abuse did so in gender, and the attitude toward child corporal punishment did so in grade and the completion of child corporal punishment prevention education [Table 3].

Table 3. Difference according to general characteristics

N=200

Variables	Categories	Awareness of Child Abuse		Knowledge of Child Abuse		Attitude Toward Child Corporal Punishment	
		Mean ±SD	t or F(p)	Mean ±SD	t or F(p)	Mean ±SD	t or F(p)
Gender	Male	2.94±0.40	1.712 (.192)	0.33±0.17	3.976 (.048)	2.66±0.73	3.765 (.054)
	Female	3.06±0.43		0.41±0.20		2.33±0.84	
Grade	1 a	2.82±0.49	7.737 (.000) a < c,d	0.43±0.29	1.102 (.349)	2.42±0.90	4.367 (.005) b > c
	2 b	3.03±0.35		0.38±0.16		2.59±0.75	
	3 c	3.12±0.40		0.41±0.13		2.03±0.75	
	4c	3.19±0.36		0.37±0.15		2.46±0.83	
Completion of Child Abuse Prevention Education	Yes	3.12±0.42	5.965 (.015)	0.42±0.21	1.654 (.200)	2.24±0.82	4.314 (.039)
	No	2.97±0.42		0.38±0.18		2.48±0.82	
Completion of Education related to Child Abuse after Entrance	Yes	3.13±0.38	30.913 (.000)	0.40±0.18	0.020 (.887)	2.34±0.85	1.263 (.263)
	No	2.78±0.44		0.40±0.23		2.49±0.76	

Discussion

Main results are discussed as follows.

First, the awareness of child abuse of nursing students was above average with average rating of 3.04 out of 4. It was similar to the result(3.02) of Jo Yu Hyang and Jeong Yeong Hae's study^[8] for nursing students. It can be said that the result of this study appeared because the subjects of nursing department of K university took lessons on child abuse through a subject of child nursing science due to the characteristics of department of nursing, and experienced the campaign activities for preventing child abuse through club activities. The knowledge of child abuse of nursing students was 6.8 out of 17. This result is difficult to make a direct comparison with the preceding studies, as there are none which have measured the knowledge of child abuse for nursing students. However, As nurses who act in all areas of clinic often encounter the children and adolescents who suffer from the physical, sexual abuse, they need to be more interested in it. Therefore, it can be said that it is very meaningful and important to educate them so that they may acquire the right knowledge of child abuse, maintain their interest in child abuse, and conduct prevention, discovery, and case management, The attitude toward child corporal punishment of nursing students was low(average rating of 2.37 points out of 6). It is thought that this result supports the result of study of Jo Kyeong Mi and Kim Un Ju^[10]. that nursing students had a low degree of tolerance for the corporal punishment, and that it is a positive result, as that the degree of tolerance for child corporal punishment is low can be a factor to increase the intention of report of child abuse. The scope of tolerance for the corporal punishment in the process of child rearing is different between nations and cultures, and Chinese students are less critical on the rough, authoritative behaviors, and physical punishment of parents^[11,12,13]. However, like the result of this study, in the study of Feng and Levine^[5], Taiwanese nurses showed a low degree of tolerance for child corporal punishment, which reveals that it is a cultural change within a young generation due to the introduction of western culture and the economic development. That is, considering the study that the professional education and the cultural difference have an important effect on the intention of report of child abuse more than the gender, age, and the socio-economic status of nurses^[14], that the tolerance for the corporal punishment gets lowered is a positive change in enhancing the intention of report of nurses.

Second, the awareness of child abuse of nursing students showed a positive correlation with the knowledge of child abuse, but a negative correlation with the attitude toward child corporal punishment. As there are no results of preceding researches, the results of this study are difficult to compare with them directly. Actually, only 35.3% of the respondents who had an experience of finding the child abuse reported it. The reporters had an attitude that they didn't allow it, had more knowledge of child abuse, and had more experience of having access to education and knowledge of child abuse^[15]. The report rate of child abuse of nurses is low, which reveals that it is an important nursing process to find and report child abuse cases, however, the level of knowledge of child abuse, preparation for it, and confidence in reporting methods and how to utilize available resource are very low^[16]. That is, it is thought that it is necessary to develop programs to cultivate the unacceptable attitude toward and right knowledge of the corporal punishment for nurses and preliminary nursing students.

Third, the awareness of child abuse had a statistically significant difference in grade, completion of child abuse prevention education, and completion of education related to child abuse after entrance. It can be said that this result appeared because the subjects of this study learned the concept of child abuse in child nursing science and had an indirect experience of child abuse prevention campaign activities through tasks. The knowledge of child abuse showed a statistically significant difference in gender, which is thought because the subjects of study are mainly composed of girl students as nursing students, and it is considered that more in-depth researches are necessary. The attitude toward child corporal punishment showed a statistically significant difference in grade and the completion of child abuse prevention education. In Korea, due to the influence of Confucian culture, corporal punishment has been widely done in a family, and educational scenes with an allowable attitude as discipline because the tendency of thinking highly of the value of a family and parents is strong, however, it is thought it is a result of the cultural change within a young generation due to the introduction of western culture and economic development, and that it is the influence of the process which is handled in child nursing science such as growth development and child abuse as nursing students go up in grade.

Conclusion

In order to increase the understanding and sensitivity of child abuse, not only have to raise the awareness of child abuse by systematically educating and promoting the standardized contents, but also through proper parenting attitude. Eradication of the abuse is urgent. In addition, the number of trainings as well as educational experiences related to child abuse can increase the reporting intention affecting abuse reporting behavior. There is a need to develop educational programs that reflect the educational needs of college students and to prevent child abuse education programs that apply various teaching methods.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Reorganization of Learning Objectives Using Ontology Technique

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Abstract

Background/Objectives: This study, the linkages between the educational curriculum were investigated by applying the ontology method to the learning goal in the field of clinical dental support among the learning goals of the department of dental hygiene.

Methods/ Statistical Analysis: In this study, the ontology was applied to the learning goals for clinical dental support field. In the basic design, the opinions on the area setting, usage purpose, provided information, and user-friendly design included in the ontology were collected. The ontology construction was developed using ASP, a web-based program and database construction was composed with MS-ACCESS 2010 version.

Findings: We have composed the learning goals of dental clinical field in the department of dental hygiene.

The dental clinical field is made up of a total of 7 subjects and classified into parts, chapters, and sections. From the learning goals, the contents that must be learned consist of priority A and the contents that should be learned optionally learn consist of B. Users can determine whether or not they can select the priorities and whether or not include chapters and sections. They can search by entering a specific keyword for the learning goals. The learning goal priority was set to 'A' and the learning goals were searched including 'chapter' and 'section'. As a result, the relevant learning goals in oral and maxillofacial surgery, conservative dentistry and orthodontics could be confirmed.

Improvements/Applications: This program will be able to be used usefully to set educational purposes and design appropriate education for it through the linkage between subjects.

Keywords: Dental Field, Dental Hygienist, Learning goals, Learning Objectives System, Ontology, Reorganization of Learning

Introduction

Ontology is an explicit formalization to conceptualize certain interest area and it can be a way of establishing knowledge systematically [1]. The formalization through ontology helps to find exact information by clearly defining and describing in detail the concept of the subject. Also, it has the advantage of linking flexibly with existing knowledge in case that knowledge is shared and new knowledge is added [2].

In the present medical field, the studies on the shared decision support system development for treatment using ontology and domain-specific language have been reported [3-8]. In the field of dentistry, ontology is divided into data analysis and knowledge discovery, dental education and training, legal protection and compliance, evidence-based dentistry, information exchange and integration, and clinical decision support systems [9-13]. In terms of dental education and training, there has been the case that ontology has been used to produce augmented reality applications to educate students [2,14-15].

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In South Korea, dental hygiene has been grown for approximately 50 years and has been looking for academic

change. American Dental Hygienists Association presents Standard of Applied Hygiene Practice, and is attempting to teach and nurture to progress systematic approach to dental hygiene knowledge and work and critical thinking, decision-making ability and problem-solving ability of dental hygienists. In South Korea, departments of dental hygiene have been established at 82 universities nationwide and about 5,000 hygienists have been graduated every year and education to produce highly competent dental hygienists has been devoted [16]. Furthermore, in order to train standardized dental hygienists who have dental hygienists' basic skills, learning goals have been set based on the core terminology draft for the development of national examination questions and learning goals [17] of the department of dental hygiene, and have been applied to the national examination of dental hygienists. The learning goals of the department of dental hygiene, as a guide about compulsory and optional contents in the curriculum of a wide range of academic subjects, are the first activities which should be performed at the beginning of education. Particularly, the collection of learning goals is used for various purposes such as suggesting directions for teaching design activities, inducing learners' motivation to be educated, determining criteria for teaching strategies, evaluating criteria for learners' achievement status, effective management of class time, and providing effective feedback, and moreover, it is used as the basis for the national examination criteria and examination questions development standards. In order to perform efficiently dental hygienists' jobs, the learning goals of the dental hygiene curriculum has in-depth relationships with the dental hygienists' jobs and the educational purposes should be set systematically, and the educational contents appropriate to them should be chosen and the organization and the evaluation method should be designed and provided [18,19].

Therefore, in this study, the linkages between the educational curriculum were investigated by applying the ontology method to the learning goal in the field of clinical dental support among the learning goals of the department of dental hygiene.

Method

The development of the ontology followed the ontology development methodology of previous studies

[20-22] which is known widely and easy to understand. In this study, the ontology was applied to the learning goals for clinical dental support field (conservative dentistry, dental prosthetics, pediatric dentistry, orthodontics, oral and maxillofacial surgery, periodontology, dental materials).

In the first step, the domain and scope of the ontology was determined. For this, the basic design was completed in a brainstorming way by consisting of 1 ontology development expert, 1 domain expert and 4 service users and by holding a total of 4 meetings for a week. In the basic design, the opinions on the area setting, usage purpose, provided information, and user-friendly design included in the ontology were collected. Considering the characteristics of end-users, the vocabulary selection of concept and the classification of concept were considered.

In the second step, the important items of the learning goals used in the ontology were listed and main sentences were also listed. The chapters and sections of the learning goals were listed and the relationships between the learning goals were elicited.

The third step is to define the class, class hierarchy, and establish the class relationships.

In the fourth step, the concept was expressed by defining the class from the list of main items created in the third step and defining the relationship between the defined class hierarchy and classes.

The fifth step was to build the actual instance according to the ontology schema. It was checked and revised whether or not the necessary concepts were not left out and the concepts were not defined imprecisely.

In the final screen configuration, the learning goals were enabled to search for the learning goals including the chapters and sections and enabled to use the priority A and B items of the learning goals separately. The ontology construction was developed using ASP, a web-based program and database construction was composed with MS-ACCESS 2010 version. The data flow diagram is shown in Figure 1.

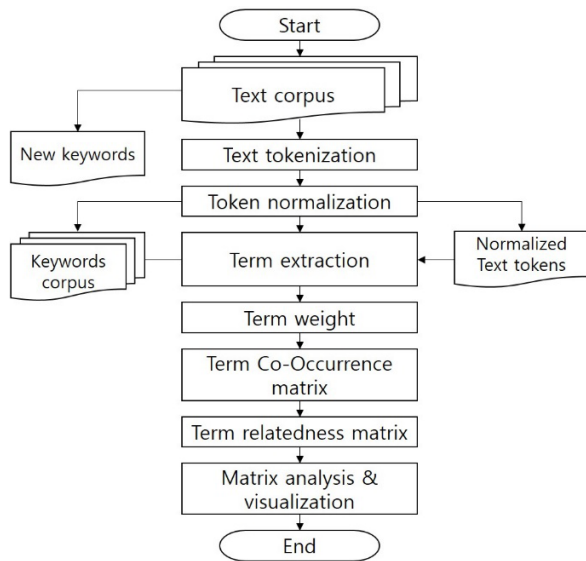


Figure 1. The data flow diagram

Result and Discussion

The composition of the learning goals of dental clinical field in the department of dental hygiene is shown in table 1. The dental clinical field is made up of a total of 7 subjects and classified into parts, chapters, and sections. From the learning goals, the contents that must be learned consist of priority A and the contents that should be learned optionally learn consist of B.

Conservative dentistry consists of 14 chapters. Priority was 69 for A and 64 for B. Dental prosthetics consists of 6 chapters in 2 chapters. Priority was 79 for A and 72 for B. Pediatric dentistry consists of 23 sections in 9 chapters. Priority was 61 for A and 76 for B. Orthodontics consists 51 sections in 11 chapters. Priority was 75 for A and 126 for B. Oral and maxillofacial surgery consists of 37 sections and 9 chapters in 4 parts. Priority was 63 for A and 90 for B.

Periodontology consists of 32 sections in 10 chapters. Priority was 67 for A and 72 for B. Dental materials consist of 30 sections in 15 chapters. Priority was 61 for A and 104 for B.

Table 1. The composition of the learning goals of dental clinical field in the department of dental hygiene

Subject	Parts	Chapters	Sections	Priority	
				A	B
Conservative dentistry	-	14	-	69	64
Dental prosthetics	2	6	18	79	72
Pediatric dentistry	-	9	23	61	76
Orthodontics	-	11	51	75	126
Oral and maxillofacial surgery	4	9	37	63	90
Periodontology	-	10	32	67	72
Dental materials		15	30	61	104

User screen is shown in Figure 2. Users can determine whether or not they can select the priorities and whether or not include chapters and sections. They can search by entering a specific keyword for the learning goals.



Figure 2. Oral and Maxillofacial Surgery Screen Configuration

The result screen of user search is shown in Figure 3. This is a screen configuration that shows the whole learning goals of oral and maxillofacial surgery.

Subject	Part	Title	Chapter	Title	Section	Title	learning goal	Priority
Oral and maxillofacial surgery	Part 1	Overview of Oral and maxillofacial surgery	Chapter 1	Dental hygiene in Oral and maxillofacial surgery	Section 1	Overview of Oral and maxillofacial surgery	We can define the Oral and maxillofacial surgery.	B
Oral and maxillofacial surgery	Part 1	Overview of Oral and maxillofacial surgery	Chapter 1	Dental hygiene in Oral and maxillofacial surgery	Section 2	Overview of Oral and maxillofacial surgery	We can list the major diseases of the Oral and maxillofacial surgery.	B
Oral and maxillofacial surgery	Part 1	Overview of Oral and maxillofacial surgery	Chapter 1	Dental hygiene in Oral and maxillofacial surgery	Section 3	Overview of Oral and maxillofacial surgery	We can explain the principles of treatment for major diseases in Oral and maxillofacial surgery.	B
Oral and maxillofacial surgery	Part 1	Overview of Oral and maxillofacial surgery	Chapter 1	Dental hygiene in Oral and maxillofacial surgery	Section 4	Overview of Oral and maxillofacial surgery	We can manage post-op patients.	B

Figure 3. whole learning goals of oral and maxillofacial surgery

Figure 4 shows searching for learning goals with the term ‘Diagnosis’ and shows the results of searching for learning goals with the term ‘Diagnosis’. The learning goal priority was set to ‘A’ and the learning goals were searched including ‘chapter’ and ‘section’. As a result, the relevant learning goals in oral and maxillofacial surgery, conservative dentistry and orthodontics could be confirmed.

In figure 5, the results obtained by applying the term ‘diagnosis’ to the ontology were expressed in an algorithm.

This program was designed to set educational purposes through the relationship between subjects and to use to design education suitable for it. The ontology was applied to help to find more accurate information by defining clearly and describing in detail the main concept of the learning goals of the national examination through the linkage between knowledge of the learning goals of the national examination of dental hygienists, in addition, it was applied to be used as basic data for defining the relationship between the learning goals and linking flexibly with existing learning goals in the creation of new learning goals. The linkage of learning goals with the term ‘Diagnosis’ was investigated after constructing the ontology and as a result, the relevant learning goals could be confirmed in oral and maxillofacial surgery and conservative dentistry. It has the advantage of obtaining easily knowledge that is difficult to find in case that it is composed of a collection of learning goals, also it helps to identify the linkage between learning goals at a glance. This helps to find more accurate information by defining clearly and describing in detail the concept

of resources when analyzing between concepts through ontology, and additionally, this is a result that reflects the advantage of ontology that it is possible to share knowledge and infer new knowledge by clarifying the relationship between terms [10].

Priority Total A B Chapter Y Section Y

Subject	Part	Title	Chapter	Title	Section	Title	learning goal	Priority
Oral and maxillofacial surgery	Part 2	Practice of Oral and maxillofacial surgery	Chapter 1	examination and diagnosis	Section 2	Meaning and Observation of Life-Symptoms	We can measure breathing.	A
Oral and maxillofacial surgery	Part 2	Practice of Oral and maxillofacial surgery	Chapter 1	examination and diagnosis	Section 2	Meaning and Observation of Life-Symptoms	We can measure body temperature.	A
Oral and maxillofacial surgery	Part 2	Practice of Oral and maxillofacial surgery	Chapter 1	examination and diagnosis	Section 2	Meaning and Observation of Life-Symptoms	We can measure the pulse.	A
Oral and maxillofacial surgery	Part 2	Practice of Oral and maxillofacial surgery	Chapter 1	examination and diagnosis	Section 2	Meaning and Observation of Life-Symptoms	We can measure blood pressure.	A

Subject	Part	Title	Chapter	Title	Section	Title	learning goal	Priority
There are no matching terms.								

Subject	Part	Title	Chapter	Title	Section	Title	learning goal	Priority
There are no matching terms.								

Subject	Part	Title	Chapter	Title	Section	Title	learning goal	Priority
Dental prosthetics			Chapter 2	dental carotid disease, examination of subjects			We can explain how to test the pulp vitality test	A
Dental prosthetics			Chapter 2	dental carotid disease, examination of subjects			We can prepare instruments for cavity formation.	A
Dental prosthetics			Chapter 2	dental carotid disease, examination of subjects			We can prepare instruments measuring temperature change.	A
Dental prosthetics			Chapter 2	dental carotid disease, examination of subjects			We can prepare electric pulp test	A

Figure 4. the results of searching for learning goals with the term ‘diagnosis’

Discussion

Specifically, in oral and maxillofacial surgery, 6 learning goals related to vital signs, systemic diseases, and dental treatment were presented. In conservative dentistry, 2 learning goals for the diagnosis of dental

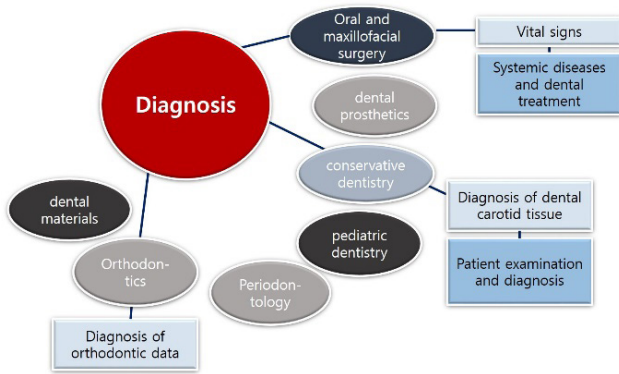


Figure 5. The results obtained by applying the term ‘diagnosis’ to the ontology

hard tissue and examination were suggested and in orthodontics, 1 learning goal for calibration diagnosis data was proposed. It presents a guide to prepare for learning by identifying the linkage of learning goals between subjects.

Moreover, the result of applying the ontology showed empty data values in some subjects. The empty data values were the values corresponded to ‘part’ and ‘section’, and the subjects were conservative dentistry, pediatric and adolescent dentistry, orthodontics, periodontology, dental materials, and practice. As a result of analyzing a collection of the learning goals to tackle this kind of problem, in oral and maxillofacial surgery and dental prosthetics, learning goals were presented by consisting of ‘part’, ‘chapter’ and ‘section’, and furthermore, in pediatric adolescent dentistry, orthodontics, periodontology, dental materials, and practice courses, they were presented by composing of ‘chapter’ and ‘section’. Lastly, in conservative dentistry, the learning goal was presented as ‘chapter’. Therefore, as learning goals were not composed in the same environment, there was a difference when the learning goals were described. It is considered that it will be necessary to be discussed to clarify the criteria that compose the learning goals when they are revised in the future.

Conclusion

The first thing to be done in the process of the preparation of learning is to select learning goals.

Learner’s prior knowledge should be identified, the depth of learning should be defined, and learning goals should be chosen, organized and evaluated in consideration of the linkage with subsequent studies. In that point, this program will be able to be used usefully to set educational purposes and design appropriate education for it through the linkage between subjects. Also, it helps to find more exact information by defining clearly and describing in detail the main concept of the learning goals of the national examination through the linkage between knowledge of the learning goals of the national examination of dental hygienists, and additionally, it will be able to be used as a basic data to define the relationship between the learning goals and to link flexibly with existing learning goals when new learning goals are created.

It is considered that differences in the expression of terminology which is the problem derived from the result of the study, in other words, the part in which the same concept is described in different terms, should be fully discussed when the learning goals are revised. In the future, if the system of overall learning goals is established by extending and applying this program to whole learning goals, it is believed that this program will serve as an opportunity to prepare guidelines for defining concepts between learning goals and designing lessons.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Study on the Relationship Trend between Chronic Diseases and Oral Health according to Diabetes Treatment: Focusing on the Local Health Survey for 2015, 2016 and 2017

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Abstract

Background/Objectives: This study intended to examine the needs of oral care and to provide the basic data required to develop related products through the trend analysis on the relation between the chronic disease and the oral health according to the diabetes treatment.

Methods/Statistical analysis: 458,301 research subjects older than 45 years were selected by requesting the raw data of 2015, 2016 and 2017 local community health survey. For the data analysis, the statistical software R program was used, and the significant level was less than 0.05.

Findings: In case of having diabetes, it was shown that the hypertension, arthritis, depression etc. were significantly high out of the chronic disease and the subjective health level was also poor ($p < 0.001$). In the oral health, in case of having diabetes, as the subjective oral health level was poor such as subjective periodontal tissue health level was poor and the mastication was inconvenient and the subjective oral health level was poor.

Improvements/Applications: For the patient with diabetes, diverse measures for the management of complications of the chronic disease and oral health care should be prepared at national level for the systematic oral health care.

Keywords: Diabetes, Oral health, Chronic diseases, Trend analysis, Local community health survey.

Introduction

Diabetes is the metabolic disease having characteristics of high blood sugar and occurs by the lack of the insulin resistance and the insufficient insulin secretion [1]. Diabetes occurs in about 9 million people around the world every year and as a result, it is estimated that 80% of the patients die [2]. Diabetes causes the chronic complications such as atherosclerosis, stroke, renal diseases, retinopathy, oral diseases, etc. As the chronic disease such as diabetes, hypertension, cardiovascular disease, etc. occurs in the adult, the

research on the relation with periodontal disease is being increased [3, 4]. The preceding researches reported that the periodontal disease has relation with cardiovascular disease and osteoporosis [5], and the blood pressure is high when having periodontal diseases than when does not having periodontal disease [6]. In addition, it was reported that the prevalence of the periodontal disease was higher in the people having diabetes [7], and the people having chronic diseases have poor periodontal condition compared to the normal people [8]. Through diverse epidemiological researches, it is known that the longer the diabetes is the possibility of the periodontal disease occurrence is high and the destruction of periodontal tissue is severe in the patient with diabetes after 30 years of age [9]. The inflammation by the diabetes accelerates the damage to the tissues

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in the surrounding area of tooth [10] and the high blood sugar increases the inflammation of periodontal tissue by changing the capillaries in the whole body and the gingiva [11]. As recently, the chronic diseases such as diabetes, metabolic syndrome, cardiovascular disease, hypertension, etc. which occur commonly in the adults of middle age and old age, are increased, the research on the relation with periodontal disease is being increased but the research at the national level is not sufficient. Therefore, this study intended to examine the needs of oral care and to provide the basic data required to develop related products through the trend analysis on the relation between the chronic disease and the oral health according to the diabetes treatment.

Method

458,301 research subjects older than 45 years were selected by requesting the raw data of 2015, 2016 and 2017 local community health survey. For the data analysis, the statistical software R program was used, and the significant level was less than 0.05. For the general characteristics of the research subjects, chi-square test was performed for the age, education level,

marital status and the income according to the gender and the trend analysis by year was analyzed with linear by linear association. The logistic regression analysis for the chronic disease and oral health was performed by taking the diabetes treatment as dependent variable.

Result and Discussion

1. General Characteristics

In the results of analyzing the general characteristics by gender, for the age, the male was 121,281 persons (60.1%) occupying the highest proportion (p<0.001). In the education level, the male graduated the college or higher was 128190 persons (41.7%) occupying the highest proportion (p<0.001). In the marital status, the male having spouse was 171,709 persons (85.4%) the most and the female having spouse, divorced, widow and separate woman in order were shown significantly (p<0.001). In the household income, the male and female from 1 million won to 3 million won were 75,178 persons (37.6%) and 88,178 persons (34.6%), the most, followed by the female and the male with less than 1 million and the male from 3 million won to 5 million won, in order (p<0.001) [Table 1].

Table 1. General Characteristics

Variable	Categories	Gender		Unit: N(%)	
		Male	Female		
Age	45 ~ 64 years old	121281	60.1	141522	p=0.000
	65 ~74 years old	47598	23.6	60452	55.1
	75 years old or older	32835	16.3	55102	23.5
Education	uneducated	6951	2.3	40360	21.4
	elementary school	41371	13.4	80565	p=0.000
	middle school	35529	11.5	40782	10.7
	high school,	95585	31.1	96948	21.4
	college or higher	128190	41.7	117099	10.9
Marital status	single	6959	3.5	3392	25.8
	have spouse	171709	85.4	166456	31.2
	divorced, separated, widow	22380	11.1	86030	p=0.000
Household income	ess than 1 million won	47343	23.7	85110	33.6
	1 million to less than 3 million won	75178	37.6	88178	p=0.000
	3 million to less than 5 million won	47043	23.5	49538	33.4
	more than 5 million won	30226	15.1	31806	19.5
Occupation	administrative management job	21050	10.4	14735	12.5
	office job	13339	6.6	7875	5.7
	sales and service job	16420	8.2	37342	3.1
	agriculture and fisheries	41847	20.8	36855	14.5
	simple technical job	54386	27.0	33141	14.3
	homemaker or unemployed, others.	54000	26.8	126856	12.9
	etc.	399	0.2	56	49.4
Total		201441	44.0	256860	56.0

2. Chronic Disease according to Diabetes

The case that does not have hypertension in the group without diabetes was 273,487 persons (69.2%), showing significantly high and the case having hypertension in the group having diabetes was 38,887 persons (61.9%) showing significantly high. For the arthritis, the subject having arthritis in the group without having diabetes was 348,725 persons (88.2%) showing significantly high and the subject having arthritis in the group having diabetes was 10,921 persons (17.3%) (p<0.001). For the depression, the case that does not have depression in

the group without having diabetes was 348,725 persons (88.2%) showing significantly high and the subject who receives the psychological counseling in the group having diabetes was 1,015 persons (1.6%) (p<0.001). For the stress psychological counseling, the subject who does not have diabetes and does not receive the psychological counseling was 388,000 persons (98.3%) showing significantly high and the subject who is receiving the psychological counseling without having diabetes was 6,714 persons (1.7%) the lowest (p<0.001) [Table 2].

Table 2. Chronic Disease according to Diabetes

Variable	Categories	Diabetes Treatment				Unit: N(%)	
		Treatment		Not Treatment		Total	
Hypertension Treatment		p=0.000					
	Yes	38887	61.9	121668	30.8	160555	35.1
	No	23947	38.1	273487	69.2	297434	64.9
Arthritis Treatment		p=0.000					
	Yes	10921	17.3	46540	11.8	57461	12.5
	No	52281	82.7	348725	88.2	401006	87.5
Psychological counseling due to depression		p=0.000					
	Yes	1015	1.6	4323	1.1	5338	1.2
	No	62176	98.4	390802	86.3	452978	98.8
Psychological counseling by the stress							
	Yes	1404	2.2	6714	1.7	8118	1.8
	No	61607	97.8	388000	98.3	449607	98.2
Total		63011	13.8	394714	86.2	457725	100.0

3. Oral Health and Oral Health Practice Trend of Person having Diabetes by Year

In the subjective oral health level, the proportion of the subject having diabetes who answered “Poor” was high but showed the decreasing trend (p<0.001). For the experience of mastication inconvenience, the proportion of “Inconvenient” was shown decreasing trend (p<0.001). For the form of using prosthesis, the proportion “I have both upper and lower prosthesis” showed the decreasing trend (p<0.001). toothbrushing showed the decreasing trend (p<0.001). In the tooth brushing after breakfast, the trend not having breakfast was increased and toothbrushing showed the decreasing trend (p<0.001). The toothbrushing after lunch showed the increasing trend (p<0.001). Toothbrushing after dinner and before sleep showed the increasing trend

(p<0.001) [Table 3].

4. Annual Trend of Reason Not Receiving Annual Oral Examination and Required Dental Treatment of Person having Diabetes

For the annual oral examination, the subject without having diabetes who did not receive examination was 317,425 persons (80.3%) the most (p<0.001). For the reason not receiving required dental examination excluding the case of not avoiding the examination, the subject having diabetes who did not receive examination by the economical reason was 5,110 persons (8.1%) showing significantly high (p<0.001). In the trend by year, the proportion of the subject who does not receive the examination while having diabetes showed the significantly increasing trend (p<0.001). Although the

reason of not receiving required dental treatment was economical but it showed the decreasing trend ($p < 0.001$) [Table 4].

Table 3. Oral Health and Oral Health Practice Trend of Person having Diabetes by Year Unit: N(%)

Variable	Categories	Diabetes				Trend of Subject having Diabetes by Year					
		Yes		No		2015		2016		2017	
Subjective Oral Health Level				p=0.000							p=0.000
	Good	8890	14.1	77580	19.6	3020	14.6	2906	13.4	3512	15.0
	Fair	17331	27.4	141049	35.7	5531	26.8	6040	27.9	6839	29.3
	Poor	37007	58.5	176788	44.7	12109	58.6	12721	58.7	13027	55.7
Experience of mastication inconvenience				p=0.000							p=0.000
	Inconvenient	26326	41.6	118338	29.9	8795	42.6	2721	42.0	8812	37.7
	No so much	8633	13.7	52872	13.4	2913	14.1	9845	12.6	3301	14.1
	Not inconvenient	28271	44.7	224218	56.7	8954	43.3	21667	45.4	11265	48.2
Form of using Prosthesis				p=0.000							p=0.008
	Have both upper and lower	15952	24.3	62238	14.8	5152	24.9	5246	24.2	5554	23.8
	Have only upper	4913	7.5	18185	5.2	1588	7.7	1687	7.8	1638	7.0
	Have only lower	2681	4.1	11189	3.0	842	4.1	938	4.3	901	3.9
	No	39682	56.1	303802	50.9	11396	55.2	12059	55.7	13407	57.4
	Not applicable(Less than 50 years old)	5297	8.1	2280	26.1	1682	8.1	1738	8.0	1877	8.0
Tooth brushing after breakfast yesterday				p=0.000							p=0.005
	Yes	55169	87.2	337122	85.3	18000	87.1	18693	86.3	20226	86.5
	No	5524	8.7	28935	7.3	1749	8.5	2038	9.4	1948	8.3
	Did not have breakfast yesterday	2537	4.1	29318	7.4	909	4.4	930	4.3	1197	5.1
Toothbrushing after lunch yesterday				p=0.000							p=0.000
	Yes	23519	37.2	177806	45.0	7558	36.6	7791	36.0	9329	39.9
	No	39179	62.0	214704	54.3	12934	62.6	13687	63.2	13839	59.2
	Did not have lunch yesterday	533	0.8	2874	0.7	168	0.8	183	0.8	204	0.9
Toothbrushing after dinner yesterday				p=0.000							p=0.000
	Yes	42924	67.9	279420	70.7	13830	66.9	14503	67.0	16137	69.0
	No	20143	31.9	114942	29.1	6771	32.8	7110	32.8	7173	30.7
	Did not have dinner yesterday	164	0.2	1027	0.3	58	0.3	49	0.2	62	0.3
Toothbrushing before sleep yesterday				p=0.000							p=0.000
	Yes	24902	39.4	178697	45.2	8017	38.8	8401	38.8	9839	42.1
	No	38217	60.4	216123	54.7	12596	61.0	13232	61.1	13503	57.8
	Did not sleep yesterday	98	0.2	569	0.1	44	0.2	30	0.1	32	0.1

Table 4. Annual Trend of Reason Not Receiving Annual Oral Examination and Dental Treatment

Unit: N(%)

Variable	Categories	Diabetes				Trend of Subject having Diabetes by Year					
		Yes		No		2015		2016		2017	
Recently received the annual oral examination					p=0.000						p=0.000
	Yes	12627	20.0	77967	19.7	4447	21.5	4573	21.1	4282	18.3
	No	50594	80.0	317425	80.3	16213	78.5	17092	78.9	19091	81.7
Reason of not receiving dental treatment					p=0.000						p=0.000
	Economical	5110	8.1	24718	6.3	1913	9.4	1762	8.3	1591	6.9
	Distance	657	1.0	3613	0.9	215	1.1	264	1.2	195	0.8
	Lack of time	2035	3.2	21381	5.4	720	3.5	784	3.7	743	3.2
	Difficulty of movement	1425	2.3	4354	1.1	455	2.2	509	2.4	481	2.1
	Low importance	1526	2.4	12201	3.1	17	0.1	13	0.1	14	0.1
	Fear for treatment	963	1.5	7096	1.8	506	2.5	568	2.7	547	2.4
	Others	907	1.4	4578	1.2	284	1.4	319	1.5	373	1.6
	Never avoided the examination	50594	80.0	317425	80.3	16213	79.8	17092	80.2	19091	82.9
Total		63217	100.0	395366	100.0	3,049			100%		

Table 5. Multiple Logistic Regression Analysis on Chronic Disease according to Diabetes

	B	S.E.	Wald	df	Significance level	Exp(B)	95% C.I of EXP(B)	
							Lower Limit	Upper Limit
Hypertension(ref: No) Yes	1.761	.009	39899.214	1	.000	5.817	5.717	5.918
Arthritis(ref: No) Yes	.292	.012	551.198	1	.000	1.340	1.307	1.373
Depression(ref: No) Yes	.280	.040	48.584	1	.000	1.323	1.223	1.431
Stress(ref: No) Yes	.049	.033	2.231	1	.135	1.051	.985	1.121
Constant	.598	.039	238.536	1	.000	1.819		

5. Multiple Logistic Regression Analysis on Chronic Disease and Oral Health according to Diabetes

In the results of performing multiple logistic regression analysis on the chronic disease according to diabetes, the hypertension, arthritis, depression were

shown as influencing factor ($p < 0.001$) [Table 5]. In the results of performing multiple logistic regression analysis on the oral health according to diabetes, subjective oral health level, mastication inconvenience, not receiving annual dental examination, toothbrushing after breakfast, lunch and dinner, toothbrushing before sleep, etc. were shown as the influencing factor ($p < 0.001$) [Table 6].

Table 6. Multiple Logistic Regression Analysis on Oral Health according to Diabetes

	B	S.E.	Wald	df	Significance level	Exp(B)	95% C.I of EXP(B)	
							Lower Limit	Upper Limit
Subjective Oral Health level (ref: Good)			46.497	2	.000			
Fair	-.033	.039	.704	1	.401	.968	.897	1.045
Poor	.178	.041	18.515	1	.000	1.195	1.102	1.296
Mastication Inconvenience(ref: Not inconvenient)			35.397	2	.000			
Inconvenient	.197	.033	35.215	1	.000	1.217	1.141	1.299
Fair	.075	.039	3.660	1	.056	1.078	.998	1.164
Toothbrushing after breakfast (ref: Yes) No	-.151	.043	12.524	1	.000	.860	.790	.935
Toothbrushing after lunch (ref: Yes) No	.164	.027	37.571	1	.000	1.178	1.118	1.242
Toothbrushing after dinner (ref: Yes) No	.134	.030	19.832	1	.000	1.144	1.078	1.213
Toothbrushing before sleep (ref: Yes) No	.208	.027	61.545	1	.000	1.232	1.169	1.298
Constant	1.866	.037	2521.457	1	.000	6.466		

Conclusion

This study analyzed the 2015, 2016 and 2017 local community health survey results of 458,301 persons having 45 years or more to verify the oral care needs of the patients with diabetes and to provide the basic data required for development of related products through the trend analysis on the relation between the chronic disease and the oral health according to the diabetes treatment. In the analysis results, in case of having diabetes, it was shown that the hypertension, arthritis, depression etc. were significantly high out of the chronic disease and the subjective health level was also poor ($p < 0.001$). In the oral health, in case of having diabetes, as the subjective oral health level was poor such as subjective periodontal tissue health level was poor and the mastication was inconvenient and the subjective oral health level was poor, it was observed that there is problem in oral health case. In the degree of oral health practice, it was shown that the people do not receive the annual oral examination well and particularly, the toothbrushing, which is the basic for oral health care, is not performed well when mastication is inconvenient, after the dinner and before sleep ($p < 0.001$). In conclusion, for the patient with diabetes, diverse measures for the management of complications of the chronic disease and oral health care should be prepared at national level for the systematic oral health care.

Ethical Clearance: Not required

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The Effects of Dialectical Behavior Therapy(DBT) Skill Training on Depression and Alcohol Abstinence Self-efficacy of Patients with Alcohol Use Disorder

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Abstract

Background/Objectives: This study is an experimental study to investigate the effect of Dialectical Behavior Therapy (DBT) skills training on depression and abstinence self-efficacy of people with alcohol use disorder.

Methods/Statistical analysis: The study was conducted on patients with alcohol use disorder diagnosed in one mental health department hospital, and 10 subjects were included in the control group receiving medication and 10 subjects were in the experimental group receiving additional dialectical behavior therapy skills training. Data collection was conducted from July 17, 2017 to September 4, 2017, once a week for a total of 8 sessions. The collected data were analyzed by Mann-Whitney U test, Friedman and repeated measure ANOVA.

Findings: The results showed that there was a significant effect on the viewpoint and interaction of the experimental group and the control group on depression, and the abstinence self-efficacy showed a significant difference in the pre-post-follow up period.

Improvements/Applications: It is expected that this program will continue to be used in education for the treatment and rehabilitation of patients with alcohol use disorders.

Keywords: Alcohol, Abstinent, self-efficacy, Alcohol Use disorder, Depression, Dialectical Behavioral Therapy(DBT)

Introduction

According to the results of the mental illness survey by the Ministry of Health and Welfare in 2016, the annual prevalence of alcohol use disorder was estimated to be 3.5% (1.39 million) of the 18-64 year old population, followed by anxiety disorder (5.9%), and the lifetime prevalence was 12.2%, which was the highest among mental disorders^[1]. In addition, alcohol use disorder has a high recurrence rate, with more than half recurrence within 1 year after treatment and show highest recurrence

risk within the first 3 months after discharge^[2].

Depression is a common emotional condition in people with alcohol use disorder, especially in that it induces negative patterns of communication and causes negative emotions and behaviors to manifest dysfunctional interactions with family members^[3]. Depression promotes recurrence of people with alcohol use disorder^[4-5], and promotes irritability, sleep disturbances, loss of appetite, and indigestion, all of which lead to ineffective symptoms in general life, which diminishes the quality of life^[6].¹

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Since alcohol is a central nervous system inhibitor, it increases the mood at first, but higher intake leads to

higher depression, and depression increases even after sobering up^[7].

Abstinence self-efficacy acts as an important psychological factor in maintaining abstinence and recovery^[8]. When faced with internal and external high risk situations related to drinking, those with high self-efficacy tend to actively abstain with strong belief in skills and abilities that they can overcome themselves, but those with low self-efficacy is more likely to give up or avoid work with focus in his or her inability in the same situation^[9-10]. In the intervention program related to abstinence, the study of depression as a variable^[11-13] and the study of abstinence self-efficacy as a variable^[13-14] have already proved effective in many studies in Korea. However, while dialectical behavior therapy skills training has been intervening in a variety of subjects outside the country, it has not seen the light in Korea. Dialectical Behavior Therapy skills training has been shown to be beneficial to people who are experiencing problems with substance use, anger control, depression, and anxiety as well as emotional problems such as an urgent response to intense emotions^[15].

Dialectical behavior therapy reduces the avoidance behavior by stopping the evaluation or judgment of oneself replacing the meaning of true life with material through the mindfulness technique and having an attitude accepting unpleasant and painful experiences as it is^[16]. It also improves the ability to continuously pursue goals through Mindfulness and improves behavioral outcomes such as automatic drinking habits^[17].

The purpose of this study was to determine whether dialectical behavior therapy skills training is effective in depression, which is an important variable in the prevention of recurrence and recovery of people with alcohol use disorders and to examine whether there is a change in abstinence self-efficacy^[18], which is an important psychological factor in improving the quality of life^[3] of people with alcohol use disorders. Research problems to achieve this objective are as follows.

Method

Research design

This study is an experimental study to investigate the effect of Dialectical Behavior Therapy (DBT) skills training on depression and abstinence self-efficacy of people with alcohol use disorder.

Research subject

This study was conducted on adult patients who were diagnosed with alcohol use disorder according to DSM-IV or DSM-5 criteria and were admitted to hospital in one mental health medicine hospital. 2 patients who had been absent for more than 2 times, and 3 patients who were discharged during the program were excluded from the study, and then 10 control subjects and 10 experimental subjects were selected as final subjects.

Research tool

Beck Depression Inventory: BDI

For the degree of depression, the Beck^[19] depression index (BDI) was used. A total of 21 items were composed of 3 sub-factors including negative attitude, difficulty in performance, and difficulty in physical condition.

Alcohol Abstinence Self-efficacy Scale: AASE)

For abstinence self-efficacy, abstinence self-efficacy scale^[20] was used. The 4 sub-domains were negative emotions, social pressure, physical pain, withdrawal and craving, consisting of 20 items, with 5 items in each domain.

Research process

Dialectical behavior therapy skills training in this study was reconstructed based on the dialectical behavior therapy guide of Linehan^[21], and the dialectical behavior therapy guide by Marra^[15].

The dialectical behavior therapy skills training process of this study was conducted for a total of 8 sessions once a week for 120 minutes each time, and after 4 weeks after the program termination, post examination was performed.

Data analysis method

To verify the effectiveness of the program, the data obtained from the pre- and post-test were analyzed using SPSS 23.0 program as follows. The collected data were analyzed by Mann-Whitney U test, Friedman and repeated measure ANOVA.

Result

1. Verification of homogeneity between experimental group and control group

[Table 1] There was no significant difference

between the two groups as a result of verifying differences between groups.

Table 1. Homogeneity test Between Experimental Group and Control Group

Variable	Group	M	SD	z
Depression	Exp.	24.00	5.08	-.23
	Cont.	24.00	6.62	
Alcohol Abstinence Self-Efficacy	Exp.	44.00	8.54	-.46
	Cont.	44.60	9.56	

2. Differences in pre-post-follow up tests of depression and abstinence efficacy

[Table 2] Participants in the experimental group showed that the negative attitude ($\chi^2 = 6.4, p < .05$) and difficulty in physical condition ($\chi^2 = 7.2, p < .05$), which are subordinate factors of depression, were significantly lower in the post-test and follow-up test scores than in the pre-test scores.

[Table 2] In the sub-scales of abstinence self-efficacy, the scores of post and follow-up test were significantly higher than pre-test scores in all sub-factors such as withdrawal and drinking impulse ($\chi^2 = 15.3, p < .001$), bodily and other anxiety ($\chi^2 = 11.2, p < .01$), negative emotions ($\chi^2 = 12.8, p < .01$), and social pressure ($\chi^2 = 7.4, p < .05$), showing significant difference between the tests.

Table 2. Comparing Pre-Post-Follow up test Scores of the Depression and Alcohol Abstinence Self-efficacy

Variable	Groups	Pre-test		Post-test		Follow up-test		df	χ^2
		M	SD	M	SD	M	SD		
Depression (1= Negative attitude, 2= Difficulty in performing, 3= Difficulty in physical condition, 4=Total)									
1	Exp.	12.50	2.76	6.60	2.88	7.10	3.03	2	6.38*
	Cont.	12.00	3.01	12.50	3.21	12.30	2.75	2	0.75
2	Exp.	6.50	2.51	4.3	2.0	4.6	1.6	2	4.90
	Cont.	7.60	2.516	7.50	1.72	7.60	1.96	2	0.54
3	Exp.	4.70	1.95	3.30	1.16	3.40	1.27	2	7.19*
	Cont.	4.50	2.07	4.70	2.26	4.50	2.07	2	2.00
4	Exp.	24.00	5.08	14.20	4.47	15.10	4.63	2	2.92
	Cont.	24.00	6.62	24.60	6.45	24.50	6.31	2	3.06
Alcohol Abstinence Self-Efficacy (1= Withdrawal and drinking impulse, 2= Body and the other anxiety, 3= Negative emotion, 4= Social pressure, 5=Total)									

Cont...

1	Exp.	11.40	151	14.40	2.17	13.80	2.15	2	1526***
	Cont	11.70	250	12.20	2.10	12.10	2.33	2	2.40
2	Exp.	11.70	353	14.60	3.17	14.0	2.94	2	11.17**
	Cont	11.10	281	11.40	2.84	11.40	2.95	2	1.00
3	Exp.	9.70	283	14.80	2.57	15.10	2.51	2	12.77**
	Cont.	10.40	363	10.50	3.69	10.50	3.66	2	0.33
4	Exp.	11.20	286	13.50	2.88	13.30	2.83	2	7.40*
	Cont.	11.40	360	11.40	3.06	11.20	3.46	2	1.00
5	Exp.	44.00	854	57.30	8.37	56.20	8.24	2	15.16**
	Cont	44.6	956	45.50	9.11	45.20	9.61	2	1.87

3. Changes in pre-post-follow up tests of depression and abstinence self-efficacy

[Table 3] Shows changes in pre-post-follow up tests of group depression and abstinence self-efficacy. Depression showed a significant difference between the two groups in the pre-post-follow up tests scores between the two groups ($F = 7.12, p < .001$), and there was significant difference according to time ($F=82.05, p < .001$). Abstinence self-efficacy by group did not show a significant difference between the two groups in pre-post-follow up tests, and there were significant differences according to time ($F=86.74, p < .001$).

Table 3. Repeated measures ANOVA of Depression and Alcohol Abstinence Self-Efficacy

Variable	Source	Type III Sum of Squares	degree of freedom	Mean Squares	F
1	Group	653.40	1	653.40	7.12*
	Time	176.40	1	176.40	82.05***
	Time*Group	220.90	1	220.90	102.74***
2	Group	821.40	1	821.40	3.55
	Time	409.60	1	409.60	86.74***
	Time*Group	336.40	1	336.40	71.24***

1=Depression, 2= Alcohol Abstinence Self-Efficacy

Discussion

This study examined the effects of dialectical behavior therapy skills training on depression and abstinence self-efficacy of people with alcohol use disorder and examined whether the effects persisted after program termination.

First, the experimental group participating in the dialectical behavior therapy skills training showed a significant decrease in the negative attitude and the physical difficulty among sub-factors of depression after the program, and similar level was maintained in the follow-up test. This is a significant result that dialectical behavior therapy skills training affects depression in the experimental group and continues to be effective. These results are consistent with previous studies on middle school students with depression tendencies^[22], elderly depression patients^[23], and inpatient female patients^[24], showing that dialectical behavior therapy skills training is a useful means of intervention for people with alcohol use disorder. In the results of the pre-post-follow-up test scores of the depression between the experimental group and the control group, the experimental group showed a significant effect on the group interaction according to time in all the sub-factors, but no significant change was observed in the control group. This means that dialectical behavior therapy skills training affects the depression of the experimental group and the effect is sustained. In addition, results of this study was supported by the results of a study on middle school students with depression tendencies^[22] and a previous study on elderly depression patients^[23].

Depression is a negative emotion commonly experienced by people with alcohol use disorders, which is uncomfortable and overwhelmingly prone to cause thought and action in suicide, requiring thorough management. The technique of imagination takes advantage of the power of the mind to produce a positive emotion, which is a simple way to visualize a relaxed scene in great detail^[25], and the contents of the program seemed to reduce the depression of the experimental group as a result of re-supplying the power to accommodate the strong and overwhelming emotional distress, causing the participants of the experimental group to experience physical and psychological relaxation.

Second, the experimental group participating in dialectical behavior therapy skills training showed a significant increase in all sub-factors in the pre-post-follow up tests of abstinence self-efficacy after the

program, and the score was also maintained in the follow-up test. In addition, through the change of the pre-post-follow up tests, the experimental group improved in all the sub-factors during the program implementation and remained until the follow-up examination period, while the control group remained almost unchanged. This is a result demonstrating that dialectical behavior therapy skills training is effective in promoting abstinence self-efficacy of people with alcohol use disorder. The result of the study is supported by a study of a 2-year clinical trial of patients with borderline personality disorder, the group that performed DBT reported that the number of days of substance use was significantly reduced, and that some have stopped using substances^[26], and a DBT program study on patients with methamphetamine abuse where abstinence was maintained in the 6-month and 1-year follow-up results^[27].

Based on these results and effects, the significance and implications of this study are as follows. For the first time in Korea, the study applied dialectical behavior therapy skills training to people with alcohol use disorder and the results showed that depression decreased and abstinence self-efficacy showed a significant change, thus providing a framework for self-regulation of abstinence and recovery of people with alcohol use disorders. In addition, the significance can be seen in that, based on the results of this study, there is potential to apply dialectical behavior therapy training at the hospital or in the community.

Conclusion

There are limitations of this study and suggestions for follow-up studies. The subjects who participated in this study were a few people with alcohol use disorder who were admitted to a single mental health medicine hospital, and there is a limit to the environmental and sociological characteristics of the subjects, making it difficult to generalize them to people with alcohol use disorder. In future studies, there is a need to study people with alcohol use disorders according to various demographic and sociological characteristics. In addition, it is proposed to study various effects of dialectical behavior therapy skills training by adding various variables such as anxiety, depression and abstinence self-efficacy.

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Conflict of Interest: Nil

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The Effect of Parenting Attitudes and Major Satisfaction on Career Decision Making Self-Efficacy in undergraduate Students

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Abstract

Background/Objectives: The purpose of this study was to examine the effect of parental attitude and major satisfaction on the career decision making self-efficacy.

Methods/Statistical analysis: The subjects were students from N university. The instruments were used structured questionnaires for major satisfaction, parental attitude, and career decision making self-efficacy. Data were analyzed using descriptive statistics, and hierarchical regression.

Findings: The mean scores of career decision making self-efficacy, major satisfaction were 2.82 ± 0.43 , 3.03 ± 0.52 points respectively. As a results of regression analysis, age and major satisfaction were statistically significant factors. Of the variables added in Model 3, only the achievement oriented was a significant factor affecting career decision making efficacy.

Improvements/Applications: Based on the results of this study, achievement-oriented parenting attitudes are needed at home to enhance career decision-making self-efficacy of college students, and career counseling should be done considering major satisfaction.

Keywords: *Career decision making self-efficacy, Parenting attitude, Major satisfaction, undergraduate students*

Introduction

Many people are highly interested in job position which is very prospective in future society. However, it is still unclear that which occupation will be more promising job due to drastic technology development, change of industrial system, and aging phenomenon. As society become more complex and uncertainty of job career increase, adolescents are susceptible to getting high stress to decide proper occupation^[1]. Especially, majority of Korean students have little time to search their aptitudes or decide their future career path during adolescence because of education system, which is mainly focused on university entrance exam and excessive burden of educational stress. Major selection without adequate consideration makes students hard to

adapt well in the university life. Searching and selecting various careers is one of the most important tasks among the college students^[2]. Undergraduate students finally decide their own career path through considerate preparation with searching about their abilities, personal interests, characteristics, and values. Through this process, they can encounter many psychological and social difficulties; insecurity future, employment anxiety, pressure for success. College students are struggling to deal with such problems by getting useful advices from their parent, teachers, and mentors^[3]. In recent years, there have been many successful cases that college students deal with career problems by easily getting useful information using online media such as internet. In practice, college students much prefer to collect information about prospective and high-income jobs using various online networks than getting advices from their alumni or professors. Besides, they can share job information by forming relationship in social networks to manage career problems in case

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they couldn't get adequate help from online searching. Various factors; career attitude maturity, career decision making, career adaptability, career preparation skills are actively studied between researchers^[4], and these factors have close correlation with job satisfactory, life satisfactory, and subjective stability^[5].

Family is the smallest unit of society which human first encounter and form one's own lifestyle and life values. Children are strongly effected from their caregivers, and the effects are not just confined to childhood but remain until adulthood^[6]. Moreover, parenting attitudes perceived by children have strong influence on achievement goals, self-esteem, self-efficacy, self-control, materialism values^[6,7]. Additionally, active interaction with parents have effects on emotional, cognitive, and social development of children and is a factor to experience socialization and develop personal skills^[8]. As Basow & Howe claimed^[9], parents have the most powerful impacts on their children for career decision and their main responsibility is that help children to make proper career decision and regard oneself as a competent and prospective person. Adolescents who were employed in jobs that do not match their majors were reported to have lower wages^[10], have lower job satisfaction^[11] and higher turnover rates^[12].

Thus, this study has conducted to provide basic materials for program development which assist career decision and improvements of college students.

Method

The subjects were 122 students from N university. Career Decision-Making Self-Efficacy Scale-Short Form(CDMSES-SF)^[13] was used as the questionnaires. This tool was translated into Korean by Lee and Lee^[14]. The higher the score, the higher the career decision-making self-efficacy. Parenting attitude is the instrument developed by Oh & Lee^[15]. This tool is divided into four areas of affection-hostility, autonomy-control, achievement-non achievement, rationality and irrationality. Each item has a five-point Likert

scale, which means that the higher the score, the more affectionate, autonomous, accomplished, and reasonable.

For the major satisfaction, 12 items of 5 points Likert scale were used, including 5 items of curriculum satisfaction and 7 items of general satisfaction among 34 items developed by Ha^[16]. Data were analyzed using descriptive statistics, Pearson's correlation and hierarchical regression by SPSS 23. To begin the study, All students completed the informed consent form and agreed to participate prior to administering the study. Participants also received information on this study including research aims, potential risks, and benefits of this study.

Result

1. General characteristics of the subjects

The sample data consisted of 122 students, 33 males (26.8%), and 90 females (73.2%). The mean age of the subjects was 21.8 years. Of the 122 students, 28 students (22.8%) were freshmen; 59 (48.0%) were sophomores, 18 (14.6%) were juniors and 18 (14.6%) were seniors. Parents were mostly concerned about their children's employment and 74 parents (60.1%) were very interested in getting a job. Career decision making self-efficacy was significant difference between the two groups in terms of the major of the subjects

2. Descriptive statistics and correlations

Descriptive statistics for main variables are shown in Table 2. The mean scores of career decision making self-efficacy, major satisfaction were 2.82 ± 0.43 , 3.03 ± 0.52 point, respectively. The average scores of affection orientation, autonomy orientation, achievement orientation, and rational orientation in the subscale of parental attitude were 2.96 ± 0.46 , 2.73 ± 0.30 , 2.96 ± 0.39 , 2.95 ± 0.49 , respectively. Career decision making self-efficacy was significantly positively related to major satisfaction ($r = .626$, $p < .001$), affection-oriented ($r = .240$, $p = .008$), and achievement-oriented ($r = .472$, $p < .001$).

Table 1. General Characteristics and Difference by Career Decision-making Self-efficacy

Variables	Categories	N	%	Mean	SD	t/F (p)
Age(yr)	Mean(SD)/Range	21.8(1.68) /20-28				
Gender	Male	33	26.8	2.83	.53	0.142 (.888)
	Female	90	73.2	2.81	.39	
Grade	1st	28	22.8	2.71	.51	0.927 (.451)
	2nd	59	48.0	2.84	.39	
	3rd	18	14.6	2.82	.40	
	4th	18	14.6	2.94	.46	
ssReligion	Don't have	71	57.5	2.89	.39	1.981 (.050)
	Have	52	42.3	2.73	.46	
Interest of children's employment	Very little interested	13	10.6	2.82	.49	0.478 (.621)
	Commonly	36	29.3	2.76	.41	
	Very interested	74	60.1	2.85	.44	
Major	Non health related	65	52.8	2.69	.45	-3.176 (.002)
	health related	58	47.2	2.94	.39	

Table 2. Descriptive Statistics

Variables	Mean ± SD	Min	Max	Range
Career decision making self-efficacy	2.82±.43	1.6	3.84	1-4
Major satisfaction	3.03±.52	1.7	4	1-4
Parental Attitude				
Affection oriented	2.96±.46	1.9	3.7	1-4
Autonomy oriented	2.73±.30	2.0	3.5	1-4
Achievement oriented	2.96±.39	2.0	3.8	1-4
Rational oriented	2.95±.49	2.7	3.9	1-4

Table 3: Correlations

	Career decision making self-efficacy	Major satisfaction	Affection oriented	Autonomy oriented	Achievement oriented
Major satisfaction	.626 (.000)**	1			
Affection oriented	.240 (.008)*	.144 (.114)	1		

Cont ... Table 3: Correlations

Autonomy oriented	.321 (.000)**	.307 (.001)*	.327 (.000)**	1	
Achievement oriented	.472 (.000)**	.445 (.000)**	.642 (.000)**	.464 (.000)**	1
Rational oriented	.273 (.002)*	.310 (.001)*	.693 (.000)**	.448 (.000)**	.566 (.000)**

3. Factors influencing the burnout of the nurses

The hierarchical regression analysis was conducted to examine the factors affecting career decision making self-efficacy (see Table 4). The analysis was used to control the effects of personal characteristics and major satisfaction, subdomain of parental attitude. Model 1 included age and major. Model 2 added major satisfaction to Model 1, and Model 3 added 4 subdomain of parental attitude to Model 2. Multicollinearity was found to be acceptable through tolerances and VIF.

Model 1 was statistically significant in age and major. In Model 2, major satisfaction and age were found to be factors significantly associated with career decision making self-efficacy. Of the variables added in Model 3, only the achievement oriented was a significant factor affecting career decision making efficacy. Age and major satisfaction were also statistically significant factors affecting career decision making self-efficacy. The adjusted explanatory power was 79.0% and increased by 2.7% over Model 2.

Table 4: Factors affecting career decision making self-efficacy

Variables	Model 1		Model 2		Model 3	
	B	t	B	t	B	t
(constant)		.983		.300		-.141
Age	.301	3.477*	.181	2.448*	.156	2.129*
Major (non-health =0)	.365	4.218**	.135	1.703	.122	1.564
Major satisfaction			.557	7.225**	.460	5.545**
Affection oriented					-.052	-.414
Autonomy oriented					.058	.715
Achievement oriented					.264	2.233*
Rational oriented					-.039	-.394
R ² (Δ R ²)	.179(.156)		.426(.411)		.471(.438)	
F (F Sig.)	12.065(.000)		28.931(.000)		14.358(.000)	

**p<.001, *p<.05

Discussion

Recently, the occupational groups have become more complex and diversified, and undergraduate students have been worried about their career after graduation. Parenting attitudes play a decisive role in the cognitive, emotional and behavioral development of children^[17]. and parents have the greatest influence on their career decisions^[18]. Also, the university students work to develop competencies to establish their careers,

and to grow as capable professionals.

The results of this study are summarized as follows.

First, there was a significant correlation between major satisfaction and career decision-making self-efficacy, and affective, autonomous, achievement-oriented, and rational-oriented attitudes among sub-variables of parenting attitude had a significant positive correlation with career decision-making self-efficacy.

In a previous study of middle school students[19], the parental attitudes perceived by the children, the more affectionate, autonomous, achievement, and rational oriented, the higher the children's self-efficacy and also, the higher the career maturity. Therefore, parental affectionate, autonomous, achievement-oriented and rational-oriented parenting attitude is considered to have a positive result in choosing and deciding the career of the child.

Second, among general characteristics, age and major characteristics were factors of career decision-making self-efficacy in model 1, and age was also a significant factor in models 2 and 3. The effect of age is believed to have contributed to confidence in career decision-making due to a great deal of interest and effort as we grow older. Additionally, major satisfaction is considered to be more important in career decision-making than major characteristics. Satisfaction in one's major increases self-efficacy in career decision-making, which is also linked to future job adjustment.

Third, in the hierarchical regression analysis, major satisfaction was the most important factor affecting career decision self-efficacy. Career decision making self-efficacy increased with increasing major satisfaction. This was similar to the research of Lee and Kim^[20], whose major satisfaction had a significant relationship with career decision efficacy^[21].

When job matching coincides with the major, job satisfaction is high and turnover intention is lowered^[22]. Therefore, career education or counseling of university should be focused on students who are not satisfied with their major. The findings of this study suggest that universities need to provide programs to support career exploration and career decision-making for students who are not satisfied with their majors.

Fourth, only achievement-oriented parenting attitude influenced career decision-making self-efficacy. Many career education researchers have reported the effects of parenting attitudes on career decisions^[18,23]. Father's achievement-oriented parenting attitude influenced the career attitude maturity of elementary school children^[23]. The current study also suggest that parents' achievement-oriented attitudes may influence how children choose and decide on their careers. Parents' achievement-centered attitudes seems to have led them to design their career plans more systematically and concretely with confidence in their careers.

If adolescences have a career that suits their aptitude through their career plans, they will be well-adapted to work and have high job satisfaction. Parents need to have a nurturing attitude that emphasizes the preparation for self-realization and the competence of the social needs. Additionally, as the degree of autonomy of parents was related to career decision-making, the more they supported autonomy, the more positive the adolescents were in the tasks necessary for career decision-making^[24]. In this study, there was a positive correlation between career decision-making self-efficacy and autonomous orientation, but it was not an influence factor. By the way, according to Kim et al, father and mother's autonomous parenting attitude was an influencing factor undergraduate students' career calling positively^[25]. Ivengar and Lepper^[26] say that in Western cultures, the positive effects of autonomous parenting attitudes are emphasized, whereas in Asian cultures, the consequences of controlled parenting attitudes are not negative. Sovet and Metz^[27] pointed out that the influence of autonomy on parenting attitudes could vary according to culture and Korean adolescents showed a positive relationship with their parents' strict and controlled behaviors and career decision-making self-efficacy. Therefore, further studies are needed because the sub-variables of rearing attitude are limited in explaining the effect on career decision-making self-efficacy.

In conclusion, in order to enhance the career decision-making self-efficacy, it is necessary to confirm the satisfaction with the major and to provide career counseling for students with low major satisfaction. In addition, Parents need to support their children to have the competencies required by future jobs.

Conclusion

This study was attempted to identify the factors that affect the career decision making self-efficacy of undergraduate students. The main results of this study are as follows. Career decision making self-efficacy was significant difference between the two groups in terms of the major of the subjects. Hierarchical regression analysis showed that of the variables added in Model 3, only the achievement oriented was a significant factor affecting career decision making efficacy. Age and major satisfaction were also statistically significant factors affecting career decision making self-efficacy. Based on the results of this study, achievement-oriented parenting attitudes are needed at home to enhance career

decision-making self-efficacy of college students, and career counseling should be done considering major satisfaction.

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Conflict of Interest: Nil

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Changes in Chemical Structure of Iopamidol Contrast Agents According to Radiation and Environmental Conditions

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Abstract

Background: To prevent contrast agent's side effects, it is important to provide accurate information about the contrast agent and fulfill the duty of explaining the medication, experience of side effects, and medical history. However, the incidence of safety accidents associated with contrast agents is continuously increasing. Therefore, the objective of this study was to prepare an improvement plan for problems derived by analyzing changes in chemical structure of contrast medium according to radiation and external environment.

Method: The chemical structure of the standard sample was analyzed using Nuclear Magnetic Resonance Spectroscopy (NMR) in P contrast agent of Iopamidol preparations used in Korean medical institutions. Samples were obtained by irradiation under 3Gy and 5Gy conditions according to the Photon 10MV, Electron 20MeV condition and the radiation dose according to the radiation and environmental conditions. Contrast agent samples after opening and sealed but expired samples were also obtained. These samples were analyzed and chemical shift values in the ¹H-NMR spectrum using NMR analysis were compared.

Findings: ¹H-NMR analysis results of P contrast medium irradiated with Photon 10MV and 5Gy and sealed but expired P contrast medium samples showed no change in chemical shift. However, there were changes in chemical shift value in P standard sample, showing triple peaks in 1.1-1.2ppm range. In addition, the sample irradiated by Electron 20MeV and 3Gy showed double peaks. The sample irradiated by Electron 20MeV and 3Gy condition showed a single peak in the 3.0-3.5ppm region, demonstrating a change in chemical shift value. In the 1.0-1.4ppm region, P contrast medium standard samples showed triple peaks and opened contrast medium samples showed double peaks in the middle peak among the triplet, demonstrating changes in chemical shift value.

Improvements: Changes in chemical structure of contrast agent were observed in contrast medium after electron irradiation and in contrast medium after opening. In this regard, guidelines for the administration of contrast medium should be prepared as soon as possible so that consumers could have accurate information and their right of choice.

Keywords: Contrast Agent, Iopamidol, Chemical Structure, Radiation, NMR, Chemical Shift

Introduction

X-ray was discovered by a German physicist, Professor Roentgen, in 1895. It has revolutionized medical imaging. Internal structures of the human body can be revealed depending on relative densities of

adjacent tissues. By energy absorbing or transmitting X-rays, medical image could be convert into a black and white ratio. However, for some biological tissues, it is difficult to use X-ray absorption to distinguish between absorption and the neighboring tissue. In the case of barium sulfate and vascular and biliary. To overcome this problem, in the early days, clinical application of iodinated benzoate was started by filling the tube or body cavity with a substance of sufficient density for X-ray absorption^[1-2].

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The iodinated material not only provides contours of the invisible tissue in traditional X-rays, but also provides physiological data as it penetrates into the tissue where disease is expected and exits through blood vessels. In addition, various iodide microparticles have been developed to show the outline of the reticular endothelial tissue in a very limited range. Such substances were developed in the early 19th century to nicely complement the existing X-ray technology^[3-4].

Contrast agent technology has advanced dramatically since then. The development of non-ionic contrast agents has removed charges, reduced osmotic pressure, and reduced overall toxicity tremendously^[5].

With these remarkable advances in CT, MRI, and ultrasound, the clinical application of contrast agents has completely changed the existing concept, enabling the clarification of difference in density of adjacent tissues that could not be distinguished by X-rays in the past. Most importantly, new possibilities for tissue growth have been developed. By changing the magnetic moment or reaction state of the tissue, it plays an important role in magnetic resonance and ultrasound imaging. Expression of target tissues by this concept and selective enhancement have provided the basis for more exciting developments in the evolution of contrast agents^[6].

However, the occurrence of safety accidents ranging from mild side effects such as rash after injection of contrast agent to death in serious cases due to increase in contrast agent use continues to increase. Recently, harm cases of contrast agents received by the Consumer Injury Surveillance System (CISS) have been steadily received and side effects related to contrast agents have increased more than eight times over five years from 1,688 cases in 2009 to 14,572 cases in 2014. In order to prevent contrast agent's side effects, it is important to provide accurate information about the contrast agent drug and fulfill the duty of explaining the medication, experience of side effects, and medical history^[7-8].

Thus, the objective of this study was to grasp safety status of contrast agents used by hospitals and prepare improvement measures for problems derived by analyzing chemical structure changes according to the change of external environment. Results of this study will help us secure consumer safety.

Method

The most useful method for determining the

structure of matter is the study of spectroscopy. Among many spectroscopy methods known to date, the best is the NMR spectroscopy method which can analyze even a small amount of sample. This method has recently been extended to all fields dealing with materials, not only in the structure of chemicals, but also in fields of metabonomics for quantitative analysis, drug development, and drug design. P contrast agents of Iopamidol formulations were also analyzed using NMR to identify chemical structural changes.

1. Research Materials

The water-soluble iodine contrast agent has a basic structure of tri-iodinated benzene, in which three iodine atoms are bonded to positions 2, 4, and 6 of the benzene ring^[9-10].

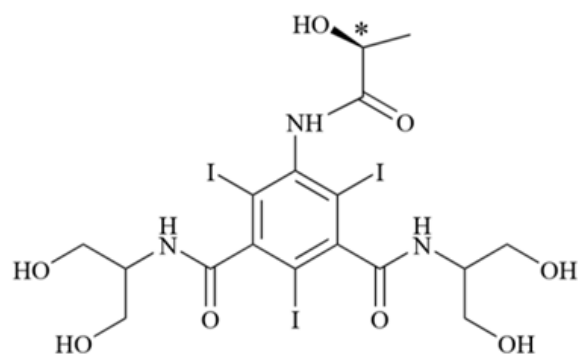
Since tri-iodinated benzene itself is not soluble in water, water-soluble iodine contrast agent is made by combining substituents with side chains (R1, R2, R3) corresponding to positions other than iodine bonds to provide water solubility^[11-12]. Therefore, the difference between various iodine contrast agent is the difference in the structure of the substitution material. By changing this structure, the water-soluble iodine contrast agent is improved^[13].

Non-ionic monomers that are widely used at present have many (5-6EA) -OH bonds on three side chains, including a carboxyl group. Hydroxyl groups have a very high affinity for water, making the entire compound water-soluble. Since non-ionic monomers are not ions, dissociation does not occur in aqueous solution or blood. They exist in one molecule. Therefore, low osmotic pressure can greatly reduce the risk of side effects. In addition, the number of iodine in non-ionic monomeric contrast medium determines the contrast of radiographic images^[14-16].

Non-ionic monomer contrast agents currently used by hospitals mainly have six types: Iopamidol, Iopromide, Iohexol, Iobitridol, Ioversol, Iomeprol [Table 1]. Among which, P contrast agent of Iopamidol formulation accounts for more than 60% of the Korean medical market. P contrast agent features Iopamidol formulation with the lowest viscosity among the first contrast agents developed in Korea. It has a molecular formula of $C_{17}H_{22}I_3N_3O_8$ [Figure 1]. As an additive, a mixture of tromethamine, sodium calcium edetate, hydrochloric acid, and water for injection shows effect for peripheral vein and cerebral artery angiography^[17].

Table 1. Types of Non-ionic Monomer Contrast Agent

Formulation	Product Name
Iopamidol	Iopmiro, Pamiray
Iopromide	Ultravist
Iohexol	Omnipaque, Omnipure, Iobrix, iMAX, Hexosure, Ashexol, Bonorex, Everay
Iobitridol	Xenetix
Ioversol	Optiray, Tomoray
Iomeprol	Imeron



IOPAMIDOL

Figure 1. Chemical Structure of P Contrast Agent (Iopamidol)

2. Experiment Equipment

NMR spectra enable structural analysis of compounds based on locations of resonance peaks. For most organic compounds, analysis with ^1H and ^{13}C is commonly used. The principle of NMR can usually be described in three steps: 1) alignment of magnetic nuclear rotation in the applied constant magnetic field; 2) perturbation caused by the oscillating magnetic field in which the alignment of the nuclear spindle is weak, which is generally called high frequency pulse; and 3) the NMR signal is detected after RF or pulse with the voltage that is induced in the detection coil by preceding surrounding nuclear spin.

The distribution of electrons in the molecule changes the resonance frequency. Thus, even the same kind of nucleus might have different NMR resonance frequencies. In NMR, instead of directly indicating the

resonance frequency, the difference from the resonance frequency of the reference material is converted into a chemical shift and displayed. In addition, spectral peaks can be cracked through spin-spin coupling with other nuclei with the same molecular spin.

In ^1H -NMR, the resonance signal is recorded by how much it is shifted from resonance signals of 12 equivalent hydrogens among TMS (Tetra Methyl Silane). In ^{13}C -NMR spectrum, the resonance signal is recorded by how far it is from resonance signals of four equivalent carbons among TMS. The position of the resonance peak is called a chemical shift expressed as δ in ppm (part per million) (Equation 1).

$$\delta = \frac{\nu_{\text{sample}} - \nu_{\text{reference}}}{\nu_{\text{reference}}} \times 10^6 \quad (\text{Equation 1})$$

The chemical shift value of ^1H appears over the range of 0-10ppm. ^{13}C chemical shift value is distributed over the range of 0-220ppm, wider than ^1H [18].

3. Research Methods

This study aims to understand changes in safety and environment of the contrast medium for P contrast agent which has the highest share among the 6 non-ionic monomer contrast agents used in Korean hospitals by analyzing its chemical composition using NMR in accordance with changes of radiation dose, radiation energy, and time.

First, NMR was used to accurately identify the chemical structure of the standard sample of P contrast medium. Next, the P contrast agent stimulated by a change in radiation energy, dose, or time under the following conditions was collected:

- (1) Radiation energy: Photon 10MV, Electron 20MeV;
- (2) Radiation dose: 3Gy, 5Gy;
- (3) Changes in time were analyzed for sealed and expired P contrast media;
- (4) External exposure: analysis after opening.

The structure of the material was derived from data of chemical structure analysis using NMR. Elements of material structure were estimated and analyzed by using chemical shift values.

Result

1. $^1\text{H-NMR}$ analysis of standard samples of P contrast agent

Analysis of the standard sample of P contrast agent was well shown in the $^1\text{H-NMR}$ spectrum. Broad peaks appeared in the 8.968ppm region of the $^1\text{H-NMR}$ spectrum. Double lines appeared around 4.5ppm. Single lines appear in 4.159ppm and 3.849ppm regions. The triplet that appeared around 3.6ppm was tromethamine. The doublet that appeared around 1.5ppm and the triplet that appeared around 1.2ppm were impurities. The highest peak in the 4.8ppm region was predicted to be water[Figure 2].

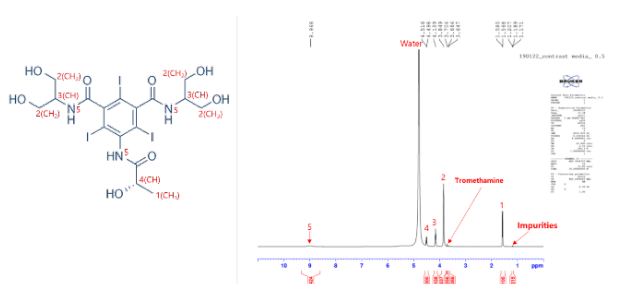


Figure 2. $^1\text{H-NMR}$ analysis of standard samples of P contrast agent

2. $^1\text{H-NMR}$ comparison analysis of specimens irradiated with standard P contrast agent and photon 10MV at 5Gy

According to $^1\text{H-NMR}$ analysis, the standard sample of P contrast medium and the P contrast medium irradiated by photon 10MV and 5Gy showed no change in chemical shift.

3. $^1\text{H-NMR}$ comparison analysis of specimens irradiated with standard P contrast agent and electron beam 20MeV at 3Gy

Analysis of $^1\text{H-NMR}$ analysis for the reference sample of P contrast medium and P contrast medium irradiated by electron 20MeV at 5Gy showed that the P reference sample had peaks in triplet at 1.1-1.2ppm region, but had double line peaks in the condition of electron beam energy 20MeV and dose 3Gy, demonstrating a change in chemical shift value[Figure 3]. In the 3.0-3.5ppm region, the P standard sample did not show a peak. However, it showed a single line peak in the condition of electron beam energy of 20MeV at 3Gy, providing evidence that the chemical shift value was changed[Figure 4].

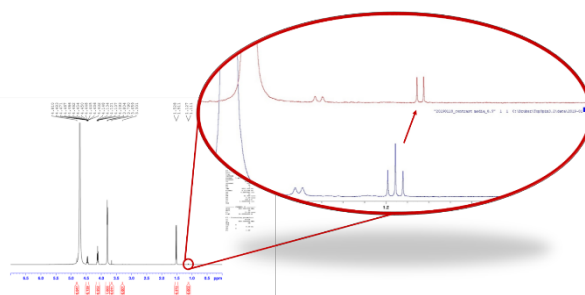


Figure 3. $^1\text{H-NMR}$ comparison analysis of specimens irradiated with standard P contrast agent and electron beam 20MeV at 3Gy (1.1-1.2ppm area)

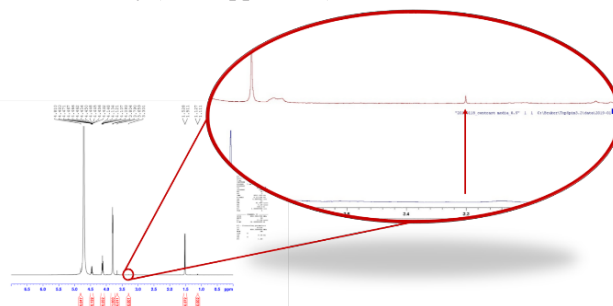


Figure 4. $^1\text{H-NMR}$ comparison analysis of specimens irradiated with standard P contrast agent and electron beam 20MeV at 3Gy (3.0-3.5ppm Area)

4. $^1\text{H-NMR}$ comparison analysis of standard P contrast agent and after fixed period of time sealed P contrast agent

$^1\text{H-NMR}$ analysis of the standard sample of P contrast agent and the sealed but expired P contrast agent showed no change in chemical shift value.

5. $^1\text{H-NMR}$ comparison analysis of P contrast agent standard samples and after opening

According to $^1\text{H-NMR}$ analysis of P standard sample and opened P contrast medium sample, the P standard sample clearly showed triple peaks in the 1.0-1.4ppm region. The opened contrast medium sample showed double peaks in the middle among the triplet, demonstrating changes in chemical shift value[Figure 5].

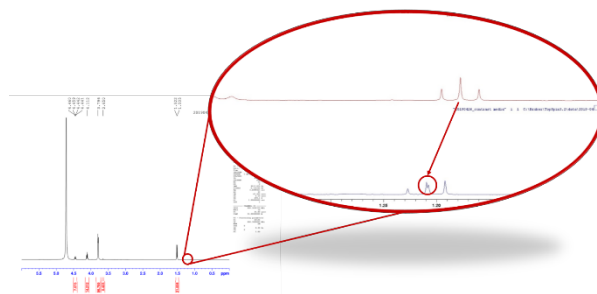


Figure 5. $^1\text{H-NMR}$ comparison analysis of P contrast agent standard samples and after opening

Conclusion

In this study, chemical structure change was analyzed by NMR for P contrast agent of Iopamidol preparation among non-ionic monomer contrast agents according to changes in radiation dose, radiation energy, and time. As a result, ¹H-NMR analysis of P contrast medium irradiated with photon 10MV at 5Gy and sealed but expired P contrast medium showed no change in chemical shift. However, there was a change in chemical shift value in contrast agent after irradiated electron beam and in opened contrast agent sample. In this regard, government guidelines for the administration of contrast medium should be prepared as soon as possible. Accurate information on the contrast agent should be provided to consumers for their right of choice.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Factors affecting the Post-Anesthetic Recovery Score and Length of Stay in the Recovery Room in Elderly Patients with Hypertension

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Abstract

Background/Objectives: As the elderly experience a decline in physical and mental function, their memory decreases, their dependence increases, and their adaptability is reduced, resulting in a reduction in their ability to adapt to surgical operations. To improve the elderly patients' resilience to surgery and anesthesia, it is necessary to identify factors that affected them.

Methods/Statistical analysis: The subjects of this study were 104 elderly patients with hypertension, who underwent elective surgery under general anesthesia, understood the purpose of this study, and voluntarily agreed to participate in the study. In this study, data on the general characteristics of patients, disease-related factors, and related postoperative factors were collected. Data collected were analyzed using IBM SPSS 25.0 program. The significance level was set to .05.

Findings: The factors significantly affecting the post-anesthetic recovery score included education level, experience of surgical operation, anesthesia length, operative site, GCS, body temperature, and cerebrovascular complications, and their explanatory power was 68.9% ($p < .001$). The factors significantly affecting the length of stay in the recovery room included the frequency of surgical operations, cardiac disease, operative site, pain, body temperature, airway obstruction, and the amount of bleeding, and their explanatory power was 54.9% ($p < .001$).

Improvements/Applications: To increase the post-anesthetic recovery score and reduce the length of stay in the recovery room in elderly surgical patients, it is necessary to identify the influencing factors and provide appropriate interventions. We suggest that further studies be conducted in the future to investigate factors related to surgical operations and anesthesia in the elderly.

Keywords: Hypertension, Elderly, Post-anesthetic recovery, Length of stay, psychotic factors

Introduction

In South Korea, the elderly population aged 65 or over was approximately 7.4 million in 2018, accounting for 14.3% of the total population of 51 million^[1]. In 2016, South Korea's life expectancy was 82.36 years old; however, its healthy life expectancy was 64.9 years old, and the duration of disease or injury in individuals is approximately 17 years^[2].

Of the elderly in South Korea, 98.5% have one or more chronic diseases, and 73.0% are patients with multi morbidity, that is, they have two or more chronic diseases. To control disease, the elderly constantly make use of medical institutions, of which 77.4% of the elderly have used health centers in the past one month, and the average number of their visits to medical institutions was 2.4 times^[3]. In addition, out of the total 491,926 operations in 2015 in South Korea, 346,811 were performed on elderly patients aged 65 or older, accounting for 70.5%^[4]. However, the perioperative mortality rate for elderly patients is 3-5 times higher than for non-elderly patients, and much attention is,

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thus, required from anesthesia induction to recovery in elderly patients^[5].

The prevalence of hypertension, which is the most prevalent among chronic diseases, is over 60.0% in individuals over the age of 65, and it increases with age, causes various diseases, and worsens symptoms^[6].

In particular, the risk of surgical operation for the elderly with hypertension increases, and such patients may often face difficulty in recovering from anesthesia^[7,8]. Therefore, surgical operations and anesthesia for elderly patients with hypertension require a careful approach, considering related influencing factors.

The post-anesthesia recovery score is used to assess the extent of recovery of patients in the recovery room, and provides reasonable information in determining discharge from the recovery room by assessing reflexes, breathing, consciousness, circulation, and skin color in patients^[9]. As elderly patients have a high prevalence of various diseases, more attention is needed for appropriate recovery management and post-anesthetic recovery management in the recovery room.

The recovery room is a place where postoperative intensive care takes place, and it has the greatest impact on patients' recovery, and is also the place where nursing care for maintaining the patients' respiratory functions, cardiopulmonary functions, and electrolyte levels is provided^[10].

The length of stay in the recovery room reflects a patient's condition, and an extended length of stay in this room indicates that a patient's recovery is poor^[11]. Therefore, a lot of effort has been made to reduce the length of stay in the recovery room. The results of previous studies have shown that factors affecting the length of stay in the recovery room among elderly patients included age, number of diseases, albumin level, chills, pain, arrhythmia amount of bleeding, cardiovascular side effects, hypertension, delirium, and anesthetic drugs^[11-12]. Regarding nursing care for elderly patients in the recovery room, there is a need for ongoing attention and techniques for effective nursing interventions that take into account the patients' physical and psychological factors.

This study attempted to determine the factors affecting the post-anesthetic recovery score and length of stay in the recovery room in elderly patients with

hypertension.

Method

The subjects of this study were 104 elderly patients with hypertension, who underwent elective surgery under general anesthesia, understood the purpose of this study, and voluntarily agreed to participate in the study.

Data collection was conducted at a university hospital from January 2, 2016 for 6 months using face-to-face questions, which were asked 10 minutes prior to the beginning of surgery after individual patients had entered the operating room area, patient charts, anesthesia records, recovery room records, and direct recording in the instruments of observations in the operating and recovery rooms

The general characteristics of the subjects included gender, age, marital status, education level, drinking status, smoking status, the experience and frequency of surgical operations, the presence or absence of past general anesthesia, and body mass index (BMI).

Disease-related factors included lung disease, thyroid disease, kidney disease, metabolic disease, cardiac disease, diabetes, cerebral disease, cancer, depression, arrhythmia, osteoporosis, dementia, and ASA class.

Postoperative factors included pain, Glasgow Coma Scale (GCS), body temperature, shivering, cardiovascular, pulmonary, and cerebrovascular complications, delirium, endotracheal extubation, airway obstruction, amount of bleeding, nausea and vomiting, the post-anesthetic recovery score, length of stay in the recovery room.

Data collected were analyzed using IBM SPSS 25.0 program:t-test or ANOVA, Scheffe test, Pearson's correlation coefficients, Stepwise multiple regression analysis.

Results

1. Differences in the post-anesthetic recovery score and length of stay in the recovery room according to the general characteristics of the subjects

As shown Table 1, among the subjects, 44 (42.3%) were female, the number of those aged 65-70 years old was 56 (53.8%), and the number of those living with

their spouse was 56 (53.8%). In terms of education level, 44 (42.3%) were elementary school graduates or below, and middle school graduates. There were 68 (65.4%) non-drinkers and 88 (84.6%) non-smokers. The number of those who had experienced surgical operations was 84 (80.8%), the number of those undergoing one operation was 56 (53.8%), and the number of those with experience of general anesthesia was 80 (76.9%). The number of

those with a BMI of 22.9kg/m² was high at 52 (50.0%).

The post-anesthetic recovery score differed according to age, education level, drinking and smoking status, the experience and frequency of surgical operations, and BMI $p < .05$. The length of stay in the recovery room differed according to education level, the experience of surgical operations, and the frequency of operation $p < .05$.

Table 1. Differences in the post-anesthetic recovery score and length of stay in the recovery room according to general characteristics(n=104)

Factors	Classification	n (%)	Post-anesthetic recovery score		Length of stay in the recovery room	
			M(SD)	X ² (p)/Scheffe	M(SD)	X ² (p)/Scheffe
Gender	Male	40(57.7)	2.20(0.65)	1.75 (.082)	67.33(17.74)	-1.84 (.068)
	Female	44(42.3)	2.0(0.43)		78.18(40.65)	
Age	65-70	56(53.8)	2.28(0.59)	3.39 (.001)	68.57(17.31)	-1.23 (.220)
	≥71	48(46.2)	1.91(0.49)		75.83(39.88)	
Marital status	With spouse	56(53.8)	2.07(0.70)	-0.83 (.406)	68.21(17.22)	-1.36 (.174)
	Others	48(46.2)	2.16(0.37)		76.25(39.84)	
Education	≤Elementary ^a	44(42.3)	1.90(0.52)	5.23 (.007)	61.81(12.80)	8.97 ($<.001$) a,c<b
	Middle ^b	44(42.3)	2.27(0.62)		85.45(40.48)	
	≥High ^c	16(15.4)	2.25(0.44)		62.50(8.56)	
Drinking	Yes	36(34.6)	2.44(0.50)	-4.60 ($<.001$)	71.11(20.39)	0.20 (.842)
	No	68(65.4)	1.94(0.54)		72.35(34.12)	
Smoking	Yes	16(15.4)	2.50(0.51)	-2.99 (.003)	78.75(12.84)	-0.99 (.325)
	No	88(84.6)	2.04(0.56)		70.68(32.03)	
Experience of surgical operation	Yes	84(80.8)	2.0(0.53)	4.53 ($<.001$)	74.76(32.46)	-2.0 (.047)
	No	20(19.2)	2.60(0.50)		60.0(9.17)	
Frequency of operation	1 ^a	56(53.8)	2.35(0.61)	14.05 ($<.001$) a>b,c	66.42(18.82)	4.29 (.016)
	2 ^b	36(34.6)	1.88(0.31)		83.33(43.29)	
	≥3 ^c	12(11.5)	1.66(0.49)		63.33(4.92)	
Experience of general anesthesia	Yes	80(76.9)	1.95(0.50)	6.20 ($<.001$)	73.0(32.27)	-0.66 (.506)
	No	24(23.1)	2.66(0.48)		68.33(20.78)	
Body Mass Index (kg/m ²)	≤22.9 ^a	52(50.0)	2.0(0.56)	3.59 (.031) a<b	76.15(39.71)	1.25 (.290)
	23-24.9 ^b	20(19.2)	2.4(0.82)		64.0(15.35)	
	≥25 ^c	31(29.8)	2.12(0.34)		72.03(30.10)	

2. Differences in the post-anesthetic recovery score and length of stay in the recovery room according to disease-related factors

As shown Table 2, in terms of disease-related characteristics, there were 16 subjects (15.4%) with kidney disease, 16 (15.4%) with metabolic disease, 16 (15.4%) with cardiac disease, 28 (26.9%) with diabetes, 24 (23.1%) with cancer, and 28 (26.9%) with dementia.

The post-anesthetic recovery score differed according to the presence or absence of cerebral disease and dementia ($p < .05$). The length of stay in the recovery room differed according to the presence or absence of kidney disease, cardiac disease, and arrhythmia ($p < .05$).

3. Factors affecting the post-anesthetic recovery score and length of stay in the recovery room

As shown Table 3, the factors significantly affecting the post-anesthetic recovery score included education level, experience of surgical operation, anesthesia length, operative site, GCS, body temperature, and cerebrovascular complications, and their explanatory power was 68.9% ($F = 13.55, p < .001$).

The factors significantly affecting the length of stay in the recovery room included education level, kidney disease, metabolic disease, diabetes, depression, operative site, cerebrovascular complication, delirium, and airway obstruction, and their explanatory power was 84.4% ($F = 44.01, p < .001$).

Table 2. Differences of the post-anesthetic recovery score and length of stay in the recovery room according to disease-related factors (n=104)

Factors	Classification	n (%)/ M(SD)	Post-anesthetic recovery score		Length of stay in the recovery room	
			M(SD)	F/t(p) Scheffe	M(SD)	F/t(p) Scheffe
Lung disease	Yes	4(3.8)	2.0(0.01)	0.40 (.687)	70.0(0.01)	0.13 (.897)
	No	100(96.2)	2.12(0.59)		72.0(30.58)	
Thyroid disease	Yes	4(3.8)	2.0(0.01)	0.40 (.687)	55.0(0.01)	1.15 (.252)
	No	100(96.2)	2.12(0.59)		72.60(30.38)	
Kidney disease	Yes	16(15.4)	2.0(0.01)	0.86 (.389)	102.50(58.13)	-4.90 ($<.001$)
	No	88(84.6)	2.13(0.62)		66.36(16.69)	
Metabolic disease	Yes	16(15.4)	2.0(0.73)	0.86 (.389)	63.75(6.70)	1.18 (.238)
	No	88(84.6)	2.13(0.55)		73.40(32.28)	
Cardiac disease	Yes	16(15.4)	2.0(0.01)	0.86 (.389)	106.25(56.02)	-5.68 ($<.001$)
	No	88(84.6)	2.13(0.62)		65.68(16.35)	
Diabetes	Yes	28(26.9)	2.14(0.35)	-0.29 (.771)	67.14(8.96)	0.98 (.326)
	No	76(73.1)	2.10(0.64)		73.68(34.55)	
Cerebral disease	Yes	8(7.7)	1.5(0.53)	3.26 (.001)	70.0(0.01)	0.18 (.851)
	No	96(92.3)	2.16(0.55)		72.08(31.21)	
ASA class	1a	8(7.7)	2.0(0.01)	2.47 (.090)	62.50(13.36)	1.27 (.285)
	2b	48(46.2)	2.25(0.60)		68.75(20.22)	
	3c	48(46.2)	2.0(0.58)		76.66(38.55)	
Cancer	Yes	24(23.1)	2.16(0.38)	-0.49 (.624)	79.16(16.78)	-1.35 (.178)
	No	80(76.9)	2.1(0.62)		69.75(32.70)	
Depression	Yes	4(3.8)	2.0(0.01)	0.40 (.687)	55.0(0.01)	1.15 (.252)
	No	100(96.2)	2.12(0.59)		72.60(30.38)	

Cont... Table 2. Differences of the post-anesthetic recovery score and length of stay in the recovery room according to disease-related factors (n=104)

Arrhythmia	Yes	16(15.4)	2.25(0.44)	-1.01	102.5(58.59)	-4.90
	No	88(84.6)	2.06(0.59)	(.315)	66.36(16.41)	(<.001)
Osteoporosis	Yes	4(3.8)	2.0(0.01)	0.40	90.0(0.01)	-1.23
	No	100(96.2)	2.12(0.59)	(.687)	71.2(30.36)	(.221)
Dementia	Yes	28(26.9)	1.85(0.65)	2.85	62.85(8.96)	1.89
	No	76(73.1)	2.21(0.52)	(.005)	75.26(34.11)	(.061)

Table 3. Factors affecting the post-anesthetic recovery score and length of stay in the recovery room

	Variables		B	SE	β	t	p	
Post-anesthetic recovery score	General characteristics	Education	-.229	.076	-.281	-3.01	.003	
		Experience of surgical operation	-.669	.298	-.456	-2.24	.027	
	Pre and Intra-operative factors	Anesthesia length	-.189	.049	-.417	-3.89	<.001	
		Operative site	.081	.026	.315	3.13	.002	
	Post-operative factors	Glasgow coma scale	.767	.184	.653	4.17	<.001	
		Body temperature	.369	.100	.443	3.67	<.001	
		Cerebrovascular complication	.605	.149	.515	4.07	<.001	
	R ² = .689, F=13.55, p<.001, Durbin Watson=2.59, Tolerance: .120-.444, Variance Inflation Factor: 2.25-8.35							
	Length of stay in the recovery room	General characteristics	Frequency of surgical operation	8.466	4.095	.195	2.06	.042
Disease-related factors		Cardiac disease	58.362	10.164	.706	5.74	.000	
Pre and Intra-operative factors		Operative site	7.926	1.431	.603	5.53	.000	
Post-operative factors		Pain	-23.080	5.391	-.540	-4.28	.000	
		Body temperature	17.970	5.011	.419	3.58	.001	
		Airway obstruction	26.360	11.195	.430	2.35	.021	
		Amount of bleeding	12.437	5.243	.230	2.37	.020	
R ² = .549 F=9.35, p<.001, Durbin Watson=1.91, Tolerance: .132-.616, Variance Inflation Factor: 1.76-7.60								

Discussion

There were differences in the post-anesthetic recovery score depending on age, education level, drinking and smoking status, the experience and frequency of surgical operations, and BMI among the general characteristics of the subjects. In particular, drinking, smoking, and BMI, which are risk factors for hypertension, had similar effects with the results of this study involving elderly patients with hypertension.

There was a difference in the anesthesia recovery score depending on cerebrovascular disease and dementia among disease-related factors. The post-anesthetic recovery score was lower in those with cerebrovascular disease than in those without this disease, and was lower in those with dementia than in those without dementia. There was a difference in the length of stay in the recovery room depending on the presence or absence of kidney disease, cardiac disease, and arrhythmia, and the length of stay in the recovery room was longer in those with diseases than in those without any disease, which is consistent with the results of a previous study^[13] regarding the length of stay in the recovery room according to the past history of disease in elderly patients. Therefore, these results could confirm that the elderly patients with hypertension also suffer from other chronic diseases.

The results of the multiple regression analysis to determine the factors affecting the post-anesthetic recovery score and length of stay in the recovery room revealed that GCS is the most influential factor in the post-anesthetic score, cardiac disease for the length of stay in the recovery room. In the case of general anesthesia, its main target of action is the central nervous system, and neurologic assessments such as GCS are, thus, needed for patients during awakening from anesthesia^[14]. As neurological injury can affect recovery from anesthesia, related careful nursing care is needed^[15].

According to the results of a study by Kim et al.^[16], cardiac disease was a factor significantly affecting the length of stay in the recovery room, and its impact was greater in elderly patients with chronic diseases such as hypertension. In the case of the increasing elderly surgical patients, the severity of the operation is high and the patients' resilience is often reduced. Therefore, adequate nursing care for elderly patients in the recovery room is, thus, important in reducing complications and mortality^[16-18]. Adequate post-anesthesia care for elderly patients is required, accordingly.

Conclusion

This study was conducted to investigate the factors affecting the post-anesthetic recovery score and length of stay in the recovery room. The results of this study established that the post-anesthetic recovery score was higher in those with higher GCS scores, the length of stay in the recovery room was longer in those with cardiac disease.

To increase the post-anesthetic recovery score and reduce the length of stay in the recovery room in elderly surgical patients, it is necessary to identify the influencing factors and provide appropriate interventions. We suggest that further studies be conducted in the future to investigate factors related to surgical operations and anesthesia in the elderly.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Influencing Factors on Happiness of Nurses in General Hospitals

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Abstract

Background/Objectives: This study was conducted to verify the effects of quality of life and stress on the happiness of nurses in general hospitals.

Methods/Statistical analysis: The participants were 173 general hospital nurses. Data were collected from November 1 to 15, 2018, and analyzed using SPSS 25.0 program. The significance level was set at .05.

Findings: The results showed a significant difference in happiness ($p < .05$) depending on the general characteristics of age, marital status, number of beds of the hospital, number of nurses of the hospital, job satisfaction level, colleague relationship satisfaction level, employment status, and subjective health. Further, stress and happiness displayed a significant negative correlation ($r = -.27, p < .001$). Job satisfaction level and subjective health were identified as significant influencing factors on happiness.

Improvements/Applications: The implementation of a happiness promotion program that considers the influencing factors is needed to promote the happiness of nurses in general hospitals.

Keywords: Nurse, Happiness, Stress, Quality of life, Influencing factors

Introduction

Every human being seeks happiness. Although people now live in an era of material prosperity, their interest in the pursuit of a happy life is only growing. Happiness is defined by subjective emotions toward and evaluation of one's overall life^[1]. In positive psychology, it is defined as a fun, actively engaging, and meaningful life^[2]. The Republic of Korea (hereafter, Korea) ranks among the lowest, at 29th, among 35 member countries of the Organization for Economic Cooperation and Development in terms of the Happiness Index; other indices, such as environmental quality, health condition, and social connections, are evaluated to be low as well^[3].

Measuring the Happiness Index of nurses at the nursing site in general hospitals is important. As happiness reduces stress and is a factor with a positive

effect on one's environment, happiness at the workplace is critical^[1]. Most importantly, nursing involves the provision of a sense of reliability and stability to patients and emotional interaction with

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them, so nurses' happiness is directly related to the happiness of patients^[4]. Although nursing is a stable profession that supports people in need and contributes to society, working as a nurse in a clinical environment is considered a difficult job. Therefore, in reality, many nurses in general hospitals prefer other clinical workplaces with better working conditions^[5].

Nurses in general hospitals tend to experience decreasing quality of life deriving from an irregular life style owing to shift work; they undergo much stress. Meanwhile, happiness and joy at the workplace are emphasized as factors that lower the intention of leaving the job for nurses^[6]. If nurses in general hospitals can lead a happy work life, their stress in the work

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environment can be reduced, which, in turn, will allow them to perform their duty, ultimately improving the quality of nursing.

Studies have been conducted on happiness in clinical nurses. Kim^[7] reported that self-respect and work engagement show a positive correlation, whereas depression shows a negative correlation. Nam et al.^[8] showed that higher sense of calling and autonomy and a lower degree of turnover relate to happiness. In Ju et al.^[4], a positive correlation was found with the nursing work environment and a negative correlation with emotional labor. Park^[9] identified a negative correlation with stress and physical symptoms. The happiness of nurses has mostly been associated with variables linked to the nursing work environment. Despite the fact that happiness is an important component for improving quality of life^[10], studies on the relation between happiness and quality of life are few, as are those on the relation between stress and happiness.

In this context, this study aimed to verify the effects of quality of life and stress on the happiness of nurses in general hospitals and to identify relevant factors for their happiness. It is expected that the results can provide useful base data for the promotion of happiness in nurses in general hospitals and clinical environments.

Method

This descriptive correlative study was conducted to verify the effects of quality of life and stress on the happiness of nurses.

The participants of this study were 173 nurses who understood the purpose of the study and voluntarily gave consent to participate in the study. The number of participants was estimated using G*Power ver. 3.1.9.2. Based on a multiple regressive analysis with medium effect size .15, significance level .05, statistical power .95, and 10 variables, the required minimum sample size was 172 nurses.

For the measurement of happiness, the Subjective Happiness Scale developed by Lyubomirsky and Lepper^[11] was used. The tool consists of four questions based on a seven-point Likert scale; higher points indicate greater subjective happiness. Cronbach's α was .78 in this study.

For the measurement of stress, the simplified work stress measurement tool developed by Jang et al.^[12] was

used. The tool consists of 24 questions in total based on a four-point Likert scale; higher points indicate higher work stress. Cronbach's α at the time the tool was developed was .79 and was .80 in this study.

For the measurement of quality of life, the official Korean version of the Professional Quality of Life Scale: Compassion Satisfaction and Fatigue Version 5, developed by Stamm^[13], was used. The tool has 30 questions based on a five-point Likert scale, with 10 items under empathy and satisfaction in a positive section and 20 items under empathy and fatigue in a negative section. Higher points indicate higher empathy and satisfaction, and vice versa. Cronbach's α was .75–.88 at the time the tool was developed, and was .70–.88 in this study.

The survey was conducted from November 1 to 15, 2018. The study purpose, process, participant anonymity, and confidentiality were explained to the participants. The research team pledged to the participants that the collected data would be used only for the study purposes of the study and that they could be withdrawn at any point without any consequence to the participants.

The collected data were analyzed using IBM SPSS 25.0. The analysis proceeded as follows:

- 1) The general characteristics of participants were analyzed based on frequency, percentage, average, and standard deviation.
- 2) Differences in the level of happiness in accordance with the general characteristics were analyzed through a t-test or ANOVA, and a post hoc analysis was conducted by a Scheffe's test.
- 3) Correlations between happiness, stress, and quality of life were studied using Pearson's correlation coefficients.
- 4) A hierarchical multiple regression analysis was conducted on the factors influencing participants' happiness.

Results

1. Differences in happiness according to the general characteristics of participants

As shown in Table 1, the participants were, on average, 31.18 years old, female, and single. In terms of religion, 123 participants (71.1%) were non-religious,

accounting for the highest number. The number of beds of the hospitals where they work was 37.16 on average, with most under 30. The number of nurses of the hospitals where they work was 13.39 on average, with most between 10 and 18. The duration of clinical experience was 87.39 months on average. A total of 103 participants (59.5%) had no experience of turnover, accounting for the highest number. The highest number of responses in terms of work satisfaction was “average,” “satisfactory” for colleague satisfaction, and “average” for subjective health (94 people, 54.3%).

The difference in the level of happiness in relation to age indicated that participants aged 40 years or older had the highest happiness index, and more so when married than when single. Further, the happiness index was higher for the participants working in a hospital with a lower number of beds and nurses, and with higher work and colleague satisfaction. In addition, participants who perceived their health condition to be subjectively healthy showed a higher happiness index ($p < .05$). No significant difference was found in other characteristics.

2. Correlation of happiness, stress, and quality of life

Table 1: General Characteristics and Differences in Happiness According to the General Characteristics of Participants (n = 173)

Characteristics	Categories	n(%)	M(SD)	Happiness	
				M±SD	t/F(p)/Scheffe’s
Age (years)	≤ 29	86(49.7)	31.18(7.53)	17.04(6.54)	6.87(.001)
	30–39	50(28.9)		18.63(3.49)	
	≥ 40	37(21.4)		19.36(3.12)	
Sex	Male	16(9.2)		18.43(3.63)	0.53(.593)
	Female	157(90.8)		17.93(3.55)	
Marital status	Married	57(32.9)		19.25(3.27)	-3.31(.001)
	Others	116(67.1)		17.37(3.54)	
Religion	No	123(71.1)		17.66(3.49)	-1.80(.073)
	Yes	50(28.9)		18.74(3.63)	
Number of beds	≤ 30	90(52.0)	37.16(23.96)	18.60(3.39)	3.27(.040)
	31–58	46(26.6)		17.58(3.93)	
	≥ 59	37(21.4)		16.94(3.19)	

As shown in Table 2, happiness had a significant negative correlation with stress ($r = -.27, p < .001$).

3. Influencing factors of happiness

To verify the explanatory power of influencing factors on happiness, happiness was set as a dependent variable, whereas the variables that showed difference among the general characteristics, such as age, marital status, number of beds and nurses, work satisfaction, colleague satisfaction, work pattern, and subjective health, were set as the primary independent variables. Quality of life and stress were set as the secondary independent variables to conduct a multiple regression analysis. The results of validation of the regressive formula showed that the Durbin–Watson statistic level was 1.86, indicating no issue in auto-correlation. The tolerance limits were .509–.951 and .505–.950, all above 0.1. The levels of variance inflation factors were 1.052–1.965 and 1.053–1.982, all at 10 or below, indicating no issue in multicollinearity.

As shown in Table 3, work satisfaction and subjective

Cont... Table 1: General Characteristics and Differences in Happiness According to the General Characteristics of Participants (n = 173)

Number of nurses	≤ 9	21(12.1)	13.39(5.95)	19.04(2.67)	3.18(.044)
	10–18	102(59.0)		17.42(3.50)	
	≥ 19	50(28.9)		18.67(3.83)	
Clinical experience (months)	≤ 24	45(26.0)	87.39(80.29)	17.15(2.78)	2.33(.076)
	25–60	49(28.3)		18.06(4.10)	
	61–120	31(17.9)		17.51(3.90)	
	≥ 121	48(27.7)		19.0(3.21)	
Turnover experience	No	103(59.5)		17.84(3.43)	-0.62(.535)
	Yes	70(40.5)		18.19(3.75)	
Work satisfaction	Satisfied	67(38.7)		19.46(2.96)	12.28(<.001)
	Average	84(48.6)		17.31(3.39)	
	Dissatisfied	229(12.7)		15.90(4.20)	
Colleague satisfaction	Satisfied	107(61.8)		18.63(3.28)	5.13(.007)
	Average	58(33.5)		16.82(3.81)	
	Dissatisfied	8(4.6)		17.37(3.46)	
Work pattern	3-shift	92(53.2)		17.31(3.87)	3.32(.021)
	2-shift	20(11.6)		18.75(3.65)	
	Full time	34(19.70)		19.42(2.64)	
	Others	27(15.6)		17.92(2.75)	
Subjective health	Good	38(22.0)		19.92(3.05)	11.20(<.001)
	Average	94(54.3)		17.90(3.45)	
	Poor	41(23.7)		16.32(3.42)	

Table 2. Correlations of Variables

(n = 173)

Variables	Happiness r(p)	Stress r(p)	Quality of life r(p)
Happiness	1		
Stress	-.27(<.001)	1	
Quality of life	-.01(.843)	.09(.207)	1

health were significant influencing factors in the primary analysis, with an explanatory power of 23.8% (F = 9.15, p <.001). In the second analysis, subjective health was found to be a significant influencing factor, with an explanatory power of 24.6% (F = 7.55, p <.001).

Table 3: Influencing Factors of Happiness (n = 173)

Variables		B	SE	β	t	p
1	Work satisfaction	-0.795	.329	-.169	-2.41	.016
	Subjective health status	-1.148	.337	-.215	-3.40	.001
Adj.R ² = .238, F(p) = 9.15(<.001)						
2	Subjective health status	-1.038	.346	-.194	-3.9	.003
Adj.R ² = .246, F(p) = 7.55(<.001)						

Discussion

This study was conducted to investigate the effects of stress and quality of life on the happiness of nurses. In terms of the general characteristics of the participants, the happiness index was the highest among those aged 40 years or above, and married were happier than unmarried participants. These findings support earlier reports on nurses stating that job satisfaction level as a nurse^[14] and happiness index^[4] are higher as nurses grow older. These also support the fact that nurses tend to find greater happiness in their 40s than in their 20s by helping others^[15]. In terms of employment status, full-time workers had a higher happiness index compared with two- and three-shift workers. This result supports the result of preceding studies^[4,8] that full-time workers are more satisfied than part-time workers and that nurses are less satisfied with their job owing to stress from a three-shift routine. These results show the need for the development of a full-time employment system and environmental support for nurses to accumulate long-term clinical experience, ultimately to promote happiness in nurses.

In this study, the happiness index was high in participants working at hospitals with a higher number of beds and those with higher work satisfaction and higher colleague satisfaction. In addition, we found a statistically significant negative correlation between happiness and stress. Therefore, the reasons for the high happiness index in the abovementioned participants can be understood from this study and previous research results^[10,16] that showed a negative correlation between work stress and happiness. Moreover, a previous study^[4] showed that an increase in happiness occurs when nurses perceive their work environment in a positive way. In other words, if the number of beds, work satisfaction,

and colleague satisfaction are high, the nurse recognizes the working environment as positive and experiences a decrease in stress, which leads to greater happiness.

In this study, work satisfaction and subjective health accounted for 23.8% of happiness. Work satisfaction is an influencing factor according to previous studies that showed that happiness increases when a nurse perceives their work environment positively^[4] and that a high level of autonomy, which affects work satisfaction, promotes happiness^[8]. Considering the earlier results^[17] that the happiness of people working in nursing colleges is affected by organizational factors, such as professional advancement, job characteristics, work environment, and welfare, rather than personal factors, happiness is particularly important for the nursing profession. Therefore, work satisfaction through improving the work environment needs to be considered as a priority in promoting the happiness of nurses.

In this study, the happiness index was high among those who perceived themselves to be subjectively healthy; subjective health alone accounted for 24.6% of happiness. This result supports a previous finding^[18] that awareness of health has a statistically significant positive correlation with happiness. Therefore, improvement in subjective health is highly important in promoting the happiness of nurses.

Conclusion

This study was conducted to verify the effects of quality of life and stress factors on the happiness of nurses in general hospitals and thereby provide basic data for the development of a detailed interventional program designed to promote the happiness of general hospital nurses.

Happiness is the ultimate goal of every human being; all strive to lead a happier life. Happiness is also characterized by its contagious nature, where one human being's happiness is spread to others. The happiness of nurses can trigger positive emotions in patients and can be effective in the treatment of the latter. Therefore, there is a need to invest much effort in promoting the happiness of nurses.

This work recommends a follow up study on various influencing factors on the happiness of nurses. We also suggest the development and application of a happiness promotion program to which such factors are applied.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Cancer Screening Findings in Korean People with Disabilities: 2016-2017

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Abstract

Background/Objectives: Cancer screening programs are effective in the early detection of several cancers. This study aimed to identify the findings of cancer screenings that were conducted in 2016 and 2017.

Methods/Statistical analysis: Sample were obtained from the National Health Insurance Service, and the cancer screening findings among both people with disabilities and those without were compared. Gastric, breast, colon, liver, and cervical cancer were analyze the findings of the screening programs. The findings were categorized as benign, suspicious of malignancy, or other categories (depending on type of cancer). Descriptive statistics and the X2-test were used to analyze the findings among the groups.

Findings: The findings were as follows: For gastric cancer screenings, 0.30% in 2016 and 0.35% in 2017 of those screened who had brain injury were found to have gastric cancer, whereas 0.16% in 2016 and 0.15% in 2017 of those screened who were non-disabled where found to have gastric cancer ($p<.001$). For breast cancer screenings, 0.90% in 2016 and 0.54% in 2017 of those screened who had brain injury had findings that were suspicious of malignancy. For colon cancer screenings, 4.48% in 2016 of those screened who had brain injury were found to have colon cancer, whereas 3.70% in 2016 of those who were non-disabled were found to have colon cancer ($p<.001$). For liver cancer screenings, people with brain injury had the most findings that were suspicious of liver cancer in 2016 ($p<.001$), whereas people with physical impairment had the most findings that were suspicious of liver cancer in 2017 ($p<.001$). The non-disabled group had the highest incidence of carcinoma in situ among groups in 2016 ($p<.001$) and 2017 ($p<.001$).

Improvements/Applications: Rigorous cancer screening programs should be implemented and expanded to include brain injury and physical impairment disabilities for the early detection of gastric, breast, colon, and liver cancer.

Keywords: Disability, Cancer, Screening, Brain injury, Physical impairment

Introduction

Cancer is a major health problem in Korea. Though the incidence and mortality rate of cancer are growing, the 5-year relative survival rate for cancer patients has improved in Korea. For example, in 2016, the cancer incidence rate was 269.0 per 100,000 individuals, but

the 5-year relative survival rate for patients with cancer increased from 41.2% (1993-1995) to 70.6% (2012-2016) [1]. Cancer screening programs may contribute to early detection and the improvement in the 5-year survival rate for cancer patients [2,3].²

In Korea, the National Health Insurance Service's screening programs focus on five types of cancer: gastric, breast, colon, liver, and cervical cancer. Gastric and breast cancer screenings are applied to people over 40 years old, colon cancer in people over 50, cervical

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cancer in women over 30, and liver cancer in people over 40 [4]. The frequency of screenings are every 2 years for gastric, breast, and cervical cancer, and once every year for colon and liver cancer [4]. Disabilities is one of venerable state in terms of healthcare. The World Health Organization’s “Global Disability Action Plan 2014-2021” states that “Disability is a global public health issue because people with disability, throughout the life course, face widespread barriers in accessing health and related services, such as rehabilitation, and have worse health outcomes than people without disability” (P.1) [5]. Increases in the number of people with disabilities are related to increases in chronic conditions such as cancer [5]. However, due to physical and socio-cultural limitations, many people with disabilities face barriers to regular access to health services [6,7]. For example, women with disabilities encounter barriers in accessing transportation, buildings, rooms, assistance, equipment, and procedures when seeking cervical cancer (pap smear and human papillomavirus testing) and breast cancer screening (mammography) [8,9].

Cancer incidence rates, survival rates, prevalence, and mortality are annually reported by the Korean government [2,10], but there is limited information regarding studies for comparing the findings of cancer screening among people with different types of disabilities and people with no disabilities. The purpose of this study was to compare the findings of five types of cancer (gastric, breast, colon, liver, and cervical cancer) screenings among both people with and without disabilities in 2016 and 2017.

Method

The study sample was obtained from 2016 and 2017 data from the National Health Insurance Service (NHIS).

In this study, 14,479,357 screenings conducted in 2016 (42,470 in those with brain injury, 448,775 in those with physical impairment, 730,712 in those with any form of disability, and 13,257,400 in those who were non-disabled) and 14,721,500 screenings conducted in 2017 (41,792 in those with brain injury, 440,912 in those with physical impairment, 731,063 in those with any form of disability, and 13,507,733 in those who were non-disabled) were analyzed.

Cancer screenings are available through the National Health Insurance Service for five types of cancers: gastric cancer, breast cancer, colon cancer, liver cancer, and cervical cancer. Findings are classified into different

categories depending on the type. The findings for gastric, breast, and colon cancer are as follows: cancer, suspicious of malignancy, benign, and undefined. The findings for liver cancer are as follows: need more follow-up diagnosis, suspicious of malignancy, and others. The findings from cervical cancer are as follows: infectious disease, carcinoma in situ, suspicious of malignancy, and others.

Frequencies and percentages for cancer screening findings were analyzed using Microsoft Excel (Redmond, Washington, USA) and SAS software (Carey, NC, USA). Descriptive statistics and the X2-test were used to calculate significance.

This secondary analysis study was approved by the Joongbu University Institutional Review Board (JIRB-2019070801-01-190710). After institutional review board approval was obtained, the NHIS approved the extraction of the sample (NHIS-2019-1-457).

Results

1. Gastric cancer screening

For the gastric cancer screenings, 0.30% in 2016 and 0.35% in 2017 of those screened who had brain injuries were found to have gastric cancer, whereas 0.16% in 2016 and 0.15% in 2017 of those screened who were non-disabled were found to have gastric cancer (p<.001). In both 2016 and 2017, the highest gastric cancer diagnosis group was the brain injury group (p<.001). [Figure 1] summarizes the findings from gastric cancer screenings conducted in 2016 and 2017.

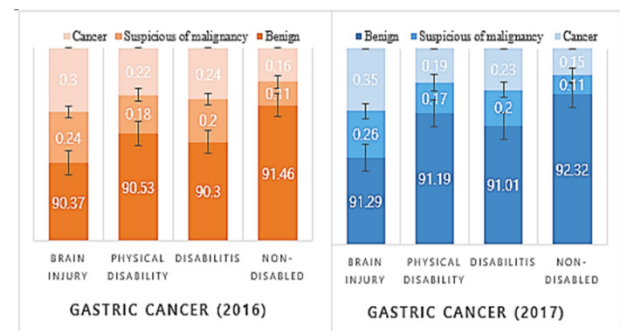


Figure 1. The findings from gastric cancer screenings conducted in 2016 and 2017

2. Breast cancer screening

For the breast cancer screenings, 0.90% in 2016 and 0.54% in 2017 of those screened who had brain injury had findings that were suspicious of malignancy, whereas 0.58% in 2016 and 0.64% in 2017 of those

screened who had physical impairment had findings that were suspicious of malignancy. In 2016, the group with the most findings that were suspicious of malignancy was the brain injury group, whereas the group including all individuals with disabilities (the disabilities group) had the most findings that were suspicious of malignancy in 2017 ($p<.001$). [Figure 2] summarizes the findings from breast cancer screenings conducted in 2016 and 2017.

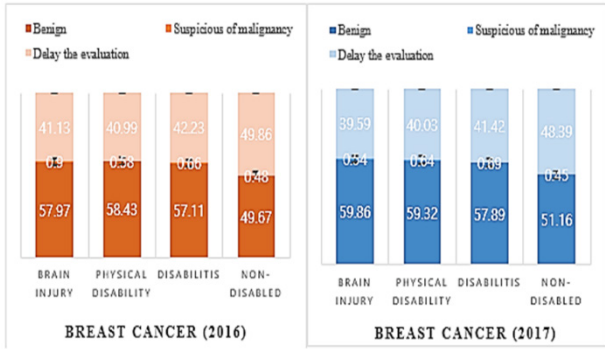


Figure 2. The findings from breast cancer screenings conducted in 2016 and 2017.

3. Colon cancer screening

For the colon cancer screenings, 4.48% in 2016 and 6.56% in 2017 of those screened who had brain injury were found to have colon cancer, whereas 3.70% in 2016 and 3.56% in 2017 of those screened who were non-disabled were found to have colon cancer ($p<.001$). In 2016, 3.75% of those screened who had physical impairment were found to have colon cancer, whereas in 2017, 3.41% of those screened who had physical impairment were found to have colon cancer. In both 2016 and 2017, the brain injury group was the highest colon cancer diagnosed group among the four groups (brain injury, those with physical disabilities, those without physical disability, and the non-disabled) ($p<.001$). [Figure 3] summarizes the findings from colon cancer screenings conducted in 2016 and 2017.

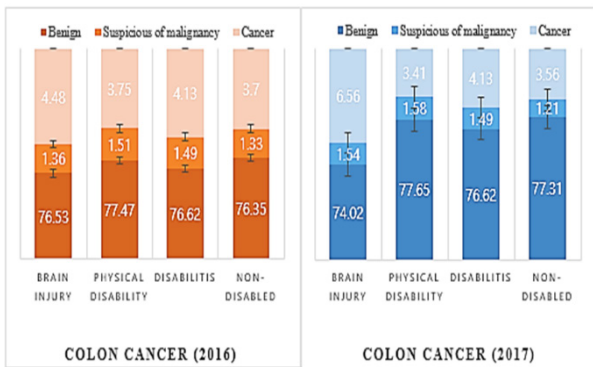


Figure 3. The findings from colon cancer screenings conducted in 2016 and 2017

4. Liver cancer screening

In 2016, 1.17% of those screened who had brain injury had findings that were suspicious of liver cancer, whereas in 2017, 0.65% of those screened who had brain injury had findings that were suspicious of liver cancer ($p<.001$). People with brain injury had the most findings that were suspicious of liver cancer in 2016 ($p<.001$), whereas in 2017 people with physical impairment had the most findings that were suspicious of liver cancer in 2017 ($p<.001$). [Figure 4] summarizes the findings from liver cancer screenings conducted in 2016 and 2017.

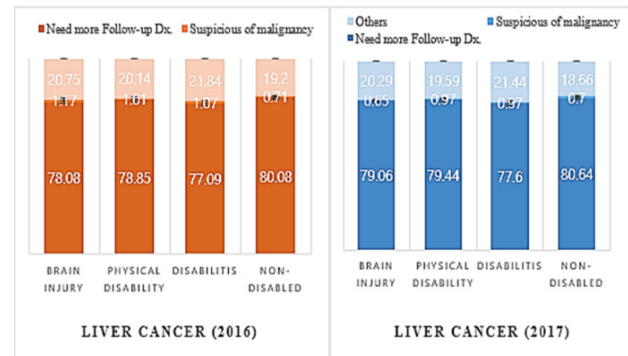


Figure 4. The findings from liver cancer screenings conducted in 2016 and 2017

5. Cervical cancer screening

For the cervical cancer screenings, the non-disabled group had the highest incidence of carcinoma in situ among the four groups in 2016 ($p<.001$) and 2017 ($p<.001$). These findings were different from findings for gastric, breast, colon, and liver cancer [Figure 5].

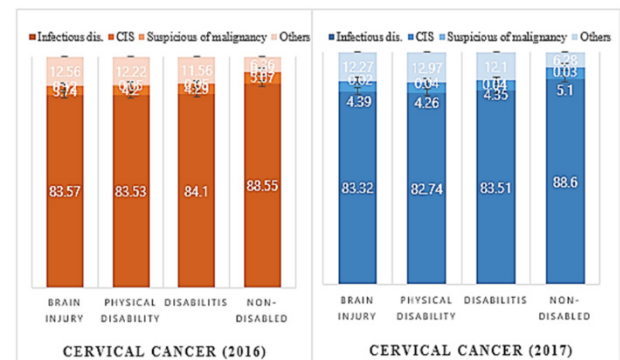


Figure 5. The findings from cervical cancer screenings conducted in 2016 and 2017

(CIS: carcinoma in situ)

Discussion

The results showed that cancer screening findings were different according to presence of disabilities and types of disability in this investigation. Particularly,

the number of suspicious of malignancy findings from gastric, breast, colon, and liver cancer screenings in disabilities caused by brain injury and physical disability were significantly higher than those without disabilities. Cancer is more common in people with disabilities than in people without disabilities because people with disabilities are less likely to be screened at optimal times.

The Korea cancer statistics showed that gastric, colorectal, prostate, thyroid, and liver cancer were highly prevalent in men, whereas women were more prone to thyroid cancer, followed by breast, colorectal, gastric, and cervix uteri cancer [1]. However, only five types of cancer screenings (gastric, breast, colon, liver, and cervical cancer) are offered by the Korean government. Cancer screening not only in those without disabilities but also in those with disabilities can reduce the incidence of late-stage cancer [11].

The gastric, colon, liver cancer are the most common cancer in Korea regardless of being disabilities [10]. Those who have disabilities are more likely to expose a cancer risk factors because there is a limit to fully utilizing physical function contrary to one's will. Particularly, person with disabilities caused by brain injury and physical impairment are not easy to take their regular health screening. [8]

Therefore, based on these findings, more effective cancer screening policies in terms of effective resources, facilities, timing and types of cancers screened should be developed and continuously implemented.

Conclusion

Cancer screening programs are designed for the early detection of cancer. The findings from this study showed that people with disabilities such as brain injury and physical impairment were more likely to be diagnosed with gastric, breast, colon, and liver cancer than non-disabled people in 2016 and 2017. Based on these results, continuous monitoring of cancer screening findings should be performed for disabilities, and various cancer screening programs, such as lung cancer screening programs, should be applied to disabilities.

Ethical Clearance: Not required

Source of Funding: The Ministry of Health and Welfare in Korea supported this study.

Conflict of Interest: Nil

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National Health Screening Program Non-Participation Rates Among Koreans with Brain Injury-Based Disabilities: 2016–2017

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Abstract

Background/Objectives: The National Health Screening Program is currently performed in Korea. This study compared the non-participation rates between disabilities caused by brain injury and those without disability in 2016 and 2017.

Methods/Statistical Analysis: Data were extracted from the National Health Insurance database. Among the data, chest X-ray, blood pressure, blood sugar, body mass index (BMI), auditory and visual functions, Hepatitis B virus, hemoglobin, liver function, bone mineral density, lower extremity function test, balance test, depression, and cognitive function test results were compared between the disability from brain injury and non-disability groups. Descriptive statistics were used to analyse the non-participation rates between these groups.

Findings: About 0.3% (n=42,457) of individuals had disabilities due to brain injury. In 2016, the non-participation rates for chest X-ray and urine cholesterol among those with disability due to brain injury were 3.8%, and 4.1%, respectively. However, the non-participation rates among those without disabilities were only 0.9% and 0.4%, respectively. The non-participation rates among disabilities due to brain injury were also significantly higher than that in those without disability population in other examination programs. In 2017, 3.3% of individuals with disabilities due to brain injury did not participate in chest X-rays, compared to 0.8% of individuals without disabilities. Similarly, the non-participation rates for urine protein test were 4.1% and 0.4%, respectively. The non-participation rate for all examination programs for health screening was higher among those with disabilities due to brain injury than that in those without disabilities. The average non-participation rates for the group of individuals with disabilities due to brain injury were 5.0% in 2016 and 4.4% in 2017, compared to 1.6% and 1.4%, respectively, for the group without disabilities.

Improvements/Applications: The National Health Screening program should be applied to all citizens regardless of disability. Policies are needed to increase participation in health screening programs among individuals with disabilities.

Keywords: Disability, Brain injury, Health, Examination, Program

Introduction

National health screening programs are effective methods that allow timely detection and evidence-based treatment to reduce morbidity and mortality [1]. However, the World Health Organization (WHO) has

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reported that people with disabilities worldwide have difficulty accessing health care and disability-related services [1,2].

In Korea, the government collects information from the National Health Insurance Service Health Screening Database (NHISD) containing the results of health screening programs for its citizens [3]. While many citizens have participated in the National Health Screening program to monitor their health and detect health changes since 1999, some individuals with health conditions such as disabilities cannot easily access the healthcare system to use the National Health Screening program due to limited physical activity and social resources. The purpose of the health screening program is to improve the long-term health outcomes such as hypertension and diabetes by providing opportunities for the insured to change their lifestyles through regular health check-up [4]. From infants to older adults, all life stages can be involved in their health status by school or government screening every one or two years [4]. The health screening program consists of two stages. The primary screening items include anthropometry, tuberculosis testing, chest disease evaluation, and breast radiation, urine protein measurement, anemia assessment, diabetes testing, blood sugar measurement, kidney ailment evaluation, nephritis assessment, liver ailment evaluation, and oral examinations, while cognitive impairment, health education, health risk assessment, blood pressure, and blood sugar are monitored based on the results of primary health screening [4].

According to a national survey of persons with disabilities in 2017, approximately 5.4% of Koreans have physical disability, disability caused by brain injury, etc. Within this population, approximately 10% of disabled individuals have disabilities caused by brain injury. Previous data showed that only 57.2% of people with disabilities caused by brain injury participated in the national health screening program, whereas 80% of people with physical disabilities received government health screening [5]. Although overall non-participation rates were reported for people with disabilities, limited detailed information was available regarding health

screening items.

Therefore, the present study investigated the national health screening non-participated rates among people with disabilities caused by brain injury and compared them to the rates among non-disabled Korean people in 2017 and 2018 using data derived from the NHISD.

METHOD

[Table 1] presents the demographics of the sample.

The study sample was derived from the NHISD, which is provided through the NHIS. The NHIS provides the National Health Insurance Data Sharing Service. Before obtaining tailored data, approval was obtained from the NHIS (NHIS-2019-1-457).

Among 13,289,870 and 13,549,525 insurant registered in 2016 and 2017, respectively, the non-participation rates for each item in the primary health screening people were compared between individuals with disabilities caused by brain injury (n=42,470 in 2016, n=41,792 in 2017) and those without disabilities (n=13,247,400 in 2016, n=15,507,733 in 2017). The majority of non-participants with disabilities caused by brain injury in 2016 and 2017 were male (61.2% in 2016 and 62.8% in 2017). The mean ages among those with disability due to brain injury were approximately 63 years in 2016 and 2017, compared to 48 years in 2016 and 49 years in 2017 among those without disability. Among people with disabilities caused by brain injury, 23% had self-employed insurance in 2016 and 2017, compared to 16% in the non-disability group.

The severity of disability among those with disabilities caused by brain injury is described in Table 1, in which lower grades indicate higher severity. In other words, grade 1 is the highest disability severity level. In the present study, 23.8% of the disabled individuals had grade 3, or moderate, disability, while the prevalence of the other grades ranged from 10–17%.

Table 1. Demographics of sample (N=13,289,870 in 2016; N= 13,549,525 in 2017)

Characteristics	Classification	Disability due to brain injury, n (%)		Non-disabilities, n (%)	
		2016 (n=42,470)	2017 (n=41,792)	2016 (n=13,247,400)	2017 (n=13,507,733)
Sex	Male	26,853 (61.2)	26,262 (62.8)	7,010,648 (52.9)	7,106,969 (52.6)
	Female	15,617 (38.8)	15,530 (37.2)	6,246,752 (47.1)	6,400,764 (47.4)
Age, years	Mean (± SD)	63.35 (±12.40)	63.42(±12.47)	48.77 (±14.02)	49.06(±14.05)
Types of insurance	Self-employed	10,046 (23.7)	9,766 (23.4)	2,237,122 (16.9)	2,263,961 (16.8)
	Employed	27,515 (64.8)	27,146 (64.9)	10,927,476 (82.4)	11,155,556 (82.6)
	Medical aids	4,909 (11.5)	4,880 (11.7)	92,802 (0.7)	16512 (0.6)
The severity of disabilities	Grade 1	4,559 (10.7)	4,549 (10.9)		
	Grade 2	7,057 (16.6)	6,768 (16.2)		
	Grade 3	10,090 (23.8)	9,663 (23.1)		
	Grade 4	6,516 (15.3)	6,328 (15.1)		
	Grade 5	6,770 (15.9)	7,052 (16.9)		
	Grade 6	7,478 (17.6)	7,432 (17.8)		

The data in this study was extracted from NHID in 2016 and 2017.

The primary health screening includes anthropometry (obesity, blood pressure, eyesight, and hearing test), tuberculosis, chest disease, breast radiation, uroscopy (protein in urine), blood (anemia, diabetes, blood sugar, kidney ailments, nephritis, and liver ailment), and oral (dental caries, periodontal disease, and missing tooth) examinations, as well as consultation (diagnosis of past medical history, lifestyle, and general status) and notification of primary health screening results and health risk assessment [4].

Among these screenings, we compared the non-participant rates of chest X-ray for tuberculosis and chest disease, blood pressure, blood sugar, body mass index (BMI), auditory and visual functions, hemoglobin, aspartate aminotransferase/alanine aminotransferase (AST/ALT), low-density lipoprotein (LDL) cholesterol, hepatitis B virus, bone mineral density test (BMD),

physical function test for elderly (low extremity function, balance test), depression, and cognitive function test between people with disabilities caused by brain injury and non-disability. Depression was screened using Patients Health Questionnaire 9-item (PHQ-9) [6] and cognitive function was measured using the Korean Dementia Screening Questionnaire C (KDSQ-C) [7].

Descriptive statistics were performed to analyze the frequencies, percentages, and means of the sample characteristics. The non-participants rates of chest X-ray for tuberculosis and chest disease, LDL cholesterol, hepatitis B, BMD test, physical function test for elderly (low extremity function, balance test), depression, and cognitive function test were calculated based on frequencies and percentages in Excel.

As this study was secondary data analysis, the Joongbu University Institutional Review Board approved a review exemption (JIRB-2019070801-01-190710).

Result

1. Non-participation rates for the National Health Screening program in 2016

[Table 2] shows the National Health Screening program non-participation rates in 2016. The non-participation rates for each health screening item among people with disabilities caused by brain injury and those without disabilities people in 2016 were investigated.

The results showed that people with disability caused by brain injury did not participate in many of the screening items, with 3.8% not receiving chest X-rays to identify tuberculosis and chest disease, compared to 0.9% of those without disabilities. The non-participation rates for blood pressure monitoring, BMI check, and auditory and visual function assessments were also higher in individuals with disability due to brain injury than in those without disabilities.

Table 2. Non-participation rate of national health screening program of disability due to brain injury and non-disabilities in 2016

Health screening items	Target disease	Disability due to brain injury		Non-disabilities	
		Target n	n (%)	Target n	n (%)
Chest X-ray	Tuberculosis and chest disease	42,457	1,620 (3.8)	13,257,533	113,896 (0.9)
Blood Pressure	Hypertension	42,457	116 (0.3)	13,257,533	1,153 (0.1)
Blood sugar	Diabetes	42,457	14 (0.1)	13,257,533	734 (0.1)
Body Mass Index (BMI)	Obesity	42,457	401 (1.0)	13,257,533	10,872 (0.1)
Pure tone audiometer	Auditory function	42,457	242 (0.6)	13,257,533	2,544 (0.1)
Vision test	Visual function	42,457	291 (0.7)	13,257,533	2,825 (0.1)
Hemoglobin	Anemia	42,457	17 (0.1)	13,257,533	871 (0.1)
AST (SGOT)	Liver disease	42,457	15 (0.1)	13,257,533	765 (0.1)
ALT (SGPT)		42,457	15 (0.1)	13,257,533	769 (0.1)
Urine analysis	Protein urine	42,457	1,743 (4.1)	13,257,533	56,681 (0.4)
LDL cholesterol	Hyperlipidemia	42,457	93 (0.2)	13,257,533	34,281 (0.3)
Hepatitis B virus antigen	Hepatitis B virus	397	14 (3.5)	485,388	26,157 (5.4)
Hepatitis B virus antibody		397	14 (3.5)	485,388	26,182 (5.4)
Bone Mineral Density	Osteoporosis	946	102 (10.8)	154,290	7,368 (4.8)
Lower extremity function	Physical function for elderly	2,605	406 (15.6)	284,502	3,609 (1.3)
Balance test		2,605	418 (16.1)	284,502	3,985 (1.4)
PHQ-9	Depression	3,021	15 (0.5)	770,438	2,524 (0.3)
KDSQ-C	Cognitive impairment	2,605	13 (0.5)	284,502	670 (0.2)

KDSQ-C: Korean Dementia Screening Questionnaire C

PHQ-9: Patients Health Questionnaire 9-item

2. Non-participation rates in the National Health Screening program in 2017

[Table 3] shows the National Health Screening program non-participation rates in 2017.

Among 13,549,626 insured individuals in 2017, 41,772 had disabilities due to brain injury. Among those with disability caused by brain injury, 3.3% did not receive chest X-ray examinations for tuberculosis and chest disease, compared to 0.8% of individuals without disabilities.

Among those with disabilities caused by brain injury, 0.3% did not participate in blood pressure monitoring; in addition, 1.0% of disabled people did not monitor their

BMI. Auditory and visual functions were not assessed in 0.6%, and 0.8% of people with disability caused by brain injury, respectively. In contrast, 0.1% of non-disabled people did not take participate in blood pressure, blood sugar, BMI, auditory and visual functions, anaemia, and liver ailment assessments.

However, similar to 2016 data, there was no difference in 2017 in the percentages of non-disabled people and people with disability caused by brain injury who did not undergo hepatitis B virus antigen and antibody testing. People with disability caused by brain injury also less often received BMD and physical function assessments compared to the rates in those without disabilities.

Table 3. Non-participation rate of national health screening program of disability due to brain injury and non-disabilities in 2017

Health screening items	Target disease	Disability due to brain injury		Non-disabilities	
		Target n	n (%)	Target n	n (%)
Chest X-ray	Tuberculosis and chest disease	41,772	1,380 (3.3)	13,507,854	103,464 (0.8)
Blood Pressure	Hypertension	41,772	117 (0.3)	13,507,854	1,572 (0.1)
Blood sugar	Diabetes	41,772	9 (0.1)	13,507,854	871 (0.1)
Body Mass Index	Obesity	41,772	401 (1.0)	13,507,854	3,455 (0.1)
Pure tone audiometer	Auditory function	41,772	266 (0.6)	13,507,854	2,851 (0.1)
Vision test	Visual function	41,772	314 (0.8)	13,507,854	3,257 (0.1)
Hemoglobin	Anemia	41,772	15 (0.1)	13,507,854	1,367 (0.1)
AST (SGOT)	Liver disease	41,772	10 (0.1)	13,507,854	1,001 (0.1)
ALT (SGPT)		41,772	11 (0.1)	13,507,854	1,010 (0.1)
LDL cholesterol	Hyperlipidemia	41,772	100 (0.3)	13,507,854	40,044 (0.3)
Hepatitis B virus antigen	Hepatitis B virus	444	16 (3.6)	489,176	22,283 (4.6)
Hepatitis B virus antibody		444	16 (3.6)	489,176	22,285 (4.6)
Bone Mineral Density	Osteoporosis	889	60 (6.8)	142,749	5,438 (3.8)
Lower extremity function	Physical function for elderly	2,247	333 (14.8)	263,758	2,674 (1.0)
Balance test		2,247	343 (15.3)	263,758	2,988 (1.1)
PHQ-9	Depression	2,733	5 (0.2)	753,399	674 (0.1)
KDSQ-C	Cognitive impairment	2,247	5 (0.2)	263,758	161 (0.1)

KDSQ-C: Korean Dementia Screening Questionnaire C

PHQ-9: Patients Health Questionnaire 9-item

Discussion

The purpose of general health screening is the early detection and prevention of cardiovascular and cerebrovascular disease, hypertension, diabetes, and other chronic disease [2,4]. In Korea, the screening targets insured individuals aged 40 years and older, who undergo screening once every two years. Almost all costs are covered by the government. However, persons with disabilities are a venerable population as a health screening.

Previous studies reported that people with disabilities have limited use of medical benefits due to their physical, emotional, and socio-cultural difficulties [8-12]. That is, people with disabilities have restrictions on their use of the healthcare system for screening during their regular health check-ups, thus increasing the prevalence of chronic disease [9]. Hwang et al. reported that 25.3% more individuals with brain impairment had experienced unmet healthcare needs than those without impairments [9]. The lack of money and inaccessible transportation were the main reasons for unmet healthcare needs [9, 11].

The results of this study showed that people with disabilities caused by brain injury did not participate in many of the screening items. Kim et al. reported that only 29.8% of 1,073 people with disabilities participated in the health screening program [5]. Assessment of the non-participants within this population according to demographic factors showed that people of lower age, lower education levels, and severe disability grades tended to have lower health screening participation [5].

Comparison of the health screening non-participation rates in 2016 and 2017 among people with disabilities caused by brain injury showed lower rates of non-participation overall. However, we did not identify the reasons for the lack of participation in health screening.

As such, this study has several limitations. First, statistical significance was not confirmed between individuals with disabilities caused by brain injury and individuals without disabilities. Second, as noted above, information was not available regarding the reasons for non-participation in health screening. Third, although it is meaningful to analyse entire data using national data, future studies should assess non-participation rates according to demographic characteristics. Despite these limitations, the determination of non-participation rates by analysis of 2 years of health screening data from an entire population is an important contribution of this

study.

Conclusion

This study investigated and compared health screening non-participation rates between people with disabilities caused by brain injury and those without disabilities. The results showed that individuals with disabilities due to brain injury received fewer health screenings as part of the program as compared to individuals without disabilities. The participation rates were particularly low for chest X-ray examinations, BMD, and physical function test among individuals with disabilities caused by brain injury compared to those in individuals without disabilities. Based on these findings, further follow-up studies on the non-participation rates of health screening and analysis of their causes are required. Moreover, policies are needed to increase health screening participation rates among individuals with disabilities.

Ethical Clearance: Not required

Source of Funding: This study was supported by the Ministry of Health and Welfare in Korea.

Conflict of Interest: Nil

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Comparison of Ventilation Volume and Airway Pressure of an Advanced Airways in Virtual Reality Ambulance Simulation

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Abstract

Background/Objectives: It is convenient to apply C-E technique during ventilation using bag-valve mask in the moving ambulance. Purpose of the study is to investigate the effective ventilation volume and airway pressure.

Methods/Statistical analysis: The National Fire Service Academy conducted Virtual Reality (“VR”) based ambulance simulations from April 17, 2018 to April 28, 2018. The mean and standard deviations of mean ventilation and airway pressure were analyzed using descriptive statistics and ANOVA and SPSS software 12.0 (SPSS Ins., Chicago, IL, USA) program.

Findings: When VR-based intubation was performed, the ventilation volumes were 375 ml (± 30.71), 225 ml (± 8.48), 324 ml (± 6.56), 244 ml (± 7.79), and 427 ml (± 10.42) when using bag-valve mask, laryngeal mask, laryngeal tube, I-gel, and intubation, respectively. Airway pressure was 17.48 cmH₂O (± 0.28) from endotracheal intubation, 14.79 cmH₂O (± 1.51) from bag-valve mask, 13.49 cmH₂O (± 0.78) from laryngeal tube, 8.66 cmH₂O (± 0.80) from I-gel, 6.73 cmH₂O (± 0.53) from laryngeal mask showed airway pressure.

Improvements/Applications: The present study has significance in that basic data for the method of using a professional airway are provided by adequate ventilation for each professional airway in transit.

Keywords: *Virtual Reality, Ventilation Volume, Bag-Valve mask, Airway Pressure, Advanced Airway, RespiTrainer® Advance*

Introduction

Since free airway and assisted respiration before the admission affect the patient’s life directly, successful airway management is an essential emergency treatment. For the patients with heart failure, they require onsite professional cardiopulmonary resuscitation (CPR) depending on the situations such as disease status, existence of witness, witness’ CPR, and so on. However, for those who are difficult to perform professional CPR at the site and who do not recover with CPR, professional CPR should be performed during the transportation. It is difficult to perform proper chest compression and

artificial respiration during the transportation due to multiple elements of obstacles.

Artificial respiration is very critical emergency treatment for the patients not only with heart failure but also with apnea. Airway should be secured, and efficient ventilation should be provided at the site applying good airway management. Generally, ventilation is provided by bag-valve mask when CPR is performed at the heart failure state before the admission.

In the ventilation of bag-valve mask, airway management, close contact between mask and face, 1/3 bag compression, prevention of hyperventilation, bag compression during chest compression, and so on may affect the ventilation, which may be worsened during the transportation. In addition, efficient delivery of ventilation may be difficult during the transportation by

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movement of ambulance and unstable posture. According to the recent guideline, efficient ventilation at the heart failure state is recommended to deliver 500 ~ 600 ml ($6 \sim 7 \text{ ml/kg}$)^[1], because the seat of ambulance crew in the ambulance is located beside the patient, it is not convenient to apply C-E technique in case of ventilation using bag-valve mask and also efficient ventilation is difficult due to obstacles despite intubation. Even in case of intubation, it can be pushed out of the mouth during chest compression, hence, it is not easy to deliver ventilation during the transportation.

Many previous studies^[2-4] were conducted related to the delivery of one-time respiration while no study was done related to the ventilation during the transportation. This study was conducted with the subjects of manikins to compare the ventilation volume and airway pressure using bag-valve mask between the situation of basic airway management and the situations of laryngeal mask, I-gel, laryngeal tube, and intubation to the bronchus in the VR-based ambulance. Also, it aimed to compare the results of VR-based study with the previous studies performed in the fixed situation and to apply this to the sites so as to suggest the fundamental data for the efficient delivery of ventilation during the transportation.

Materials and Method

1. Research design and data collection

This is a comparative study to measure the ventilation volume of bag-valve mask with RespiTrainer® Advance in the situation applying special ventilator in the VR-mock ambulance. To do so, VR-based simulation ambulance was used in National Fire Service Academy and “urban beltway scenario” was applied among developed scenarios. Transportation time was for 6 minutes maintaining 60 to 80 km/hour. In the test, 150 times of ventilation volume were compared between the case only using bag-valve mask and the cases using bag-valve mask in the states of intubation, laryngeal tube, I-gel, and laryngeal mask. For the data, ventilation volume to be delivered to the lung and airway pressure were collected using RespiTrainer® software.

2. VR based simulation ambulance

The VR based ambulance designed to enable the education and training of emergency services in various road environments was developed as a fire research and development (R&D) project. VR based simulation ambulance implemented VR by applying Ambulance

Driving Simulation S/W to computer controlled moving platform design [Figure 1]. Six scenarios have been developed to suit the surrounding environment, such as rural, urban and suburban environments, and are designed so that the rescuer can drive while monitoring scenarios set up outside the ambulance.

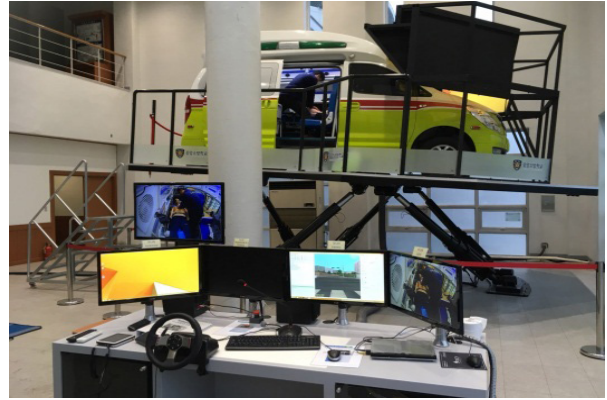


Figure 1. VR-based simulation ambulance

2. RespiTrainer® Advance

RespiTrainer® Advance (version 1.1, Ingmar, Pittsburgh, USA) is the equipment that is optimized for a wide range of special air intubation training and skills, and has realistic materials and anatomical structures. High-performance test lungs (QuickLung®) can achieve realistic lung capacity in adults, and software can be used to verify data such as ventilation and airway pressure. Airway resistance and compliance were set at $5 \text{ cmH}_2\text{O/L/s}$ and $50 \text{ ml/cmH}_2\text{O}$, which are the mean values of healthy persons without lung disease [Figure 2].

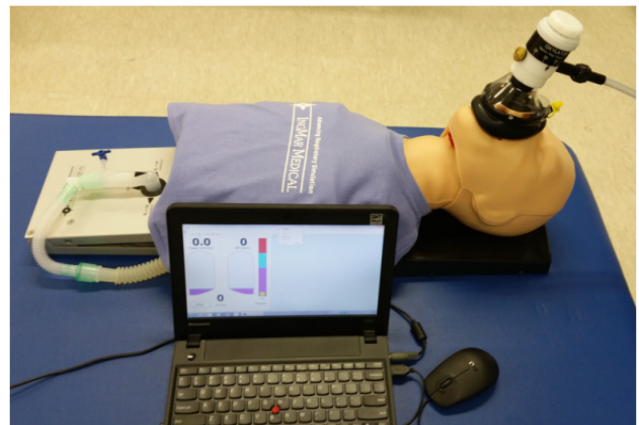


Figure 2. RespiTrainer® Advance

3. Advanced Airway

For BVM, storage sac was attached to Laerdal® Silicone Resuscitator, and volume of bag was used with 1,600 ml. #4 of I-gel® was used after closing opened end

for reducing pressure of stomach. King LTS-D™ #4 was used for laryngeal tube, injecting 80 ml of air to the cuff after closing upper esophageal opening for reducing pressure of stomach. With respect to the tube for intubation, Mallinckrodt® I.D. 7.5 was used fixing 22 cm of intubation depth. Cuff was fixed by Thomas® Tube Holder not to be moved or pulled out after injecting 10 ml of air [Figure 3].

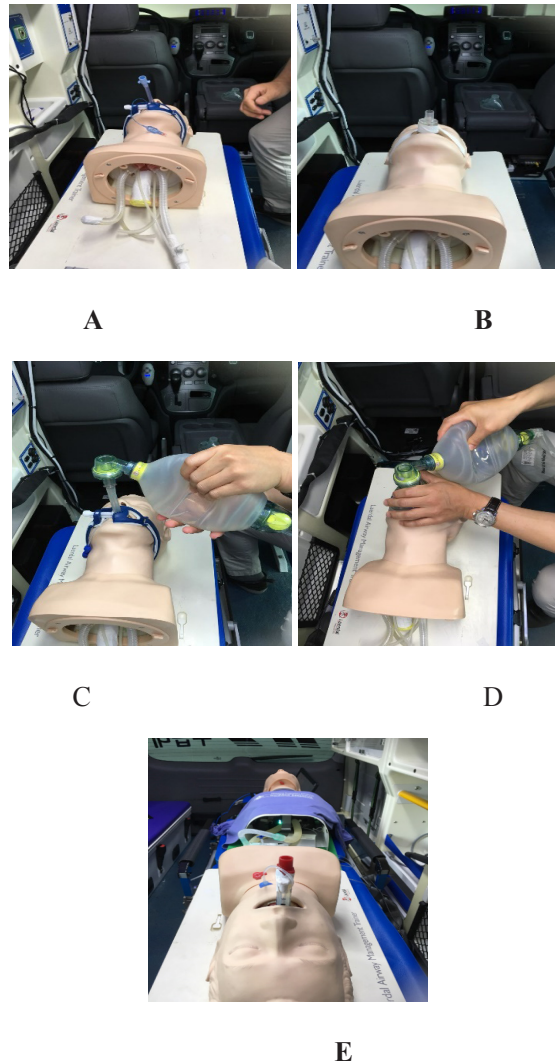


Figure 3. Advanced Airway. Endotracheal intubation(A), I-gel(B), Laryngeal mask airway(C), Bag-valve mask (D), Laryngeal tube (E)

All experiments were conducted within a VR-based simulation ambulance and were conducted at the National Fire Service Academy from April 17, 2018 to April 28, 2018. All data were collected using RespiTrainer® software (version 1.1, Ingmar, Pittsburgh, USA) to collect ventilation and airway pressure. The collected data were analyzed using SPSS software 12.0 (SPSS Inc., Chicago, IL, USA). The mean and standard deviation of ventilation and airway pressure were analyzed using descriptive statistics and ANOVA.

Result

1. Ventilation volume

Ventilation volumes delivered to the lung were compared between the case using VR-based bag-valve mask and the cases using bag-valve mask in the states of intubation. Ventilation volumes were 375 ml (± 30.71), 225 ml (± 8.48), 324 ml (± 6.56), 244 ml (± 7.79), and 427 ml (± 10.42) when using bag-valve mask, laryngeal mask, laryngeal tube, I-gel, and intubation, respectively [Table 1].

Table 1. Comparison of delivered volume

	Mean (ml)	Min	Max	SD	F	p	Scheff'e
ETa	427.15	399.0	463.0	10.42	4449.09	.000	a>bcd
BVMb	375.18	168.0	436.0	30.71			b<a, b>cde
LTc	324.66	305.0	346.0	6.56			c<ab, c>de
I-geld	244.60	229.0	270.0	7.79			d>e, d<abc
LMAe	225.64	205.0	252.0	8.48			e<abcd

ET: Endotracheal tube

BVM: Bag-valve mask

LT: Laryngeal tube

LMA: Laryngeal mask airway

2. Airway pressure Ventilation volume

Table 2 shows the results of airway pressure analysis with VR-based endotracheal intubation. The endotracheal tube showed an average airway pressure of $17.48 \pm .28$ cmH₂O, with a minimum airway pressure of 16.70 cmH₂O and a maximum airway pressure of 18.30 cmH₂O. The bag-valve mask showed an average airway pressure of $14.79 \pm .151$ cmH₂O, with a minimum airway pressure of 4.60 cmH₂O and a maximum airway pressure of 17.40 cmH₂O. Laryngeal tube showed an average airway pressure of $13.49 \pm .78$ cmH₂O, with a minimum airway pressure of 11.40 cmH₂O and a maximum airway pressure of 15.40 cmH₂O. I-gel showed an average airway pressure of $8.66 \pm .80$ cmH₂O, with a minimum airway pressure of 6.70 cmH₂O and a maximum airway pressure of 12.10 cmH₂O. Laryngeal mask airway showed an average airway pressure of $6.73 \pm .53$ cmH₂O, with a minimum airway pressure of 5.70 cmH₂O and a maximum airway pressure of 8.10 cmH₂O [Table 2].

Table 2. Comparison of airway pressure

	Mean	Min	Max	SD	F	p	Scheff'e
ET ^a	17.48	16.70	18.30	0.28	3752.02	.000	a>bcd
BVM ^b	14.79	4.60	17.40	1.51			b<a, b>cde
LT ^c	13.49	11.40	15.40	0.78			c<ab, c>de
I-gel ^d	8.66	6.70	12.10	0.80			d>e, d<abc
LMA ^e	6.73	5.70	8.10	0.53			e<abcd

ET: Endotracheal tube

BVM: Bag-valve mask

LT: Laryngeal tube

LMA: Laryngeal mask airway

DISCUSSION

Airway management is very important for emergency patients. If breathing of a patient is erratic or a patient does not breath, assisted respiration should be provided. The optimization of ventilation during CPR is a broad of research^[5]. A bag-valve mask is used being connected with intubation or with a laryngeal tube, I-gel, laryngeal mask, and so on also in a state it is intubated during positive pressure ventilation^[6,7]. The present study comparatively analyzed ventilation volume delivered to the lung when air was ventilated using a bag-valve mask after a professional airway was intubated in a moving ambulance.

Ventilation volumes were found to be in the order of intubation, bag-valve mask, laryngeal tube, I-gel, and laryngeal mask, showing values of 427 ml, 375 ml, 324 ml, 244 ml, and 225 ml, respectively ($p = .000$). In previous studies, ventilation volumes of intubation, bag-valve mask, laryngeal tube, and laryngeal mask were found to be 497 ml, 386-421 ml, 365 ml, and 351 ml, respectively^[8,9]. However, these studies were conducted in a stationary situation. The surest method to secure an airway is to insert a tube into the airway. While intubation is the method most widely used in hospitals to maintain an airway^[10,11], successful intubation is not easy in a pre-hospital situation. It is possible only when the performer has sufficient experience and is prepared at all times. Thus, intubation is not much performed in a pre-hospital situation in practice^[12,13]. For such a reason, supraglottic airway devices (laryngeal tube, I-gel, and laryngeal mask) are recommended in a pre-hospital situation because they make intubation relatively easy. However, while intubation of a supraglottic airway device is easy, the ventilation state may be poor as it is difficult to achieve adhesion in a moving site and it can be pushed superior and it is difficult to prevent inhalation of stomach contents^[8].

It is also difficult to continuously deliver air required for ventilation volume in a moving ambulance. When the maximum volume and the minimum volume were compared, these values were shown to be in the order of intubation (min. 399 ml, max. 463 ml), bag-valve mask (min. 168 ml, max, 436 ml), laryngeal tube

(min. 305 ml, max. 346 ml), I-gel (min. 229 ml, max. 270 ml), and laryngeal mask (min. 205 ml, max. 252 ml) with the exception of the minimum of bag-valve mask. Differences between minimums and maximums of intubation, bag-valve mask, laryngeal tube, I-gel, and laryngeal mask were shown to be 64 ml, 268 ml, 41 ml, 26 ml, and 47 ml, respectively. All ventilation methods excluding intubation showed low respirations [Figure 4].

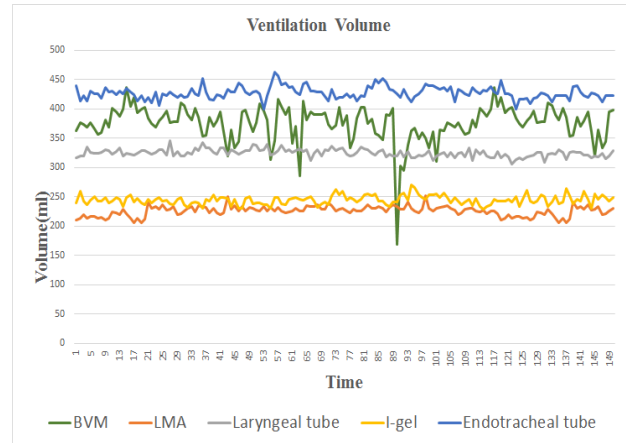


Figure 4. Ventilation volume in a VR-based moving ambulance. Minimum and maximum volumes of the ventilation method for which only a bag-valve mask was used continued to be in an unstable state

If the pressure inside the airway exceeds 20 to 25 cmH₂O, it might cause lung damage with reflux and aspiration complication^[13-15]. In previous studies, intubation, laryngeal tube, laryngeal mask, I-gel, and bag-valve mask showed values of 8 to 11 cmH₂O, 8 to 10 cmH₂O, 7.86 cmH₂O, 10 cmH₂O, and 8 to 10 cmH₂O, respectively [8, 16, 17]. In the present study, intubation, bag-valve mask, laryngeal tube, I-gel, and laryngeal mask showed pressure values of 17.48 cmH₂O (±.28), 14.79 cmH₂O (±1.51), 13.49 cmH₂O (±.78), 8.66 cmH₂O (±.80), and 6.73 cmH₂O (±.53), respectively ($p=.000$). It was difficult to continuously deliver airway pressure in a moving ambulance. The minimum and maximum pressures were shown to be in the order of intubation (min. 16 cmH₂O, max. 18 cmH₂O), bag-valve mask (min. 4 cmH₂O, max. 17 cmH₂O), laryngeal tube (min. 11 cmH₂O, max. 15 cmH₂O), I-gel (min. 6 cmH₂O, max. 12 cmH₂O), and laryngeal mask (min. 5 cmH₂O, max. 8 cmH₂O) with the exception of the minimum pressure of bag-valve mask [Figure 5].

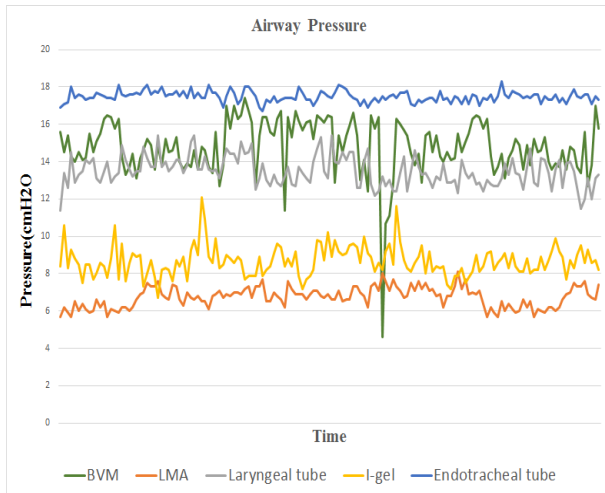


Figure 5. Airway pressure in a VR-based moving ambulance. In the case of the ventilation method for which only a supraglottic airway device and a bag-valve mask were used, the minimum and maximum pressures continued to be in an unstable state.

It is convenient to apply C-E technique during ventilation using bag-valve mask in the moving ambulance. Upon the results of VR-based simulation ambulance study, ventilation was high in the order of intubation, bag-valve mask, laryngeal tube, I-gel, and laryngeal mask while laryngeal mask and I-gel had less efficient ventilation.

As not an actual patient but an experimental lung was used, the present study had limitations in that airway resistance or anatomical difference could not be taken into account; VR-based urban outer road scenario failed to sufficiently reflect the field road situation; and it was not clear whether VR-based computer-controlled moving platform design sufficiently reflected the suspension of an ambulance actually driven. However, the present study has significance in that basic data for the method of using a professional airway are provided by analyzing adequate ventilation for each professional airway in transit.

Conclusion

Bag-valve mask is a device to be able to provide the patients who require assisted ventilation with positive pressure ventilation. In case of assisted respiration, 500-600 ml (6-7 ml/kg) is recommended and it is hard to provide proper ventilation volume during the transportation. This is a study performed in the subjects with manikins showing the highest ventilation volume in case of intubation followed by bag-valve mask,

laryngeal tube, I-gel, and laryngeal mask in VR-based ambulance. Compared to the previous studied conducted in the fixed state, ventilation volumes showed lower by 69 ml, 19 ml, and 125 ml in intubation, laryngeal tube, and laryngeal mask, respectively; and minimum and maximum ventilation volumes showed the differences by 168 - 436 ml, 205 - 252 ml, 305 - 346 ml, 229-270 ml, and 399 - 463 ml, in bag-valve mask, laryngeal mask, laryngeal tube, I-gel, and intubation, respectively; demonstrating difficulty in delivering constant amount of respiration in the transportation. Among supraglottic airway devices, laryngeal tube and I-gel showed with 225 ml and 244 ml, demonstrating difficulty in close contact with airway.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Effects of Social Support and Life Stress of Women in Climacterium on Meaning of Life

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Abstract

Background/Objectives: This study is intended to provide basic data on the development of nursing intervention programs to solve the stress of life, the social support, life stress and meaning of life for Climacterium women.

Methods/Statistical analysis: The study was conducted by Climacterium women in W city in Gangwon province, collecting data from February 11 to February 22, 2019, and a total of 173 people.

Findings: The study found that Climacterium women's social support was significant in age, education, marriage, occupation, and monthly income, and that life stress was significant in age, education, marriage, and monthly income. The meaning of life was significantly higher in education, marriage, occupation, and monthly income. Social support for Climacterium women showed a negative correlation with life stress, and a significant static correlation with the meaning of life. Economic problems, which are a lower factor of life stress of Climacterium women, have been a factor that has a significant negative impact on the meaning of life.

Improvements/Applications: Since Climacterium women play a pivotal role in family life, it is necessary to develop a support program that can measure the level of life and fully play a pivotal role in society as a whole.

Keywords: *Climacterium women, Social support, Life stress, Meaning of life, Gangwondo*

Introduction

The climacteric period of women brings about substantially physical, psychological and social changes in terms of developmental steps. Since the blood concentration of estrogens reduce due to the decline of ovarian function, physical and mental symptoms appear in this period^[1]. In addition to physical and mental symptoms, they experience life crisis due to life stress within family life if they do not adapt to it as children grow up, land jobs or go independent for marriage in terms of society^[2]. When faced with stress, social support not only cope with positive stress, but help the environment change to be able to cope with

individual crisis through interaction within the social system of life of women in climacterium. This life stress can affect their whole life and bring about a diverse range of maladaptive symptoms, which consequently could influence on the meaning of life. The meaning of life is cited to serve as a positive factor that grants welfare even in case of stressful situations or accidents that trigger extreme level of stress^[3-4]. The loss of life meaning that could lead to climacteric crisis is one of critical issues for regaining their physical, emotional and psychological conditions since most of them have devoted to family life and child-rearing and centered the meaning of life in family rather than themselves after they got married^[5]. Therefore, research is needed to be carried out to prepare for methods to regain climacterium that affects the meaning of life in a positive way and to remove their life stress and enjoy healthy life.

The present study is thus intended to lay foundations to explore entire life stresses and enhance the meaning

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of life they experience by examining variables that social support and life stress affect the meaning of life they feel.

Method

The present study is narrative research to identify the association among social support, life stress and meaning of life of women in climacterium. It presumed that their social support and life stress affect the meaning of life. We set a study model as shown in Figure 1 based on this premise.



Figure 1. Research Model

Subjects in this study were women in climacterium who reside in W city, Gangwon-do. We collected data from February 11 to February 22, 2019. We explained the purpose and reason of our research to women who consented to participate in our study by visiting home, business and educational centers where subjects remain. We needed 166 subjects to determine the number of samples by using G*power 3.1 program^[6] needed for regression analysis shown as effect size=.15, level of significance $\alpha=.05$, and power=.095. Questionnaires were administered to 180 subjects and eventually analyzed data from 173 subjects except for seven non-responded or ineligible questionnaires among collected papers.

For data analysis, we used SPSS v.23 program. ANOVA was employed to analyze the mean difference among demographic features, social support, life stress and life meaning of study subjects. Scheffé test was conducted for post analysis. Pearson's correlation coefficient was adopted to see the association among social support, life stress and life meaning of study subjects according to demographic features. We employed multiple regression and analyzed outcomes to identify the effects of their social support on life stress and life meaning.

Instrument

1. Social support

We used an instrument applied by^[7]. This instrument consists of 13 questions as scales to measure social support of women in climacterium. Questions include seven regarding family support and six on subscales. Each question consisted of five-point Likert scale ranging from 1 point "never" to 5 point "highly." As scores are higher, they are likely to receive more social supports from family, friends, neighbors and groups. Reliability coefficient shown in^[7]'s research turned out Cronbach's $\alpha=.943$ and the coefficient in this study presented Cronbach's $\alpha=.953$. For sub-sectors, family support was Cronbach's $\alpha=.926$ and support from other people showed Cronbach's $\alpha=.938$, respectively.

2. Life stress

Questionnaire through which 20 items were extracted and arranged from instrument on life stress of women in climacterium developed by^[8] was used in the present study. Questions were 20 questions regarding four sections encompassing five questions on family relationship, five questions on economy, five questions on health and other five questions on role. Individual question consisted of five-point Likert scale ranging from 1 point "never serious" to 5 point "very serious" depending on life stress experiences. As scores are higher, it indicated higher level of life stress put on women in climacterium. Reliability coefficient shown in^[7]'s research exhibited Cronbach's $\alpha=.914$ and the coefficient in this study was Cronbach's $\alpha=.955$. For sub-sectors, family support was Cronbach's $\alpha=.944$, economy was $\alpha=.954$, health was Cronbach's $\alpha=.918$ and role presented Cronbach's $\alpha=.895$, respectively.

3. Meaning of life

An instrument on the meaning of life was developed by^[9] and the meaning of life scale (MLQ: Meaning in Life Questionnaire) used by^[10] was restructured. Questions consisted of five-point Likert scale ranging from 1 point "never" to 5 point "highly yes." As scores are higher, it refers to stronger motivation for pursuing the meaning of life, grants and perceives more meanings to subjective life. Reliability coefficient shown in [10]'s research exhibited Cronbach's $\alpha=.880$ and the coefficient in this study was Cronbach's $\alpha=.923$

Results

1. Frequency analysis on demographic features of study subjects

Results of analyzing the frequency of demographic features among 173 participants regarding age revealed that 85 participants in 46 to 50-year-old primarily accounted for 49.3%, whereas 12 people in 40 to 45-year-old were least. For academic background, 81 participants were graduates accounted for 46.6%, while nine under elementary school accounted for 5.5%. For marriage year, 11-15 years accounted for 32.9% (57), while 16-20 years accounted for 8.2% least (14). Part-time job or temporary work accounted for 37% (64), followed by regular job (23.3%, 40), housewife (19.2%, 33), professional (12.3%, 21) and self-employment (8.2%, 14) among entire respondents regarding occupation. Less than four million won accounted for 27.4% (47) regarding monthly income, while less than a million won accounted for 12.7% least (22). Regular menstruation or climacterium primarily accounted for 35.6% (62) regarding menstruation status.

2. Difference among social support, life stress and meaning of life according to demographic features

Distribution analysis was conducted and Scheffé test was later performed as post-analysis to examine the difference of each variable. The mean difference of age revealed that social support (F=8.68, p<.001) and life stress (F=3.40, p<.05) were statistically different. Post-analysis showed that social support was the highest in a group ranging 40-year to 45-year-old compared to other groups. The 40-year to 45-year-old group showed higher life stress than a 51-year to 55-year-old group.

The mean difference of academic background revealed that social support (F=7.66, p<.001), life stress (F=15.53, p<.001) and meaning of life (F=2.95, p<.05) were statistically significant. Post analysis suggested that a “graduated from more than graduate school” group showed higher social support than other groups. In contrast, a “graduated from elementary school” group showed the highest level of life stress compared to a “graduated from high school” group and “graduated from university” group.

Meanwhile, the mean difference of marriage year presented results that social support (F=9.01, p<.001), life stress (F=4.11, p<.01) and meaning of life (F=2.85, p<.05) were statistically significant. Post analysis

suggested that a “16-20 years” group showed higher marriage years than other groups. On the other hand, a “single” group showed higher marriage years than a “less than five-year” group.

The mean difference of occupation revealed that social support (F=6.72, p<.001) and meaning of life (F=2.82, p<.05) were statistically significant. Post analysis showed that a “self-employment” group presented higher social support than other groups.

The mean difference of monthly income suggested that social support (F=4.41, p<.01), life stress (F=3.77, p<.01) and meaning of life (F=5.79, p<.001) were statistically significant. Post-analysis specifically revealed that a “less than three million won” group showed higher social support than a “less than two million group” and a “more than four million won” group. A “less than two million group” showed higher level of life stress than a “less than three million group.” A “more than four million won” group showed higher meaning of life than a “less than three million won” group and a “less than two million group.”

3. First hypothesis

‘Social support of study subjects will give negative effects on life stress.’

As shown in Table 1, the influence over life stress of control variables were statistically significant (F=11.617, p<.001). It indicates lower life stress as their academic background and social support are higher and the first hypothesis is supported.

Table 1. The Effect of Social Support on Life Stress of Research Subjects (N=173)

Variables	B	β	t	TOL	VIF	
Age	-.111	-.108	-.53	.155	6444	
A.b	-.297	-.325	-3.23**	.627	1595	
M.y	.024	.044	.298	.296	3374	
Occ	.003	.005	.045	.544	1840	
M.i	-.019	-.028	-.25	.488	2050	
M.s	.133	.125	.78	.246	4060	
Social support	F.s	-.035	-.038	-.29	.386	2591
	O.s	-.450	-.564	-3.87***	.300	3329

Cont... Table 1. The Effect of Social Support on Life Stress of Research Subjects (N=173)

R ²	.592
Adj. R ²	.541
F	11.61
p	.000***
D-W	1.728
*p<.05, **p<.01 ***p<.001	A.b: Academic background, M.y: Marriage year Occ: Occupation, M.i: Monthly income M.s: Menstruation state, F.r: Family relationship Eco: Economy, D-W: Durbin-Watson

R ²	561
Adj. R ²	.490
F	7.92
p	.000***
D-W	1.618
*p<.05, **p<.01 ***p<.001	A.b: Academic background, M.y: Marriage year Occ: Occupation, M.i: Monthly income M.s: Menstruation state, F.r: Family relationship Eco: Economy, D-W: Durbin-Watson

4. Second hypothesis

‘Social support of study subjects will affect the meaning of life positively.’

Family support and supports from other people as subfactors of social support did not affect the meaning of life significant. Therefore, the second hypothesis was rejected.

5. Third hypothesis

‘Life stress of study subjects will affect the meaning of life negatively.’

As shown in Table 2, The independent variable explains the independent variable as 56.1%, which was statistically significant (F=7.926, p<.001). Monthly income (p<.01) showed positive impacts on the meaning of life. Stress from economic problems (p<.01) gave negative effects on the meaning of life. This implies that higher monthly incomes means higher meaning of life. As life stress is higher due to economic problems, it can be said that the meaning of life is low. Thus, the third hypothesis was adopted.

Table 2. The Effect of Life Stress on Meaning of Life of Research Subjects (N=173)

Variables	B	β	t	TOL	VIF	
Age	.009	.008	.038	.170	5.877	
A.b	-.035	-.035	-.28	.464	2.155	
M.y	.180	.306	2.00	.303	3.297	
Occ	.073	.099	.83	.512	1.955	
M.i	.315	.429	3.38**	.441	2.266	
M.s	-.108	-.117	-.68	.242	4.139	
Life stress	Fr	-.108	-.132	-.93	.354	2.825
	Eco	-.443	-.525	-2.70**	.188	5.331
	Health	.056	.057	.240	.124	8.074
	Role	-.108	-.104	-.62	.251	3.982

Conclusion and Proposal

This study is intended to examine the effects of social support and life stress of women in climacterium on the meaning of life.

First, the difference among social support, life stress and meaning of life according to demographic features of women in climacterium revealed that social support was statistically significant different in terms of age(p<.001), academic background(p<.001), marriage year(p<.001), occupation(p<.001) and monthly income(p<.01). Life stress was statistically significant different in terms of age (p<.01), academic background (p<.001), marriage year (p<.01) and monthly income (p<.01). Meaning of life was statistically significant different in terms of academic background (p<.05), marriage year (p<.05), occupation (p<.05) and monthly income (p<.001).

Second, the correlation among social support, life stress and life meaning of women in climacterium suggested that social support and life stress showed negative correlations, while social support and meaning of life showed significantly positive correlations.

Third, regression analysis of their social support, life stress and meaning of life exhibited that social support gave negative effects on life stress, while no effect on meaning of life.

Fourth, higher level of stress from economic problems as a subfactors of their life stress functioned as a variable that significantly affects the meaning of life adversely.

In short, we would like to propose as follows based on the above findings.

First, subject scope needs to be expanded to generalize and apply results as the present study tested women in climacterium who reside in some small and medium-sized cities in Gangwon-do. In addition, a

continuous follow-up study is proposed to reduce life stress and enhance the meaning of life among ordinary middle-aged women in family and society.

Second, specific and verifiable evidence should be prepared by studying medium variables that their social support and life stress can affect the meaning of life and by establishing local governance.

Third, women in climacterium play pivotal roles in family life such as education in family and drive to boost energy in the society. Thus, support program to play pivotal roles in the society needs to be developed and national policy should be established to estimate the level of life and construct social support system for efficient handle.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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The Effect of Adult Attachment Types, Gender Role Attitude on the Heterosexual Relationship Satisfaction in University Students

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Abstract

Background/Objectives: The purpose of this study was to examine adult attachment types, gender role attitudes and heterosexual relationship satisfaction of college students and to examine how they affect satisfaction with heterosexual relationships.

Methods/Statistical analysis: This study is a descriptive correlation study to investigate the degree of adult attachment type, gender role attitude, and heterosexual relationship satisfaction of college students. The data were collected by 183 college students located in S, G and C province who agreed to participate in this study. The collected data were analyzed by frequency and percentage, mean and standard deviation, Pearson correlation and multiple regression.

Findings: The results of this study were as followings: Male 29.8% female 70.2%, mean age 24.8 years. There was a statistically significant negative correlation ($r = -0.622$, $p < .01$) in satisfaction with heterosexual relationship and adult attachment, and significant positive correlation ($r = 0.236$, $p < .01$) between heterosexual satisfaction and gender role attitude. The worse the attachment anxiety, the worse the heterosexual relationship satisfaction ($B = -.528$, $p < .001$), the worse the attachment avoidance, the lower the Heterosexual relationship satisfaction ($B = -.632$, $p < .001$). On the other hand, the more classical the gender role attitude, the more likely the Heterosexual relationship satisfaction is fall ($B = -.412$, $p = .001$).

Improvements/Applications: Therefore, it is necessary for a university student to develop a program that can identify his or her attachment type and actively cope with this relationship.

Keywords: *adult, attachment, college, heterosexual relationship, Gender role.*

Introduction

Erikson suggested building close relationships with people as a fulfillment task to accomplish in early adulthood. Humans live through many development tasks throughout their lives, and the early adulthood is a time of building a mature interpersonal relationship by building a close relationship through their interpersonal relationships with others [1]. College students at this time experience difficulties or conflicts in forming a broader interpersonal relationship [2], and seem to be fully exercising their functions as adults, but they are not completely separated from their parents, causing anxiety about full independence with the psychological burden on the role demanded by society.

Attachment refers to an intimate, strong emotional bond that one feels about someone close to him that is formed through interaction with a primary parent in the early part of one's life [3]. Adult attachment is the result of the transition to friends and lovers who are not primary carers [4]. Unstable adult attachment is a variable that foretells the personality characteristics of an individual and has a significant effect on the quality of the relationship and the satisfaction of the relationship. Unstable adult attachment is divided into two dimensions: anxiety attachment and avoidance attachment; anxiety attachment means a dimension that is too preoccupied with relationships or afraid of being rejected or abandoned by others; and avoidance attachment means a dimension that makes it uncomfortable to be intimate with others [5]. In addition, the attachment target of university students

in the suddenly expanded relationship is diverse and the attachment pattern is complicated, so the attachment is different from the initial stage of development [6]. Many attachment theorists argue that in order to understand adult interpersonal patterns, it is more appropriate to understand the overall level and pattern of attachment to current opposite sex friends or intimate others than to identify the type of attachment to parents formed in the early stages of development [7]. Adult attachment is also consistently studied in a wide range of fields as well as developmental psychology and is known as a significant variable to heterosexuality satisfaction [8,9]. A university student's experience in heterosexuality is closer than other interpersonal relationships, including family and friends, and the formation of intimate heterosexuality in early adulthood has a positive effect on individuals, such as helping them in mental health and improving the quality of life throughout their lives [10]. In particular, heterosexuality is an important concern for college students and a key interpersonal and developmental task. In fact, among the issues that university students appeal to counseling centers [11], they reported that the most influential person is their opposite sex [12].

Compared to the innate biological concept of sex (sex), the gender role is an expected behavioral characteristic of men or women in the affected society and culture based on biological gender [13]. In general, the masculinity of gender roles represented an independent, competitive and achievement-oriented character, and femininity had been known to represent a warm, sensitive and friendly character, and acting according to gender roles was considered very natural and desirable for men and women [14]. According to the study, such gender roles also affect relationships between men and women, women who value the quality of relationships in resolving conflicts between lovers try to resolve conflicts more actively than men, while men who value the status of relationships tend to avoid conflicts [15]. Cheng (2010)'s study also found that women are socialized and educated to solve problems more relationship-oriented in conflict situations, while men tend to avoid them by being socialized and educated as achievement or task-oriented [16]. However, since the study by Lee and Park [17] did not distinguish between men and women, and Kim and Lee [18] conducted the study only on women, it was not clear how gender roles actually affect heterosexual satisfaction, so it was thought that it would be necessary to repeat the study. Since the previous research was reviewed that there

were many references to adult attachment and gender role as variables that affect the heterosexual relationship satisfaction in college students, this study tries to re-examine the effect of adult attachment type and gender role on the satisfaction of the opposite sex in university students. Therefore, I want to find out the relationship between adult attachment style, sex role attitude and heterosexual relationship of college students, what variables are influencing them, and try to contribute to the mature heterosexual relationship satisfaction of college students.

Method

This study was conducted for about three months from August to October 2018. The survey was conducted on 183 college students attending N University in C city, C Province. All data used was collected according to the approved guidelines and screening procedures of "N University". A total of 190 questionnaires were collected and 183 of them were used in the study, excluding seven insufficient ones.

Adult attachment type

In this study, we found that students in college had to measure adult adhesion patterns in their bodies. Kim [19] modified and validated the ECR-R (Experience of Close Relation Ship-R) of Frey, Waller and Brennan [20]. The scale of attachment-anxiety is 18 questions and the sub-scale of attachment-avoidance is 18 questions, consisting of 36 questions, five-point Likert scale, and Kim's study [19] showed that Cronbach's α was .89 and .85, respectively. In this study, Cronbach's α of attachment-anxiety was .85, an attachment-avoidance was .92.

Gender role attitude

Developed by Osmond and Martin [21], it was measured by the Sex Role Attitude Measurement Tool (SRA), which was translated into Korean by Moon's study [22]. The gender-role attitude consisted of performance-force perception (12 items) and gender-role recognition (5 items), and a total of 17 items were measured on a 5-point Likert scale (1=not at all, 5=very much). The total score is 17 to 85 points, meaning the higher the score, the more modern gender roles they have. In a study by Moon's [22] Cronbach's α was .82. In this study, the total questionnaires Cronbach's α was .83.

Heterosexual relationship satisfaction

The Marital Satisfaction Inventory (MSI) developed by Snyder [23] was revised by Kwon and Chae [24] to a phrase that You [25] considers suitable for dating in Korea, and used the sentence analyzed by Lee [26]. Overall dissatisfaction, emotional communication problems, problem-solving communication, and shared time conflict are composed of 41 questions and are a true measure of response with ‘Yes’ or ‘No’. The higher the score on the scale, the more satisfied the relationship is. In a study by Lee [26], the Cronbach’s α was overall dissatisfaction .90; emotional communication problems .85, problem-solving communication .74, and shared time .74, with a total of .91. In this study, the Cronbach’s α was found to be overall dissatisfaction .83, unsatisfactory emotional.85, unsatisfactory problem-

solving communication .83, shared time .84, and overall as .88

Result and Discussion

The general characteristics of the subjects in this study are as shown in Table 1. The average age of the subjects was 20.80±1.80. There were 53 (29.0%) men and 130 (70.1%) women, while 124 (67.8%) were currently dating. When asked about the number of heterosexual relationship, 97 respondents (53.3 %) answered “two times,” When asked, “How long was the dating period?” 54 respondents (29.0 %), 32 respondents (17.5 %) answered “between six months and one month,” 49 respondents (26.8 %) said they had dating for more than three years, and 10 respondents (5.5 %) answered that they had been dating for more than three years.

Table 1. General characteristics (N=183)

Characteristics	Categories	n(%) or M±SD
Age		20.80±1.80
Gender	Male Female	53(29.0) 130(70.1)
Now, Heterosexual relationship	Yes	124(67.8)
Number of heterosexual relationship	1-2 times	97(53.0)
	3-5 times	57(31.1)
	More than 5 times	29(15.8)
The period of heterosexual relationship	Less than 3 month	38(20.8)
	3-5months	54(29.5)
	6months-1year	32(17.5)
	1year-3yesar More than 3 years	49(26.8) 10(5.5)

Table 2 shows the correlation between each variable.

Table 2. Correlations among adult attachment type, gender role attitude and heterosexual relationship satisfaction.

Variables	1	2	3	4	5	6	7
1	1	.328***	-.183***	-.567***	-.534***	-.598***	-.687***
2.		1	-.249 ***	-.485***	-.510**	-.568**	-.524**
3.			1	-.426***	-.436**	-.489**	-.501**

Cont... Table 2. Correlations among adult attachment type, gender role attitude and heterosexual relationship satisfaction.

4.				1	.355**	.345***	.378***
5.					1	-.477***	.367***
6.						1	.421***
7							1

1. attachment- anxiety, 2.attachment-avoidance, 3. Gender-role attitude, 4. Dissatisfaction overall, 5. Emotional communication problems, 6. Problem-solving communication, 7.Shared time conflict. * p<.05, ** p< .01, *** p< .001

The results of multi-regression analysis on how each variable affects the Heterosexual relationship satisfaction are as shown in Table 3. The worse the attachment anxiety, the worse the heterosexual relationship satisfaction (B= -.528, p<.001), the worse the attachment avoidance, the lower the Heterosexual relationship satisfaction (B= -.632, p<.001). On the other hand, the more classical the gender role attitude, the more likely the heterosexual relationship satisfaction is fall (B= -.412, p=.001).

Discussion

This study is a descriptive relationship study to identify factors that affect the satisfaction of the heterosexual partner in college students. Based on the results of the previous research, I would like to discuss some. In the correlation between the variables in this study, the two sub parameters of attachment types, attachment

Table 3. Multiple regression of adult attachment type, gender role attitude and heterosexual relationship satisfaction

Predictors	Heterosexual relationship satisfaction						
	B	SE	β	t	p	tolerance	VIF
Constant	5.598	6.908		13.598	<.001		
Attachment anxiety	-.528	.089	-.416	9.244	<.001	.980	1.017
Attachment avoidance	-.632	.078	-.378	-8.437	<.001	.989	1.014
Gender role attitude	-.412	.165	-.378	4.132	.001	.991	1.015

Anxiety and attachment avoidance, both showed a statistically significant negative correlation with the heterosexual relationship satisfaction. In the Attachment Anxiety case, the results were the same as in the preceding study, in which people with attached anxiety tend to be immersed in interpersonal relationships and reduce their satisfaction with the opposite sex if they feel

afraid of being abandoned and rejected in a relationship they feel close to [8,27].

In a study by Lee and Yang [27], people who tend to attachment avoidance themselves to high self-esteem but avoid close relationships, excessively belittling reliance on others, and believing in themselves, they are more likely to be isolated alone. That result was similar to this

report because it could be thought that the heterosexual relationship satisfaction would be reduced. In addition, according to Erickson's theory of psychological and social development [1], the primary developmental task in early adulthood is to gain intimacy through relationships between peers and lovers. This suggests that active intervention is necessary in satisfying the opposite sex of university students, which is early in adulthood. The results of this study showed that gender role attitudes had a statistically significant negative correlation with heterosexual relationship satisfaction, and that the higher the posture of traditional, or classical gender roles, the lower the rational relationship satisfaction level. In the study by Choi and Yang, who studied the relationship between adult women's love-relationship satisfaction and the gender stereotype, there was no significant statistical difference between gender stereotypes and heterosexual relationships [29], and there was a significant relationship in the study by Sanchez et al [30]. It is believed that the reason for this is that Choi and Yang conducted research with a gender stereotype tool with strong sociocultural concepts [29], rather than a tool for gender roles with strong biological gender concepts.

Conclusion

This study investigated the effect of adult attachment type and gender role attitude on heterosexual relationship satisfaction, and the result was to induce interpersonal satisfaction through healthy heterosexual relationship of university students and to form more mature interpersonal relationship after employment. It is meaningful that the basic data is presented. As a result, it is expected that this basic data will give students the opportunity to re-experience the attachment and gender roles of college students, thereby forming a positive heterosexual relationship, and also to be the basis for positive interpersonal relationships. However, it is difficult to expand the results of this study because the study was conducted only by a small number of early adult students. In addition, it is necessary to be careful because it cannot convey the characteristics of the socio-cultural perspective in the gender role attitude because it can convey the biased knowledge. In addition, since the results of research on various sub concepts were not reported in the satisfaction of heterosexual relations, it is suggested to conduct research on these sub concepts later.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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The Effects of Economic Stress, Career maturity and Major Satisfaction on the Job Stress in Third and Fourth Grade Students of University

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Abstract

Background/Objectives: As most college students go older, more stress about getting a job. This study was to investigate the effects of economic stress, career maturity and major satisfaction on college students' job stress..

Methods/Statistical analysis: Data collection was conducted from November, 2017 to June, 2018 in 200 students who understood the purpose of the study and agreed to participate in the study. The collected data were analyzed by frequency, mean, standard deviation, Pearson correlation, and multiple regression analysis.

Findings: The subjects were 78 (38.4%) male and 122 (60.1%) female. The mean age was 21.9 (± 1.47). Employment stress was statistically significant positive correlated with economic stress ($r = .567, p < .001$), significant negative correlated with majors' satisfaction ($r = -.426, p < .001$) and career maturity ($r = -.585, p < .001$). Also Major satisfaction was statistically significant positive correlated with career maturity ($r = .329, p < .001$). According to the results of a multi-regression analysis to find out the impact of economic stress, career maturity, and major satisfaction on the job stress. The higher job economic stress ($\beta = .384$), job stress was higher. Also the lower career maturity ($\beta = -.398$), the higher the job stress, and the lower the major satisfaction ($\beta = -.278$), the e job stress was higher.

Improvements/Applications: Various youth career education and career development nursing programs will be required to lower the employment rate of college students, so the results of this study will be basic data.

Keywords: *Job, economy, stress, career maturity, major, satisfaction, college student*

Introduction

At the stage of development, college students who are in early adulthood in late adolescence experience various stresses because they have to expand their social activities from admission to college, adapt to new environment and study, worry about tuition fees, and the recent rise in the youth unemployment rate [1]. In addition, this period cannot be independent from the parents psychologically, and the stress can be higher than any time due to the high dependency. In particular, the financial burden of college tuition, living expenses, and the possibility of employment in the future of college students caused economic stress, and the economic stress was the highest in college life [2]. For college students living in modern society, employment is a

very important factor in determining their overall life. As most college students go to higher grades, they are more likely to be stressed with regard to employment. This is not a problem confined to specific departments, but is experienced by all university students in Korea [3]. However, as youth unemployment has been increasing due to the economic downturn at home and abroad, it has recently been shown that the youth unemployment rate in our 20s is 10.7 percent, higher than the overall unemployment rate of 5.2 percent. [4], the nation's youth (ages between 15 and 29) has been rising continuously since 2012, but the unemployment rate recorded 9.8 percent in 2017 and 10.0 percent in the first quarter of 2018, far above the total unemployment rate. The employment assistance index for young people, which indicates the unemployment rate, stands at 23 percent

and the number of unemployed young people, including potential job seekers, stands at about 1.13 million, with one in five young people known to be unemployed [5]. There are many reasons like this that college students will experience a great deal of stress in finding a job. Job stress is a stress that occurs during the process of college students determining career paths or preparing for employment, which increases physical or psychological instability and increases awareness and tension related to employment [6]. Career is more important than simply choosing a job, because it depends on all aspects of life, including occupation and social status, depending on the career we choose [7]. Therefore, the choice of majors comes first in choosing a career, which is a very important choice in a college student's life that is related to a career. Thus, mature students in choosing their careers will be able to live happy lives, satisfied with the jobs they choose. Crites [8] said that the degree of relative job preparation that appears when compared to students of the same age group. In Kang's study, he explained that there is a need to devise ways to enhance the career maturity of college students, describing them as a variable that has a greater impact on career-setting levels [9]. There were also studies that looked at the relationship between job stress and job insecurity and career maturity in relation to employment. In particular, since many department selection opportunities are given before entering university, and each university's admission selection methods are becoming more diverse, the educational environment surrounding universities is rapidly changing due to the changes, so students choose their own grades and geography, or departments their parents wish to pursue rather than choose their own favorite and desired I think this problem is becoming more of a job stress. What is closely related to the careers of college students depends on what they preach their major. A high level of satisfaction with one's major makes one's thoughts on career clear and leads to a state of peace with one's decision. The degree of satisfaction in the major will be high if the departments in which you belong now match the standards for your career path or career set by an individual [10]. College students' satisfaction with their majors is a positive factor in determining their jobs and having a positive impact on their confidence in their job-related task performance, and as a result, students with high degree of professional satisfaction showed high levels of career maturity [10, 11]. The results of a preceding study to find out the relationship between major satisfaction and job stress report that the higher the degree of major satisfaction, the lower the

job stress and the lower the degree of major satisfaction, the higher the job stress [12]. Therefore, career maturity is very necessary for university students. The degree of satisfaction with the majors is a clear indication of students own idea of career and a comfortable state of students's decision [8]. Major satisfaction is the product of judging the course or career set by an individual, and if the current department is consistent with the ideal of his / her life or future career or occupation, the major satisfaction will be high [9]. This study is to find out how the economic stress, seniority, and satisfaction level of majors affect the job stress of university students, and to present basic data on the preparation of nursing intervention measures to reduce the employment stress of college students

Method

The questionnaire data was collected using the questionnaire printed for about 8 months from the beginning of November, 2017. The study was conducted on 260 third and fourth grades attending university in C Province who agreed to the study. All data used was collected according to the approved guidelines and screening procedures of "N University".

Economic stress

In this study, to measure economic stress, Kang [13]'s tools were used to modify and supplement the Economic Hardship Questionnaire (EHQ) developed by Lempres [14] to suit college students. A total of 12 questions are the five-point Likert scale, and the higher the score, the more economic difficulties they have experienced. In Kang's study [13], the Cronbach's α was .88 and in this study it was .89

Carrier maturity

To measure the maturity of a career, Kim [15] modified the Career Maturity Inventory (CMI) developed by Crites [8]. CMI consists of two sub-domain areas: attitude scale and capability scale, and in this study, attitude measure was used. The higher the score the better the carrier maturity. The Cronbach's α in this study was .86.

Major satisfaction

In order to measure the major satisfaction of those studied, the Program Evaluation Survey [16] developed by Illinois University was modified by Kim and Ha [17]. A total of 18 questions are included, and the higher the score on the 5-point marker scale, the higher the

professional satisfaction level. In the study by Kim and Ha [17], tool reliability, Cronbach's α was .92, and .88 in this study

Job stress

Based on the Cornell Medical Index (CMI) of Cornell University's Shepherd et al [18] to measure the employment stress of university students and modified by Kang [19] were used. 21 questions in total. It consist on the 5-point Likert scale, the higher the score means higher economic stress. In Kang's study [20], Cronbach's α was .703 and it was .731 in this study.

Result and Discussion

1. General characteristics of the subjects

The general characteristics of the participants are shown in Table 1. The mean age of the subjects was 21.96± 1.44 years. The study participants included 78 males (38.4%) and 122 females (60.1%). By grade, 59.1% of third grade students. The students' majors was the health and medical science (53.2%) is the most.

Table1. General characteristics (N=200)

Characteristics	Categories	n(%) or M±SD
Age		21.96±1.44
Gender	Male Female	78(38.4) 122(60.1)
Grade	Third year	120(59.1)
	Forth year	80(39.4)
Average grade (The highest rating is 4.5)	Below 2.0	5(2.5)
	2.01~3.0	34(16.7)
	3.01~4.0	142(70.0)
	Above 4.01	19(9.4)
Major	Science	8(6.1)
	Engineering	26(19.7)
	Line of humanities	38(18.7)
	Health and medical science	108(53.2)
	Arts and physical science	10(4.9)

2. Correlations among economic stress, career maturity, major satisfaction and job stress

Table2 shows the results of Pearson's correlation coefficients to confirm the correlation between economic stress, career maturity, major satisfaction, and employment stress.

Table 2. Correlations among economic stress, career maturity, major satisfaction and job stress (N=200)

Variables	Economic stress	Career maturity	Major satisfaction	Employment stress
Economic stress	1	-.328***	-.286***	.567***
Career maturity		1	.329***	-.585***
Major satisfaction			1	-.426***
Job stress				1
* p<.05, ** p< .01, *** p< .001				

Table 3 shows the results of multiple regression. The higher the economic stress ($\beta=.384$), job stress was higher. Also the lower career maturity ($\beta=-.398$), the higher the job stress. And the lower the major satisfaction ($\beta=-.278$), the job stress was higher.

Table 3. Multiple regression of job stress, economic stress, career

Predictors	Job stress						
	B	SE	β	t	p	tolerance	VIF
Constant	4.625	7.908		11.510	<.001		
Economic stress	.428	.012	.384	7.244	<.001	.981	1.014
Career maturity	-.632	.089	-.398	-7.407	<.001	.986	1.016
Major satisfaction	.090	.079	-.278	2.135	.001	.983	1.015

Discussion

In this study, the career maturity was 3.48 out of 5. Although not a study using the same tools as this study, Han's study of nursing students [20] found that the career maturity status was 3.91 points, slightly higher than this study subjects. The reason is that nursing students get a job even before they graduate, and the employment rate is better than those of other majors. It is believed that nursing students are more mature in their career maturity than other college students. As shown in this study, career maturity and major satisfaction have shown a statistically significant positive correlation, which can be thought that higher major satisfaction will result in a mature attitude in determining course. As a result of the above, Han's research [20] supported this study. In this study, there was a statically significant negative correlation between the career maturity and the job stress, multiple regression analysis also showed that the lower the maturity of career, the higher the employment stress. A study by Kim and Choi [21], who studied college students' depression, employment stress and career maturity, also showed a significant negative correlation between employment stress and career maturity, and found that the lower their career maturity, the higher the employment stress, the same as the result of this study. I think getting a good job for third and fourth graders is a very important crisis in life. Therefore, the stress they have to suffer is thought to be very high. Therefore, I think stress management and arbitration are very important interventions in early adult nursing.

In this study, there was a statistically significant correlation between major satisfaction and career maturity. Also, the higher the satisfaction of the major, the lower the job stress. In the preceding study,

satisfaction with the major chosen when going to college is a major factor in the formation of career consciousness, and satisfaction with the major of university students is a factor that has a positive effect on job determination and confidence in job-related task performance. As a result, students with high degree of satisfaction in major studies reported high levels of seniority [11, 21], so preceding studies supported the results of this study. Through the above discussion, it can be seen that economic stress, career maturity, and major satisfaction are important variables that affect job stress. If the students prepare the educational environment at the university level to reduce economic stress and increase the degree of student's professional satisfaction, I think it can help the job stress of college students decrease if the degree is increased by various efforts of the department itself.

Conclusion

The results of this study could be used as a basic data for developing pro-program for career counseling and guidance to reduce employment stress for college students in the future. In the development of a program to enhance the cadence of college students, the government should consider the above findings and apply such methods as improving the teaching method and granting them a chance to succeed in making decisions about their academic performance so that they can contribute to enhancing their professional satisfaction and further enhancing their career maturity. However, since this study targeted university students from some local material universities, there are limitations to the wider interpretation of the research results. We believe that there is a need for continuous exploration of variables that can attempt repeated research for college students in more diverse departments and that can mediate or

control job stress.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Major Factors Having Influence on the Subjective Happiness of Korean Youth; From the 13th KAHBOS Data

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Abstract

Background/Objectives: As a study of secondary analysis that analyzed the 13th (2017) Korean Adolescents' Health Behavior Online Survey data second time, this is a descriptive study performed for the purpose of identifying the major factors having influence on the subjective happiness perceived by the youth.

Methods/Statistical analysis: The subjects of the 13th (2017) survey were 64,991 students from total 800 schools and out of them, 62,276 students from 799 schools participated showing 95.8% of participation rate. For the general, physical and psychological factors, the complex sample frequency analysis and for the major factors having influence on the subjective happiness, the complex sample regression analysis were used.

Findings: The age, grade, economic level, frequency of having breakfast per week, experience of receiving treatment by the violence, frequency of physical activities more than 60 minutes per week, fatigue recovery with the sleep, weight control effort, BMI, smoking, stress, subjective cognition of body type, subjective health, suicidal ideation and the agony counselor were drawn as the major factors having statistically significant influence on the subjective happiness received by Korean youths.

Improvements/Applications: To enhance the happiness of the youth, the happiness enhancement program about breakfast management prevention of violence, physical activities more 60 minutes per week, sleep and fatigue recovery, weight control, smoking, stress management, suicidal ideation, counseling with the family as counselor, etc. is need to be activated.

Keywords: Youth, Happiness, Health Behavior, KAHBOS, Affecting factors

Introduction

Adolescence is the period that the rapid changes are experienced in the physical, mental and spiritual aspect and particularly, the growth and the development in this period influence on the adult period, too, and ultimately, the adolescence is considered as important phase to determine the quality of life of a man. Happiness refers to the subjective state that one experiences the positive emotion or satisfaction in one's life through the control and commitment exerting the strengths and the potentials of an individual^[1]. In the research of Diener^[2] that

investigated the happiness from 7,204 college students in 42 countries, most people consider the satisfaction in life and the happiness very important and only 6% of the respondents answered that the money is more important than the happiness and 69% answered that the happiness is one of the most important scales^[3].

The research results that studied the Korean adolescents are as follows. National Youth Policy Institute reported that in the results of analyzing the first and third graders of middle school and the second graders of high school using NYPI Panel Survey data, it was shown reverse V shape that the happiness is high in the third graders of middle school that the first graders of middle school and the second graders of high school. Another research explored the factors having influence on the subjective happiness of youth by analyzing the

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10th Adolescents' Health Behavior Online Survey in 2014^[4], and its results showed that the happiness was higher in the middle school students than the high school students.

The subjective happiness index of the Korean youth published by 2016 8th International

Comparison of Youth and Children Happiness Index, the subjective happiness index of Korean youth was 82 points showing the lowest among the 22 OECD countries. This result explains that as shown in various data that reported the seriousness of the cognition of stress and depression and the suicidal ideation in the adolescence, the happiness and the satisfaction in life perceived by Korean youth is significantly low compared with the other countries^[5].

The subjective happiness is the evaluation method of recognition on overall subjective well-being and one evaluates subjectively what degree he/she feels the happiness^[6]. The happiness in the adolescence has influence on the quality of life after one became adult, which will become major evaluation factor in the area of mental health in the national level. That is, the emotional aspect is the most essential factor for sound growth of youth influencing through entire life. Therefore, this study is attempted to identify the current status for the sound growth in the emotional level related to the happiness of the youth and to contribute to establishing the direction for the purpose of identifying the major factors having influence on the happiness perceived subjectively by Korean youths.

Method

The 13th (2017) survey was conducted with 64,991 students from total 800 schools, 400 middle schools and 400 high schools, but 62,276 students from 799 schools participated showing 95.8% of participation rate based on the number of students.

For the general characteristics, the questionnaire items asking the gender, age, academic achievement, economic condition, residential type, number of breakfast taken per week, hour of using smartphone, experience of receiving the treatment by the violence were used.

For the physical factor, the questionnaire items asking the physical activities, degree of fatigue recovery with sleep, weight control effort, BMI, drinking,

smoking.

For the psychological factor, the questionnaire items asking stress, subjective body image, subjective health, subjective happiness, suicidal ideation, the agony counselor were used.

The data were analyzed after generating complex sample plan file by giving weight using the IBM SPSS 25.0 program, and the analysis was conducted by setting the significance level to 0.05. For the degree of general, physical and psychological factors of the subject, the complex sample frequency analysis was used. For the major factor having influence on the subjective happiness perceived by the subject, the complex sample regression analysis was used.

Results

1. General, physical and psychological factors

Out of the general factors, in the gender, the male was 31,624 students (52.1%), showing highest proportion, the age was 12-15 (54.1%), in the academic achievement, 47,624 (76.4%) students answered that their academic achievement is medium and in the economic condition, 53,970 (86.5%) students were medium showing highest proportion.

Out of the physical factors, in the number of days performing physical activities more than 60 minutes a week, '2 days or less' was high (68.1%), and 46,128 students (74.9%) answered that 'fatigue is not recovered with sleep'.

Out of the psychological factors, in the stress, 23,259 students (37.2%) answered that they feel 'very much' and 23,564 students (39.0%) answered 'happy'.

2. Factors having influence on subjective happiness

To identify the factors having influence on the subjective happiness of Korean youth, the complex sample regression analysis was performed taking the subjective happiness as dependent variable and the rest of variables as independent variable.

The significant difference was shown in the age, academic achievement, frequency of having breakfast a week, treatment experience by the violence, frequency of physical activities more than 60 minutes a week, fatigue recovery with sleep, weight control effort,

BMI, smoking, stress, subjective cognition of body type, subjective health, suicidal ideation and the agony counselor. its explanatory power was 34.1% ($F = 653.55$, $p < .001$)

Discussion

This study was conducted to identify the major factors having influence on the subjective happiness of Korean youth. In the results of this study, the happiness in the students of 12~15years old was lower than the student whose age is 16 ~ 18 years old, which is as same as results of the research by Lee and Known^[7] and as the happiness in the youth can be enhanced by the commitment to the peer group and the reinforcement of fellowship, which is reinforced when the school age is higher^[8], it is deemed to be shown lower in the students

of 12-15 years old, which is relatively younger age. In this study, the higher the academic achievement, the lower the happiness. Since in the results of research by Park and Seong^[9] the better the academic achievement, the higher the happiness in the youth and in the results of research by Han and Han^[10], the higher that economic level, the higher the happiness in the youth, they showed the different results from this research. Considering the fact that the fervor of academic achievement in the Korean youth is shown high than the youth of any society^[11] and that the stress is severe by that, the relation between them needs to be researched repeatedly. In addition, as the psychological factors, family relationship, the peer relationship, etc. may have more influence than the income level of household^[12], it need to understand the happiness in the youth considering these factors more.

Table 1. Demographic • Physical • Psychological Factors of Subjects

Characteristics			n(weight %)/ M
Demographic Characteristics	Gender	Male	31,624(52.1)
		Female	30,652(47.9)
	Age (year)	12-15	35,888(54.1)
		16-18	2,5973(45.9)
	Academic grade	High	8,528(13.6)
		Medium	47,624(76.4)
		Low	6,124(9.9)
	Economic level	High	6,713(11.0)
		Medium	53,970(86.5)
		Low	1,593(2.6)
	Living arrangement	With family	59,162(95.4)
		Others	3,114(4.6)
	Frequency of breakfast (day/week)	≤3	24,325(38.9)
		≥4	37,951(61.1)
	Smartphone usage time (min)		202
Healed by violence	Yes	555(0.9)	
	No	60,600(99.1)	

Cont... Table 1. Demographic • Physical • Psychological Factors of Subjects

Physical factors	Physical activities performed 60 minutes or more (day/week)	≤2	41,980(68.1)
		≥3	20,296(31.9)
	The level of fatigue recovery by sleep	Sufficient	1,6148(25.1)
		Insufficient	46,128(74.9)
	Weight control efforts	No effort	29,479(47.9)
		Effort	32,797(52.1)
	Body Mass Index(BMI)(kg/cm2)	<18.5	12,557(20.6)
		18.5-24.9	30,959(52.4)
		≥25	15,819(26.9)
	Alcohol drinking	Yes	24,417(40.2)
		No	37,859(59.8)
	Smoking	Yes	8,150(13.7)
		No	54,126(86.3)
	Psychological factors	Stress	Feeling a lot	23,259(37.2)
A little feeling			39,017(62.8)
Subjective body awareness		Thin	15,646(25.2)
		Normal	22,245(35.7)
		Overweight	24,385(39.1)
Subjective health status		Good	44,913(71.8)
		Normal	13,417(21.7)
		Bad	3,946(6.5)
Subjective happiness		Very happy	18,573(29.1)
		Happy	23,564(38.0)
		Average	15,309(25.0)
		Not happy	4,041(6.5)
		Very not happy	7,89(1.3)
Suicidal thoughts		Yes	7,584(12.1)
		No	54,692(87.9)
Worried counselor		Family	24,861(40.1)
		Others	37,415(59.9)

Table 2. Factors Influencing Subjective Happiness

Characteristics		B	t(p)	F(p)/ R2
Age(year)	12-15	-.071	-5.76(<.001)	653.55(<.001)/ .341
	16-18	1.0		
Academic grade	High	-.228	-12.37(<.001)	
	Medium	-.123	-8.18(<.001)	
	Low	1.0		
Economic level	High	-.414	-12.24(<.001)	
	Medium	-.212	-6.88(<.001)	
	Low	1.0		
Frequency of breakfast(day/week)	≤3	.035	4.27(<.001)	
	≥4	1.0		
Healed by violence	Yes	1.0		
	No	.125	2.66(.008)	
Physical activities performed 60 minutes or more(day/week)	≤2	1.0		
	≥3	-.073	-7.88(<.001)	
The level of fatigue recovery by sleep	Sufficient	1.0		
	Insufficient	-.237	-26.73(<.001)	
Weight control efforts	No effort	.055	6.67(<.001)	
	Effort	1.0		
Body Mass Index(BMI)	<18.5	.045	2.69(.007)	
	18.5-24.9	.081	7.20(<.001)	
	≥25	1.0		
Smoking	Yes	1.0		
	No	.055	3.88(.001)	
Stress	Feeling a lot	1.0		
	A little feeling	.595	62.90(<.001)	
Subjective body awareness	Thin	-.068	-4.70(<.001)	
	Normal	-.045	-4.19(<.001)	
	Overweight	1.0		
Subjective health status	Good	-.583	-31.80(<.001)	
	Normal	-.187	-10.06(<.001)	
	Bad	1.0		
Suicidal thoughts	Yes	1.0		
	No	.463	30.96(<.001)	
Worried counselor	Family	-.182	-24.20(<.001)	
	Others	1.0		

In the results of this study, the quality of life was represented high in the students having 3 breakfasts a week than those who having 4 breakfast a week, which is same as the results of research by Lee and Kwon^[7]. In addition, those who do not have treatment experience by the violence perceived happier than those who have it, which is similar to the results of research by Park, Hong and Han^[13]. The high stress in the youth may influence on the acts of violence, which becomes the cause of low happiness^[13]. Therefore, to prevent the acts of violence by the youth, it needs to enhance the happiness. In the results of research by Kim and Yeom^[14], there was difference according to the gender but the subjective happiness was represented high when the physical activities per week by the youth is more than 0 ~2days. However, this study showed the difference as the happiness was low when it was 3 days or more, for which the additional research is needed considering the detailed setting on the type and the scope of the physical activities and other characteristics of the youth. In the results of this study, the happiness was low when the students do not recover from fatigue with sleep compared to when they do not, which is as same as the result of research by Lee^[15] and proves the importance of physical factors in the happiness. Therefore, to enhance the happiness of the youth, the sleep enough to recover from the fatigue is needed. In the results of this study, the happiness was high when the students do not control the weight and when the BMI is less than 25kg/m², which is as same as the results of research by Sim^[16]. The adolescent who satisfies with his/her own appearance is high feels happy but if the satisfaction is low, as the high interest is not satisfied, the happiness is lowered as he/she shrinks psychologically^[16]. Therefore, to enhance the happiness of the youth, it is necessary to make them to have correct perception on the appearance. In the results of this study, the happiness was high when perceiving less stress. This result is as same as the results of research by Suh^[17] and since the stress in the youth may cause the anxiety and frustration of the youth resulting in emotional problem^[18], the active intervention to relieve the stress is required.

In the results of this study, the students who do not think of suicide feel higher happiness compared to those who think of it, which is as same as the results of research by Park and Lee^[19]. The depression, which is being increased continuously, can be led to suicidal impulse, which may hinder the satisfaction with life and exert negative influence on the happiness^[20, 21].

Therefore, the emotional approach to reduce the stress and the depression is required.

In this study, higher happiness was shown in case of counseling the agony with other than family than the case of counseling the agony with the family. However, the open communication can become a factor to enhance the happiness of the youth^[22], it is necessary to maintain not only the positive relationship with the peer group but also the efficient communication with the family.

Conclusion

The youth can grow up as a matured adult as long as they adapt to lots of changes experiencing the emotionally. The emotion is the important factor to stabilize the life and among them, the happiness is the important factor having influence on the quality of life. Therefore, to enhance the happiness of the youth, effort to activate the intervention program around the breakfast, prevention of violence, physical activities more than 60 minutes per week, sleep and fatigue recovery, weight control, non-smoking, stress management, suicidal ideation, counseling with the agony counselor, etc. is required. And the follow-up research considering the diverse factors having influence should be made and the happiness enhancement program should be developed.

Ethical Clearance: Not required

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Effects of Intervention on Home-Based Environmental Counselling for Children with Severe Allergic Diseases

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Abstract

Background/Objectives: Home-based environmental management is the key to managing allergic diseases. This study identified the effects of environmental counseling intervention in children with atopic dermatitis and respiratory diseases.

Methods/Statistical analysis: The participants were 198 children with allergic diseases who participated in the study in 2016. In 2017, 66 children with severe allergic diseases in a follow-up study were selected. We ultimately analyzed the effect of environmental counseling in 26 children. To assess the effect of the intervention, the research team conducted a pre-test (baseline) and post-test (follow-up) twice. Trans-epidermal water loss (TEWL) and scoring atopic dermatitis (SCORAD) index were used to assess atopic dermatitis (AD) and forced expiratory volume in 1 second (FEV₁), forced vital capacity (FVC), immunoglobulin E (IgE), and eosinophil counts were used to assess respiratory diseases.

Findings: In children with AD, the baseline and follow-up SCORAD index values were 40.33 and 31.15 points, respectively. In children with respiratory diseases, the baseline and follow-up FEV₁ values were 77.77 and 87.53 points, respectively; baseline and follow-up FVC values were 81.38 and 95.54 points, respectively; baseline and follow-up IgE values were 520.86 and 481.37 points, respectively; and baseline and follow-up eosinophil values were 4.97 and 4.42 points, respectively. Thus, home-based environmental counseling decreased FEV₁ and FVC values.

Improvements/Applications: Patients with respiratory diseases treated with home-based environmental counseling exhibited positive changes in FEV₁ and FVC values. Home-based indoor environmental counseling is regularly needed to manage respiratory diseases. The parents of children with respiratory diseases must try to minimize their exposure to harmful substances indoors.

Keywords: respiratory diseases, counseling, children, home-based, indoor environmental

Introduction

Allergies are known chronic diseases with a high prevalence in infants and children^[1]. A literature review of studies published between 1995 and 2013 reported that allergic disease symptoms have decreased or stopped in children and adolescents^[2]. However, allergic diseases are increasing as lifestyles become Westernized and the environment becomes more

polluted^[3]. This evidence suggests that environmental management is very important in allergic diseases. Although the Asthma Control Guideline emphasized the need for environmental control^[4], insufficient studies have examined the effects of disease improvement due to environmental control. A study reported in *The New England Journal of Medicine* found that environmental intervention in allergen sensitization and environmental risk factors improved asthma conditions^[5]. Children with allergies are generally sensitive to many indoor allergen factors, but counseling or education on comprehensive indoor allergens is commonly lacking. Preventive education and teaching interventions for

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asthma patients reportedly improved symptoms^[7-8] One study showed the effects of asthma by environmental interventions in the home^[5], but this study focused on the effects of atopic dermatitis and respiratory diseases in socioeconomically disadvantaged children. Among the reported Korean studies, there was insufficient evidence of the environmental risk factors and allergic diseases for socioeconomically disadvantaged groups^[6]. Previous studies focused on reducing exposure to only one allergy-causing substance found indoors rather than trying to improve the indoor environment as a whole^[5,9-10]. Therefore, here we aimed to assess the effectiveness of a home-based comprehensive environmental counseling intervention in children with allergic diseases to provide evidence of the ability of voluntary management of the indoor home environment through environmental counseling to help improve allergic diseases.

Method

1. Study Design

This study was conducted in 2016 as part of the Korea Environmental Industry & Technology Institute (KEITI) for the Environmental Diseases Prevention Project (EDPP) for socioeconomically disadvantaged people. The purpose of the EDPP is to identify indoor hazardous environment factors for home based the living space and provide socioeconomically disadvantaged children the environmental management service through counseling. This study aimed to identify changes in the symptoms of children with atopic dermatitis and respiratory diseases before and after intervention using environmental counseling.

2.2. Study Sample

We obtained the EDPP data from the KEITI between 2016 and 2017. The EDPP participation criteria were chosen by low-income households as children with allergic diseases. The study target were 198 children with allergic diseases who participated in the study in 2016. We excluded those who did not meet our inclusion criteria as shown in Figure 1. Of the 198 children with allergic diseases who participated in the EDPP in 2016, 66 with severe allergic diseases were screened. The inclusion criteria were as follows: 1) age over 6 months, 2) sensitivity to food allergens, 3) sensitivity to inhalant allergens, 4) positive for skin test findings, and 5) agreement to participate in the study. The final sample included 26 children with severe allergic diseases; 21 who participated in the EDPP in 2017 but did not participate

in the clinical intervention trials were omitted. Among the final 26 patients, 13 had atopic dermatitis, while the other 13 had respiratory diseases[Figure 1].

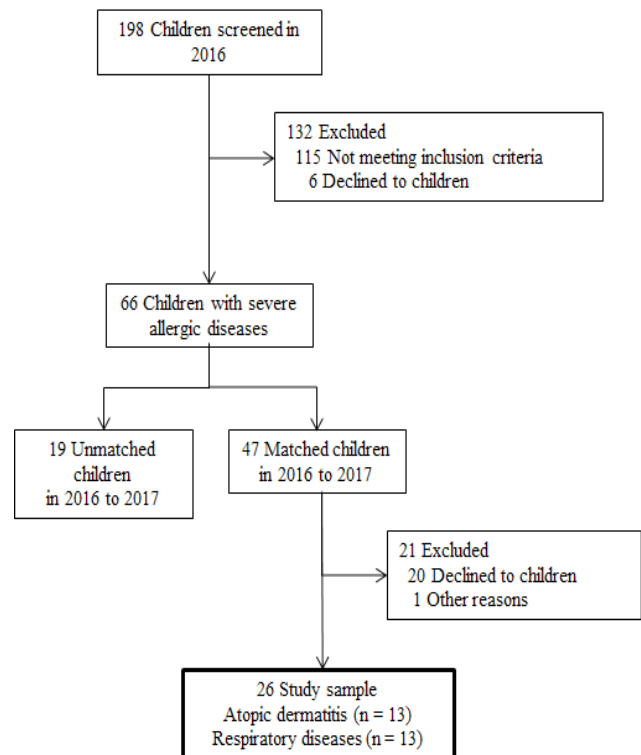


Figure 1. Selection process for study participants

3. Outcome Measures

To check the intervention effect of the environmental counseling at the Environmental Health Center for Childhood Asthma, Korea University conducted the same clinical tests two times. Demographic characteristics, disease duration, and diagnosis were investigated. Outcome measurements included skin, blood, and pulmonary function tests. The effects of the intervention in patients with atopic dermatitis were tested using the trans-epidermal water loss (TEWL) test and SCORing Atopic Dermatitis (SCORAD) index. Patients with respiratory diseases were subjected to tests of immunoglobulin E (IgE), eosinophils, forced expiratory volume in 1 second (FEV₁), and forced vital capacity (FVC). We measured TEWL using a “Tewameter” TM300 (Courage and Khazaka Electronics, Cologne, Germany). The SCORAD index was evaluated for overall surface and visually distinct symptoms and two subjective variables^[11]. The IgE concentration was measured by Coat-A-Count Total IgE IRMA (Diagnostic Products Co., Los Angeles, CA, USA)^[12]. The pulmonary function test was measured in accordance with the guidelines of the American Association for Respiratory Care^[13]. The FEV₁ and FVC

tests were conducted in accordance with the guidelines of American Thoracic Society and European Respiratory Society^[14]. We selected the highest of three FEV₁ and FVC values collected using the pulmonary function test instrument (1022 digital spirometer; VIASYS, Palm Springs, CA, USA). In addition, food and inhalation allergen sensitization was confirmed using the multiple allergen simultaneous test (MAST).

2.4. Intervention and follow up

The intervention provided counseling for environment management for patients through home visits by an environmental counselor. Environmental counselors are trained professionals who completed professional training on the Eco-Mom-Korea. One family's counseling time (for parents and patients) was a total of 6 hours. The environmental counselors visited the home three times and called the family by mobile phone 10 times. The first home visit included indoor environmental monitoring and a pre-survey, the second visit included home indoor environment management, and the third visit included health behavior management counseling and other topics. Children with severe allergic diseases visited the hospital twice before and after the intervention. The first test (baseline) was administered on November 9, 2017, while the second (follow-up) was administered on November 30, 2017. No participant dropped out from the study.

2.5. Statistical Analysis

The statistical analysis was performed with basic statistics and a paired sample t-test. The probability of significance was interpreted as being statistically significant when less than 0.05.

Result and Discussion

The average age was 10.69 years; 53.8% (n = 14) of the participants were girls. Those with a family history comprised 84.6% (n = 22) of the sample, while those delivered by cesarean section comprised 46.2% (n = 12). Those who had been breastfed accounted for 65.4% (n = 17), while those with secondhand smoke exposure accounted for 57.7% (n = 15). The prevalence over 6.73 years of age was 50.0% (n = 13) for atopic dermatitis and 50.0% (n = 13) for respiratory diseases. In baseline atopic dermatitis function, mean TEWL was 36.33 (range, 18.80–76.90), while mean SCORAD index was 40.33 (range, 20.00–76.00). Regarding baseline respiratory disease function, mean FEV₁ was 77.77% (range, 60.00–114.00%), mean FVC was 81.38% (range, 60.00–113.00%), mean IgE was 520.86 IU/mL (10.00–1131.00 IU/mL), and mean eosinophil proportion was 4.97% (range, 1.30–10.10%). Regarding environmental exposure, secondhand smoke affected a mean 57.70% (n = 15) of patients. The allergen sensitization prevalence was 30.8% (n = 8) for food and 80.8% (n = 80.8) for inhalants [Table 1].

Table 1. Baseline characteristics of the 26 children

Characteristic	n/N	% or 95% CI
Demographic Characteristic		
Girls (%)	14/26	53.8
Age (yr)	10.69	2.93 (5.00-16.00)
Family history (%)	22/26	84.6
Cesarean section (%)	12/26	46.2
Breastfeeding (%)	17/26	65.4
Duration of allergic diseases (yr)	6.73	3.21 (2.00-15.00)
Allergy symptoms within 1 week before (%)		
Atopic dermatitis	13/26	50.0

Cont... Table 1. Baseline characteristics of the 26 children

Respiratory diseases	13/26	50.0
Baseline atopic dermatitis function (% of predicted value)		
Trans-epidermal water loss (n = 10)	36.33	19.58 (18.80-76.90)
Scoring atopic dermatitis (n = 12)	40.33	15.23 (20.00-76.00)
Baseline respiratory diseases function (% of predicted value or IU/mL)		
Forced expiratory volume in one second (n = 13)	77.77	14.54 (60.00 – 114.00)
Force vital capacity (n = 13)	81.38	15.38 (60.00 – 113.00)
Immunoglobulin E (n = 13)	520.86	439.88 (10.00 – 1131.00)
Eosinophil (n = 13)	4.97	3.07 (1.30 – 10.10)
Environmental exposure (%)		
Secondhand smoke exposure	15/26	57.7
Allergen (%)		
Food allergen	8/26	30.8
Inhalant allergen	21/26	80.8

The final 26 children selected had a 30.8% food allergen sensitization prevalence in 2016 that increased to 46.2% in 2017, while the inhalation allergen sensitization prevalence was 80.8% in 2016 and decreased slightly to 76.9% in 2017 for inhalants [Table 1-2].

Table 2. Changes in food allergen and inhalant allergen sensitization rate

Examination item	Baseline (n, %)	Follow-up (n, %)	Difference*
Food allergen	8 (30.8)	12 (46.2)	-8(-15.4)
Inhalant allergen	21(80.8)	20(76.9)	1(3.9)

*Differences were used to determine the difference between 2016 and 2017

In children with atopic dermatitis, the baseline TEWL index was 36.33 (range, 18.80–76.90), while the follow-up TEWL was 48.64 (range, 17.60–101.50), an increase of 12.31. The baseline SCORAD index was 40.33 (range, 20.00–76.00), while the follow-up SCORAD was 31.15 (range, 13.00–71.00), a decrease of 9.18. In children with respiratory diseases, the baseline FEV₁ was 77.77% (range, 60.00–114.00) and the follow-up FEV₁ was 87.53% (range, 73.00–122.00%), an increase of 9.76% (p = 0.023). In addition, the baseline

FVC was 81.38% (range, 60.00–113.00%), while the follow-up FVC was 95.54% (range, 85.00–123.00%), an increase of 14.16% (p = 0.004). Also, the baseline IgE was 520.86 IU/mL (range, 10.00–1131.00 IU/mL), while the follow-up IgE was 481.37 IU/mL (range, 14.30–1253.00 IU/mL), a decrease of 39.49 IU/mL. The baseline eosinophil proportion was 4.97% (range, 1.30–10.10%), while the follow-up eosinophil proportion was 4.42% (range, 1.00–8.20%), a decrease of 0.55% for inhalants [Table 3].

Table 3. Allergy symptom changes after intervention

	Examination items	Baseline (M, 95% CI)	Follow-up (M, 95% CI)	Difference*	t(p)**
Atopic dermatitis	TEWL n = 10	36.33 (18.80-76.90)	48.64 (17.60-101.50)	-12.31	-4.816 (0.001)
	SCORAD n = 12	40.33 (20.00-76.00)	31.15 (13.00-71.00)	9.18	1.584 (0.142)
Respiratory diseases	FEV1 (%) n = 13	77.77 (60.00-114.00)	87.53 (73.00-122.00)	-9.76	-2.604 (0.023)
	FVC (%) n = 13	81.38 (60.00-113.00)	95.54 (85.00-123.00)	-14.16	-3.498 (0.004)
	IgE (IU/mL) n = 13	520.86 (10.00-1131.00)	481.37 (14.30-1253.00)	39.49	0.562 (0.584)
	Eosinophil (%) n = 13	4.97 (1.30-10.10)	4.42 (1.00-8.20)	0.55	1.254 (0.234)

abbreviation: M, mean; CI, confidence interval; TEWL, trans-epidermal water loss; SCORAD, scoring atopic dermatitis; FEV1, forced expiratory volume in one second; FVC, forced vital capacity; IgE, immunoglobulin E: *Difference values were used to determine the difference between 1 week (baseline) and 3 weeks; **P values were determined using the paired sample t-test.

The symptoms of allergy-stricken children can be decreased even slightly with focus on environmental management at home. Environmental counseling aims to continuously manage the home indoor environment by identifying allergens and linking them to health behaviors to reduce allergies. One study reported the importance of developing self-care plans, patient education and counseling, and regular checkups to effectively manage asthma[15]. Therefore, the families of severely allergic children require much attention and practice. In previous studies, the effects of home-based environmental intervention were assessed for children with asthma, but in our study, health changes for home-based environmental counseling intervention were evaluated for children with atopic dermatitis and respiratory diseases. In this study, the levels of FEV1 and FVC were lower after the intervention. While not significant, IgE and eosinophil levels decreased. Since we did not investigate the participants' medication use or disease treatment during the intervention period, environmental counseling had limited ability to explain the reduction in these factors. That is why our findings may have been accidental. However, it is clear that reducing exposure to allergens in the home can decrease children's respiratory and allergy symptoms.

We provided information on bedding management, ventilation (air circulation), and vacuum cleaner use, cleaning water dusters, and maintaining proper temperature and humidity through three home visits and 10 telephone consultations. In particular, a recent meta-analysis[16] study reported that air filtration improved asthma symptoms. While previous studies showed no change in waste capacity in a home-based environmental intervention[5], our study showed the opposite result. Seo et al. suggested that long-term and systematic environmental monitoring is necessary since socioeconomically disadvantaged children are exposed to indoor environmental risk factors[6]. Therefore, environmental management education through continuous counseling will be needed, as more frequent environmental counseling may effectively reduce the symptoms of atopic dermatitis and respiratory disease.

We confirmed that ongoing counseling by environmental counselors is effective at preventing allergies. However, subsequent studies are needed since our study intervention methods were not sophisticated, the methods of arbitration were not evaluated, and few samples were obtained. Having a particularly small sample was the largest study limitation.

Conclusion

In summary, TEWL in atopic dermatitis patients was not improved through this intervention of environmental counseling. However, The symptoms of FEV₁ and FVC in children with respiratory diseases were improved after the intervention. Therefore, environmental counseling in the home positive affected respiratory disease symptoms. The parents of children of respiratory diseases will need to try to reduce their exposure to harmful substances indoors and clean up the in-home environment.

Ethical Clearance: Not required

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Conflict of Interest: No other author has reported a potential conflict of interest relevant to this article.

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Differences of Emotional Intelligence, Self-Effectiveness and Job Stress Levels by ambulance worker Personal Characteristics

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Abstract

Background/Objectives: As the field activity of the fire fighter is increased increasing the exposure to the traumatic event, the development of effective program to reduce the job stress is needed.

Methods/Statistical analysis: The present study investigated levels of emotional intelligence, self-efficacy, and job stress by personal characteristics, working environment of ambulance workers, and grasped their correlations. A survey of ambulance workers in service at fire stations in the northern Gyeonggi province was conducted from Feb. 22 to Mar. 31, 2019 and 160 questionnaires were analyzed. Collected data were subjected to frequency analysis, t-test, and ANOVA using SPSS software 12.0 program.

Findings: Emotional intelligence showed a score of 63 out of 80 points. Emotional intelligence of females was higher than that of males. That of workers not younger than 35 years was higher than that of workers younger than 30 years. That of fire engineers or fire lieutenants was shown to be higher than that of firefighters. Job stress of females was higher than that of males. That of EMT level 2 qualification holders or workers who took the training course was shown to be higher than that of EMT level 1 qualification holders. That when less than three workers were mobilized was shown to be higher than that when three workers and more were mobilized. Self-efficacy showed a positive correlation with emotional intelligence but a negative correlation with job stress. Emotional intelligence showed a negative correlation with job stress. The higher the emotional intelligence, the higher the self-efficacy. The higher the emotional intelligence and self-efficacy, the lower the job stress.

Improvements/Applications: To reduce the job stress, the health should be improved and the field response capability should be enhanced by establishing the strategy to enhance the emotional intelligence.

Keywords: Emotional Intelligence, Self-effectiveness, Job Stress, Health Promotion, Health Condition

Introduction

The fire fighter encounters many direct traumatic events in various accident sites that he/she is in fear of physical injury or life. Since the accident such as industrial accident, building collapse, natural disaster,

etc. is rapidly increased by the diversification of social environment, the disaster management system is needed. As of 2018, the activity of 119 Rescue Center was 2,788,101 cases and occupies more than 68% out of 4,066,201 mobilization cases of fire fighting. Fire-fighting officer carries out the job hard to bear physically and mentally and belongs to stress high risk group due to frequent exposure to the traumatic event, irregular shift and standby for mobilization, health risk and physical

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hazard, insufficient manpower, tragic accident, etc.

Emotional intelligence^[1] is the positive emotional propensity and understands the feeling of not only himself (herself) but also other surrounding people exactly and is the ability to utilize and regulate his/her own feelings^[2]. According to Shin^[3], the emotional intelligence regulates the self-expression based on the recognition of one's own emotion, is the ability to establish relationship with others effectively and positively, and the changes of the emotional intelligence has effect on the self-efficacy.

Han^[4] said that as the individual having high positive emotional propensity has relatively excellent positive problem solving ability and makes effort to solve the problem actively, the stress level was very low.

Self-efficacy means the conviction that one can do a certain work. It can be defined as judgment on one's own ability to organize and perform a series of behavioral processes required to achieve the job assigned to the person^[5]. Gist and Mitchell^[6] have stated that persons with a high level of self-efficacy can effectively perform their jobs and make continuous efforts for the goals without giving up. Job stress can be said to be the level at which one personally perceives psychological and physical adverse effects caused by business ability and environment of an organization member due to requirements of individuals and difference in opinions depending on the job. It means psychological and emotional tension level of perceiving the imbalance in the relation between an individual and the job environment^[7].

The factors having effect on the job stress are personal characteristics, social support, job characteristics, personal health condition, working environment and organization characteristics and there are lots of researches for them but the research on the mental health of fire fighter has been made mainly on the post-traumatic stress disorder.

The purpose of this study is to provide the basic data for effective job stress reduction by identifying the effect of the emotional intelligent perceived by the fire fighter on the self-efficacy and job stress and the mediating effect of self-efficacy.

Materials and Method

1. Experimental tools

1) Emotional Intelligence

For emotional intelligence, WLEIS (Wong and Law Emotional Intelligence Scale) was used. WLEIS is a tool developed by Wong and Law^[2] and adapted by Lim^[8]. The tool is comprised of 16 questions belonging to four sub-categories: four questions related to one's own emotional understanding, four questions related to other's emotional understanding, four questions related to utilization of emotion, and four questions related to adjustment of emotion. Its total score ranges from 16 to 80 and, with higher score indicating higher level of emotional intelligence.

2) Self-Efficacy

Self-efficacy means the conviction that one can successfully perform a particular behavior in a particular situation^[5]. Personal Efficacy Beliefs Scale developed by Riggs and Knight^[9] was used after translation. It is made up of 20 questions related to perception of one's own emotion, perception of other's emotion, adjustment of one's own emotion, and utilization of emotion. The higher the score, the higher the self-efficacy.

3) Job Stress

To measure job stress, Job Content Questionnaire (JCQ) prepared by adapting job stress tool developed by Karasek et al^[10] to fit the Korean environment of which the validity was verified was used. This tool has a total of 14 questions: five questions for job requirements, three questions related to the authority to make decisions and job autonomy, and six questions related to availability of skill. Its score ranges from 0 to 42, with higher score indicating higher job stress.

2. Data Collection and Analysis

A survey of ambulance workers in service at the fire stations in the northern Gyeonggi province was conducted from Feb. 22 to Mar. 31, 2019. A total of 160 questionnaires were analyzed. Collected data were subjected to frequency analysis, t-test, and ANOVA using SPSS software 12.0 program.

Results and Discussion

Demographic characteristics of study subjects are summarized in Table 1. Regarding gender, there were 115 (71.9 %) males and 45 (28.1 %) females. As for age, the number of workers not younger than 30 years was 109 (68.1 %) and the number of workers younger than

30 years was 51 (31.9 %). Regarding education level, the number of graduates from a 4-year college or higher level was 88 (55 %) and the number of graduates from a 2-year college was 68 (42.5). Regarding qualification levels, the number of EMT (emergency medical technician) level 1 qualification holders was 96 (60.0 %), the number of nurses was 37 (23.1 %), and the number of EMT level 2 qualification holders was 24 (15 %). Regarding service career, the number of workers with service career between 1 and 3 years was 52 (32.5 %) and the number of workers with service career between

3 and 5 years was 43 (26.9 %). For salary, 103 (64.4 %) workers were receiving a monthly payment between 3 and 4 million won. As for rank, 140 (87.5 %) workers were fire engineers or firefighters. For marriage status, 87 (54.4 %) workers were unmarried. Regarding the number of workers mobilized, 138 (72.8 %) workers were mobilized in a group of four workers or more. Regarding exercise and hobbies, 146 (76.4 %) workers were found to exercise regularly and 139 workers (72.8 %) were enjoying hobbies [Table 1].

Table 1. General characteristics of the subjects(N=160)

Variables	Categories	n	%
Gender	Male	115	71.9
	Female	45	28.1
Age	24 ~ 29a	51	31.9
	30 ~ 34b	69	43.1
	>35c	40	25.0
Education level	High school	4	2.5
	College	68	42.5
	University	83	51.9
	Over graduate school	5	3.2
Certification	EMT level 1a	96	60.0
	EMT level 2b	24	15.0
	Nurse c	37	23.1
	Education d	3	1.9
Work period (year)	<1a	17	10.6
	1 ~ <3b	52	32.5
	3 ~ <5c	43	26.9
	5 ~ <8d	33	20.6
	≥8f	15	9.4
Monthly income (Korean won)	<3,000,000	23	14.4
	3,000,000 ~ <3,500,000	62	38.8
	3,500,000 ~ <4,000,000	41	25.6
	≥4,000,000	34	21.2
Class	Fire fighter a	67	41.9
	Senior fire fighter b	73	45.6
	Fire sergeant	16	10.0
	Fire lieutenant	4	2.5
Marital status	Married	73	45.6
	Single	87	54.4
Number of people	<3a	16	8.3
	3-4b	37	19.4
	>4c	138	72.3
Regular exercise	Yes.	45	23.6
	No.	146	76.4
Hobby	Yes.	139	72.8
	No.	52	27.2

Regarding emotional intelligence by gender, females showed higher values than males ($p = .043$). For job stress, females had higher job stress than males ($p = .045$). Although self-efficacy and job stress of females were higher than those of males, differences between the two were not statistically significant. Emotional intelligence of workers not younger than 35 years was found to be higher than that of workers younger than 30 years ($p = .041$). Job stress of workers younger than 30 years was higher than that of workers not younger than 35 years ($p = .047$). However, self-efficacy did not show any statistically significant difference among age groups. According to education level, self-efficacy of graduates from a college or a graduate school was higher than that of high school graduates ($p = .049$).

By qualification level, job stress of EMT level 1 qualification holders was found to be lower than that of EMT level 2 qualification holders and those who took the training course ($p=.007$). By service period, self-efficacy of workers with service career between 5 and 8 years was higher than that of workers with a service career of 8 years or longer ($p = .045$). Emotional intelligence was higher when service career was longer. Job stress of workers with service career shorter than 3 years was shown to be higher ($p = .028$).

Regarding emotional intelligence of workers of each rank, the emotional intelligence of fire engineers was found to be higher than that of fire lieutenants or fire captains ($p = .050$). Self-efficacy of fire engineers and fire lieutenants was found to be higher than that of firefighters ($p = .048$). Job stress was shown to be higher when less than three workers were mobilized than that when three or more workers were mobilized ($p = .033$). Emotional intelligence had a score of 63 out of 80 points. Self-efficacy had a score of 57 out of 100 points and job stress had a score of 38 out of 42 points [Table 2].

We intended to look into traumatic events caused by repeated exposure to diverse rescue sites^[10], including psychological stress where dangerous situation should be immediately coped with and psychological difference felt in a working environment different from general working circumstances.

The overall job stress level of subjects had a score of 38 points, similar to the result of Yoon et al^[11]. Although the result by gender was shown to be similar to that of preceding studies^[12,13], some studies have reported different results.

Table 2. Emotional intelligence, self-efficacy, and job stress of the subjects according to general characteristics(N=160)

Variables	Categories	Self-efficacy		Emotional intelligence		Job stress	
		M±SD	p	M±SD	p	M±SD	p
Gender	Male	63.26±6.25	.108	51.76±0.38	.043	37.37±0.53	.288
	Female	65.57±7.31		56.88±0.34		38.23±0.43	
Age	24 ~ 29 ^a	63.21±6.13	.362	56.68±0.51	.041 c>a	39.45±0.45	.047 c>a
	30 ~ 34 ^b	64.53±6.69		57.81±0.56		38.34±0.27	
	>35 ^c	62.76±1.12		58.84±0.65		37.21±0.69	
Education level	High school ^a	60.41±5.08	.049 a<cd	55.65±0.43	.522	39.20±0.58	.341
	College ^b	63.77±7.34		57.78±0.46		38.22±0.60	
	University ^c	65.02±5.41		57.88±0.51		39.32±0.53	
	Over graduate school ^d	65.77±6.21		57.77±0.44		39.31±0.33	
Certification	EMT level 1 ^a	65.53±6.35	.318	57.89±0.35	.441	39.12±0.35	.007 bd>a
	EMT level 2 ^b	63.37±6.21		56.77±0.42		42.41±0.54	
	Nurse ^c	62.74±6.77		57.79±0.37		40.23±0.59	
	Education ^d	64.20±9.17		55.73±0.38		42.43±0.37	

Work period (year)	<1 ^a	62.5±5.79	.045 d>f	56.71±0.44	.487	39.35±0.56	.028 ab>f
	1 ~ <3 ^b	63.72±7.23		56.72±0.72		39.30±0.26	
	3 ~ <5 ^c	63.0±5.60		57.84±0.90		38.17±0.34	
	5 ~ <8 ^d	66.77±6.71		58.89±0.62		36.18±0.65	
	≥8 ^f	61.24±7.21		58.85±0.71		35.09±0.67	
Monthly income (Korean Won)	<3,000,000	62.27±7.50	.973	56.73±0.39	.687	39.32±0.39	.471
	3,000,000 ~ <3,500,000	63.14±6.06		56.83±0.36		38.28±0.46	
	3,500,000 ~ <4,000,000	62.72±5.92		56.88±0.49		38.22±0.68	
	≥4,000,000	62.71±7.98		57.73±0.76		38.24±0.32	
Class	Fire fighter ^a	62.11±7.28	.050 b<e	54.71±0.55	.048 a<bc	40.55±0.25	.003 a>ce
	Senior fire fighter ^b	64.48±6.17		58.83±0.46		38.31±0.39	
	Fire sergeant ^c	61.12±7.77		58.88±0.43		37.05±0.24	
	Fire lieutenant	59.17±6.83		55.92±0.55		36.16±0.97	
Marital status	Married	65.31±5.21	.984	57.90±0.40	.297	38.25±0.20	.232
	Single	64.73±7.77		56.70±0.56		39.32±0.37	
Number of people	<3 ^a	62.41±9.21	.394	57.79±0.42	.247	41.42±0.28	.033 a>bc
	3-4 ^b	65.54±7.56		59.08±0.28		36.38±0.66	
	>4 ^c	64.42±7.74		57.86±0.61		37.17±0.64	
Regular exercise	Yes.	64.77±7.21	.420	58.85±0.54	.311	39.11±0.45	.211
	No.	63.21±6.99		57.81±0.46		41.29±0.45	

Yoon et al^[10] have also reported that the younger the worker, the lower the specialty education level, the shorter the service period, and when the rank of the worker is firefighter and the worker is unmarried, the higher the job stress. However, some studies have also shown that the longer the service period, the higher the job stress^[15-17].

Emotional intelligence of females was higher than that of male. That of workers not younger than 35 years was higher than that of workers younger than 30 years.

Self-efficacy showed a positive correlation with emotional intelligence ($r = 0.462, p = .000$). supporting previous result showing that the higher the emotional intelligence, the higher the self-efficacy^[18, 19]. Self-efficacy and job stress showed a negative correlation ($r = -0.119, p = .042$). Emotional intelligence showed a negative correlation with job stress ($r = -0.173, p = .018$) [Table 3].

Table 3. Correlation coefficients between related variables(N=160)

Variable	Self-efficacy	Emotional intelligence	Job stress
Self-efficacy	1	.462(0.000)	-.119(.042)
Emotional intelligence	.462(0.000)	1	-.173(.018)
Job stress	-.119(.042)	-.173(.018)	1

Based on the above study result, emotional intelligence and self-efficacy were confirmed to have an effect on job stress. Accordingly, a program that increases emotional intelligence and self-efficacy should be developed. Physical and mental health of ambulance workers should be improved by establishing a strategy to enhance emotional intelligence and self-efficacy to

reduce job stress.

Conclusion

Emotional intelligence of females was higher than that of males.

Self-efficacy showed a positive correlation with emotional intelligence but a negative correlation with job stress. Emotional intelligence showed a negative correlation with job stress. The higher the emotional intelligence, the higher the self-efficacy. The higher the emotional intelligence and self-efficacy, the lower the job stress.

Based on above mentioned results, the emotional intelligence has effect on the job stress. Therefore, to reduce the job stress, the health should be improved and the field response capability should be enhanced by establishing the strategy to enhance the emotional intelligence.

Ethical Clearance: Not required

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Influence of Job Satisfaction and Burnout on Nursing Service Quality in Long-Term Care Hospitals

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Abstract

Background/Objectives: This study was performed to investigate the effects of job satisfaction and burnout on nursing service quality in long-term care hospital.

Methods/Statistical analysis: Participants were 120 nurses working at 10 long-term care hospitals. Data were collected from August to September, 2017. The collected data were analyzed using SPSS 22.0

Findings: Job satisfaction was different according to total clinical experience, career in present hospital, and monthly income. Burnout was different according to age, marital status, total clinical experience, monthly income, and pattern of shift. Nursing service quality was different according to monthly income, and pattern of shift. There were significant correlations among job satisfaction, burnout and nursing service quality. Factor influencing nursing service quality was burnout and explanatory power was 33.6%.

Improvements/Applications: In order to improve the nursing service quality, it is important to create an environment where nurses can work long-term and reduce burnout.

Keywords: Job satisfaction, Burnout, Exhaust, Nursing service quality, Long-term care hospital

Introduction

In the medical service sector, the nursing workforce is involved in most medical service areas at the point of contact with the patient. Therefore, both nurse- and patient-related factors can have significant influence on nursing service quality. Because nursing service is a strategic factor determining the productivity and competitiveness of nursing units at hospitals and is also a factor affecting the perception of nursing care by its consumers, it is essential to improve nursing service [1]. However, many previous studies have shown that nurses suffer from burnout due to accumulated fatigue and stress due to such factors as excessive workload and interpersonal conflict, and that such job burnout reduces work efficiency and organizational productivity, resulting in reduced nursing service quality [2]. In addition, burnout can have other negative consequences

such as lowered job satisfaction. Job satisfaction drives nurses to have pleasant and positive attitudes toward their work, which affects the quality of nursing care for patients [3]. Reduced job satisfaction can not only affect nursing service quality but also results in turnover, which can be extended to the problem of supply and demand of the nursing workforce and human resource management. 4

Most domestic studies on nursing service quality conducted up to now have focused on the assessment of nursing service quality from the consumer's perspective, such as nursing care customer satisfaction, revisit intention, and perception gap in nursing service between customers and providers, and on the assessment of the economic profits of hospitals [1,4]. However, studies on factors affecting nursing service quality from the perspective of nursing providers have not been widely conducted. For quality management in nursing services from the perspectives of nursing providers, this study aimed to investigate the effects of job satisfaction and burnout on nursing service quality, and to provide basic

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data for nursing human resource management.

Method

1. Study design

The present study was a descriptive correlational study designed to examine the relationship between job satisfaction, burnout, and the nursing service quality among nurses in long-term care hospital.

2. Participants

Participants in this study were 126 nurses from 10 long-term care hospitals. The study was conducted between August and September of 2017. The sample size was calculated using G*Power 3.1.9.2. Based on linear multiple regressions with the effect size .15, significance level of .05, and power of test of .95, the sample size calculated was larger than the recommended size of 74; thus, it satisfied the requirement. One hundred twenty (95.2%) questionnaires were used for final data analysis, excluding six that was considered inadequate.

3. Instruments

3.1. General characteristics

General characteristics were age, career in present hospital, total clinical experience, marital status, educational background, monthly income, and pattern of shift.

3.2. Job satisfaction

Job Satisfaction was measured using the Minnesota Satisfaction Questionnaire^[5] developed by Minnesota Industrial Research Institute, translated by Lee and Park^[6] and supplemented by Choi^[7]. A total of 15 items were rated on a 5-point Likert scale, ranging from “very unsatisfied” (1 point) to “very satisfied” (5 points). A higher score indicates higher job satisfaction. The reliability of this tool was calculated to be .69 in a study^[7] and .827 in the present study.

3.3. Burnout

Burnout was measured using Maslach Burnout Inventory developed by Maslach and Jackson^[8], and translated by Choi and Chung^[9]. This tool consists of a total of 22 items, and each item is rated on a 7-point Likert scale, ranging from “never” (0 points) to “every day” (6 points). A higher score indicates higher burnout. The reliability of this tool was calculated to be .84 in a

study^[9] and .906 in the present study.

3.4. Nursing service quality

A nursing service quality was developed by Joo^[10] to measure the quality of Korean nursing services based on the SERVPERF model developed by Cronin and Taylor^[11], and the tool that was modified and supplemented by Lee^[12]. This tool consists of a total of 20 items, and each items is rated on a 5-point scale, ranging from “strongly disagree” (1 point) to “strongly agree” (5 points). A higher score indicates higher quality of service. The reliability of this tool was calculated to be .97 in a study^[12] and .938 in the present study.

4. Analysis

Data were analyzed using SPSS version 20.0 software according to the following analyses:

1) The differences in job satisfaction, burnout, and nursing service quality according to the general characteristics of the participants were analyzed using t-test and analysis of variance, and the post-hoc test was performed using the Scheffé test.

2) Pearson’s correlation coefficients were calculated to examine the correlations between job satisfaction, burnout, and nursing service quality.

3) The factors that affect nursing service quality were analyzed using multiple regression analysis.

Result

1. General characteristics

The participants of this study were 120 nurses, the majority (n=68 [56.7%]) of which were aged 40 to 50 years as shown in table1. The majority of the participants (n=104 [86.7%]) were married. In terms of education level, the majority (n=72 [62%]) were junior college graduates. The proportion of those with more than 15 years of total clinical experience was the highest (41.7%). In terms of years at the current long-term care hospital, 40 (33.3%) had worked at the hospital for less than 5 years, 42 (35%) had worked at the hospital for 2-5 years, and 38 (31.7%) had worked at the hospital for more than 5 years. The majority of the participants (n=87 [72.5%]) had an average monthly income of 2-2.5 million South Korean won (KRW). In terms of shift pattern, the number of those with 3-shift work was 58 (48.3%).

Table 1: General characteristics (N=120)

Characteristics	Categories	n(%)
Age(year)	< 40	28(23.3)
	40 - < 50	68(56.7)
	≥ 50	24(20.0)
Marital status	Unmarried	16(13.3)
	Married	104(86.7)
Educational background	Diploma	72(60.0)
	Bachelor	38(31.7)
	Higher than a master's degree	10(8.3)
Total clinical experience(year)	< 7	36(30.0)
	7 - < 15	34(28.3)
	≥ 15	50(41.7)
Career in present hospital(year)	< 2	40(33.3)
	2 - < 5	42(35.0)
	≥ 5	38(31.7)
Monthly income (Won)	< 200	18(15.0)
	201 - < 250	87(72.5)
	≥ 250	15(12.5)
Pattern of shift	3 shift work	58(48.3)
	2 shift work	12(10.0)
	Fixed	50(41.7)

2. Differences in variables by general characteristics

Table 2 shows the differences in job satisfaction, burnout, and nursing service quality according to the general characteristics of the participants. A significant difference was observed in job satisfaction according to total clinical experience ($F=9.786$, $p<.001$), number of years at the current hospital ($F=3.966$, $p<.001$), and average monthly income ($F=9.203$, $p<.001$). The results of the post-hoc test revealed that the score for job satisfaction was higher in those with more than 15 years of total clinical experience compared with those with less than 7 years of total clinical experience, in those who had been at the current hospital for more than 5 years compared with those who had been at the current hospital for less than 2-5 years, and in those with an average monthly income of more than 2.5 million KRW compared with those with an average monthly income of less than 2 million KRW.

A significant difference was observed in burnout according to age ($F=7.664$, $p=.001$), marital status ($t=2.100$, $p=.037$), total clinical experience ($F=7.935$, $p=.001$), average monthly income ($F=4.493$, $p=.013$) and shift pattern ($F=3.721$, $p=.027$). The results of the post-hoc test revealed that the score for burnout was higher in those under the age of 40 than in those over the age of 50, in those who were unmarried than in those who were married, in those with less than 7 years of total clinical experience than in those with more than 15 years, in those with an average monthly income less than 2 million KRW than in those with an average monthly income of more than 2.5 million KRW, and in those with 3-shift work than in those with fixed shift work.

A significant difference was observed in nursing service quality according to average monthly income ($F=4.445$, $p\leq.014$) and shift pattern ($F=6.988$, $p=.001$). The results of the post-hoc test revealed that the score for nursing service quality was higher in those with an average monthly income of more than 2.5 million KRW than in those with an average monthly income of 2-2.5 million KRW and in those with fixed shift work than in those with 3-shift work.

Table 2: Differences variables by general characteristics (N=120)

Characteristics	Categories	Job satisfaction		Burnout		Nursing service quality	
		Mean±SD	t/F	Mean±SD	t/F	Mean±SD	t/F
Age(year)	< 40a	3.13±0.50	1.637	2.52±0.64	7.664*** a>c	3.77±0.42	0.788
	40 - < 50b	3.25±0.59		2.08±0.90		3.72±0.40	
	≥ 50c	3.42±0.63		1.61±0.83		3.85±0.52	
Marital status	Unmarried	3.14±0.51	-0.860	2.51±0.77	2.100*	3.64±0.31	-1.110
	Married	3.27±0.59		2.02±0.88		3.78±0.47	
Educational background	Diplomaa	3.24±0.62	2.717	2.12±0.88	0.519	3.72±0.44	0.801
	Bachelorb	3.18±0.47		2.10±0.89		3.78±0.47	
	Higher than a master's degreec	3.65±0.59		1.82±0.81		3.91±0.45	
Total clinical experience(year)	< 7a	2.95±0.59	9.786 *** a<c	2.48±0.87	7.935 *** a>c	3.64±0.34	1.970
	7 - < 15b	3.24±0.52		2.15±0.71		3.77±0.46	
	≥ 15c	3.48±0.53		1.77±0.87		3.83±0.50	
Career in present hospital(year)	< 2a	3.31±0.60	3.966 * b<c	2.10±0.96	2.537	3.74±0.37	0.568
	2 - < 5b	3.06±0.62		2.29±0.77		3.72±0.47	
	≥ 5c	3.40±0.47		1.85±0.14		3.82±0.51	
Monthly income (Won)	< 200a	2.92±0.65	9.203 *** a<c	2.52±0.74	4.493 * a>c	3.71±0.38	4.445 * b<c
	201 - < 250b	3.24±0.53		2.08±0.90		3.71±0.46	
	≥ 250c	3.73±0.50		1.62±0.62		4.07±0.37	
Pattern of shift	3 shift worka	3.16±0.60	1.704	2.30±0.90	3.721 * a>c	3.62±0.49	6.988 *** a<c
	2 shift workb	3.42±0.58		2.04±0.72		3.71±0.29	
	Fixedc	3.33±0.56		1.85±0.83		3.93±0.38	

unit: cm, *: p<0.05, **: p<0.01, ***: p<0.001

3. Degree and correlation among variables

The mean scores for job satisfaction, burnout, and nursing service quality among the participants was 3.25, 2.09, and 3.76 points, respectively as shown in table 3. The nursing service quality is significantly correlated with job satisfaction ($r = .397, p < .001$), with burnout ($r = -.579, p < .001$).

Table 3: Degree and correlations among variables (N=120)

	M±SD	Range	Job satisfaction	Burnout
			r	r
Job satisfaction	3.25±0.58	1-5	-	-.526***
Burnout	2.09±0.88	0-6	-.526***	-
Nursing service quality	3.76±0.45	1-5	.397***	-.579***

unit: cm, *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$

4. Factors influencing nursing service quality

To identify the explanatory power of factors related to the quality of nursing service, a linear regression analysis was conducted with nursing service quality as the dependent variable, an with job satisfaction and burnout as the independent variables. Burnout ($\beta = -.512, p < .001$) had a significant influence on the nursing service quality, with an explanatory power of 33.6% in table 4.

Table 4: Factors influencing nursing service quality (N=120)

Variables	β	p	Adj.R2	F
Job satisfaction	.127	.151	.336	31.073***
Burnout	-.512	.000		

unit: cm, *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$

Discussion

This study found that there were significant differences in job satisfaction according to number of

years of clinical experience, number of years at the current hospital, and average monthly income. These results are consistent with the results of a study [13] showing a significant difference in job satisfaction according to clinical experience among nurses in tertiary hospitals, and the results of a study [14] showing a significant difference in job satisfaction according to clinical experience and wages among general hospital nurses. Therefore, in order to enhance job satisfaction in nurses, it is essential to provide economic satisfaction by guaranteeing adequate wages, and to provide conditions for nurses to build their career until they become skilled at the job.

The results of this study also found that there was a significant difference in nursing service quality according to average monthly income and shift pattern. In other words, nursing service quality was found to be significantly higher in those with fixed shift work, which is consistent with the results of a previous study [13] showing that nursing service quality was significantly higher in general hospital nurses who did not work at night. In addition, these results are similar to the results of a study [14] indicating that nursing performance in general hospital nurses differed according to wage levels. Therefore, in order to improve nursing service quality, it is necessary to reduce night shifts, increase fixed shift work, and offer appropriate wages to nurses.

The results of this study showed that nursing service quality was significantly positively correlated with job satisfaction, and that burnout was a variable with a 33.6% influence on nursing service quality. These results are consistent with the results of a previous study involving public health nurses [16] and another previous study involving general hospital nurses [13] showing that job satisfaction was positively correlated with nursing service quality, although there was a difference in the subjects between the studies. The results of this study are also supported by those of a previous study [15] that found that burnout was positively correlated with nursing service quality among nurses in comprehensive nursing care wards.

Physical and emotional exhaustion can lower nursing service quality. Therefore, in order to improve nursing service quality in long-term care hospitals, it is necessary to manage nursing human resources through increasing regular shift work, providing proper conditions for career building, and, thus, proactively reducing burnout among nurses.

Conclusion

Job satisfaction was found to be significantly higher and burnout was lower in those with significantly more clinical experience. Therefore, inducing nurses to work long-term and enhancing their nursing job satisfaction are ways to improve nursing service quality.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Antimicrobial Effect of Cinnamon Oil Against Oral Microorganisms

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Abstract

Background/Objectives: There has been a growing interest in the antimicrobial activity of natural extracts that inhibit the growth of microorganisms without side effects. Therefore, we evaluated the antibacterial effects of cinnamon oil against *oral microorganisms* existing in dental plaque.

Methods/Statistical analysis: Dental plaque was formed on bovine specimens using a growth medium for 6 days, followed by treatment with either 2.5% cinnamon oil, 0.12% chlorhexidine gluconate, or 10% dimethyl sulfoxide for 5 min, twice per day. On day 7, each specimen was imaged using quantitative light-induced fluorescence–digital to assess microbial activity of dental plaque. A one-way analysis of variance and the Scheffe *post hoc* test were performed to analyze the differences in red/green ratio (R/G values) of dental plaque between the three treatment groups.

Findings: The average R/G values of dental plaque was the lowest in the 2.5% cinnamon oil group (1.180 ± 0.010), and these values were significantly different from those of the chlorhexidine gluconate group (1.249 ± 0.008) ($p < 0.001$). Furthermore, the changes in the mean R/G values of each specimen showed statistically significant differences over time ($p < 0.05$). Thus, we suggest that cinnamon oil is an effective antimicrobial agent that inhibits the proliferation of anaerobic bacteria in dental plaque.

Improvements/Applications: Further studies should compare and analyze the antimicrobial activity of cinnamon oil against *oral microorganisms* at different concentrations.

Keywords: Antimicrobial agent, Antimicrobial effect, Cinnamon oil, Oral microorganisms, Oral diseases

Introduction

According to the 2018 Statistics Korea report, dental caries and periodontal disease are among the top 10 outpatient diseases for which Koreans visit medical institution^[1], and these easily preventable conditions are costly to both patients and the national healthcare system. Therefore, the government and dental professionals should work to develop a variety of intervention strategies to effectively prevent these diseases.

Dental caries and periodontal diseases are the main diseases that lead to tooth extraction, and their main

cause is dental plaque, which contains more than 700 microbial species^[2]. Dental plaque is a complex mass of microorganisms with high viscosity created when various oral bacteria get attached to salivary glycoproteins thinly attached to the tooth surface^[3]. If dental plaque is not removed periodically, new bacteria will keep attaching to its surface, which makes the dental plaque more mature^[4]. Eventually, mature dental plaque becomes the cause of demineralization of the tooth or inflammation of periodontal tissue^[4]. Therefore, for the prevention of oral diseases, dental plaque accumulated on tooth surfaces should be thoroughly removed periodically.

The methods of controlling dental plaque are divided into mechanical methods such as tooth-brushing and chemical methods such as oral rinsing^[5]. Although tooth-brushing is the most basic method to control dental plaque, many people do not use proper tooth-brushing

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technique and fail to effectively remove dental plaque^[5]. Chemical methods are effective for removing interdental plaque that cannot be removed by tooth-brushing^[6]. Hence, chemical methods are necessary for effective control of dental plaque.

Unfortunately, however, chlorhexidine gluconate, the most commonly used antimicrobial agent, can have side effects such as extrinsic dental staining or oral dryness, despite its effectiveness at inhibiting dental plaque formation^[7,8]. In addition, when used constantly, its ability to inhibit dental plaque formation can diminish due to antibiotic resistance^[9].

Recently, there has been increasing interest in essential oils extracted from herbs such as sweet basil as an alternative to chlorhexidine gluconate^[10]. In particular, several studies have found that cinnamon oil has antibacterial effects on various bacteria, including *Staphylococcus aureus*^[10,11]. Therefore, in this study, we analyze the antibacterial effects of cinnamon oil against *oral microorganisms* present in dental plaque using quantitative light-induced fluorescence–digital (QLF-D).

Method

This study was approved by the Ethics Committee of Gachon University (No. 1044396–201904-HR-057–01). An *in vitro* study was performed to evaluate the antimicrobial effects of cinnamon oil against *oral microorganisms*. All experimental processes in this study are based on previous studies^[12–14].

First, cinnamon oil extracted from *Cinnamomum zeylanicum* via steam distillation was purchased from doTERRA (USA). Based on the results of a preliminary solubility test, the concentration of cinnamon oil to be used in the study was 2.5%. Tooth specimens (6 mm in diameter × 5 mm in thickness) were made using bovine incisors without cracks or white spots. Human stimulated saliva was collected from one healthy individual who had no active oral diseases and who had not used any antibiotics within the prior 3 months. The collected saliva was inoculated into each specimen, placed on a 24-well plate, and then incubated for 4 h (10% CO₂, 37°C). Then the saliva was aspirated from the wells, and a pre-made growth medium (0.5% sucrose and basal medium mucin) was added to the plate^[12]. The plates were incubated for 6 days (10% CO₂, 37°C), with the growth medium replaced at the same time each day. During the 6 days, each specimen was treated with

either 2.5% cinnamon oil (experimental group), 0.12% chlorhexidine gluconate (positive control group), or 10% dimethyl sulfoxide (negative control group) for 5 min, twice per day.

On day 7 of incubation, each specimen was photographed using QLF-D to assess microbial activity of dental plaque. QLF-D detects porphyrins produced by oral bacteria using 405 nm blue light. The blue light conditions were set as follows: shutter speed 1/30 s, aperture 5.0, and ISO 1,600^[15]. The average red/green ratio (R/G values) of the images was calculated using ImageJ (NIH, MD, USA)^[13]. A higher R/G values indicate high anaerobic bacterial activity.

A one-way analysis of variance (ANOVA) and the Scheffé *post hoc* test were performed to analyze differences in R/G values of dental plaque between the three treatment groups. A repeated measures ANOVA was conducted to compare the changes in the mean R/G values of dental plaque of each treatment group over time. A p-value < 0.05 was chosen to indicate a significant difference between groups.

Result and Discussion

R/G values were the lowest in the 2.5% cinnamon oil group (1.180 ± 0.010), and there was a significant difference between this group and the chlorhexidine gluconate group (1.249 ± 0.008), with the values of the 10% dimethyl sulfoxide group being highest (1.461 ± 0.003; p < 0.001) [Table 1]. The red fluorescence of each specimen is shown in Figure 1. A higher red fluorescence intensity indicates heightened activity of anaerobic bacteria. As a result of the repeated measures ANOVA, the changes in the mean R/G values of each specimen showed statistically significant differences over time (p < 0.05) [Figure 2]. In particular, the R/G change was the smallest in the specimen which was treated with 2.5% cinnamon oil.

We used cinnamon oil extracted by steam distillation, because this method extracts the highest concentration of antimicrobial components^[16], and the 2.5% cinnamon oil was found to have a greater antimicrobial effect against *oral microorganisms* than 0.12% chlorhexidine gluconate and 10% dimethyl sulfoxide. Our results suggest that cinnamon oil can be used to inhibit the formation of the pathogenic bacteria that cause dental diseases as effectively as chlorhexidine gluconate, which is commonly used in clinical practice.

As an increasing number of studies have confirmed the antimicrobial effects of cinnamon oil, in-depth research to amplify the antimicrobial activity of the oil has begun. One study reported that cinnamon oil's antimicrobial effect increases when combined with other essential oils, such as thyme oil^[17]. Another recent study proposed the combination of cinnamon and antibiotics as an alternative therapeutic application that not only decreases the side effects of antibiotics but also enhances their curative effects on infectious diseases^[18]. Although the antimicrobial effects of cinnamon oil against various microorganisms such as *S. aureus* have come to light, the mechanism behind them have not been fully elucidated. A few studies have suggested that cinnamaldehyde, a major component of cinnamon oil, causes microleakage of bacterial cell membranes^[19,20]. Moreover, a study found that not only cinnamaldehyde but also eugenol, another component of cinnamon oil, has antibacterial activity^[21]. Our study revealed, using QLF-D, that cinnamon oil inhibits the proliferation of anaerobic bacteria in dental plaque. Further research is needed to clarify the antimicrobial mechanism of cinnamon oil against pathogenic *oral microorganisms*. Furthermore, future studies should analyze and compare the antimicrobial activity of cinnamon oil against *oral microorganisms* according to concentration. Finally, it is necessary to search for other surfactants with high biocompatibility aside from dimethyl sulfoxide that can be used as a chemical solvent for cinnamon oil.

Table 1: R/G values according to treatment group (at 7 day)

Treatment group	R/G values	
	Mean ± SD	F(p)
2.5% Cinnamon oil	1.180 ± 0.010 ^a	621.277 (<0.001)
0.12% Chlorhexidine gluconate	1.249 ± 0.008 ^b	
10% Dimethyl sulfoxide	1.461 ± 0.003 ^c	

^{a,b,c}The different characters are significant by Scheffe's multiple comparison at $\alpha=0.05$.

A: 2.5% cinnamon oil, B: 0.12% chlorhexidine gluconate, C: 10% dimethyl sulfoxide



Figure 1. Red fluorescence of each specimen (at 7day)

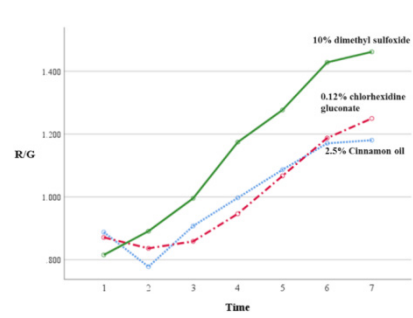


Figure 2. Changes in the mean R/G values of each specimen over time

Conclusion

Cinnamon oil is a natural substance that has a strong antibacterial effect against *oral microorganisms* without the side effects associated with chlorhexidine gluconate. This finding suggests that cinnamon oil has the potential to be developed as a preventive agent to prevent oral diseases. Further studies should analyze the antimicrobial effect of cinnamon oil against *oral microorganisms* at different concentrations. Furthermore, it is necessary to search for other surfactants with high biocompatibility aside from DMSO that can be used as a chemical solvent for cinnamon oil.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Study on Admission Motivation and Institution Selection Intention of Elderly Residing in Long-Term Care Institutions

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Abstract

Background/Objectives: The purpose of this study was to investigate the significant factors related to admission motivation and institution selection, in elderly residing in long-term elderly care institutions.

Methods/Statistical analysis: The study analyzed the data of 381 resident elderly among the data of ‘validation of long-term care institutions (institution salary) evaluation’ by Kim et al. The frequency analysis, t-test, oneway ANOVA, and multiple regression analysis were applied using SPSS21.0.

Findings: First, main determinants of institution admission were to review the children, including the son/daughter-in-law and daughter/son-in-law, rather than the individual or spouse, and the institution was determined taking into account the level and accessibility of the services as available for the elderly person requiring those services for care. Second, for institution admission motivation, it was found that the higher the ‘institution preference,’ the higher the institution recommendation intention and institution reselection intention. In other words, institution admission motivation was high in ‘family relations,’ but it was found that the present institution should have the ‘preference for institution’ as noted for the current institution, if it is to be recommended to another elderly person or is to be readmitted.

Improvements/Applications: The most important consideration of the service quality of the caregiver is the core of the operation of long-term elderly care institutions rather than the size, credibility and location of the institution.

Keywords: Long-term care institutions, Admission motivation, Institution recommendation intention, Institution reselection intention, Institution preference, Service quality

Introduction

As the elderly long-term care insurance system in Korea has been implemented for more than 10 years, the social endeavors to support the surge of elderly residing in long-term care institutions, the expansion of the day-care institution and the short-term care institution for deinstitutionization, and the rapid increase in community care are all different variables to be considered as these issues are being repeated.

In Korean culture, it is known that many elderly people prefer to live at home until death. This is because the meaning of ‘home’ for the elderly is its own domain, and it refers to the identity of the person ^[1] as a place to communicate with friends and neighbors. Therefore, the advent of institution admission due to the movement of the place of residence does not only mean the movement of the settlement, but also the interpersonal relationship which has been lived in the past, and also the separation with life. For this reason, there is still a negative perception of institution admission for an elderly person in society^[1]. Although socially long-term elderly care institutions are spreading, for the elderly, institution admission is a shame, and therefore resistance is high ^[2-5]. Above all, the elderly individuals are more likely to experience negative life circumstances

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regarding their ability to care for themselves before institution admission. Migration from home to long-term elderly care institutions can be the most negative event experienced by the elderly [6-8].

Therefore, the purpose of the study is to analyze the minute details on why and who decided on the admission to which institution, the intentions to recommend the current institution to other elderly individuals who may require similar types of care, and the reasons for readmission if one had left and returned, even with the negative perception of elderly residence movement. The purpose of this study was to investigate factors related to admission motivation and institution selection in elderly residing in long-term elderly care institutions.

Method

1. Data

The data of resident elderly among the data of 'verification of effectiveness of long-term care institutions evaluation' by Kim et al., [9] was analyzed. In this case, after being recommended the elderly who can be surveyed from the institution, when the elderly allowed the questionnaire, the study conducted face-to-face questionnaires. Finally, the resulting data of 385 subjects were used for analysis.

2. Measurement Tools

Admission motivation : The admission motivation consisted of 8 items with reference to previous studies related to institution admission motivation. It was used in analysis through 3 sub-variables including family relations, need of care, and institution preference.

Institution selection intention and related factors : Institution selection intention was divided into institution recommendation intention and institution reselection intention. It was composed of a 3 point Likert scale with the 2 questions.

3. Characteristics of Subjects

In this study, the participants were noted that 71.7% were females and 28.3% were males, and the average age was 79.54 years old with most participants being 80 or older. There were generally no spouses (79.8% no spouses), 70.3% attended school, and 29.7% did not attend school.

4. Data Analysis Method

In this case, the frequency analysis, t-test, oneway ANOVA, and multiple regression analysis were applied using SPSS win 21.0.

Results

1.General Tendency of Variables

First, the institution admission determiner was found to be primarily determined as the responsibility of the son/daughter-in-law. When choosing an institution, they considered the level of service and the accessibility of the institution. In this instance, the service level was noted at 35.2%, and the institution accessibility was 35.0%. In the case of admission costs, it is unlikely that these factors will be taken into consideration, since the rates for long-term care institutions nationwide are similar in scope.

In these cases, according to institution use experience, 64.1% of people were in the first institution, and when transferred, they were transferred mainly from other nursing homes. Generally speaking, the reasons for the transfer seemed to be a preference for the new institution rather than the inconvenience of service or accessibility, and institution selection was somewhat different from the consideration.

In addition, 75.5% of the respondents answered that they would like to recommend admission to other elderly people, and that this is positive, and the reason is because the service is considered to be of good quality. Also, 76.2% of the respondents answered that there is an intention to return to the current institution and choose again, because the service is of good quality.

Next, the institution admission motivation was 4.209 for 'family relations', 3.220 for 'need for care,' and 3.437 for 'institution preference,' and it was found they chose the current institution as family members were close to where the institution was or through family recommendation.

2. Difference of Admission Motivation and Institution Selection Intention

Among the admission motivations, 'family relations' was significantly different according to age, marital status, and economic status of the elderly. That being said, the elderly in their 70s were choosing an institution for 'family relations' compared to elderly in their 60s,

and elderly people who were married rather than those who had divorced, widowed, or parted ways with their spouses, who were in general households selected institution because of ‘family relations.’ ‘Institution preference’ was significantly different according to gender and economic status of the elderly. In other words, elderly women compared to elderly men, and the elderly in the general household were more likely to adhere to the institution than a person considered to be in the category of welfare household elderly. However, the specific ‘need for care’ according to sociodemographic characteristics of resident elderly was not significant [Table 1].

In the case of institution recommendation intention in the selection of the institution, the difference according to the education level and economic condition of the elderly was considered to be shown as significant. The

institution recommendation intention of the elderly with education was higher than the institution recommendation intention of the elderly with no education, and for this reason the institution recommendation intention of the elderly in general households was higher than that of the elderly in welfare households. By way of explanation, the institution reselection intention in the selection of institution was significantly different according to the marital status and education level of the elderly. Taking this result into account, the institution reselection intention of the elderly with no spouse was higher than the institution reselection intention of the elderly with spouse, and the institution reselection intention of the elderly with education was higher than the institution reselection intention of the elderly without education [Table 2].

Table 1. Difference in motivation for facility entrance

Variables		Admission Motivation									
		Family relation			Need of care			Institution preference			
		M	S.D	t/F	M	S.D	t/F	M	S.D	t/F	
Sex	male	4.158	1.072	-.621	3.133	0.955	-.835	3.138	1.054	-2.744**	
	female	4.230	0.932		3.255	0.949		3.561	0.802		
Age	60'	3.848	1.016	6.950**	3.088	0.974	.189	3.098	1.229	1.477	
	70'	4.477	0.835		a	3.233		1.009	3.527		0.890
	over 80	4.117	1.010		ab	3.229		0.944	3.425		0.850
Marital status	married	4.399	0.597	2.564*	3.284	0.874	.527	3.289	0.874	.604	
	other	4.158	1.047		3.200	0.973		3.472	0.908		
Education level	No education	4.136	0.909	-.879	3.279	0.989	.580	3.267	0.825	-1.653	
	With education	4.238	0.998		3.194	0.935		3.502	0.924		
Economic status	Ordinary	4.411	0.820	6.211***	3.194	0.970	-.527	3.546	0.885	2.642**	
	Basic supply	3.582	1.139		3.268	0.915		3.181	0.896		

** p<.01, *** p<.001,

Table 2. Difference in intention to select facilities

<N=381>

		Intention to Select					
		Institution recommendation intention			Institution reselection intention		
		M	S.D	t/F	M	S.D	t/F
Sex	Male	2.673	.582	-1.290	2.730	.505	-.195
	female	2.756	.472		2.740	.454	
Age	60'	2.783	.422	.765	2.739	.449	.082
	70'	2.684	.536		2.723	.503	
	over 80	2.749	.501		2.744	.457	
Marital Status	married	2.747	.496	.277	2.737	.471	1.932*
	other	2.729	.509		2.827	.415	
Education level	No education	2.649	.566	-1.952*	2.720	.479	-2.800**
	With education	2.768	.475		2.631	.521	
Economic status	Ordinary family	2.779	.465	2.755**	2.788	.437	1.382
	Basic supply family	2.589	.598		2.762	.451	

* p<.05, ** p<.01

2. The Effects of Institution Admission Motivation of Resident Elderly on Institution Selection Intention

Particularly important in order to investigate the effect of resident elderly’s institutional admission motivation on institution recommendation intention and institution reselection intention, the study conducted a hierarchical regression analysis of institution recommendation intention and institution reselection intention using independent variables for stage 1 control variables (sociodemographic characteristics) and stage 2 admission motivation [Table 3, Table 4].

[Table 3] shows the results of the hierarchical regression with the dependent variable as the institution recommendation intention. In effect, the Model II was significant, but Model I with only control variables was shown to not be significant. The Durbin-Watson value was 1.639 and the independence of the residuals was secured. It is important to realize that the control variables accounted for 4.1% of institution recommendation intentions and admission motivation accounted for 12.1% of institution recommendation intentions, and a

total of 8 variables accounted for 16.2% of institution recommendation intentions of resident elderly. Of the 8 variables, only the influence of institution preference was considered to be significant, and institution recommendation intention was higher when admission was preferred.

[Table 4] shows the results of the hierarchical regression, with the dependent variable being the institution reselection intention. As a result, Model II was significant, but model I with only control variables was not significant. The Durbin-Watson value was 1.844 and the independence of the residuals was secured. However, to sum up the results, the control variables accounted for 4.5% of the institution recommendation intention, and admission motivation explained 4.9% of the institution recommendation intention, and a total of eight variables accounted for 9.4% of resident elderly’s institution reselection intention, and the model’s explanatory power seems to be low. Of the 8 variables, only the influence of institution preference was shown to be significant, and institution reselection intention was higher when admission was preferred.

Table 3 . The effect of entrance motivation on elderly resident’s facility recommend intention

Institution Recommendation Intention							
		Model I			Model II		
		B	Beta	t	B	Beta	t
Constant		2.434		6.014***	2.095		4.705***
Control variables	Sex (1=male)	-.083	-.080	-.896	.005	.005	.052
	age	.004	.064	.769	.004	.059	.737
	Presentation of spouse (1=yes)	.124	.106	1.193	.162	.139	1.641
	Education level (1=none)	-.169	-.165	-1.945*	-.093	-.091	-1.114
	Economic status (1=general home)	.066	.061	.766	.057	.052	.629
Admission motivation	Family relation	-.040			-.079	-.164	-1.598
	Need of care	-.081			-.944		
	Institution preference	.225 .434			4.647***		
		F =1.312 R2=.041			F =3.639** △R2 =.121 R2=.162		

p<.01, *p<.001

Table 4. The effect of entrance motivation on elderly resident’s reselection intention

		Institution Reselection Intention					
		Model I			Model II		
		B	Beta	t	B	Beta	t
Constant		2.459		5.635***	2.283		4.564***
Control variables	Sex (1=male)	-.111	-.099	-1.113	-.050	-.045	-.498
	age	.003	.041	.489	.002	.032	.383
	Presentation of spouse (1=yes)	.053	.042	.471	.081	.065	.734
	Education level (1=none)	-.139	-.125	-1.481	-.086	-.078	-.914
	Economic status (1=general home)	.167	.144	1.802	.176	.151	1.745
Admission motivation	Family relation	-.017			-.072	-.139	-1.303
	Need of care	-.032			-.363		
	Institution preference	.156 .278			2.860**		
		F =1.142 R2=.045			F =1.957** ΔR2 =.049 R2=.094		

*p<.05, **p<.01, ***p<.001

Discussion

Results First, the main determinants of institution admission were children, including the son/daughter-in-law and daughter/son-in-law, rather than from the individual or spouse, and the institution was determined taking into account the level and accessibility of the services for the elderly person requiring care. Most of the elderly are shown to be living in the institution that they currently reside in, and recommending the institution that they are living in to other elderly people has high intention and high intention to reselect. This implies that the satisfaction of the elderly residing in the institution is high, but on the other hand, it can be predicted that there is no alternative but to live in care facilities or formal elderly care institutions. In other words, if the admission determinant was ‘self’ rather than ‘children, daughter-in-law, and relative’s, it was shown that the adaptation was higher^[8], and if admission was made by the recommendation of a child or relatives, skepticism and self-esteem about life were low and psychological depression and anxiety was high^[10]. Considering this, the main determinants of institution admission are as determined from the elderly’s ‘children,’ and it is difficult to interpret the answer only positively that the elderly will recommend and reselect the institution in which they live. Therefore, active policies are needed

to improve the quality of life of elderly people who are going to live the rest of their days in an institution.

Second, in institution admission motivation, it was found that the higher the ‘institution preference,’ the higher the institution recommendation intention and institution reselection intention was measured in these cases. In other words, institution admission motivation is noted as being high in ‘family relations,’ but if the institution in which the resident is present recommends it to other elderly people, or if these individuals leave for some reason and then return, the ‘preference for institution’ for the current institution needs to be present. In addition, it is necessary to integrate the fact that perceptions related to service was the reason for institution selection, reason for institution recommendation intention, and noted as the reason for institution reselection intention in the previous analysis. The suitability between the type of service and the needs of the elderly will lead to institution preference, and will also be reselected and recommended to elderly people in similar situations.

Conclusion

Consequently, the most important consideration of the service quality of the caregiver is the core of the

operation of long-term elderly care institutions rather than the size, credibility and location of the institution. Under these circumstances, it is important to improve the quality of life of elderly people by improving the service quality, which is an important issue in the elderly welfare policy. At present, the core staff of the available service provision for the elderly patients is the care worker. In these cases, support for care workers may be one of the ways that can be reviewed to find new initiatives to improve service quality, and such support may include increasing the number of care workers per elderly person, and an effort to consider managing the improvement of labor conditions of care workers.

Ethical Clearance: Not required

Source of Funding: Self

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The Effect of New Nurse's Peer Satisfaction and Educational Satisfaction on Clinical Performance

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Abstract

Background/Objectives: The purpose of this study was to analysis the effects of peer satisfaction and educational satisfaction to nurses' clinical performance.

Methods/Statistical analysis: The subjects of this study were 162 nurses who understood the purpose of the study and agreed to voluntarily participate in the study. The collected data were analyzed using Pearson's correlation coefficients and hierarchical multiple regression analysis using the IBM SPSS 25.0 program.

Findings: The results showed that peer satisfaction and education satisfaction were significant factors, and their explanatory power was 27.5% ($F = 6.08, p < .001$).

Improvements/Applications: In order to improve the clinical performance of new nurses, education programs considering the impact factors are needed. This study can be used as the evidence.

Keywords: *clinical performance, peer satisfaction, educational satisfaction, nurse, regression*

Introduction

Nursing is becoming more complex and the severity of patients is increasing with the increase in the elderly population. As a result, nurses are required to have a high level of abilities required for patient care. The acquisition of new nurses' fast and stable clinical performances ensures the safety of patient care, increases satisfaction, and lowers turnover to stabilize the organization^[1]. However, some nurses, particularly new nurses, were reported lack of clinical performance^[2]. New nurses have a difficult time not only because they need to improve their clinical performance, but also because they have to adapt to their organizations. Critical thinking^[3,4], working conditions^[5], and experience as a nursing college student^[6] were found to be factors affecting a nurse's clinical performance in previous studies. Nurses' critical thinking skills enable them to pinpoint the patient's problem and provide nursing care for the problem. The physical and human environment

of the nurse's organization affects the nurse's work efficiency. Moreover, number of studies described factors that influence new nurses' clinical performance. In previous studies, social support^[7], interpersonal relationship^[8], problem solving ability^[9] were found to be an influencing factors, considering similar variables related to this study.

Social support, in particular, plays an important role in fostering professionals who can function independently and support nursing in their different roles and ultimately increase the organizational adaptability of new nurses. As with social support, new nurses learn about interpersonal skills in the clinical setting and try to form natural relationships. Problem solving skills are the ability to identify and solve problems that patients have in common with critical thinking.

The clinical performance of graduated new nurses depends not only on academic skills at school, but also on education and preparation for job skills in the field^[10]. And in Korea, the nursing education certification evaluation is used to confirm the overall evaluation of nursing education and the degree of achievement of learning outcomes. The aim of this course is to ensure

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that they are able to play a role as new nurses for the 4th grade students who are about to graduate.

Through many years of continuous evaluation, it is expected that the quality of nursing education and the basic ability of new nurses will be improved. However, the evaluation of the difference between these results and the new nurse's ability in actual clinical practice is still somewhat insufficient. Therefore, there are evaluation difficulties in the part of how these training programs can actually help care for patients. It can be a reasonable evaluation method to verify how helpful the training content has been to patient care through the satisfaction assessment of trained nurses. The relationship with peers is also important because nursing performs patient care while interacting with other professions. As well as communicating with colleagues, support from colleagues is relevant to the performance of nurses^[11].

In addition, after graduating, he becomes a new nurse and acquires knowledge and practical skills that are more suitable for the field through training conducted at the clinical site. However, little has been done about how satisfied new nurses are in the various levels and contents of education provided. For this reason, satisfaction with education can be relatively neglected because new nurses place the highest priority on acquiring knowledge and acquiring practical skills. However, educational satisfaction is likely to influence how much more educated people can focus on the content of education, which may affect the future image of education. Nurses are professions with high demands for continuous education in clinical settings, regardless of position. We must continue to learn new nursing techniques that change from evidence to relatively simple ability to learn new diagnoses and equipment. Therefore, in professional nurses, education is a very important element of capacity building and satisfaction with such education is related to the effectiveness of education and should not be overlooked.

Yet, not enough is known about how peer satisfaction and educational satisfaction impacts clinical performance. Therefore, although few of the existing studies have been found, we want to identify the impact of education satisfaction and peer satisfaction on clinical performance, which is considered to be important factors in the clinical performance of nurses.

Thus, the purpose of this study was to describe the influencing factor to clinical performance in hospital staff new registered nurses.

Method

This study is a descriptive correlation study to identify the effect of new nurses' peer satisfaction and educational satisfaction on clinical performance.

The subjects of this study were 162 nurses who understood the purpose of the study and agreed to voluntarily participate in the study. The number of subjects in this study is calculated by $G * Power$ ver. 3.1.9.2. Program. As a result of multiple regression analysis, the minimum number of samples required was 153 with a mean effect size of .15, significance level .05, power of .95, and 7 variables.

The tools used in the study were clinical performance, peer satisfaction, and educational satisfaction measurement tools.

The clinical performance measurement tool was modified and supplemented by Kim^[12], which was developed by the Korea Nursing Evaluation Institute^[13]. With a four-point Likert scale of 21 total questions, the range of scores is 21-84, and the higher the score, the better the nursing performance. At the time of tool development, the Cronbach's α was .91, and in this study it was .94.

Peer satisfaction was measured using a three-point scale in paragraph 1 consisting of satisfied, average, dissatisfied.

The education satisfaction level measured the tools developed by Lowery^[14] and translated by Lee^[15]. As a five-point Likert scale with a total of 14 questions, the higher the score, the higher the degree of satisfaction with the exercise leader and overall practice. At the time of tool development, the Cronbach's α was .96, and in this study it was .96.

Data were collected about participants' age, gender, Work Department, Working Period, Working department Training Period, Hope Department, Hospital Practice Experience, Residence, Work Satisfaction, Peer Satisfaction, Hospital Satisfaction, Department Movement Experience, matching nurse's image, subjective health awareness.

Weights were assigned through the IBM SPSS 25.0 program to generate a composite sample plan file and analyzed. The significance level was set to .05.

The subjects’ characteristics and the factors were calculated using actual numbers and weighted percentages, and χ^2 -test was used to compare groups. Pearson’s correlation coefficients and hierarchical multiple regression were used to determine the factors that influence to clinical performance.

Results

1. General characteristics of the subjects

Clinical performance was significantly different according to gender ($p = .018$) and job satisfaction ($p < .001$), Peer satisfaction ($p < .001$), hospital satisfaction ($p < .001$), nurse image compliance ($p < .001$), subjective health ($p = .001$) (Table 1).

2. Correlation between peer satisfaction, educational satisfaction, and clinical performance

The results of analyses show that correlations between clinical performance and educational satisfaction are significant positive correlation ($r = .23$, $p = .011$), between clinical performance and peer satisfaction are significant negative correlation ($r = -.30$, $p < .001$) (Table 2).

3.3 Influencing factors of clinical performance

Multiple regression analysis was performed using clinical performance as a dependent variable to identify the explanation ability of factors affecting clinical performance.

In order to confirm the explanatory power of factors affecting clinical performance, the clinical performance was used as a dependent variable, and the primary independent variables of gender, job satisfaction, hospital satisfaction, matching nurse image, and subjective health awareness, which showed differences in general characteristics of subjects. As a variable, secondary regression analysis was performed by additionally inputting peer satisfaction and education satisfaction. The regression showed that the Durbin-Watson statistic was 1.62, indicating no autocorrelation. Tolerance limits of .620-.935 and .558-.921 were all 0.1 or higher, and the dispersion expansion factors of 1.069-1.640 and 1.085-1.793 were all below 10, indicating no multicollinearity.

In the first analysis, as shown in Table 3, work satisfaction was a significant factor and the explanatory power was 22.2% $F = 6.10$, $p < .001$. The second analysis also showed that work satisfaction and education satisfaction were significant factors, and their explanatory power was 27.5% ($F = 6.08$, $p < .001$).

Table 1. General Characteristics & Differences in Clinical Performance to the General Characteristics of Subjects n=162

Characteristics	Categories	n(%)	M(SD)	Clinical performance	
				M±SD	t/F(p)/ Scheffe
Age (yr)			25.1(1.25)	73.72(10.52)	1.76(.087)
Gender	Male	9(5.6)		81.77(9.69)	2.39(.018)
	Female	153(94.4)		73.25(10.40)	
Working department	Internal medicine	46(28.4)		72.08(10.33)	0.80(.449)
	Surgery	47(29.0)		74.63(11.06)	
	others	69(42.6)		74.20(10.29)	
Working period(month)	≤ 6	75(46.3)	6.32(2.85)	72.20(10.65)	-1.72(.086)
	>7	87(53.7)		75.04(10.28)	
Training period (week)	≤ 4	62(38.3)		74.35(10.80)	0.59(.552)
	>5	100(61.7)		73.34(10.37)	
Desired department	Yes	95(58.6)		73.07(10.63)	-0.66(.508)
	No	67(41.4)		74.18(10.47)	

Cont... Table 1. General Characteristics & Differences in Clinical Performance to the General Characteristics of Subjects n=162

Hospital practice experience	Yes	59(36.4)		73.33(10.10)	-0.36(.723)
	No	103(63.6)		73.95(10.79)	
Residence	Home	50(30.9)		74.98(10.84)	1.10(.313)
	Others	112(69.1)		73.16(10.37)	
Work satisfaction	Satisfied ^a	67(41.4)		78.85(10.71)	16.16(<.001) a>b,c
	Average ^b	77(47.5)		69.93(8.34)	
	Dissatisfied ^c	18(11.1)		70.88(10.68)	
Peer satisfaction	Satisfied ^a	127(78.7)		75.29(10.37)	8.35(<.001) a>b,c
	Average ^b	31(19.1)		69.03(9.14)	
	Dissatisfied ^c	4(2.5)		60.50(4.43)	
Hospital satisfaction	Satisfied ^a	68(42.0)		77.95(10.81)	10.63(<.001) a>b,c
	Average ^b	68(42.0)		70.50(8.93)	
	Dissatisfied ^c	26(16.0)		71.11(10.07)	
Department movement experience	Yes	17(10.5)		74.26(10.72)	0.23(.816)
	No	145(89.5)		73.66(10.53)	
Nurse image consistent	Consistent ^a	48(29.6)		79.0(9.80)	11.40(<.001) a>b,c
	Medium ^b	79(48.8)		72.65(10.83)	
	Inconsistent ^c	35(21.6)		68.91(7.50)	
Subjective health	Good	39(24.1)		79.12(11.86)	7.74(.001)
	Average	86(53.1)		72.55(8.63)	
	Poor	37(22.8)		70.75(11.23)	

Table 2. Correlation of Variables**(n=162)**

Variables	Clinical performance r(p)	Educational Satisfaction r(p)
Clinical performance	1	
Educational Satisfaction	.23(.010)	1
Peer Satisfaction	-.30(<.001)	-.23(.011)

Table 3. Influencing Factors of Clinical Performance**n=162**

Variables		β	t	p
1	Work satisfaction (ref: normal) Satisfied	.263	2.97	.003
Adj.R ² = .222, F(p) = 6.10(<.001)				
2	Educational Satisfaction	.219	-3.9	.003
	Work satisfaction (ref: normal) Satisfied	-.104	2.80	.006
Adj.R ² = .275, F(p) = 6.08(<.001)				

Discussion

This study produced new knowledge that general characteristics, peer satisfaction, and education satisfaction influencing on the clinical performance of new nurses in the following sections, we discuss our findings compared with previous research findings. And we identify limitations.

As expected, the positive correlation between clinical performance and education satisfaction was supported.

Training for new nurses is an essential part of reducing the turnover of new nurses^[16], increasing satisfaction and increasing the productivity of nursing organizations^[17].

In the previous study, the more educated and experienced nurses had fewer drug failures, and the less patient fall down accident^[18]. These findings provide a practical evidence that goes beyond the vague expectations or expectations that nurses' education improves the quality of patient care. In other words, the actual number of medication errors and the number of patients fall of the subjects were examined and objectively showed that the more education, the less these mistakes were made and the quality of patient care improved.

Previous studies have shown that differences in satisfaction with education and willingness to participate have an impact on the effectiveness of education. However, it is pointed out that if such educational satisfaction is high, the effect of education is high and the factors that increase the educational satisfaction are highly related to race, grade, and

individual's disposition^[19]. However, as mentioned above, educational satisfaction is influenced by various factors such as personal disposition and race. How this subjective judgment can be objectively assessed is very important to secure the basis for understanding the exact phenomenon in the future. The tools used in this study were also reliable, which can be seen as a result of confirming the relationship between satisfaction and clinical performance.

In addition, in the same context as this study, if the organization's career development support, including education, is satisfactory, the turnover rate of nurses will be lowered, and the nurse's capacity will be strengthened as time goes by, and clinical performance will be improved. However, satisfaction is subjective judgment, which may lead to inaccurate interpretation. Therefore, there is a need for repeated research by using different satisfaction evaluation tools.

In this study, researchers found that clinical performance and education satisfaction were correlated and clinical performance and peer satisfaction were negatively correlated. ($r = -.30$, $p < .001$) However, previous studies have reported that the higher the peer support of new nurses, the higher the clinical performance^[20]. In addition, high peer support influences job satisfaction, thus increasing job satisfaction^[21]. The support of colleagues and supervisors is important factor to help new nurses adapt to the clinical field, and since clinical adaptation is directly related to their job ability, the support improves the new nurse's ability. Existing studies have shown that active support from co-workers and supervisors is a factor that helps new nurses cope with the situation and work well^[22]. Since new nurses

may feel uncertainty and loneliness, it is important to reliably adapt to the hospital system in order to work effectively in hospitals^[23]. Peer support and support can enhance clinical performance and eliminate isolation^[24]. The negative correlation between peer satisfaction and clinical performance in this study is different from previous studies. It seems that the research tool showed a difference in that it was a three-point scale of a single question. In addition, this study was aimed at new nurses in a hospital, and the diversity of organizational culture was excluded. In addition, it is necessary to confirm the difference between peer support used in previous studies and peer satisfaction in this study. It may be necessary to confirm this part as not all support may lead to satisfaction. Therefore, further research is needed because the findings that peer support is associated with peer satisfaction could not be found.

Conclusion

There was a significant correlation between peer satisfaction and educational satisfaction with clinical performance. And explanatory power was also significant. Based on the results, it has been found that there is a need to increase peer satisfaction and educational satisfaction in order to enhance the clinical performance of nurses, which should be considered in the development of strategies and interventions.

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Conflict of Interest: There is no conflict of interest

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Diagnostic Performance of Multiparametric MR Imaging According to the Location of Prostate Cancer

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Abstract

Background/Objectives: Most prostate cancers occur in the peripheral zone (PZ) of prostate and a few in the transition zone (TZ). We compared MRI findings and clinicobiologic findings among PZ, TZ and PZ+TZ prostate cancers to determine if cancer location is independently associated with outcomes.

Methods/Statistical analysis: A retrospective study was performed of 70 men who underwent multiparametric-MRI prior to radical prostatectomy from 2014.03~2018.02. Fifty-two prostate cancers were included in this study. We investigated the comparison serum-PSA, tumor size, prostate weight, Gleason score, presence of extracapsular extension, ADC value on DWI, PIRADS category and pathologic tumor stage, according to the location of prostate cancer (PZ, TZ, and PZ+TZ prostate cancers), using statistical methods.

Findings: 30/52(58%) were PZ in location, 14/52(27%) were in TZ, and 8/52(15%) were with PZ+TZ prostate cancer. Patients with PZ+TZ cancer presented with large total cancer size ($\geq 1.5\text{cm}$), MRI evidence of presence of extracapsular invasion ($p < 0.001$), seminal vesicle invasion ($p = 0.026$) and lymph node invasion ($p < 0.001$). The mean ADC value was significantly lower in the PZ+TZ cancer (mean ADC 0.455 – 0.83 (median 0.643)) than in PZ (0.4555 – 1.342 (median 0.90)) and TZ cancer (0.579 – 1.211 (median 0.895)) ($p=0.005$). There was no significant difference related to serum PSA (p value 0.065), Gleason score (p value 0.235) between PZ, TZ and PZ+TZ lesion.

Improvements/Applications: PZ+TZ prostate cancer is associated with tumor, ECE, seminal vesicle invasion and low ADC value. So, tumor location should be taken into account in the process of evaluation, and mp-MRI can be a good tool to staging prostate cancer.

Keywords: Prostate gland, Prostate cancer, Prostate MRI, Diffusion weighted imaging, Transition zone, Seminal vesicle

Introduction

Prostate MRI is an important diagnostic method for detecting, locating and staging prostate cancer. Prostate MRI and reporting and data system for prostate cancer have evolved. Among them, multiparametric MRI (MP-MRI) and the PI-RADS classification are the most commonly used and the most accurate diagnosis of prostate cancer these days. MP-MRI is a combination of T2-weighted imaging (T2WI), diffusion weighted

imaging (DWI) and dynamic contrast-enhanced (DCE) MRI and is an accurate imaging modality in the detection, localization and stage of prostate cancer, providing both functional tissue information and anatomical information [1,2,3]. About 80% of prostate cancers occur in the peripheral zone (PZ) and 20% of prostate cancers occur in the transition zone (TZ). Most benign prostatic hyperplasia occurs in the TZ. At peripheral zone, tumor usually show smaller volume but Gleason score has higher than transition zone, so it appears more aggressive features [4]. And tumor extent, extracapsular extension of prostate cancer is associated with poor prognostic factors. And it contribute to positive surgical margins during

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surgery [5,6]. The presence of extracapsular extension (ECE) of prostate cancer after radical prostatectomy is one of the poor prognostic factors associated with cancer recurrence, cancer progression, and cancer-related mortality [7,8]. ECE is also associated with an increase in prostate-specific antigen (PSA) among prognostic factors, and a surgical margin after prostatectomy [9]. MRI findings of ECE in prostate cancer include bulging contours, irregular lines or spindles protruding out of the capsule, and tumor-capsule contact length greater than 1 cm [10]. Our purpose of this study is to evaluate MP-MRI and kinetic features among cancer location and cancer extent, and correlate with clinicopathologic findings for investigate for diagnostic accuracy of preoperative imaging.

Method

This retrospective study was performed with Institutional Review Board approval and the requirement for obtaining informed patient consent was waived. A total of 74 patients diagnosed with prostate cancer, based on MP-MRI prior to radical prostatectomy at our institution between March 2014 and February 2018 (mean age, 72 years; range, 60 – 87 years), were retrospectively analyzed. Clinical, MRI, and pathologic features were obtained. But 22 men were excluded due to whose MR imaging was low-quality with artifact, or incomplete clinicopathologic factors, or underwent neoadjuvant chemotherapy, or underwent robot-assisted prostatectomy. Of all 74 patients, 22 patients were excluded from this study. Fifty-two patients' data was analyzed. One genitourinary radiologist and 3 pathologists reviewed each case and matched each MRI region one more time after surgery was done. First, by clinicopathologic factors, age, preoperative serum PSA, total cancer size and Gleason score was investigated. The 2nd, MR finding included extracapsular extension, like bulging contour, capsular irregular spindle, neurovascular bundle asymmetry, breach capsule tumor extension and tumor capsule contact length. In addition, lymph node invasion, seminal vesicle invasion and ADC value was investigated.

Philips Intera Achieva 3 T MRI system (Philips Medical Systems, Best, Netherlands) was used. Axial, sagittal and coronal views of T2-weighted MRI images of prostate were obtained, using turbo spin echo (TSE) technique. The parameters were TR/TE/FA = 2500/100/90, FOV = 180 × 180 mm, matrix size = 312 × 306, 1.0 NEX, section thickness = 3 mm, and

intersection gap = 0. For T1-weighted MRI images, the axial T1-weighted 3D dynamic gradient-echo fat-suppressed sequence (e-THRIVE GD) technique was used to obtain one pre-contrast image, along with ten early and delayed contrast-enhanced images, each at a one-minute interval. The parameters were TR/TE/FA = 3.3/1.6/10, FOV = 200 × 200 mm, matrix size = 200 × 199, 1.0 NEX, section thickness = 3.5 mm, intersection gap = 0. DWI-Sense of prostate were obtained. In single shot echo-planar imaging with sense encoding, a b-value of 1000 mm²/s was used. The parameters were TR/TE/FA = 3260/65/90, FOV = 180 × 180 mm, matrix size = 72 × 72, 6.0 NEX, section thickness = 3 mm, and intersection gap = 0. For calculation of ADCs, a region of interest smaller than the lesion was selected, without including necrosis or liquids.

For statistical analysis, Statistical Package for the Social Sciences (SPSS), version 25.0 (SPSS Inc., Chicago, IL, USA) was used. Chi-squared analysis, Mann-Whitney and Kruskal-Wallis tests were respectively used to evaluate differences in clinicopathologic outcomes (age, tumor size, serum PSA, Gleason scores, extracapsular invasion, seminal vesicle invasion, lymph node metastasis) between PZ, TZ and PZ+TZ prostate cancers.

Result and Discussion

A total of 52 patients with prostate cancer consisted of eligible study groups. Table 1 showed 30/52(58%) were PZ in location, 14/52(27%) were in TZ, and 8/52(15%) were with PZ+TZ prostate cancer. Patients with PZ+TZ cancer presented with larger total cancer size (≥ 1.5 cm) than PZ cancer or TZ cancer (p value = 0.008). MR finding included extracapsular extension, like bulging contour, capsular irregular spindle, neurovascular bundle asymmetry, breach capsule tumor extension and tumor capsule contact length greater than 10mm. Patients with TZ cancer were less likely to have extracapsular extension (35% [TZ cancer], 40% [PZ cancer] versus 100% [PZ+TZ cancer], p = 0.006). Patient with TZ cancer were less likely to have seminal vesicle invasion (7% [TZ cancer], 13% [PZ cancer] versus 50% [PZ+TZ cancer], p = 0.026). Patients with PZ+TZ cancer were more likely to MRI evidence of presence of extracapsular invasion (p value = 0.006), seminal vesicle invasion (p = 0.026) and lymph node invasion (p < 0.001) than PZ cancer and TZ cancer. The mean ADC value was significantly lower in the PZ+TZ cancer (mean ADC 0.455 – 0.83 (median 0.643)) than in PZ (0.4555

– 1.342 (median 0.90)) and TZ cancer (0.579 – 1.211 (median 0.895)) (p=0.005). There was no significant difference related to serum PSA (p value = 0.065) and Gleason score (p value = 0.235) between PZ, TZ and PZ+TZ lesion. Figure 1 case was 73-years-old man with transition zone prostate cancer with extracapsular extension. Serum PSA was measured 33.84ng/ml. T2 weighted image showed enlarged transition zone and low signal intensity mass lesion on T2 weighted image, similar to benign prostatic hyperplasia. But, diffusion weighted image showed moderate water restriction and low ADC at transition zone than normal-appearing tissue, suggestive of transition zone prostate cancer. Also, T2 weighted image showed irregular bulging contour, capsular irregular spindle, showing positive extracapsular extension. Gross pathology showed transition zone prostate cancer with extracapsular

extension (Gleason score 8). Figure 2 case was 66-years-old man with left peripheral zone prostate cancer, organ confined cancer. Diffusion weighted image shows focal ovoid water restriction lesion at left peripheral zone and T2 weighted image showed no extracapsular extension. Figure 3 case was 73-years-old man with both peripheral zone and transition zone prostate cancer with extracapsular extension. Serum PSA was measured 48.7ng/ml. The diffusion weighted image (b=1000mm²/s) shows heterogeneously high signal intensity at both peripheral zone and transition zone and water restriction. The ADC value of the lesion was 0.455 x 10⁻³ mm²/s. T2 weighted image shows marked bulging contour, capsular irregular spindle, showing extracapsular extension. Gross pathology shows both peripheral zone and transition zone prostate cancer with extracapsular extension (Gleason score 9).

Table 1. Comparison of MRI radiologic findings according to location of prostate cancer

Characteristics	PZ	TZ	PZ + TZ	P value
Number of patients	30	14	8	
Age in years at surgery (median)	58-81 (69.5)	62-79 (70.5)	66-78 (72)	0.656
PSA (ng/mL)				
Median	3.1-43.6 (20.3)	2.5-66.2 (34.4)	5.6-53.3 (29.5)	
≥ 9	21 (41.2%)	7 (13.7%)	2 (3.9%)	0.065
≤ 10	9 (17.6%)	6 (11.8%)	6 (11.8%)	
Gleason score				
6	5 (9.6%)	1 (1.9%)	0 (0%)	
7	21 (40.4%)	12 (23.1%)	5 (9.6%)	0.235
8~10	4 (7.7%)	1 (1.9%)	3 (5.8%)	
Prostate weight				
mean	18-94 (56)	17-116 (66.5)	21-100 (60.5)	
median	12 (30.0%)	6 (15.0%)	2 (5.0%)	0.865
	12 (30.0%)	5 (12.5%)	3 (7.5%)	
Total cancer size				
< 1.5cm	22 (42.3%)	10 (19.2%)	1 (1.9%)	
≥ 1.5cm	8 (15.4%)	4 (7.7%)	7 (13.5%)	0.008
Extracapsular invasion	12 (23.1%)	5 (9.6%)	8 (15.4%)	0.006
Seminal vesicle invasion	4 (7.7%)	1 (1.9%)	4 (7.7%)	0.026
LN invasion	0	0	3 (5.8%)	<0.000
* ADC value				
1	0.455-1.3420 (0.90)	0.579-1.211 (0.895)	0.455-0.83 (0.643)	
2	14 (26.9%)	5 (9.6%)	7 (13.5%)	0.056
	16 (30.8%)	9 (17.3%)	1 (1.9%)	
Time/SI curve				
2	13 (35.1%)	3 (8.1%)	1 (2.7%)	0.151
3	9 (24.3%)	8 (21.6%)	3 (8.1%)	

* ADC value: ADC values (mean ADC value) (x 10⁻³ mm²/s)

ADC value 1: number of patients with less than mean ADC values

ADC value 2: number of patients with more than mean ADC values

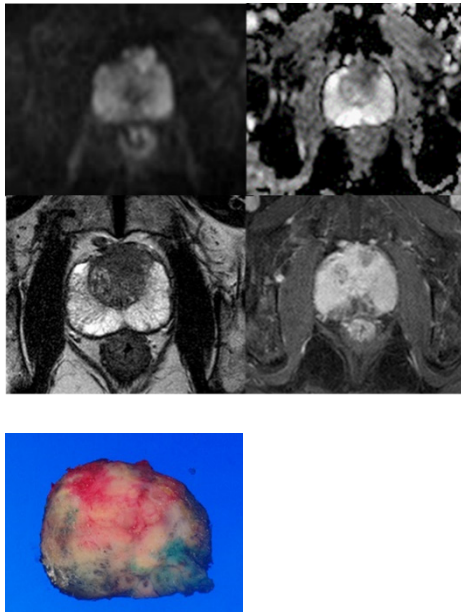


Figure 1. Prostate cancer of transition zone in 74-years old man

(Serum PSA 33.84ng/ml, ADC 0.639, Gleason score 8)

A. The diffusion weighted image (b=1000mm²/s) shows high signal intensity at transition zone.

B. On the ADC map shows water restriction and low ADC than normal-appearing tissue at transition zone, the ADC value of the lesion was 0.639 x 10⁻³ mm²/s .

C. The axial T2 weighted image shows bulging contour, capsular irregular spindle and tumor capsular contact lengths longer than 1cm, positive extracapsular extension.

D. The axial dynamic contrast enhanced image shows heterogeneously enhancing mass with extracapsular extension at transition zone.

E. Gross pathology of specimen shows adenocarcinoma, extracapsular extension at transition zone.

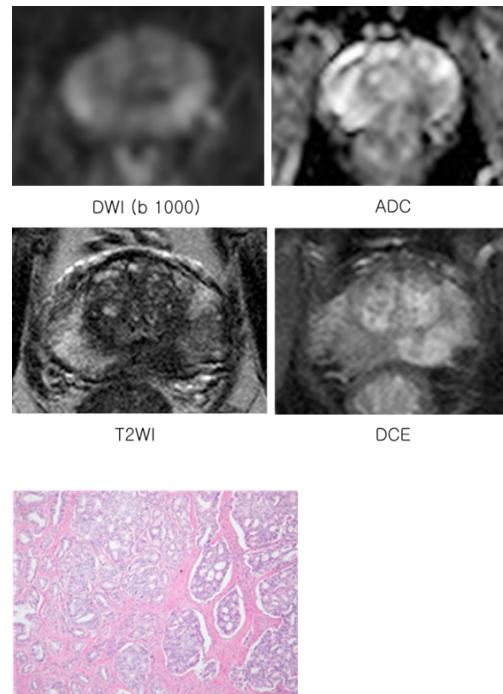


Figure 2. Prostate cancer with left peripheral zone in 66-years-old Ma

(Serum PSA 26.4ng/ml, ADC 0.552, Gleason score 8)

A. The diffusion weighted image (b=1000mm²/s) shows focal high signal intensity at left peripheral zone.

B. On the ADC map shows mild water restriction and low ADC than normal-appearing tissue at left peripheral zone, the ADC value of the lesion was 0.552 x 10⁻³ mm²/s .

C. The axial T2 weighted image shows focal low signal intensity nodule in left peripheral zone without extracapsular extension.

D. The axial dynamic contrast enhanced image shows heterogeneously enhancing nodule without extracapsular extension at transition zone.

E. Histopathology of specimen shows adenocarcinoma, organ confined tumor at left peripheral zone (H & E stain, x 200).

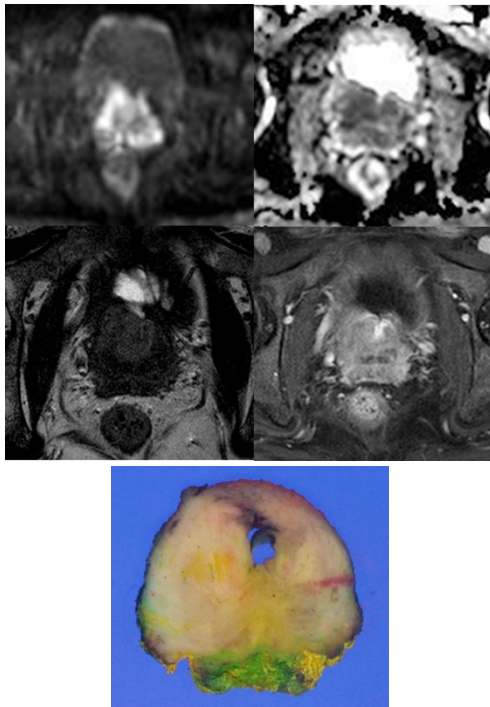


Figure 3. Prostate cancer with peripheral zone and transition zone in 73-years-old Man

(Serum PSA 48.7ng/ml, ADC 0.455, Gleason score 9)

- A. The diffusion weighted image ($b=1000\text{mm}^2/\text{s}$) shows heterogeneously high signal intensity at both peripheral zone and transition zone.
- B. On the ADC map shows water restriction and low ADC than normal-appearing tissue at both transition zone and peripheral zone, the ADC value of the lesion was $0.455 \times 10^{-3} \text{mm}^2/\text{s}$.
- C. The axial T2 weighted image shows marked bulging contour, capsular irregular spindle and tumor capsular contact length was longer than 1cm, positive extracapsular extension.
- D. The axial dynamic contrast enhanced image shows irregular heterogeneously enhancing mass with extracapsular extension at both transition zone and peripheral zones.
- E. Gross pathology of specimen shows adenocarcinoma, extracapsular extension at both peripheral and transition zone.

Conclusion

The transition zone of the prostate is mainly caused by benign prostate hyperplasia, and the incidence of prostate cancer is lower than the peripheral zone. Transition zone prostate cancer is difficult to diagnose even by core needle

prostate biopsy, and it is difficult to differentiate between prostate hyperplasia and prostate cancer of transition zone by transrectal prostate ultrasound or previous conventional prostate MRI. However, MP-MRI scans allowed precise differential diagnosis. The diffusion weighted images would correlate with the pathological moderate and prostate cancer stages of prostate cancer, thus increasing the role of MP-MRI. So, our conclusion is, PZ+TZ prostate cancer is associated with aggressive pathologic features, extracapsular extension, seminal vesicle invasion and low ADC value and can lead to worse outcomes. In the process of predicting patient risk and assessing the patient's prognosis before prostatectomy, it is necessary to take into account the location of the tumor and the stage of the prostate cancer. MP-MRI can be a good diagnostic tool for detection and staging of prostate cancer. MP-MRI is a beneficial preoperative assessment tool for determining location and extent of prostate cancer.

Ethical Clearance: Not required

Source of Funding: Nil

Conflict of Interest: Nil

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A Study on the Awareness of Community Public Health Project among the Employees in The Public Health Center

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Abstract

Background/Objectives: This study aims to select the priority projects for the community inhabitants considered by the employees of the public health center and to enhance the inhabitants' health and their satisfaction level on the usage of public health center.

Methods/Statistical analysis: The questionnaire survey of 152 employees working at G health center in Gyeongsangbuk-do conducted a survey on projects that should be conducted as a priority level among residents' public health center for local residents. The survey items were composed of 4 - point Likert scale for health care project, health promotion project, and health care for the elderly.

Findings: Chronic disease control (3.40 ± 0.97) was rated as the most needed project with respect to the questionnaire on the priority of public health service projects for the elderly, followed by operation of the center for the elderly with dementia (3.34 ± 0.91) and visiting health control (3.21 ± 0.88). Medical rounding for silver center (2.82 ± 0.92) and bathing project for the disabled elderly (2.93 ± 0.88) were rated as the least needed.

Improvements/Applications: This study was conducted to utilize it as a basic data to prepare improvement plans for improving the health of local residents and activating the functions of public health center.

Keywords: *Public health center, Public health project, Health control, Health enhancement, Chronic disease*

Introduction

Public health center try to improve the quality of public health services and to enhance the health of the inhabitants by establishing the public health service projects to meet the community requirements and developing community public health service plans to cope with the needs of the inhabitants^[1-4]. According to Article 3 of Community Public Health Act, it was determined that the heads of local governments should establish and prepare the plans of community public health services to submit to the Minister of Health and Welfare so as to contribute the disease diagnosis and health enhancement of the inhabitants^[5,6].

Rapid increase of the elderly population, chronic and degenerative-centric changes of diseases, and initiation of local government era affected the significant changes of public health environments^[7-9]. Upon the changes of public health environments, demands of public health services from the community inhabitants have been expressed variously and actively. However, priority setting among community public health services in the communities and overall establishments of public health service projects independently are needed to meet the dynamic needs of public health services from the inhabitants within the limited scope of public health service resources such as human resources, facilities, budget and so on, in the communities^[10-13].

Plans of community public health services should be prepared not only by the persons in charge in the public health center but also by the related institutions such as local governments, local councils, and so on, as well as inhabitants upon their participations in the planning in multiple ways^[14-16]. When planning the community public health services, participations of multiple stakeholders and

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harmonious communication will enhance the reliability of the plans upon applications of various opinions to the plans^[17,18]. Securing the balance by adjusting interests of different parties, it is expected to enhance the feasibility of the projects and to raise the inhabitants' interests and participations in the public health service institutions^[19,20]. Although it is important to prepare the plans of community public health services, the interest level in the planning process and implementation of the plans has been raised, which requires the suggestions of objective guidelines to apply these interests^[21,22]. Therefore, it is very critical process to establish both mid-to-long-term plans and annual short-term plans and to evaluate their outcomes so as to maximize the utilization effects of the project plans^[23,24].

Accordingly, the research purposes are as follows;

Priority setting among community public health services in the communities and overall establishments of public health service projects independently are needed to meet the dynamic needs of public health services from the inhabitants within the limited scope of public health service resources such as human resources, facilities, budget and so on, in the communities. This study aims to select the priority projects for the community inhabitants considered by the employees of the public health center and to enhance the inhabitants' health and their satisfaction level on the usage of public health center.

Method

The questionnaire survey of 152 employees working at G health center in Gyeongsangbuk-do conducted a survey on projects that should be conducted as a priority level among residents' public health center for local residents.

The questionnaire was distributed and the method of writing was explained. The survey items were composed of 4 - point Likert scale for health care project, health promotion project, and health care for the elderly as seen in [Figure 1]. The statistical program of SPSS version 18.0 was used for data analysis.

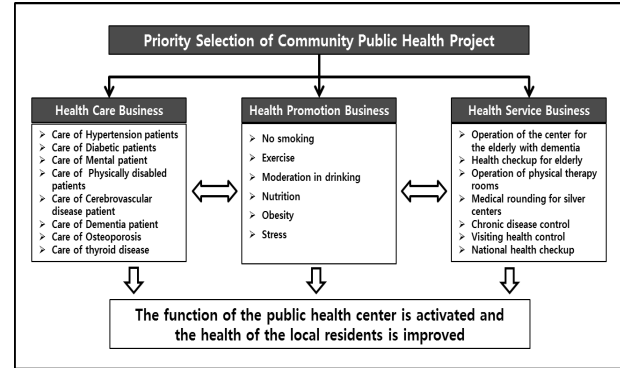


Figure 1. Priority selection of community public health project

Result

1. General characteristics of the subjects

With respect to the functions of 152 study subjects, technical functions were 38.2%, nursing and medical service were 35.5%, and public health administration was 26.3%. For the gender of the subjects, 24.7% were males and 75.3% were females. As for the age groups, 32.9% were 50s or older, 31.6% were 30s, 23.7% were 40s, and 11.8% were 20s. In terms of education level, 40.1% were university graduates, 39.5% were college graduates, 10.5% were graduate school graduates, and 9.9% were high school graduates as seen in [Table 1].

Table 1. General characteristics of subjects

Unit: person (%)

Classification	Nursing, medical	Public health	Technical functions	Total
Gender				
Males	3(5.6)	13(32.5)	21(36.2)	37(24.7)
Females	51(94.4)	27(67.5)	37(63.8)	115(75.3)
Age				
20 ~ 29	6(11.1)	4(10.0)	8(13.8)	18(11.8)
30 ~ 39	17(31.5)	10(25.0)	21(36.2)	48(31.6)
40 ~ 49	13(24.1)	8(20.0)	15(25.9)	36(23.7)
50 and older	18(33.3)	18(45.0)	14(24.1)	50(32.9)

Cont... Table 1. General characteristics of subjects**Unit: person (%)**

Education				
High school	4(7.4)	3(7.5)	8(13.8)	15(9.9)
College	19(35.2)	17(42.5)	24(41.4)	60(39.5)
University	24(44.4)	14(35.0)	23(39.6)	61(40.1)
Graduate	7(13.0)	6(15.0)	3(5.2)	16(10.5)
Total	54(100.0) (35.5)	40(100.0) (26.3)	58(100.0) (38.2)	152(100.0) (100.0)

2. Necessity in health care business

In the question about health care business for public health center employees, Care of dementia patients(3.52±0.85) was the highest priority. And care of hypertension patients (3.46±0.91), and care of diabetes patients (3.32±1.02). Care of thyroid disease(2.87±0.93) appeared to be the lowest business ranking as seen in [Table 2].

3. Necessity in health care business

In the question of health promotion projects for public health center employees, smoking cessation(3.47±0.77) was the most important. And it appeared as the priority business necessary in order of obesity(3.36±0.93) and

exercise(3.28±1.12). The project for stress (3.12±1.15) was ranked lowest as seen in [Table 3].

4. Needs of public health service projects for the elderly

Chronic disease control (3.40±0.97) was rated as the most needed project with respect to the questionnaire on the priority of public health service projects for the elderly, followed by operation of the center for the elderly with dementia (3.34±0.91) and visiting health control (3.21±0.88). Medical rounding for silver centers (2.82±0.92) and bathing project for the disabled elderly (2.93±0.88) were rated as the least needed ones as seen in [Table 4].

Table 2. Questions about necessity in health care business**Unit: person (%)**

Contents	Very Necessary	Necessary	Unnecessary	Very Unnecessary	Mean ± S.D.
Care of Hypertension patients	46(30.3)	99(65.1)	3(2.0)	1(0.7)	3.26±0.91
Care of Diabetic patients	51(33.6)	94(61.8)	4(2.6)	0(0)	3.30±1.02
Care of Mental patient	44(28.9)	81(53.5)	22(14.5)	2(1.3)	3.16±0.93
Care of Physically disabled patients	26(17.1)	94(61.8)	24(15.8)	2(1.3)	3.12±0.89
Care of Cerebrovascular disease patient	40(26.3)	91(59.9)	17(11.2)	0(0)	3.21±0.94
Care of Dementia patient	59(38.3)	73(48.0)	19(12.5)	0(0)	3.23±0.85
Care of Osteoporosis	20(13.2)	94(61.8)	28(8.4)	6(3.9)	3.05±1.04
Care of thyroid disease	10(6.6)	79(52.0)	54(35.5)	5(3.3)	2.97±0.93

Table 3. Questions about necessity of health promotion business**Unit: person (%)**

Contents	Very Necessary	Necessary	Unnecessary	Very Unnecessary	Mean ± S.D.
No smoking	71(46.7)	71(46.7)	95(9)	0(0)	3.42±0.77
Exercise	55(36.2)	81(53.3)	14(9.2)	0(0)	3.25±1.12
Moderation in drinking	51(33.6)	81(53.3)	14(9.2)	1(0.7)	3.22±0.86
Nutrition	49(32.2)	81(53.3)	15(9.9)	0(0)	3.20±0.95
Obesity	60(39.5)	80(52.6)	9(5.9)	1(0.7)	3.31±0.93
Stress	51(33.6)	81(53.3)	11(7.2)	4(2.6)	3.16±1.15

Table 4. Questionnaires on the priorities of public health service projects for the elderly**Unit: person (%)**

Contents	Very Necessary	Necessary	Unnecessary	Very Unnecessary	Mean ± S.D.
Operation of the center for the elderly with dementia	53(34.9)	66(43.4)	27(17.8)	1(0.7)	3.34±0.91
Health checkup for the elderly	36(23.7)	77(50.7)	35(23.0)	1(0.7)	3.04±0.94
Operation of physical therapy rooms	30(19.7)	85(55.9)	32(1.1)	3(2.0)	3.01±1.05
Medical rounding for silver centers	21(13.8)	84(55.3)	36(23.7)	9(5.9)	2.82±0.92
Bathing project for the disabled elderly	38(25.0)	60(39.5)	44(28.9)	8(5.3)	2.93±0.88
Chronic disease control	47(30.9)	93(61.2)	8(5.3)	1(0.7)	3.40±0.97
Visiting health control	35(23.0)	93(61.2)	22(14.5)	1(0.7)	3.21±0.88
Managements of cancer patients	23(15.1)	84(55.3)	40(26.3)	3(2.0)	3.01±1.02
National health checkup	33(21.7)	78(51.3)	33(21.7)	6(3.9)	3.14±0.94

Discussion

In Korea, the public health environment has been remarkably changed since the complete amendment of the Act of Community Public Health in 1995, and the position and roles of community public health services perceived passively have been expanded more and more.

With the establishment of local public health service planning, the works of public health center were activated and the collaborative system with local governments and healthcare professionals was established. In addition, collaborative relationships with private groups within the community were developed to perform the effective community public health project and they were utilized

as the useful data to establish the national public health service projects. Hence, the importance of preparation and utilization was empathized for the practical community public health service projects, and they tried to enhance the quality of medical services and health of the community inhabitants based on this.

The rapid increase of the elderly population and the change of disease pattern mainly focusing on chronic degenerative diseases are changing the health care environment in Korea. In addition, the opening of the era of full-scale local autonomy has a leading effect on the change of the health care environment. On the other hand, according to the change of the health care environment, the health care needs of residents are diversified and actively expressed. In order to meet the diverse health care needs of the community residents within the scope of health care resources such as limited manpower, facilities and budgets of the public health center, it is necessary to select the priority of community health care problems. Therefore, through this study, we will select priority projects for local residents that public health center employees think, and through this, we will increase the health promotion of local residents and the satisfaction of using public health center.

According to the results of the study, Among the health care projects for adults, the priority projects for the care of dementia patients(3.52±0.85), hypertension patients(3.46±0.91), and diabetes patients(3.32±1.02) were answered as the most necessary, and the demand for the smoking cessation(3.47±0.77) and obesity projects(3.36±0.93) was high in the health promotion projects(3.28±1.12). Chronic disease control (3.40±0.97) was rated as the most needed project with respect to the questionnaire on the priority of public health service projects for the elderly, followed by operation of the center for the elderly with dementia (3.34±0.91) and visiting health control (3.21±0.88). Therefore, we will carry out priority projects selected by public health center employees and select and manage the blood pressure recognition rate, blood sugar recognition rate, smoking rate, walking practice rate, and dementia test rate of local residents as performance indicators of public health center.

In order to successfully perform the health project, the competence and consciousness of the employees of the public health center are largely dependent on the results of the survey, so it is necessary to select the priority projects of the public health center for the local

residents and to improve the performance indicators for the project.

Conclusion

This study was conducted by dividing priority projects for health promotion of local residents into health management projects, health promotion projects, and welfare projects for the elderly. Through this, this study was conducted to utilize it as a basic data to prepare improvement plans for improving the health of local residents and activating the functions of public health center. The results of the study are as follows. First, the health care project for local residents is carried out by care of dementia patients, care of hypertension patients, and care of diabetic patients. The performance index is improved by selecting blood pressure recognition rate, blood sugar recognition rate and dementia test rate. Second, the health promotion project for local residents is carried out with smoking cessation business and obesity business, and the performance index is managed by selecting the smoking rate and walking practice rate.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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The Health Care Needs of Local Residents in Korea

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Abstract

Background/Objectives: This study is to utilize the health services of N- citizens as a basic data for establishing the 7th Regional Health Plan (2018 ~ 2022) respectively.

Methods/Statistical analysis: Tools for measuring the health care needs of the subjects were revised and supplemented by the tools of the Community Health Survey. Data was collected through a questionnaire from August 1 to August 21, 2018. Although 447 questionnaires were collected, 403 questionnaires were used for data analysis, except for 44 which were not clear or missing. The collected data were analyzed with the SPSS 18.0 program.

Findings: The result showed that the overall health service level was 2.90 out of 4.0, and the kindness of staff in the sub - area was the highest with 3.32 points, followed by medical service level 2.86, modernization of facilities 2.77, and excellence in equipment 2.69 points. The total health care needs of the subjects were 3.38 out of 4.0, health care services and health promotion services were 3.41 points higher respectively. As a result of analyzing the difference between total health care need, health care service, health promotion service, elderly health service, maternal & child health service by general characteristics, only gender and total health care demand showed statistically significant differences($t=-2.095$, $p=.037$). The result showed that there was positive correlation of the total health care need, health care service($r=.862$, $p<.01$), health promotion service($r=.849$, $p<.01$), elderly health service($r=.868$, $p<.01$), maternal & child health service($r=.856$, $p<.01$) in citizens of N city.

Improvements/Applications: Development of a health promotion program is needed to improve the population's health potential and the ability to overcome the risk factors of the disease.

Keywords: Health care, Health service, Need, Health care service, Resident

Introduction

In the meantime, the healthcare environment is changing, such as changes in disease patterns, an increase in the elderly population, a decrease in fertility, and an increase in the demand for health and welfare services. In order to implement the division of medicine and promote health promotion projects, the need for basic data for establishing health plans and developing health promotion programs is increasing.

The challenge facing health centers as health administrative agencies is to carry out the broader primary health care needs of local residents. It also develops and expands basic health care services such as new approaches for the health management of the residents, such as disease prevention and poor health promotion projects [1]. In addition, it is urgently needed

to redefine the function and role of the public health center to proactively cope with new health care demands as well as the primary health care functions for local residents [2].

The Local Health Law stipulates that the head of local autonomous governments should set up a local health care plan every four years and establish an annual plan every year [3, 4]. In addition, in the 「National Health Promotion Act」, The plan for establishing and implementing a detailed plan for the promotion of public health is stipulated, and the importance of the local health care plan is increasing [5].

In addition, the World Health Organization (WHO) encourages the regular calculation of health policy indicators, health-related socio-economic indicators, health care management indicators, and health status

indicators necessary for evaluating the performance of health policy [6, 7].

Korea has been conducting national health indicator surveys every three years since 1983. However, this survey is a sample survey for establishing a national health plan at the central level, but local governments with different conditions use the result in health care planning, but there are limitations [3].

To establish a health care plan, comprehensive data on community health issues as well as health-related health indicators are needed [4]. The results of this survey will serve as an index not only for evaluating the performance of the health projects that have been promoted but also for establishing the health center plan of the public health center that meets the needs of the citizens.

In order to effectively promote health projects, it is necessary to set goals and develop strategies for health promotion projects based on information on the health level of citizens, the use of health institutions, and the health consciousness behavior of local residents. In addition, measures should be taken to maximize the utilization of available health resources in the community by inducing community involvement.

Therefore, in order to effectively promote the health and health promotion projects for citizens of N city, the health service for the 7th regional health plan (2019 ~ 2022) was established by conducting a survey on the health center service level and the health service needs of the residents. It will be used as basic data and as a data for developing health projects and health promotion programs.

Method

1. Research Design

This study is a descriptive study to utilize the health services of N- citizens as a basic data for establishing the 7th Regional Health Plan (2018 ~ 2022) respectively. It will be used as basic data and as a data for developing health projects and health promotion programs.

2. Data Collection

The subjects of this study were 447 people from N city by random sampling method. They explained that the purpose of the study and the data collected were not used for anything other than the study, and

the anonymity and confidentiality of the subjects were guaranteed. In addition, the subjects were explained to the subjects that they have the right to participate or refuse the study at any stage of the study. Afterwards, the survey was conducted after receiving written consent for the research subjects who voluntarily participated. Data was collected through a questionnaire from August 1 to August 21, 2018. Although 447 questionnaires were collected, 403 questionnaires were used for data analysis, except for 44 which were not clear or missing.

3. Instruments

Health service level

The tools for measuring the level of health services have been modified and supplemented in the tools of the community health survey [8]. The tool was developed in four categories and was evaluated on a four-point scale, with four points representing 'very good' and one point representing 'very bad'. Higher scores indicate higher levels of health service, and Cronbach's α is 0.816.

Health care needs

A tool for measuring the level of health services was developed by modifying and supplementing the tools in the Community Health Survey [8]. The tool is divided into four categories and evaluated on a 4-point scale: 4 points for 'very necessary', 3 points for 'need', 2 points for 'not needed', and 1 point for 'not required at all'. Higher scores indicate higher levels of health care needs, and Cronbach's α is 0.961. The Cronbach's α value for health care needs was 0.961.

4. Data Analysis

The collected data were analyzed with the SPSS 18.0 program:

- The frequencies and percentages of the general characteristics of the subjects were calculated.

- To analyze the differences in the health care needs by general characteristics of the subjects, t-test and ANOVA were done. A Scheffé test was done as a post hoc test.

- The correlation between the health care need, health care service, health promotion service, elderly health service and maternal & child health service was analyzed with the Pearson's correlation coefficient.

Result

1. General characteristics

[Table 1] presents the general characteristics of the subjects. 28.3% of males and 71.7% of females had the highest age of 20 ~ 49, 58.5% of the total. The highest educational level was 45.4% for college graduates and 35.0% for high school graduates. The married status was the highest with 59.3% and the unmarried was 28.0%.

Table 1. General characteristics n=403

Characteristics	Categories	n	%
Gender	Male	114	28.3
	Female	289	71.7
Age(years)	10~19	71	17.6
	20~29	84	20.8
	30~39	84	20.8
	40~49	68	16.9
	50~59	39	9.7
	60~69	49	12.2
	70 over	8	2.0
	Education	Over college	183	45.4
High school		141	35.0
Middle school		38	9.4
Elementary school		41	10.2
Married status	Alone	113	28.0
	Spouse	239	59.3
	Bereavement	36	8.9
	Separation	8	2.0
	Divorce	7	1.7

2. Level of health service

The results of analyzing the health service level of the subjects are shown in Table 2. The overall health service level was 2.90 out of 4.0, and the kindness of staff in the sub - area was the highest with 3.32 points, followed by medical service level 2.86, modernization of facilities 2.77, and excellence in equipment 2.69 points.

Table 2. Level of health service

Division	Min.	Max.	M±SD
Health service level	1.50	4.00	2.90±.57
Kindness of Staff	1.00	4.00	3.32±.56
Modernization of facilities	2.00	4.00	2.77±.80
Excellence in equipment	1.00	4.00	2.69±.79
Medical Services	1.00	4.00	2.86±.67

3. Health care need

The total health care needs of the subjects were 3.38 out of 4.0, and the details are shown in Table 3. Among the sub-domains, health care services and health promotion services were 3.41 points higher respectively, followed by maternal and child health services 3.36 and elderly health services 3.34.

Table 3. Health care need

Division	Min.	Max.	M±SD
Total health care need	1.23	4.00	3.38±.48
Health care service	1.50	4.00	3.41±.53
Health promotion service	1.00	4.00	3.41±.54
Geriatric health service	1.00	4.00	3.34±.56
Maternal & child health service	1.00	4.00	3.36±.57

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4. Differences in the health care needs by the general characteristics

[Table 4] shows the analyzed difference in the health care needs according to the general characteristics of the subjects.

As a result of analyzing the difference between total health care need, health care service, health promotion service, elderly health service, maternal & child health service by general characteristics, only gender and total health care demand showed statistically significant differences($t=-2.095$, $p=.037$). In other words, total health care need was higher for female than for male.

The sub-regional health care service showed no statistical difference by general characteristics.

Table 4. Difference in health care needs by general characteristics

General Characteristics	Categories		Total health care need	Health care service	Health promotion service	Elderly health service	Maternal & child health service
Gender	Male	M±SD	3.31±.50	3.33±.53	3.36±.59	3.28±.61	3.28±.60
	Female	M±SD	3.41±.46	3.45±.52	3.43±.52	3.37±.54	3.38±.56
		t or F(p)	-2.095(.037)*	.704(.058)	-1.114(.266)	-1.534(.126)	-1.801(.072)
Age(years)	10~19	M±SD	3.36±.50	3.37±.57	3.36±.57	3.33±.56	3.35±.61
	20~29	M±SD	3.34±.50	3.34±.54	3.38±.52	3.30±.58	3.38±.65
	30~39	M±SD	3.40±.44	3.42±.51	3.44±.56	3.38±.54	3.36±.52
	40~49	M±SD	3.39±.47	3.45±.51	3.41±.53	3.32±.55	3.31±.54
	50~59	M±SD	3.37±.42	3.35±.48	3.43±.47	3.36±.53	3.36±.55
	60~69	M±SD	3.43±.54	3.54±.51	3.44±.61	3.37±.63	3.38±.63
	70 over	M±SD	3.52±.39	3.72±.45	3.55±.45	3.55±.43	3.39±.45
		t or F(p)	.343(.914)	1.477(.185)	.305(.934)	.390(.885)	.105(.996)

Cont... Table 4. Difference in health care needs by general characteristics

Education	Over college	M±SD	3.37±.50	3.41±.55	3.42±.56	3.31±.59	3.32±.61
	High school	M±SD	3.37±.49	3.38±.52	3.37±.55	3.35±.56	3.36±.58
	Middle school	M±SD	3.33±.40	3.30±.45	3.41±.49	3.29±.47	3.38±.47
	Elementary school	M±SD	3.51±.38	3.56±.48	3.48±.48	3.51±.46	3.50±.46
		t or F(p)	1.249(.292)	1.304(.273)	.518(.670)	1.488(.217)	1.198(.310)
Married status	Alone	M±SD	3.33±.47	3.34±.53	3.35±.52	3.30±.55	3.32±.55
	Spouse	M±SD	3.40±.48	3.43±.53	3.44±.54	3.34±.56	3.36±.58
	Bereavement	M±SD	3.39±.53	3.48±.55	3.37±.60	3.44±.64	3.38±.61
	Separation	M±SD	3.55±.45	3.67±.47	3.54±.82	3.66±.49	3.38±.58
	Divorce	M±SD	3.54±.36	3.52±.47	3.57±.47	3.45±.54	3.63±.45
		t or F(p)	.880(.476)	1.243(.292)	.852(.493)	1.206(.308)	.489(.744)

* p<0.5

5. Correlation between the health care need, health care service, health promotion service, elderly health service and maternal & child health service

As shown in table 5, the result showed that there was positive correlation of the total health care need, health care service(r=.862, p<.01), health promotion

service(r=.849, p<.01), elderly health service(r=.868, p<.01), maternal & child health service(r=.856, p<.01) in citizens of N city. This means that higher the total health care need in the citizens increase to more the level of health care service, health promotion service, elderly health service and maternal & child health service.

Table 5. Correlation between the health care need, health care service, health promotion service, elderly health service and maternal & child health service

Division	Total health care need	Health care service	Health promotion service	Elderly health service	Maternal & child health service
Total health care need	1				
Health care service	.862**	1			
Health promotion service	.849**	.713**	1		
Elderly health service	.868**	.696**	.647**	1	
Maternal & child health service	.856**	.634**	.642**	.713**	1

** p<0.01

Discussion

This study attempted to provide basic data for establishing and evaluating local health policies that actively cope with changing social environment, regional environmental characteristics, and local health care environment through health survey of citizens in N city. In order to promote the health of local residents and to provide high quality health care services, the organization began by recognizing the need for new challenges and countermeasures by strengthening the medical capacity of localization by linking the organizations and functions of public health centers and public health centers.

The results of analyzing the health service level of the subjects showed that the kindness of staff had the highest score of 3.32 points out of 4.0, followed by medical service level of 2.86 points. This was similar to the results of the Lee ^[9] study, which found that 60.3% were satisfied with the professionalism of health center doctors. Park, et al ^[10] suggested a way to improve the satisfaction level based on the opinions of public health service users. To this end, the public health center should devise ways to increase its utilization by reinforcing active publicity activities. In addition, health centers are not public private institutions, but public health institutions for residents, so they should be able to provide visiting services.

The total health service needs of the subjects were 3.38 out of 4.0, with health care service and health promotion service being 3.41, respectively. The results were similar to the results of the survey on local residents in C city ^[11]. The results were 3.30 out of 4 in health care services, including health clinics, health program support, national health examination, etc. The results showed a high score, and the health promotion services such as smoking cessation clinic and oral health were higher than 3.10. In this way, it is necessary to identify services that have high demands of local residents and to devise plans to efficiently provide public health services based on the contents of the services.

The health business at the health center was primarily responsible for maternal and child health care, prevention, family planning and acute infectious disease management and some public health care. Most medical services rely heavily on the private sector, so preventive health services and health care services are managed separately ^[3]. However, due to the implementation of the national health insurance system and rapid changes

in disease patterns, a system of health service provision should be established and the functioning of the public service sector should be strengthened ^[12, 13].

In order to effectively and proactively cope with health problems, active health policy is required rather than passive methods that rely on treatment after sickness. Therefore, it is necessary for N citizens to improve their health potential and to cope with disease risks by providing their own health practice and providing health programs at various public health centers. As a result, it is thought that local residents can improve their quality of life and improve health promotion by improving their proper functioning level by practicing their own health care.

Based on the level and needs of the public health services of the residents identified in this study, the development of high quality services and the effect verification study should be conducted. In addition, measures should be in place to expand the scope of service use so that residents can use and receive various public health services.

Conclusion

This study will provide basic data for establishing and evaluating the local health policy actively coping with changing social environment, regional environmental characteristics and local health care environment through N-citizen health care surveys. In order to effectively and actively respond to healthcare problems, aggressive healthcare policies are required instead of passive methods that rely on treatment after the disease develops. Therefore, by improving the self-health management ability of N-citizens, it is thought that the health promotion and quality of life of the subjects can be improved.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Health Care Needs According to the Life-Cycle of Community Residents

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Abstract

Background/Objectives: The purpose of this study analyzes health care needs by life cycle and provides basic data for developing health care programs accordingly.

Methods/Statistical analysis: Tools for measuring the health care needs of the subjects were revised and supplemented by the tools of the Community Health Survey. Data was collected through a questionnaire from August 1 to August 21, 2018. Although 897 questionnaires were collected, 843 questionnaires were used for data analysis, except for 54 which were not clear or missing. The collected data were analyzed with the SPSS 18.0 program.

Findings: The analysis of health care needs by life cycle was the highest in adolescents with 3.41 out of 4.0, followed by 3.40 in childhood, 3.39 in elderly, 3.35 in adulthood, and 3.31 in pregnancy. The difference in the health care needs by life cycle according to the general characteristics is as follows: in the difference analysis of health needs by gender and life cycle, there was a statistically significant difference in adolescents ($t=-2.770$, $p=.006$) and adulthood ($t=-1.970$, $p=.049$). There was also a statistically significant difference in health needs in adolescence ($F=2.225$, $p=.039$) and adulthood ($F=2.449$, $p=.024$). The difference between marital status and health demand was statistically significant in adolescence ($F=4.570$, $p=.001$) and adulthood ($F=3.715$, $p=.005$).

Improvements/Applications: Therefore, in order to improve the health potential of the residents, it is necessary to develop a health care program according to the life cycle.

Keywords: Health care, Need, Life-cycle, Community, Residents

Introduction

Recently, with the aging of the population and the extension of life expectancy, there is a need for a customized healthcare approach to optimize and use an approach that is optimized for healthcare targets [1, 2]. In other words, health care has different levels and influencing factors according to age, and a differentiated approach strategy is needed.

The task of the public health center as a front line for the health administration is to broadly fulfill the primary health care needs of the local residents and at

the same time to provide a new approach to the health management of the residents [3]. In other words, by developing and expanding basic health services such as disease prevention and health promotion projects [4, 5], it is urgently required to re-establish functions and roles so as to actively cope with primary health care and new healthcare demand for local residents

In particular, local health care plans should improve the efficiency of health care projects by coordinating plans to meet the health care environment and national health care policy, and provide comprehensive, high quality health care services to the locals. It is desirable to establish a local health care plan focusing on opinions of users of public health centers in order to continuously carry out preventive activities such as health promotion and health education that meet the needs of local residents and systematically promote the contents of

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various businesses [6, 7].

The basic approach to lifelong health care programs assumes that the factors that threaten the maintenance and promotion of health during an individual's lifetime are different. Therefore, the program provided to each individual depends on the overall life cycle characteristics and individual characteristics [8].

The life cycle is the process of changing a person's life through certain stages at the individual or family level, i.e., according to the stages of human development, infancy, childhood, adolescence, adulthood, middle age, and old age.

In the case of operating health projects by life cycle, there is an advantage in that each program can be specified. However, since the current national health projects are operated by business units, life cycle health projects are distracting in terms of setting the direction of the project and there are many limitations in connection with the current health programs [8].

Therefore, this study divided the life cycle into pregnancy, childhood, adolescents, adulthood, and elderly, and analyzed health care needs of each life cycle considering current on - going health care business, we tried to provide basic data for setting the program.

Method

1. Research Design

This study is a descriptive study to analyze health care needs by life cycle and provides basic data for developing health care programs accordingly. The life cycle was divided into pregnancy, childhood, adolescent, adulthood and elderly.

2. Data Collection

The subjects of this study were 897 people from N and C city by random sampling method. They explained that the purpose of the study and the data collected were not used for anything other than the study, and the anonymity and confidentiality of the subjects were guaranteed. In addition, the subjects were explained to the subjects that they have the right to participate or refuse the study at any stage of the study. Afterwards,

the survey was conducted after receiving written consent for the research subjects who voluntarily participated. Data was collected through a questionnaire from August 1 to August 21, 2018. Although 897 questionnaires were collected, 843 questionnaires were used for data analysis, except for 54 which were not clear or missing.

3. Instruments

Health care needs

A tool for measuring the level of health services was developed by modifying and supplementing the tools in the Community Health Survey [9]. The tool is divided into four categories and evaluated on a 4-point scale: 4 points for 'very necessary', 3 points for 'need', 2 points for 'not needed', and 1 point for 'not required at all'. Higher scores indicate higher levels of health care needs. The Cronbach's α value for health care needs was 0.959.

4. Data Analysis

The collected data were analyzed with the SPSS 18.0 program:

- The frequencies and percentages of the general characteristics of the subjects were calculated.

- To analyze the health care needs by life cycle according to general characteristics of the subjects, t-test and ANOVA were done. A Scheffe test was done as a post hoc test.

- The correlation between the maternal health care, childhood health care, adolescent health care, adult health care & elderly health care was analyzed with the Pearson's correlation coefficient.

Result

1. General characteristics

[Table 1] presents the general characteristics of the subjects. 35.6% of males and 64.4% of females had the highest age of 20 ~ 49, 63.8% of the total. The highest educational level was 53.6% for college graduates and 32.0% for high school graduates. The marital status was the highest with 57.8% and the unmarried was 32.9%.

Table 1. General characteristics**n=843**

Characteristics	Categories	n	%
Gender	Male	300	35.6
	Female	543	64.4
Age(years)	10~19	172	20.4
	20~29	219	26.0
	30~39	172	20.4
	40~49	147	17.4
	50~59	60	7.1
	60~69	61	7.2
	70 over	12	1.4
Education	Over college	452	53.6
	High school	270	32.0
	Middle school	61	7.2
	Elementary school	60	7.1
Married status	Unmarried	277	32.9
	Spouse	487	57.8
	Bereavement	54	6.4
	Separation	13	1.5
	Divorce	12	1.4

2. Level of health care needs according to life-cycle

[Table 2] shows the results of the analysis of the health care needs of the life cycle, pregnancy, childhood, adolescents, adulthood and the elderly. The highest in adolescence was 4.0 to 3.41, followed by 3.40 in childhood, 3.39 in elderly, 3.35 in adulthood, and 3.31 in gestational age.

Table 2. Level of health care needs according to life-cycle

Division	Min.	Max.	M±SD
Pregnancy	1.00	4.00	3.31±.76
Childhood	1.00	4.00	3.40±.72
Adolescents	1.00	4.00	3.41±.62
Adulthood	1.00	4.00	3.35±.60
Elderly	1.00	4.00	3.39±.58

3. Difference in the health care needs by life cycle according to general characteristics

[Table 3] shows the analyzed the difference in the health care needs by life cycle according to the general characteristics of the subjects.

In the difference analysis of health needs by gender and life cycle, there was a statistically significant difference in adolescents ($t=-2.770$, $p=.006$) and adulthood ($t=-1.970$, $p=.049$). In both adolescents and adulthood, health needs were higher for women than for men. There was also a statistically significant difference in health needs in adolescence ($F=2.225$, $p=.039$) and adulthood ($F=2.449$, $p=.024$). Adolescence did not differ statistically by group. And in adulthood, the health needs of those in their 60s and over 70s were higher than those

in their 10s, 20s, 30s and 40s. There was no statistically significant difference in health care needs by life cycle in educational background. The difference between marital status and health demand was statistically significant in adolescence ($F=4.570$, $p=.001$) and adulthood ($F=3.715$, $p=.005$). The health needs of adolescents were higher in divorced persons than in separated persons and in adulthood, the health needs of divorced people were higher than those of unmarried, spouse and separated persons.

Table 3. Difference in the health care needs by life cycle according to general characteristics

General Characteristics	Categories		Pregnancy	Childhood	Adolescents	Adulthood	Elderly
Gender	Male	M±SD	3.31±.88	3.42±.78	3.33±.59	3.29±.58	3.35±.52
	Female	M±SD	3.29±.68	3.39±.69	3.45±.52	3.38±.62	3.41±.61
		t(p)	.691 (.490)	.582 (.561)	-2.770 (.006)**	-1.970 (.049)*	-1.315 (.189)
Age(years)	10~19, a	M±SD	3.18±.82	3.46±.81	3.32±.54	3.32±.51	3.35±.50
	20~29, b	M±SD	3.36±.78	3.45±.81	3.42±.57	3.32±.80	3.47±.75
	30~39, c	M±SD	3.23±.63	3.42±.54	3.43±.70	3.29±.49	3.40±.50
	40~49, d	M±SD	3.24±.61	3.24±.63	3.34±.55	3.34±.51	3.30±.53
	50~59, e	M±SD	3.27±.98	3.46±.93	3.51±.63	3.42±.50	3.31±.51
	60~69, f	M±SD	3.23±.56	3.33±.48	3.60±.85	3.53±.48	3.46±.47
	70 over, g	M±SD	3.69±1.71	3.50±.59	3.43±.50	3.82±1.07	3.45±.56
		F(p)	1.575 (.151)	1.920 (.075)	2.225 (.039)*	2.449 (.024)*	1.663 (.127)
					a,b,c,d<f,g		
Education	Over college	M±SD	3.32±.75	3.43±.75	3.41±.59	3.33±.60	3.39±.61
	High school	M±SD	3.35±.84	3.40±.74	3.38±.59	3.37±.61	3.40±.56
	Middle school	M±SD	3.09±.57	3.22±.68	3.36±.99	3.25±.68	3.27±.59
	Elementary school	M±SD	3.26±.53	3.40±.44	3.49±.47	3.49±.48	3.46±.44
		F(p)	2.074 (.102)	1.421 (.235)	.555 (.645)	1.751 (.155)	1.117 (.341)
Married status	Unmarried, a	M±SD	3.28±.74	3.36±.71	3.31±.53	3.28±.51	3.33±.51
	Spouse, b	M±SD	3.28±.59	3.39±.57	3.42±.52	3.33±.51	3.38±.51
	Bereavement, c	M±SD	3.29±1.00	3.40±.95	3.51±.67	3.50±.52	3.45±.44
	Separation, d	M±SD	3.26±.67	3.26±.82	3.12±.85	3.27±.89	3.44±.63
	Divorce, e	M±SD	3.61±.51	3.78±.41	3.69±.38	3.70±.40	3.61±.36
		F(p)	.723 (.576)	1.326 (.259)	4.570 (.001)**	3.715 (.005)**	1.491 (.203)
				d<e	a,b,d<e		

* $p<0.5$, ** $p<0.01$.

4. Correlation between the health care needs by life cycle

As shown in table 4, the result showed that there was positive correlation of the total health care need, health care service($r=.862$, $p<.01$), health promotion

service($r=.849$, $p<.01$), elderly health service($r=.868$, $p<.01$), maternal & child health service($r=.856$, $p<.01$) in citizens of N city. This means that higher the total health care need in the citizens increase to more the level of health care service, health promotion service, elderly health service and maternal & child health service.

Table 4. Correlation between the health care needs by life cycle

Division	Pregnancy	Childhood	Adolescents	Adulthood	Elderly
Pregnancy	1				
Childhood	.842**	1			
Adolescents	.333**	.343**	1		
Adulthood	.420**	.428**	.516**	1	
Elderly	.428**	.449**	.479**	.719**	1

** p<0.01

Discussion

This study identified health care needs according to the life cycle of local residents through the survey on health care of citizens in N and C cities. Based on the research results, we attempted to develop a health care program according to the life cycle. In addition, in order to promote the health of local residents and provide high-quality health care services, it was started with the recognition that the organization needs to reinforce medical capacity and new challenges and responses by linking the organizations and functions of public health centers and public health centers [10].

As a result of this study, health care needs were the highest at 3.41 out of 4.0 in adolescents and 3.40 in childhood. Therefore, it is necessary to focus on health care in childhood and adolescence.

Various health problems occur in each life cycle, and in order to solve these problems, health care services should be provided in consideration of physical and health characteristics. Adolescence is a process of growing up into adulthood and establishing a healthy lifestyle that affects health in adulthood [8]. Therefore, it is considered that what is required in adolescence is the development of a health care program to establish a healthy lifestyle and to build a self-image of health. In childhood, it is a continuation of the growth process of infancy, in which positive self-image and healthy life habits are formed through physical, mental and social growth. Therefore, in this period, it is necessary to develop health care programs such as health education and counseling to form health lifestyles.

Adulthood is the most active period of exerting physical, mental and social potential, and forms various social positions and relationships. It is also the time

to begin to be affected by health risks, depending on the health habits formed in the previous stages of the life cycle. In particular, since the forties, the disease of chronic degenerative diseases such as cancer and cerebrovascular diseases will increase rapidly. Therefore, the early detection of diseases is the most important time because the health lifestyle and the management of disease risk factors in this period are to determine the health of the old age. In old age, the incidence of disease continues to increase and mortality is high, and the causes of death are cerebrovascular diseases and cancer. This period is relatively weak in relation to individual health risk factors and diseases [11].

Lifelong health programs should include vaccinations, regular health check-ups, counseling and health education, and development of life cycle programs that take into account age-specific health care needs. Summarizing the characteristics of the life cycle programs included in a lifelong health care program, infants and toddlers should be monitored for vaccination and physical and mental development. In childhood, it is important to strengthen health education and counseling to establish healthy lifestyles. From adolescence onwards, health checkups should be strengthened periodically for early detection of chronic diseases. Of course, clinical tests and training content should be appropriately modified according to the risk factors identified individually [10, 12].

In addition, public health centers should provide appropriate services according to life cycles and encourage the participation of community members in social activities. And they need constant efforts, such as strengthening health infrastructures and developing health programs, to create a supportive environment for local residents and to manage their chronic diseases

efficiently.

Conclusion

Each life cycle leads to a variety of health problems. To solve these problems, it is necessary to provide health care services, taking into account their physical and health characteristics. Lifelong health programs also include vaccinations, routine screenings, counseling, and health education, but health care programs should be developed to take into account the characteristics of health care by life cycle.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Patients and Guardians' Perception on Comprehensive Nursing Care Services

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Abstract

Background/Objectives: This study is an exploratory study applying the Q-method to identify the characteristics and types of patients and guardians' perception on the comprehensive nursing care services.

Methods/Statistical analysis: A total of 430 Q-populations were extracted and the final 39 Q-samples were selected through processes such as deduplication and removal and integration of similar statements. The P-sample was selected for 32 people visiting a general hospital in which Comprehensive nursing care services were implemented. Data collection for P-samples was conducted in the consultation room of the hospital, and Data analysis was performed using the PC-QUANL program.

Findings: As a results, patients and guardians' perceptions on comprehensive nursing care services were identified as 'Expectation type for high quality inpatient care service and reduced care burden', 'Skepticism type for the establishment of comprehensive nursing care service system', and 'Indifferent type of comprehensive nursing care services system'. **Improvements/Applications:** This study can be used as a basic data for the establishment and development of comprehensive nursing care services system by identifying patients and guardians' understanding and needs for it.

Keywords: *Q-methodology, Comprehensive nursing care services, patients and guardians' perception*

Introduction

The comprehensive nursing care services system is a nursing service centered on nurses and other nursing staffs in the ward, without a guardian or private caregiver. It is a new inpatient care model developed to reduce the burden of nursing care expenses and improve the quality of infection control and hospitalization services in the hospital^[1,5], and it is a new nursing delivery system under the concept of guardians-free ward, providing nursing and care with nurses and other nursing personnel.

In Korea, caring of inpatients has traditionally been recognized as the responsibility of families (mainly women), but upon entering the modern society, family conflicts and financial burdens for caring and

nursing by families were increased due to changes in social conditions and lifestyles, including reduction of family functions due to nuclear family, increased opportunities for women to participate in society, aging population, and increasing number of people with chronic diseases^[2,3]. In order to address the economic and social burden of hospitalization and the degradation problems of quality of nursing inpatients, Korea first conducted a comprehensive nursing service system with public medical institutions in 2013, and as a result, it was confirmed that satisfaction among patients and guardians using comprehensive nursing care services increased, as the vulnerability of hospital infections was revealed during the MERS outbreak in 2015, and the demand for improvement of the culture of caregivers and visitors became higher^[1]. As a result, the National Health Insurance Service changed the name to "the comprehensive nursing care services" in accordance with the partial revision of the Medical Law by applying health insurance costs from 2015. As a result, the nation's

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hospital-centered nursing service delivery system has brought about a drastic change, with the inclusion of caring services, the service has been expanded from 107 institutions/7000 beds in 2015 to 495 institutions/37,000 beds nationwide as of the end of December 2018^[5] and plans to expand the number of beds by 100,000 by 2020^[6].

However, there are no studies on the perception of comprehensive nursing care services of patients and guardians at the present time, which is being expanded gradually to establish this system. Through this study, their types of perception of this system are identified and their characteristics are explored to understand the meanings of it.

The purpose of this study was to explore ways to improve the comprehensive nursing care service and to provide evidence and basic data for the stable spread of this system in Korea.

Method

A total of 430 Q-populations were extracted and the final 39 Q-samples were selected through processes such as deduplication and removal and integration of similar statements. The P-sample was selected for 33 people visiting a general hospital in which Comprehensive nursing care services were implemented. Data collection for P-samples was conducted in the consultation room of the hospital, and Data analysis was performed using the PC-QUANL program. Q-sorting is a process of modeling the perceptions and thoughts of patients and guardians about these services using a method of forcibly distributing 39 questions to the Distribution Chart for Q-sample, close to the normal distribution [Figure 1].

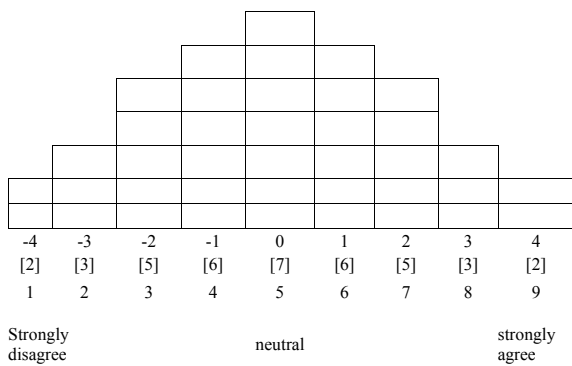


Figure 1. Distribution of Q sorting

Result and Discussion

3.1. Composition of Q-factors

In this study, various factors were designated and statistically processed, and the results were compared and reviewed, and three types were found. It was found that there were 17 people for Type 1 and 10 for Type 2 and 5 for Type 3. These three types accounted for 47.3% of the total variance and the explanatory power of each type is shown in Table 1.

Table 1. Eigen value and correlation between types

	Type 1 (N=17)	Type 2 (N=10)	Type 3 (N=5)
Eigen value	8.3631	5.1742	2.0841
Variance	.2534	.1568	.0632
Cumulative	.2534	.4102	.4734
Type 1	1.000		
Type 2	.090	1.000	
Type 3	.053	.444	1.000

3.2. Analysis of Characteristics by each type

Type1 were well aware of the positive aspects of these services and were named ‘Expectation type for high quality inpatient care service and reduced care burden’ because the system allows patients to receive professional care services more than before, and the caregiver considers it a good system to reduce the time and cost of nursing care.

Type 2 recognized that it would be unreasonable to implement these services with the current nursing human resources system, rather, there is a high risk of falling due to the absence of guardians, the role of nurses, nurse assistants, private caregivers, and guardians becomes ambiguous, and as they perceived it as a system that would make it harder for nurses to add the role of caregivers, this type was named ‘Skepticism type for the Establishment of Comprehensive Nursing Care Service System’.

Type 3 was named ‘Indifferent type of comprehensive nursing care services system’ because the average age was 33 years, belonging to relatively young people who had never played the role of guardian compared to other types,

did not know much about the contents and scope of this service, and did not show much interest in the system itself [Table 2] [Table 3].

Table 2. Statement of Z-score by type $\geq | 1 |$

Type	Q-Statement	Z-score	
1	Q07	In order for the comprehensive nursing care service to work properly, more manpower is needed.	1.66
	Q08	It helps to maintain a livelihood since guardians do not have to reside.	1.46
	Q11	You can get professional nursing at a low cost.	1.38
	Q06	With national health insurance covered, the burden of caring costs could be reduced.	1.33
	Q12	It allows patients to feel more secure as it can receive professional nursing care.	1.26
	Q05	Infectious disease caused by contact of guardians and patients can be prevented.	1.24
	Q02	It is too much for a nurse to do both nursing and caring for several patients.	1.14
	Q10	With no guardian, the nurse will be able to concentrate more on the patient's care.	1.10
	Q27	The attention of nurses is burdensome.	-1.03
	Q24	The guardian cannot reside, so the guardian cannot properly identify the patient's condition.	-1.06
	Q09	The role classification of nurses, nurse' aides, caregivers and guardians is ambiguous.	-1.10
	Q39	Patients are lonely and anxious because there is no guardian.	-1.10
	Q15	Nurses' self-esteem in comprehensive nursing service is likely to be lowered.	-1.14
	Q25	Since there are no guardians, it seems that the nurse might not even know how to treat the patient recklessly.	-1.21
	Q16	The nurse may even serve as a caregiver, which may result in neglect of the professional nursing.	-1.29
	Q37	If the nurses are busy and ask for something, they have to wait a long time.	-1.33
	Q35	It is embarrassing that a nurse, instead of a guardian, has even treated him with a toilet.	-1.41
Q32	The callbell rings often and it's noisy.	-1.45	
Q38	People with dementia can also be hospitalized in comprehensive nursing service wards if there is no guardian.	-1.79	

Cont... Table 2. Statement of Z-score by type $\geq | 1 |$

2	Q07	In order for this service to work properly, more manpower is needed.	2.21
	Q02	It is too much for a nurse to do both nursing and caring for several patients.	2.17
	Q16	The nurse may even serve as a caregiver, which may result in neglect of the professional nursing.	1.53
	Q18	Nurses are having a lot of trouble because of patients who even have the nurses do a little errand.	1.50
	Q23	There is a risk of falling because there are no guardians.	1.28
	Q09	The role classification of nurses, nurses' aides, caregivers and guardians is ambiguous.	1.14
	Q08	It helps to maintain a livelihood since guardians do not have to reside.	1.03
	Q30	It provides an environment for nurses to provide quality nursing.	-1.02
	Q12	It allows patients to feel more secure as it can receive professional nursing care.	-1.06
	Q14	It is inconvenient because visiting hours are limited.	-1.09
	Q29	This service needs to be expanded.	-1.09
	Q03	Nurses substitute for the guardian's role even if there is no guardian.	-1.18
	Q39	Patients are lonely and anxious because there is no guardian.	-1.25
	Q10	With no guardian, the nurse will be able to concentrate more on the patient's care.	-1.38
Q38	People with dementia can also be hospitalized in this service wards if there is no guardian.	-2.47	
3	Q06	With national health insurance covered, the burden of caring costs could be reduced.	1.75
	Q21	I am not aware of the difference between long-term care hospitals and this service.	1.73
	Q16	The nurse may even serve as a caregiver, which may result in neglect of the professional nursing.	1.36
	Q28	I am not familiar with the scope of service for this service system.	1.21
	Q08	It helps to maintain a livelihood since guardians do not have to reside.	1.06
	Q10	With no guardian, the nurse will be able to concentrate more on the patient's care.	-1.21
	Q30	It provides an environment for nurses to provide quality nursing.	-1.24
	Q04	Life in the ward is pleasant because there are no other guardians.	-1.29
	Q03	Nurses substitute for the guardian's role even if there is no guardian.	-1.34
	Q05	Infectious disease caused by contact of guardians and patients can be prevented.	-1.41
	Q33	It is better to be hospitalized in this service ward than in the general ward.	-1.64
	Q38	People with dementia can also be hospitalized in this service ward if there is no guardian.	-2.04
	Q31	Professional nurses provide quality service in three shifts per day.	-2.43

Table 3. Especially positive and negative statements compared to other types

Type	Q-statement	Z-score	Others' Z-score	Difference
1	Q10	1.101	-1.295	2.396
	Q05	1.236	-0.755	1.990
	Q11	1.381	-0.084	1.465
	Q12	1.259	-0.067	1.325
	Q35	-1.406	-0.187	-1.220
	Q37	-1.327	-0.072	-1.255
	Q32	-1.453	-0.183	-1.270
	Q25	-1.206	0.066	-1.272
	Q15	-1.138	0.517	-1.655
	Q24	-1.060	0.633	-1.694
	Q09	-1.097	0.813	-1.910
	Q16	-1.289	1.443	-2.732
2	Q23	1.282	-0.321	1.604
	Q16	1.530	0.034	1.496
	Q09	1.136	-0.303	1.439
	Q18	1.500	0.200	1.300
	Q07	2.214	1.103	1.111
	Q02	2.173	1.064	1.109
	Q10	-1.380	-0.054	-1.317
	Q14	-1.091	0.263	-1.325
	Q29	-1.092	0.319	-1.411
	Q12	-1.065	1.095	-2.160
3	Q21	1.733	-0.211	1.944
	Q06	1.746	0.532	1.214
	Q33	-1.638	-0.106	-1.532
	Q04	-1.287	0.310	-1.532
	Q05	-1.414	0.570	-1.984
	Q31	-2.431	0.302	-2.733
See all statements in Table 3 except below.				
Q33	It is better to be hospitalized in this service ward than in the general ward.			
Q04	Life in the ward is pleasant because there are no other guardians.			
Q31	Professional nurses provide quality service in three shifts per day.			

Discussion

Type 1 expected high quality inpatient nursing services and reduced burden on guardians for comprehensive nursing services. In Korea, private caring costs currently cost about 100,000 won a day, while the comprehensive nursing services are paid with health insurance benefits, allowing nursing services to be provided at the level of 20,000 won of their own charge^[15], thus reducing the financial burden of nursing, as well as ensuring quality of care for patients and guardians. In addition to the caring costs, the satisfaction level of patients increased with the service satisfaction level and the resulting willingness to reuse after the nursing care integration service implementation^[12,13], and patient safety indicators such as pressure ulcer, fall, infection, etc. were also improved^[17,18]. And according to^[1], satisfaction level is over 10% higher than non-test units of comprehensive nursing service, and more than 85% of patients are willing to use them again^[8]. In order to achieve the same effect as Type 1 thinks and anticipates positively, institutional support is required for the continuous expansion of the application of nursing and caring cost by disease and medical department within the current this system, and for accurate evaluation criteria of the patient's nursing needs and application of the project based on it.

Type 2 recognized that this system is currently unreasonable in the nursing human resources system, but the risks of falling due to the absence of guardians and the roles classification of nurses, nurse aids, private caregivers, and guardians is ambiguous, and the nurse can be even more difficult to take on the role of caregivers. The first problem that has been raised from the early stage of pilot operation to the current nursing care integrated service system is the nursing staff supply and demand problem and the placement criteria of nurses which do not reflect the nursing requirements^[2,8]. If this service is implemented without a clear standard for the expansion of nursing staff and job-specific work, the burden on nurses will increase, however, quality inpatient nursing services for patients cannot be expected, and many problems may arise due to the absence of caregivers. Therefore, it is believed that in order for the comprehensive nursing care service to be well established, it is necessary to analyze the workload by the nursing staff first, and to supplement the system such as the criteria for placement of nurses and proper task delegation by nursing profession.

Type 3 did not have much interest in these services, and showed a tendency not to know the difference between long-term care hospitals and these services, health insurance application status, and the scope and contents of comprehensive nursing care services. This system provide patients with high quality inpatient nursing services as well

as a guardian's burden reduction, also is necessary for the management of hospital infections, and is considered to be a system that shows positive performance, in the case of indifferent type who do not know the information about the purpose of implementation of this system, the difference between general wards or long-term care hospitals, and the scope of comprehensive nursing care services, like type 3, it is thought that this perception was shown due to a relatively young generation with no experience as guardians or poor exposure to information on this system. In order for this system to be successfully settled in Korea, public relations strategies are needed so that the general public as well as the few patients and guardians who can experience this service directly in some wards of some hospitals can learn about the system.

Conclusion

This study was designed to identify subjective perception of patients and guardians who experienced nursing care integration service by applying Q-methodology and to provide basic data for policy development research so that the comprehensive nursing care service system in Korea can be expanded in a more advanced direction by analyzing the characteristics of each type according to recognition.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Study on the Subjectivity of Medical Professionals Towards Pet Robots

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Abstract

Background/Objectives: The objective of this study is to understand the subjectivity of medical professionals in their perception of pet robots, describe the characteristics of each subjectivity type and understand the categorization of pet robots.

Methods/Statistical analysis: The Q methodology was applied. Twenty medical professionals (doctors or nurses) currently employed in a clinical setting were asked to categorize 56 statements on pet robots. The collected data were analyzed using QUANL PC Program.

Findings: In this study, there were six people with a factor weight of 1.0 or higher in Type 1, six such people in Type 2 and eight people in Type 3. An analysis of subjectivity towards robot pets using the PC QUANL program revealed three factors, with an explanatory power of 77.61%. The explanatory power was 65.65% for factor 1, 6.42% for factor 2, and 5.53% for factor 3. As such, factor 1 can be seen as explaining robot pets the most. The study results show that the perception towards pet robots were categorized along three factors. The subjectivity types were ‘those who support the emotional advantages’, ‘those who emphasize the ease of pet management’ and ‘those who emphasize the convenience from technological development’.

Improvements/Applications: This study provided data for the use of pet robots in clinical settings and education of medical professionals.

Keywords: *Pet robot, Medical professional, Subjectivity, Q methodology, Nurses*

Introduction

Simple intervention where animals are used as a tool to form a trusting relationship between the patient and the medical professional and to start communication strengthens the treatment environment, makes patients happy, increases their responsiveness and helps them stay in contact with reality. In addition, their sense of self-respect is also promoted and leads them to have more positive interactions with others, which increases sociability^[1]. Animal-assisted therapy conducted with the anticipation of positive aspects of intervention where animals are used is a part of a comprehensive treatment process that was designed to promote the physical,

social, emotional and cognitive functions of human beings. In general, animal-assisted therapy brings physical benefits such as lowered cardiac disorders or blood pressure, brings social benefits such as joy and harmony, as well as bringing emotional benefits such as decreasing loneliness. It also has a psychological benefit of increasing social activities. In particular, animal-assisted therapy for the elderly was found to reduce loneliness^[2].

But using live animals poses the issue of individual preference, risk of infection or allergies and trauma caused by animals. As such, they can be a threat to health to those with a weakened immune system such as children or the elderly. This has led to limited cases of application. If the patient is living alone, there may be difficulties of taking care of the animal^[3]. To address these issues, countries in Europe or Japan are developing robot pets. Intervention programs using robot pets

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can ensure a safe environment while maintaining or promoting the physical, mental and social health of the patient.

Medical professionals take up the largest share of work in a medical environment and are key personnel who have the most frequent contact with patients. As such, they need to provide safe and quality medical services within a limited time and in a fast-changing medical environment^[4]. The subjectivity of their perception towards patients in a nursing environment affect their nursing. Therefore, it is important to understand the perception of nurses or would-be nurses.

There is a lack of studies using robot pets on medical professionals. Q methodology starts from the perspective of the actor rather than the hypothesis of the researcher, and allows for understanding the characteristics of each type according to the structure of human subjectivity^[5]. Since the perception of medical professionals towards robot pets is a subjective and unique experience, Q methodology appeared to be appropriate in verifying the types of perception.

As such, this study seeks to provide basic data for the development of a differentiated education program, by understanding the structure of subjectivity towards robot pets from the perspective of medical professionals. The data will contribute to the development of an application program for robot pets in clinical settings and a Korean robot pet by medical professionals in the future.

Method

1. Selection of Q Population and Q Sample

Q The parent group was selected with a focus on students of nursing studies. To extract comprehensive statements on the effects of robot pets, review of literature from home and abroad, open-ended questionnaires and in-depth interviews were used. Through this process, 3 areas and approximately 200 Q parent groups were concluded. By bringing together the literature collected through literature review, a total of 100 Q parent groups were extracted. The Q sample extracted in this study was reviewed and revised to select highly distinctive 56 samples.

2. Q-sort and Data Analysis Method

The Q categorization takes the statements of the Q sample and asks the subjects selected through the P sample to normally distribute them, so that each

individual autonomously define robot pets^[6]. A Q card was used on 25 medical professionals to collect data. It took mostly 20-30 minutes for one subject to complete the Q categorization. The distribution of the Q sample categorized the statements selected through the Q sample from very strong agreement to very strong disagreement according to the importance. Statements on robot pets were categorized on a 14 point scale. Then an interview was conducted with the subject on the statements on the polar ends. For Q factor analysis, Principle Component Factor Analysis, varimax method was used. With a reference point of an Eigen value of 1.0, various number of factors were entered to get results and total explanation variance. The collected data had scores allocated from the Q sample distribution table. The converted scores were then used. The converted scores were coded in the order of Q sample numbers and processed with the main factor analysis by QUANL PC Program. Data analysis was done with the QUANL pc program.

3. Ethical consideration on research objects

The plan for this study was submitted to the Public Institutional Review Board designated by the Ministry of Health and Welfare before starting for ethical considerations related to subjects and received approval (P01-201812-23-007). Study subjects were described the objectives of the study and were guaranteed anonymity and confidentiality. They were also told that if they do not wish to share their personal information, it was not required. Contact information was given in case that they wanted to withdraw from the study at any time after completing the questionnaire. Questions unrelated to the study were also sincerely answered for ethical considerations.

It was also explained that subjects could withdraw from the study at any time after voluntary consent had been given. To uphold the rights of subjects and guarantee privacy, all collected data were anonymized and coded through Q sorting

Result and Discussion

1. Characteristics of each type towards robot pets

An analysis of subjectivity towards robot pets using the PC QUANL program revealed three factors, with an explanatory power of 77.61%. The explanatory power was 65.65% for factor 1, 6.42% for factor 2, and 5.53% for factor 3. As such, factor 1 can be seen as explaining

robot pets the most [Table 1]. Individuals corresponding to each factor are a group of people who have a similar response to robot pets.

Table 1: Eigen Value, Variance, and Cumulative Percentage

	Type I	Type II	Type III
Eigen Value	13.1308	1.2847	1.1059
Variance(%)	0.6565	0.0642	0.0553
Cumulative	0.6565	0.7208	0.7761

2. Analysis of each type

- Those who support the emotional advantages: There were a total of 6 people in Type 1. Those in Type 1 most strongly agreed with the statement, ‘I feel comfortable because interaction is done through sensors. (Z=2.39)’, ‘Responsibility is reduced.(Z=2.34)’, and ‘I don’t need to walk it.(Z=2.12)’. The statement that received the strongest disagreement were ‘I wish there would be a growth stage like a pet’, ‘I feel skeptical as a single button can erase all memories of the owner’, and ‘Even those who do not like pets can easily access it.(Z=-0.76)’.

The characteristics of Type 1 concern the emotional support received from robot pets that is similar to what can be received from live pets. They stated that there would not be any emotional lack because it’s a robot, and that when the robot pet is lost they would experience a similar feeling to the death of a pet dog. But they also said that robot pets can be seen as consumables in a society when even live pets are abandoned. They think that robot pets can be used for emotional support in a clinical setting, and that would be of help to the treatment of patients. This led to Type 1 being named ‘those who support the emotional advantages’.

- Those who emphasize the ease of pet management: There were a total of 6 subjects in Type 2. Statements that received the strongest agreement by Type 2 people were ‘My family likes it’ (Z=2.61)’, ‘It is convenient not to clean after them.(Z=2.48)’, and ‘With commercialization of robots, science and technology will further develop.(Z=2.40)’. The statements that received the strongest disagreement by those in Type 2 were ‘Even those who do not like pets can easily access it’, ‘I feel skeptical since all memories of the owner can

be erased with a single button’ and ‘It can remember the owner throughout its life.(Z=-0.75)’.

Type 2 individuals saw the advantages of pets in robot pets and are satisfied with the convenience in management as it saves the efforts, time or money required for raising pets. As such, they stated that it would be easier to apply robot pets in a clinical setting. Type 2 was named ‘those who emphasize the ease of pet management’.

- Those who emphasize the convenience from technological development: There were a total of 8 people in Type 3. The statements that received the strongest agreement by those in Type 3 were ‘I don’t have to worry about feeding the pet when traveling.(Z=2.42)’, ‘It costs a lot more when it is broken.(Z=2.25)’, and ‘No grooming is required.(Z=2.24)’. Statements that received the strongest disagreement by Type 3 people were ‘People who don’t like pets can easily access it’, ‘I wish it had a growth stage like pet animals’ and ‘I feel skeptical as all memories about the owner can be erased with a single button.(Z=-0.78)’.

Those in Type 3 were impressed with the scientific and technological development before robot pets and are interested in the benefits that would bring. They like that technological progress can help replace animals but are also worried about the downsides that may appear in the future. They are worried about humans being replaced by robots and human relations being undermined as a result of machines taking over. As such, Type 3 was named ‘Those who emphasize the convenience from technological development’.

Discussion

Type 1 are those who support the emotional advantages. They do not think that just because it is a robot the advantages of having a pet, such as emotional stability or maintenance of cognitive functions are undermined. They believe that emotional bonding can occur between the owner and robot pet and can even help in health management for the elderly living alone.

The social support function of animals is used as a way to meet the various health-related needs of the elderly. Animal-assisted therapy is found to have a positive effect on the mental state of the elderly with dementia^[7]. In other countries, animals are widely used in hospitals or nursing homes in the form of animal-assisted therapy (AAT) or animal-assisted activities (AAAs). AAT and AAAs are known to have an emotional effect of relaxing or motivating

the individual, as well as physical effects of improved vital signs or social effects such as improved communication between the admitted patient and nursing provider^[8].

Type 2 are those who emphasize the ease of pet management. Raising a pet requires time and money similar to raising a baby. In recent years, such animals are called as companions rather than pets, to emphasize the point that they live their life together with you. This signifies a shift from a concept of ownership to a concept of companionship^[9]. Basically, owners of such animals see the animals as an agent, that is more like a close friend or relative with whom they can have an affectionate relationship^[10].

Despite such positive benefits, most hospitals or nursing homes are concerned about allergies, infections, biting, scratching, diseases or stress of animals when applying animals to therapy^[11]. In particular, they can pose health threats to the elderly who have a weak immune system. There is also the challenges of taking care of animals^[12], making raising a pet difficult. In Korea, apartments being more common places a further restraint.

Type 3 are those who emphasize the convenience from technological development. This type is interested in the practical benefits brought by science and technology, as applied to robot pets. They believe that with scientific progress, there will be more convenience and life will become better. Meanwhile, they are concerned about undermined human relations and caretaking as robots replace humans. They feel melancholic about how emotions such as love, traditionally felt in human relations are now being shifted to come from machines.

People in this group see pets as providing psychological sense of stability and protection both at home and outside, the way a friend or companion would^[13], and as an object of affection similar to a family member. They also noted their satisfaction with the emotional intimacy they feel from their pets^[14]. Participants in this study think of their pets as family, get much consolation from them and considered taking care of them as important. They also noted that we need to think about whether such emotional aspects being met by machines or technology is going to be accepted by the elderly.

This study analyzed the subjective perception of medical professionals towards robot pets and categorized it into three types. The result showed that most medical professionals had a positive perception towards robot pets and saw the application of robot pets in a clinical setting as positive. When categorized by their characteristics, the perception of these medical professionals could be broken down into three types: Those who support the

emotional advantages, those who emphasize the ease of pet management, and those who emphasize the convenience from technological development.

This study on subjectivity can be used as basic data in developing measures to apply robot pets which are garnering increasing attention. Moreover, the presentation of the subjective structures and characteristics of each type is anticipated to help in developing education programs for medical professionals.

However, since convenience sampling was used and subjects were not selected by taking into consideration the factors affecting their perception towards robot pets, there is a limit to generalizing the study findings. As such, a follow-up verification of the types is needed by composing a Q sample with a variety of backgrounds in subjects.

Conclusion

This study provided the basic data required to adopt policies of applying robot pets, by categorizing the subjective perception of medical professionals towards robot pets. As this study analyzed the perception of medical professionals towards robot pets and verified the types, we anticipate educational programs that consider the characteristics of each type to be developed. In addition, it is suggested that a qualitative study be conducted to verify the various factors that affect the nursing of patients who would benefit from robot pets. It is also suggested that additional study be conducted by selecting samples that take into account various factors.

Ethical Clearance: Approved Public Institutional Review Board in South Korea(P01-201812-23-007).

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Conflict of Interest: Nil

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Study on the Relationship between Major Satisfaction, Career Resilience and Career Decision-Making Level

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Abstract

Background/Objectives: The study was intended to provide basic data on the career decisions-making level of students in optometry. The degree of major satisfaction, career resilience, and career decision-making level of the students of the optics department were identified, and their correlation was investigated.

Methods/Statistical analysis: The study included a total of 146 students, 64 boys (43.8 %) and 82 girls (56.2 %), all of which analyzed statistical differences through verification of various methods using the SPSS ver 18.0 statistics program.

Findings: The general characteristics of the subjects were 64 male students (43.8 %) and 82 female students (56.2 %), 58 first graders (39.7 %), 34 second graders (23.3 %), 31 third graders (21.2 %), and 23 fourth graders (15.8 %). Religion was composed of 49 Christians (33.6 %), Catholics (8.5 %), Buddhists (2.4 %), and No religion (79.6 %). The degree of major satisfaction was 3.20, career resilience was 3.37, and the level of career decision-making level was 3.12. The correlation between the three variables has shown that all three variables have significant correlations.

Improvements/Applications: To this end, it is deemed necessary to create an appropriate environment for students to show their visions of their majors and to encourage them to develop and participate in programs that can help them decide on their career paths through efforts

Keywords: Career decision-making level, Career resilience, College student, Major satisfaction, Optometry

Introduction

The choice of departments and majors should be made with due consideration to the conviction of the career path and their aptitude. However, the nation's college students tend to choose their majors according to their social atmosphere and their own grades rather than choosing one based on one's interests or aptitude. In many cases, students passively choose based on their high school entrance exam scores and recommendations from simple acquaintances rather than their own choices. As a result, it is reported that there are a lot of conflicts about career path since college entrance^[1]. In the same

vein, attempts are now being made to emphasize the authenticity of elementary, middle and high schools. In order to improve the choice of majors in universities, such as the introduction of a free semester system and the creation of new career courses, the government is providing support at the national level^[2].

Career resilience refers to the patient and flexible adaptation of an individual in a crisis, such as a frustrated or troubled one, while paying attention to how he or she responds to a negative environment with respect to his or her career path^[3]. A person with high career elasticity has the characteristics of achieving his or her goals, adapting to his or her work environment and pursuing success even in times of uncertainty and frustration^[4]. Career Resilience is an important element throughout career management, as well as a fragmentary process of career choice, achievement and adaptation^[5]. That is why it is time for job seekers to change their career policy and

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career resilience is gaining attention^[6]. In short, career resilience is a specific characteristic of individuals who adapt to unexpected changes in their work environment, and those who are more likely to be able to cope more effectively with negative conditions related to their work or career, such as career obstruction, uncertainty, and worsening relations with colleagues^[7].⁶

One of the important development tasks of youth is employment, which leads to the growth and development of competent adults^[8]. At this time of year, planning and preparation for one's own career path is thorough and self-directed in making decisions^[9]. A career decision is a systematic and continuous process through which a person's life progresses. In order to enhance career decisions with a career mind-set, we need to learn a series of courses ranging from career recognition, exploration, and decision making^[10]. The career decision level should be the level at which an individual chooses and decides his or her career path with a firm sense of identity and solid information acquisition and thorough examination of his or her problems^[11].

Health-related students should take a heavy responsibility for the health of the people and take their own course. Therefore, students need to choose and cope with their careers with a strong sense of pride, knowledge and attitude toward their majors. The satisfaction of the choice of majors should be high in response to these situations. One of the ways to improve satisfaction with your major selection while attending college is when your interests and aptitude are well suited to your major due to on-site practice, service, volunteer work, and major classes^[12]. Another case is that students are satisfied with the various curricula, comparisons and curricula of their departments after entering the majors that suit their aptitude and interest in elementary, middle and high school^[13]. In both of these cases, the development of various programs that can attract active interest or interest in universities could be a practical alternative to increasing the satisfaction of the choice of majors.

Therefore, through this study, we will examine the correlation between major choice satisfaction, career resilience, and career decision-making level of university students, identify the influencing factors of each variable, and apply various program development and education in order to effectively respond to society that is diversifying through satisfactory career choice.

Method

The subjects of the study were students attending optometric major at a four-year university located in South Chungcheong Province. The survey was conducted from September 1 to November 30, 2018. It explained that personal information was kept confidential and that anonymity was thoroughly guaranteed.

In this study, the major selection satisfaction tool, which was modified and supplemented by Kim, was investigated for the major selection satisfaction test. The questionnaires calculated the average score using the five-point Likert scale for the three questions concerning confidence in the choice of majors and class satisfaction, and the higher the average score, the higher the choice of majors, the positive meaning.

The Career resilience of this study was modified and used by Kim^[14]. Based on the three levels of personal, professional, and social factors of Career resilience extracted through theoretical review, this scale is structured to reflect the respective attitudes and behaviors of the factors that have helped to overcome the crises and adversity experienced in the course of a college student's career development

This scale consists of a total of 30 questions and is measured by the Likert 5 point scale, with five sub-factors of 6 questions of self-confidence, 6 questions of achievement and passion, 6 questions of career self-reliance, 6 questions of change counterpoint and 6 questions of relationship utilization. The Cronbach α was 0.94 in this study.

The level of career determination is a measure of the degree of career choice and determination to identify obstacles that interfere with an individual's career decisions. In this study, a career decision scale (CDS) test was measured using a tool modified by Kim. This test consists of 18 self-reporting questions on the Likert 5-point scale.

The first two questions indicate a level of confidence in career choice, and the following 16 identify the prerequisites for education and for non-conformity. Scoring was conducted separately from paragraphs 1-2 and 3-18, because the higher the score, the higher the confidence level, the higher the score, the better the course is not determined. Therefore, the higher the score, the higher the score, the higher the grade, the higher the level of career decision.

Result and Discussion

1. General characteristics of the subjects

Sociodemographic characteristics of subjects are Table1.

Table 1: General characteristics of subjects

Characteristics	Category	N	%
Sex	Male	64	43.8
	Female	82	56.2
Grade	1st	58	39.7
	2nd	34	23.3
	3rd	31	21.2
	4th	23	15.8
Religion	Christianity	49	33.6
	Catholicism	8	5.5
	Buddhism	2	1.4
	No religion	87	59.6
Admission type	Rolling admission	80	54.8
	Regular admission	66	45.2
Reason for application	In conformity with one's character	16	11.0
	To have a volunteer job	3	2.1
	A suggestion from one's parents or others.	47	32.2
	In view of high school records	45	30.8
	High employment rate	35	24.0
A service experience	To exist	100	68.5
	To have none	46	31.5
Why did you participate in the service?	For the purpose of earning credit	22	15.1
	To help others	36	24.7
	To have access to a variety of lives	33	22.6
	Out of concern for social problems	4	2.7
	To spend one's spare time	3	2.1
	Etc.	2	1.4
Part-time experience	To exist	132	90.4
	To have none	14	9.6
The reason why I had a part-time job.	To make pocket money	108	81.9
	To experience various jobs	10	7.6
	For an experience that can help you find a job.	8	6.0
	To meet a variety of people.	2	1.5
	Recommendation from family members and neighbors	2	1.5
	Etc.	2	1.5

Cont ... Table 1: General characteristics of subjects

How long have you had your part-time job?	Less than a month	13	8.9
	1-6 Months	40	27.4
	6 months-1 year	27	18.5
	More than one year and two years	23	15.8
	More than two years	29	19.9
Did you get anything from your part-time job?	Not have a thing	5	3.4
	Almost never.	7	4.8
	Be of average	38	26.0
	There's a little.	51	34.9
	There are a lot of them	31	21.2
What did you get from your part-time job?	Appropriate Time	3	2.3
	Management Method the psychological well-being of social relations	14	10.6
	Positive interpersonal relationship	39	29.5
	Appropriate actions for a given environment	63	47.7
	Etc.	13	9.9
Your level of study	Be good at	38	26.0
	Be of average	92	63.0
	Poor	16	11.0
The economic level of one's family	Be on the rich side	20	13.7
	Be of average	87	59.6
	Poor.	39	26.7

2. Mean value on Major Satisfaction, Career Resilience and Career Decision-Making Level

Major satisfaction, Career resilience and Career decision-making level are shown in Table 2. Overall Career resilience was 3.37, with the factors of Career resilience: self-confidence 3.54, achievement fervor 3.47, career self-reliance 3.35, transformation counterparty 3.12, and relationship utilization 3.41. And the Major satisfaction rate was 3.20, and the career decision-making level was 3.12.

Table 2: Mean value on Major satisfaction, Career resilience and Career decision-making level

	M	SD
Major satisfaction	3.20	.70
Career resilience	3.37	.62
Self-confidence	3.54	.73
Achievement fervor	3.47	.72
Career self-reliance	3.35	.70
Transformation counterparty	3.12	.75
Relationship utilization	3.41	.70
Career decision-making level	3.12	.57

3. Differences in Major Satisfaction according to sociodemographic characteristics

According to general characteristics, the results of comparing the choice satisfaction level of majors showed that there are differences between sex, motivation for applying for college entrance, and the level of study you think of. Male students were higher than female students, and students who said they were “fit their aptitude” in the application motive than students who said “consider their parents’ or others’ recommendations” or “in consideration of their high school grades.” Students who answered that their grades were average showed the highest satisfaction level of their choice of majors.

4. Differences in Career Resilience according to sociodemographic characteristics

Cognitive attitudes toward donating cornea have been shown to vary according to gender, presence of chronic and incurable patients in the family, your wish to donate organs, recommended that family donate their

organs, wish to participate in training on organ donation, Information on organ donation registration procedure is available, the one I want to receive when I donate my organs, Opinion on the absence of a price for an organ donor, and want to pay for organ donation.

5. Differences in Career Decision-Making Level according to sociodemographic characteristics

Behavioural attitudes toward donating cornea have been shown to vary according to your wish to donate organs, recommended that family donate their organs, presence of information about organ donation organizations, wish to participate in training on organ donation, Information on organ donation registration procedure is available, the one I want to receive when I donate my organs, Opinion on the absence of a price for an organ donor, and want to pay for organ donation.

6. Relation between Major satisfaction, Career resilience and Career decision-making level

The correlation between Major satisfaction, Career resilience and Career decision-making level has shown that all three variables have significant correlation<Table 3>. The degree of satisfaction with the major and career resilience were correlated, and the level of career resilience and career decision-making level were found to be very closely related.

Table 3: Relation between Major satisfaction, Career resilience and Career decision-making level

	Major satisfaction	Career resilience	Career decision-making level
Major satisfaction	1	.316**	.187*
Career resilience		1	.412**
Career decision-making level			1

*p<0.05, **p<0.01

Discussion

This study was conducted as a basic data for developing a program to develop a society that can flexibly adapt to the rapidly changing employment market after graduation by identifying differences in major selection satisfaction of college students in the health category, as it was determined that their major selection satisfaction would be affected by

the relationship between demographic characteristics and each variable.

Comparing the satisfaction level of choice of majors according to the general characteristics, the results show that there are differences in gender and motivation for applying for college entrance and those male students are higher than female students, which are why the nature of the health category requires a sense of mission and has a clear path to professional work. The lower the economic level and experience of part-time work experience, period, and experience of society, the higher the resilience of career. It is believed that the active attitude to overcome the work atmosphere and economic difficulties of society through part-time work may have influenced the work atmosphere of society. The level of career decision was found to differ only depending on the length of a part-time job, but the shorter the part-time period, the less experienced the society will be and the less judgment will be available to consider the career decision more.

The correlation between each variable showed that the higher the degree of satisfaction in the major, the higher the level of career decision, the clearer the decision on career path and the higher the interest in the profession related to the major. Path elasticity has shown a significant correlation with career decision level, which can be interpreted as a firm belief in one’s ability to effectively carry out difficult choices and decisions related to career path.

Conclusion

The factors that determine a satisfactory career path are based on not only individual interest and ability, but also job appreciation, and the more satisfied a university student is with his or her major and the more satisfied he or she is with his or her major professors and majors, the more active she is in collecting information for employment and the more self-identity she can improve her career resilience as well. Jobs may involve not only intrinsic motivations, such as those that suit one’s aptitude and personality, but also altruistic motives, such as a sense of calling. In particular, health care students need not only aptitude or personality but also a process of value recognition such as calling when choosing their careers. Therefore, universities need to develop programs to improve their belief that students can overcome difficulties in career selection and preparation, and provide appropriate counseling for developing career plans that meet their goals, interests, personalities, and talents to improve their professional satisfaction.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Manufacture and Useful Evaluation of Educational Mammography Phantom

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Abstract

Background/Objectives: The purpose of this study is to manufacture a new phantom in variety material and evaluate its usefulness.

Methods/Statistical analysis: Based on the modeling, pectoralis major muscles and mammary glands were printed; in order to express the soft material of the breast, we used the molding method. The assessment was conducted by 3 radiographers who have been in real clinical settings for more than five years.

Findings: The mammary gland tissue and pectoralis major muscles were printed using the SLA method and Polyjet method. At this time, the spheres with a diameter of 1 cm were printed and located at both sides of the mammary gland to test the degree of compression, which is the essential part of mammography and contributed to the phantom for a higher quality of education.

Improvements/Applications: After accessing the manufactured phantom at the clinical level, all of the evaluators concluded that the phantom may be applied for education.

Keywords: *Phantom, Education, Mammography, Manufacture, 3D printer*

Introduction

With an increase in the interest in women's cancers among the public, there is also a rising importance in the early diagnosis of breast cancer. Therefore women are regularly receiving mammograms, leading to a steady increase in the number of mammogram screening cases. A growing desire for a healthy life has triggered an increase in awareness and needs for screening for early detection of breast cancer. In accordance with this trend in Korea, the national health screening center has designated a mammogram as one of the essential tests and is recommended for those over 40 years old.

The most important thing in mammography is the fact that the use of radiation for medical purposes carries both significant medical benefits and the risk of radiation exposure; hence, improper care can lead to fatal side effects

for the patients [1-4]. For this reason, radiographers should refrain from having the patients retake a mammogram and exposing them to unnecessary radiation. It is also advisable that radiographers are fully trained in mammography and improve their practice skills before performing mammography in a real clinical setting.

Mammography is the most optimized test for early detection and diagnosis of breast cancer. Mammography is performed on symptomatic or asymptomatic women through basic examinations with the Cranio-Caudal and Mediolateral-Oblique (MLO) directions [5-9]. Therefore, radiographers should be fully aware of all screening methods for mammography and practice for a variety of patients in advance.

The main purpose of screening mammography is to detect any symptoms of diseases in advance by minutely screening the shape and size of breast masses, mammary gland expansion, and calcification. It can possibly detect lesions, but high-quality images with an appropriate amount of radiation are still required.

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During mammography, breast compression is applied using a compression paddle, which is to compress breasts to a film and reduce breast thickness, resulting in a decline in exposure to radiation while improving image quality [10]. As patients have different shapes and sizes of breasts, it is necessary for radiographers to practice on various types of breasts.

However, less than half of medical schools in Korea do not have a regular mammography curriculum for radiology majoring students. Even if a few does have one, practice is not being carried out properly. The reason is that breasts are a private part of the human body, and there are few phantoms available for practice. Mammography phantoms made in Japan are expensive and lose their shape after several practices. Moreover, it does not show parenchymal tissues in the breasts, and thus, radiographers cannot judge whether they are screening the object in a right position. Therefore, most of the current radiographers strive for mammography practice and training.

3D printers, which has been on the rise these days, have the advantages of reducing time for producing, customized manufacturing and saving the costs for producing, etc [11]. It makes a product from various materials by various methods according to a modeled design map [12]. In the case of breasts, as it is impossible to use hard materials, mammography phantoms should be manufactured with different or new materials. In a prior study, a phantom was manufactured with soft materials which led to a discovery of a transparent material which enables the internal structure to be identified. Therefore the purpose of this study is to manufacture a new phantom in this material and evaluate its usefulness. 3D printer technology has lately been utilized for various purposes, and in particular, it is actively used in the healthcare industry, which leads in a need of a variety of materials[13-14].

Materials and Method

1. Modeling

As seen in Figure 1, the breast images used in this study were based on MRI DICOM Volume data and obtained by 0.1 mm Volume Scanning from GE Signa HDxt 3.0T(GE Healthcare, Milwaukee, WI, USA) device. The obtained images were edited on TeraRecon, a 3D program in order to convert the file format into STL format. STLView (Module Works GmbH) was used to separate and obtain modelling of different structures. Through mesh tools provided by Rhinoceros (McNeel North America, USA), mammary gland, canal, and pectoralis major muscles were edited using a modeling

structure to distinguish more stably and clearly. The pectoralis minor muscle when modeled for the first time was manufactured without any differentiation from pectoralis major muscles and modeling was processed with pectoralis major muscle as the main object.

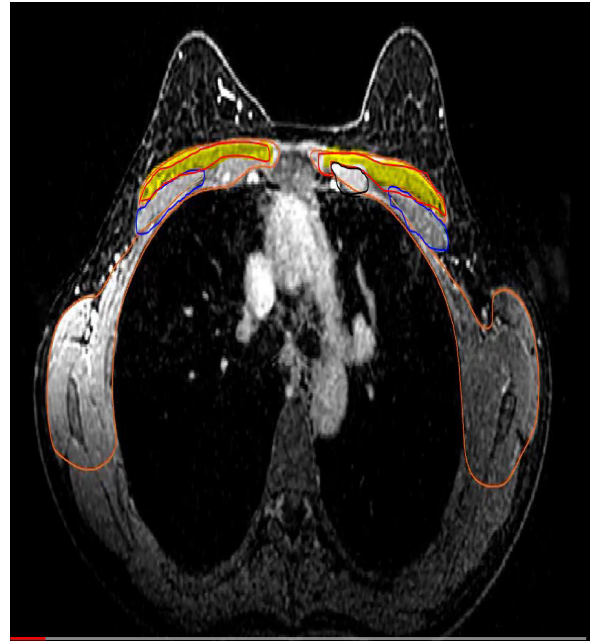


Figure 1. MRI DICOM file for breast, duct, muscle modeling

2. 3D Printing

Based on the modeling, pectoralis major muscles and mammary glands were printed; in order to express the soft material of the breast, we used the molding method. The molding method is to model and print the outer surface of the breast and fill the inside with silicone, which needs to be done carefully to prevent air bubbles. In addition, as seen in Figure 2, after mammography, contrast agents were mixed and printed to identify pectoralis major muscles and mammary glands in the images. Spheres of 1 cm in diameter were also printed to see how much compression has been applied when screening.



Figure 2. Made by mixing the colorant / contrast agent (barium) with silicone

The printer resources used for each printing are as follows:

In order to manufacture breasts using the molding method, when printing the outer surface of the breast, Projet660, a CJP (ColorJet Printing) printer, was used, which is an additive manufacturing technology involving two components – core and binder. It took 4 hours in total, and the printer material used was VisiJet PXL, which is like plaster.

Pectoralis major muscles, as show in Figure 3, were manufactured using Form 2 SLA (Stereolithography) and took 6 hours in total. Clear resin was used as printing materials.

Mammary glands were manufactured using Object 500 Connex 3 in the PolyJet method, which uses UV cured acrylic resins, and it took 2 hours. The spherical prints which enable radiographers to see the degree of compression were manufactured using a sponge material, and they were also printed by using the same method.



Figure 3. 3D printer model Form2 by SLA method

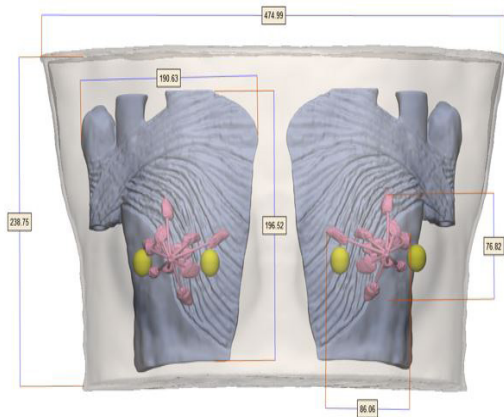
3. Useful evaluation

To assess the usefulness of mammography training phantom manufactured using a 3D printer, various assessments were conducted with mammography device currently used in hospitals. The following were assessed: whether pectoralis major muscle and mammary glands are clearly distinguished from each other in mammogram images; whether they show the appropriate concentration; whether the spheres were useful to check the degree of compression; and whether the quality of the materials were similar to actual breasts during mammography. The assessment was conducted by 3 radiographers who have been in real clinical settings for more than five years.

Results

1. Modeling

As seen in Figure 4, the modeling was based on MRI dicom images where the breast was scanned in 1 mm. The light gray colored outer surface of the breast was modeled by 474.99 x 238.75 mm in size, and the dark gray colored pectoralis major muscles were modeled by 190.63 x 196.52 mm in size. The pink colored mammary glands were modeled by 86.06 x 76.82 mm in size whereas the spheres for checking the degree of compression were colored in yellow and modeled by 10 mm in size.



(a)



(b)

Figure 4. (a) Frontal view of modeling and size of intramammary mammary gland and pectoral muscle and compression check circular sphere. (b) Lateral view of modeling and size of intramammary mammary gland and pectoral muscle and compression check circular sphere

As seen in Figure 4, the front and back sizes of the surface of the breast was modeled by 348.22 mm and those of mammary glands were modeled by 62.57 mm. the spheres for checking the degree of compression were placed in parallel to both ends of the mammary tissue so that they do not interfere with the breast image.

2. 3D Printing

As seen in Figure 5, the phantom was manufactured using silicone in the molding method to enhance the reality of parenchyma of the breast. To achieve this, the outer surface of the breast was modeled and printed for 14 hours in the additive manufacturing method and made it 2 cm thick to support the weight of silicone. The silicone was poured and hardened several times

in order to prevent air bubbles. The amount of silicone was readily controlled to be hardened while regulating the location of each component, and this was done repeatedly as this must be done at the final stage and all the tissues, pectoralis major muscles, mammary glands, and the spheres for checking compression should be placed inside the breast tissue.



(a)



(b)



(c)

Figure 5. (a) In order to produce a molding method by printing the outside of the breast. (b) Pectoral muscle of breast printed by SLA method. (C) Mammary gland tissue of breast printed by Polyjet method

As seen in Figure 5, the pectoralis major muscles in the breast were printed in the SLA method, which took 6 hours. To enhance the reality of the muscle, the comp pattern was modeled and printed at its top. Two were printed to place each on the left and right sides, and to reflect the end of the muscle as being adjacent to the humerus according to bone anatomy, the part of the bone was modeled and printed.

As seen in Figure 5, the mammary glands in the breast were printed for 2 hours in the Polyjet method using UV cured acrylic resins. To express the mammary tissue, the duct connecting the acini to the nipple was printed together, and as it may fall back during

mammography, each tip of the nipple and the duct were tied and fixed using a thread. Also, a colorant was used to produce a red color in order to visually identify the mammary gland tissue in the breast.

3. Useful evaluation

In order to assess the usefulness of the mammography training phantom manufactured by a 3d printer, a mammogram was taken using a mammography device currently used in hospitals. As seen in Figure 6, the results showed that pectoralis major muscles and mammary glands were distinguished from each other with showing adequate concentrations. Also, the spheres manufactured to check the appropriate degree of compression were pressed along with the breast when screening and it showed that there is an appropriate degree of compression when the phantoms were pressed up to the red borders from the quality control assessment. These were assessed by the 3 radiographers with more than five years of experience, and they all had the same opinions.

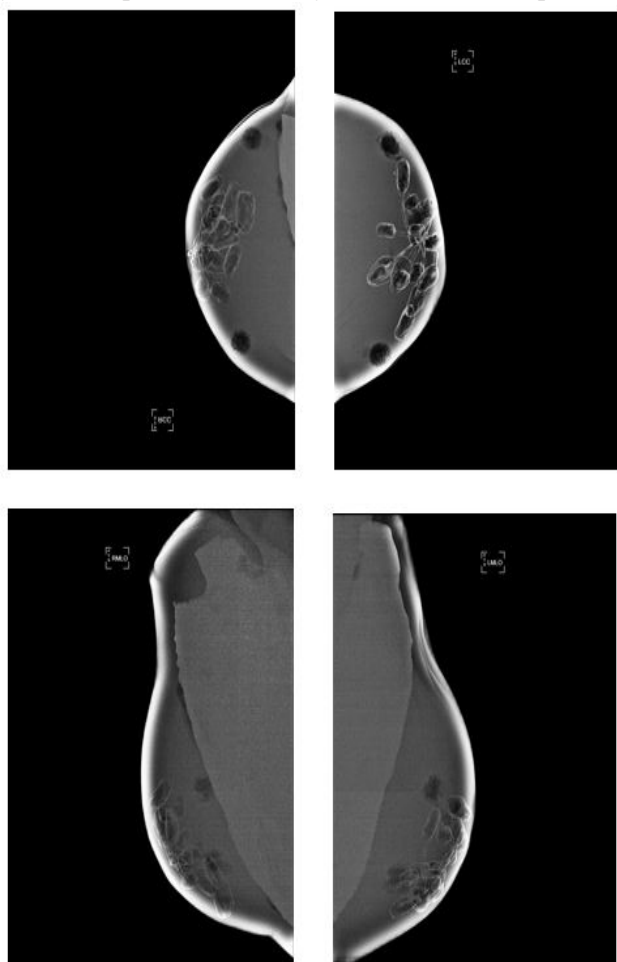


Figure 6. Radiographic image of 3D printed educational mammography phantom

Discussion

Mammography is a structure that must be represented in the image in Cranio-Caudal and Medio-Lateral views, but it must be practiced continuously using anatomically separated phantoms to express it. To achieve this, 3D modeling was implemented by retrieving MRI images to completely separate mammary gland, ductal and pectoral muscle tissue and to apply techniques to express them on radiographic images [15].

In a previous study, we developed a 3D printer system for the production of customized bone models of surgical patients based on open source [16]. Although the usefulness has been proved to be used in making a human bone model as described above, the usefulness of a soft material such as fat of breast is not proven.

In the previous study, we studied the materials and design for making phantom for mammography education. It is expected to contribute greatly to future research and education [17].

Conclusion

A mammography training phantom was manufactured using a 3D printer. The inside of the breast was filled with silicone and manufactured by the molding method in order to express the soft material of the breast. The mammary gland tissue and pectoralis major muscles were printed using the SLA method and Polyjet method. At this time, the spheres with a diameter of 1 cm were printed and located at both sides of the mammary gland to test the degree of compression, which is the essential part of mammography and contributed to the phantom for a higher quality of education. After accessing the manufactured phantom at the clinical level, all of the evaluators concluded that the phantom may be applied for education.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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The Effects of Hypertension, Dyslipidemia, Myocardial Infarction, and Angina Pectoris on Stress by Cardiovascular Diseases

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Abstract

Background/Objectives: This study aimed to determine the effects of hypertension, dyslipidemia, myocardial infarction, and angina pectoris on stress by cardiovascular diseases.

Methods/Statistical analysis: The raw data from the Korea Health Statistics 2017: Korea National Health and Nutrition Examination Survey (KNHANES) VII-2 were used. A total of 6,458 out of 8,127 respondents were included, with the exception of 1,669 aged <20 years. The analyses were carried out by using an SPSS Version 20.0 program.

Findings: The group diagnosed with hypertension was more strongly correlated with stress than the group not diagnosed with hypertension (approx. 3.6 times, $p < .001$). It has been confirmed that hypertension among cardiovascular diseases is correlated with psychological, mental health related to stress. No statistical significance was found for the other items.

Improvements/Applications: The results of this study have demonstrated that hypertension among cardiovascular diseases is correlated with stress. Cardiovascular diseases can affect mental health (stress, depressive disorder, etc.); therefore, it is necessary to reinforce regular exercise and psychological relief programs. This is expected to help determine the morbidity of cardiovascular diseases and promote mental health.

Keywords: Myocardial infarction, Angina pectoris, Dyslipidemia, Hypertension, Mental health, Stress

Introduction

Cardiovascular diseases include hypertension, hyperlipidemia, myocardial infarction, and angina pectoris [1, 2]. Myocardial infarction and angina pectoris are classified as ischemic heart diseases [2, 3]. An ischemic heart disease is an acute or chronic type of heart disorder that can

occur with a reduction or discontinuation of blood supply to cardiac muscles as coronary artery disease develops [2].

Due to high prevalence, cardiovascular diseases can have an impact on life expectancy as well as on the quality of life [4]. The occurrence of cardiovascular diseases is affected by the lifestyle factors, including smoking, alcohol intake, and nutrition, as well as by the irreversible factors, such as gender, age, race, and family history [3]. Jung et al. [5] noted that depression affected hypertension and dyslipidemia; Cho [6] reported that stress affected myocardial ischemia and arrhythmia. The occurrence of

cardiovascular diseases is associated with various factors, including heredity, family history, lifestyle, anxiety, and stress.

The World Health Organization^[7] reported that the main causes of death around the world included ischemic heart disease, stroke, lower respiratory infection, chronic obstructive pulmonary disease (COPD), and diarrhea in 2000 and that the most frequent cause of death was ischemic heart disease, followed by stroke, COPD, lower respiratory infection, and Alzheimer's disease and dementia, in 2016^[7]. The Korea National Statistical Office^[8] reported that the most frequent cause of death in 2017 was malignant neoplasm, followed by heart disease, cerebrovascular disease, pneumonia, intentional self-harm (suicide), and diabetes.

Compared with WHO^[7], the Korea National Statistical Office^[8] was more likely to report noncommunicable diseases (NCDs) than communicable ones as principal causes of death. It was also more likely to report heart diseases related to the circulatory system^[7, 8]. Cardiovascular diseases are associated with lifestyle, stress, and psychological factors^[3, 5, 6]. Lamers et al.^[9] noted that emotional well-being positively affected the prognoses of physical diseases. Prince et al.^[10] contended that physical health might essentially coexist with mental health. Lamers et al.^[9] and Prince et al.^[10] emphasized that physical diseases might be correlated with psychological and mental convalescence. Cho^[6] noted that there might be little confidence in stress and cardiovascular diseases despite a lot of research on stress and cardiovascular diseases.

This study aimed to determine the association between hypertension, dyslipidemia, myocardial infarction, and angina pectoris among cardiovascular diseases and stress in adulthood. This study intended to determine the association between cardiovascular diseases and mental health, which involves stress, on the basis of the raw data disclosed by the Ministry of Health and Welfare (MOHW) and the Korea Centers for Disease Control and Prevention (KCDC). It aimed to provide basic data that could help relieve stress caused by cardiovascular diseases in the circulatory system and develop a stress reduction program.

Method

1. Instruments of Study

The raw data from the Korea Health Statistics 2017: Korea National Health and Nutrition Examination Survey (KNHANES) VII-2 disclosed by MOHW and KCDC^[11] were used.

The sampling framework was composed of the available data from the recent Population and Housing Census as the basic framework and those regarding the public noticed price for multi-unit houses. The □-1 and 2 (2016-2017) surveys had the sampling framework stratified by cities and provinces, eups, myeons, and dongs, and housing type and used the residence area ratio and the householder's education ratio as the stratification criteria. A circulatory sampling survey was conducted for 12 months from January to December. The sample size was 13,248 households in 576 research districts.

The raw data from KNHANES VII-2 disclosed by MOHW and KCDC^[11] were based on the data from the household member identification survey, health surveys, examinations, and the nutrition survey. The household member identification survey is to determine every residence and household status within selected districts through sample design and choose household members. The health surveys can be divided into household surveys, health interview, and health behavior surveys. The nutrition survey covered dietary life behavior, dietary supplements, nutritional knowledge, and food stability status and food consumption. The examinations were composed of somatometry, blood pressure and pulse rate measurement, blood test and urinalysis, oral examination, pulmonary function test, and so on.

To meet the theme of this study, the items concerning the household identification survey and the health surveys were included and the instruments related to the socio-demographic characteristics, cardiovascular diseases, and mental health were applied. The composition of the instruments is presented in [Table 1].

Table 1. Items of surveys

Category		Item
Household member identification survey		<ul style="list-style-type: none"> • Every household member’s status and household member inclusion within selected districts through sample design
Health survey	<ul style="list-style-type: none"> • Household survey • Health interview • Health behaviour survey 	<ul style="list-style-type: none"> • General characteristic <ul style="list-style-type: none"> • Morbidity • Medical check-up • Vaccination • Restricted activity <ul style="list-style-type: none"> • Quality of life <ul style="list-style-type: none"> • Damage • Smoking • Alcohol intake • Physical activity • Mental health • Safety consciousness • Obesity & weight control • Feminine health, etc.
Nutrition survey	<ul style="list-style-type: none"> • Dietary life behaviour & food stability survey 	<ul style="list-style-type: none"> • Dietary life • Food safety • Food intake frequency • Food intake
Examination	<ul style="list-style-type: none"> •Somatometry & pulmonary Function test, etc. 	<ul style="list-style-type: none"> • Somatometry • Blood pressure • Pulse rate • Blood test • Urinalysis • Oral examination •Pulmonary function test, etc.

2. Subjects of study

Based on the number of household members in the database (DB) of the raw data, 8,127 persons were included. Coding for the number of household members was identified to determine the concordance in the number of household members between health in basic DB and “cardiovascular diseases and mental health.”

Among the 8,127 persons in the raw data, those aged <20 years were excluded from the research. This is not only because cardiovascular diseases often occur in adulthood but also because those aged ≥20 years are legally permitted to drink and smoke. With the exception of 1,669 respondents aged <20 years, a total

of 6,458 respondents were finally included. Of the 6,458 respondents aged ≥20 years, those who had missing data or made no answer were excluded from the analysis. The subjects of this study are as presented in [Table 2].

Table 2. Subjects of study

Category		N : 6,458	%
Gender	Male	2,895	44.8
	Female	3,563	55.2
Age	20’s	731	11.3
	30’s	976	15.1
	40’s	1,202	18.6
	50’s	1,281	19.8
	60’s	1,142	17.7
	70’s≤	1,126	17.4
Self-rated health	Very good,	243	3.8
	Good,	1,278	19.8
	Average	3,118	48.3
	Bad,	931	14.4
	Very bad	235	3.6

3. Variable composition

The variables in this study included the general characteristics, morbidity of cardiovascular diseases, and mental health. The variables for the general characteristics included gender, age, household income, education, and occupation. The items concerning cardiovascular diseases were myocardial infarction, angina pectoris, hyperlipidemia, and hypertension. The variables for mental health included stress perception rate.

4. Ethical consideration and research procedure

For ethical consideration, approval exemption was obtained from the Institutional Review Board (IRB) of C University (human_007_20190523_1st)(Approval exemption) before starting the research. The procedure included research theme selection, literature review, IRB approval exemption, request of MOHW and KCDC for KNHANES □-2, KNHANES □-2 data review, selection of

items related to the cardiovascular system and stress, and result analysis.

5. Analysis

The analysis was performed by using an SPSS WIN 20.0 Version program. For empirical analyses, frequency analysis, χ^2 , and dichotomous logistic regression were used. The significance level was set at $p < .05$.

Result and Discussion

1. Variation in stress perception rate by general characteristics

The variation in the stress perception rate by the general characteristics is as presented in [Table 3]. Every group had a low stress status, regardless of gender, age, and self-rated health. Those who were male ($p < .01$) and who were in their thirties, forties, and fifties were more likely to perceive stress ($p < .001$). Those groups whose self-rated health was at the average level or bad were more likely to perceive stress ($p < .001$).

In terms of gender and age, 6,052 out of 6,458 respondents were included, with the exception of those having missing data. In terms of self-rated health, 5,785 out of 6,458 respondents were included, with the exception of those having missing data.

Table 3. Variation in stress perception rate by general characteristics

		Stress perception rate (6,052)		χ^2	p
		High : 1,662(27.5)	Low : 4,390(72.5)		
Gender	Male	686(25.5)	2,004(74.5)	9.340	.002**
	Female	976(29.0)	2,386(71.0)		
Age	20's	261(39.1)	407(60.9)	115.979	.000***
	30's	319(35.3)	585(64.7)		
	40's	307(27.4)	815(72.6)		
	50's	318(26.4)	886(73.6)		
	60's	227(20.9)	861(79.1)		
	70'≤	230(21.6)	4,143(78.4)		
Self-rated health (5,785)	Very good,	31(12.8)	836	221.057	.000***
	Good,	230(18.0)	1,045(82.0)		
	Average	833(26.8)	2,277(73.2)		
	Bad,	377(40.6)	551(59.4)		
	Very bad	114 (49.6)	116 (50.4)		

* $p < .01$, *** $p < .001$

2. Effects of general characteristics on stress perception rate

Dichotomous logistic regression was used to determine the effects of the general characteristics on the stress perception rate. The independent variables were gender, age, and self-rated health. The dependent variable was the stress perception rate, which was "high" or "low." The results of this study are presented in [Table 4].

The older the respondents in their forties to seventies were, the more likely they were to have the stress perception rate affected ($p < .001$). The poorer self-rated health the respondents had, the more likely they were to have the stress perception rate affected ($p < .001$).

Lee et al. [12] noted that the better self-rated health, the more satisfied with life and the less depressed. Park and Yang [13] contended that self-rated health affected stress perception. Lee et al. [12] and Park and Yang [13] suggested the association between self-rated health and stress, which is consistent with the results of this study.

Table 4. Effects of general characteristics on stress perception rate

Category		B	P	Exp(B)	95% Confidence interval	
					Lower	Upper
Gender		-.113	.069	.893	.791	1.009
Age	20's			1		
	30's	.218	.048*	1.243	1.002	1.544
	40's	.617	.000***	1.854	1.499	2.293
	50's	.735	.000***	2.086	1.689	2.575
	60's	1.244	.000***	3.469	2.760	4.360
	70'≤	1.295	.000***	3.652	2.896	4.607
Self-rated health	Very good,			1		
	Good,	-.346	.097	.707	.470	1.065
	Average	-.957	.000***	.384	.260	.568
	Bad,	-1.742	.000***	.175	.117	.263
	Very bad	-2.379	.000***	.093	.058	.149

*p<.05, ***p<.001

3. Cardiovascular disease and stress perception rate

The association between cardiovascular diseases and the stress perception rate is as presented in [Table 5]. The group diagnosed with hypertension was wider-ranging than the group not diagnosed with hypertension. As for the association between hypertension and stress, the group diagnosed with hypertension showed a low rate of stress perception and the group not diagnosed with hypertension showed a statistically significantly low rate of stress perception (p<.001).

No significance was found for the other items. 6,050 persons were included to determine hypertension and dyslipidemia diagnosis status, with the exception of missing data. 5,781 and 5,780 persons were included to determine myocardial infarction and angina pectoris diagnosis status, respectively, with the exception of missing data.

Table 5. Cardiovascular disease and stress perception rate

		Stress perception rate (6,050)		χ ²	P
		High: 1,661 (27.5)	Low: 4,389 (72.5)		
Hypertension diagnosis status	Yes	340(22.6)	1,165(77.4)	23.789	.000***
	No	1,321(29.1)	3,224(70.9)		
Dyslipidemia diagnosis status	Yes	300(26.0)	853(74.0)	1.474	.225
	No	1,361(27.8)	3,563(72.2)		
Myocardial infarction diagnosis status (5,781)	Yes	17(23.6)	55(76.4)	.522	.470
	No	1,566(27.4)	4,143(72.6)		
Angina pectoris diagnosis status (5,780)	Yes	29(25.2)	86(74.8)	.274	.601
	No	1,553(27.4)	4,112(72.6)		

***p<.001

4. Effects of cardiovascular disease on stress perception rate

Dichotomous logistic regression was used to determine the effects of cardiovascular diseases on the stress perception rate. The independent variables were hypertension diagnosis status, dyslipidemia diagnosis status, myocardial infarction diagnosis status, and angina pectoris diagnosis status. The dependent variable was the stress perception rate, which was “high” or “low.” The results of this study are presented in [Table 6].

The group diagnosed with hypertension was more

strongly associated with stress than the group not diagnosed with hypertension ($p < .001$). No significance was found for the other items. As mentioned before, Lamers et al. [9] and Prince et al. [10] found that emotional well-being and mental health affected physical diseases. Similarly, this study found that the emotional, psychological condition of stress significantly affected the physical disease of hypertension. This result is also consistent with the finding of Jung et al. [5] that depression affected hypertension and dyslipidemia. Because emotional, psychological status is also associated with cardiovascular diseases and other diseases, it is necessary to develop relevant prevention programs.

Table 6. Effects of cardiovascular disease on stress perception rate

Category	B	P	Exp (B)	95% Confidence interval	
				lower	upper
Hypertension diagnosis status	-.347	.000***	.707	.609	.821
Dyslipidemia diagnosis status	.046	.569	1.047	.893	1.229
Myocardial infarction diagnosis status	-.097	.733	.907	.518	1.588
Angina pectoris diagnosis status	-.004	.986	.996	.644	1.540
*** $p < .001$					

Conclusion

This study aimed to determine the association between hypertension, dyslipidemia, myocardial infarction, and angina pectoris and the stress perception rate by cardiovascular diseases. The results of this study have demonstrated that hypertension among cardiovascular diseases is correlated with stress. Hypertension among cardiovascular diseases can affect stress and depressive disorder; therefore, it is necessary to reinforce regular exercise and psychological relief programs. This is expected to help determine the morbidity of cardiovascular diseases and promote mental health.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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An Analysis of the Risk of the Infection Disasters by Legal Infectious Disease Outbreak in South Korea

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Abstract

Background/Objectives: This study aimed to analyze the risk of the infection disasters by outbreak status of Group 1 to 4 legal infectious diseases in South Korea.

Methods/Statistical analysis: The raw data regarding “legal infectious diseases under complete surveillance” disclosed by the Ministry of Health Welfare (MOHW) and the Korea Centers for Disease Control and Prevention (KCDC) were used. The infectious diseases are divided into Group 1, 2, 3, 4, and 5 infectious diseases, designated infectious diseases, infectious diseases supervised by the World Health Organization (WHO), bioterrorism-related infectious diseases, sex-mediated infectious diseases, zoonosis, and medically-related infectious diseases. Of these, Group 1 to 4 legal infectious diseases found between 2014 and 2018 were included in this study. The analyses were carried out by using an SPSS Version 20.0 program.

Findings: Between 2014 and 2018, the number of Group 2 legal infectious diseases (562,830 cases) was greatest, followed by Group 3 (194,847), Group 1 (25,844), and Group 4 (3,183). Group 3 (625 cases) resulted in the greatest number of deaths, followed by Group 2 (275), Group 4 (214), and Group 1 (18). Of these, Middle East Respiratory Syndrome (MERS), Group 4 infectious disease, resulted in 38 cases of death in 2015. Such a high death toll was due to the poor awareness of the risk of MERS introduced from abroad and the absence of a good control and coping system. Since the MERS outbreak in 2015, the awareness of infection disasters has changed, resulting in the absence of death in 2016.

Improvements/Applications: It is unclear how to determine the intensity of infection for infectious diseases introduced from abroad. It is necessary to make efforts to improve precautions, reinforce coping against the spread, enhance capabilities through mock drill, improve the legal system, and increase infrastructures with the objective of building an efficient crisis control system against infectious diseases.

Keywords: *Infectious disease, Legal infectious disease, Surveillance, Infection disaster, Prevention*

Introduction

The law regarding infectious disease prevention and control has been established to prevent the outbreak and prevalence of infectious diseases harmful to the people's health, define the requisites for their prevention and control, and contribute to the promotion and maintenance

of the people's health [1]. In 2014, some countries, including the United States, made an agreement among them to accelerate prevention, surveillance, and coping against the intentional, accidental, and natural threats of infectious diseases [2].

In this context, the law regarding infectious disease prevention and control has been established to classify the legal infectious diseases in pursuit of infectious disease prevention and control [1]. The legal infectious diseases are divided into Group 1, 2, 3, 4, and 5 infectious

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diseases, designated infectious diseases, infectious diseases supervised by WHO, bioterrorism-related infectious diseases, sex-mediated infectious diseases, zoonoses, and medically-related infectious diseases [1].

While the infectious disease mortality is on the increase, there is no treatment for Ebola virus whose lethality is 50% to 90% [3]. Since its discovery in 2012, Middle East Respiratory Syndrome (MERS)-CoV has affected approximately 1,100 people, including children, in 12 countries and resulted in higher mortality than Severe Acute Respiratory Syndrome (SARS) (40% vs. 10%) [4].

In 2015, South Korea was at risk of national disaster due to the outbreak of MERS [5]. Since the introduction of MERS into South Korea in 2015, 38 out of 186 persons definitively diagnosed with the disease have died [6]. It can be said that the disease strongly affected its society, economy, and health [5, 6]. Five super-spreaders were very likely to affect infection: 82.7% of all those definitively diagnosed with the disease were reportedly able to spread it [6]. The prevalence of new infectious diseases, including SARS, Avian influenza, and MERS, which are sources of anxiety, requires efforts to cope with critical situations at the national level [7].

Benca [8] noted that regions having artificial disasters (war, terrorism, industrial accidents, etc.) and natural disasters (earthquake, flood, tsunami, volcano explosion, etc.) are strongly correlated with the factors for infectious disease outbreak. That is, disaster zones are at high risk of infectious disease outbreak. In addition, WHO [9] noted that people could be more susceptible to an infectious disease if it occurred at specific regions and was more likely to occur.

Infection may cause damage to spread rapidly from a certain area to vast regions. While research on some cases of infection has been conducted, few studies using annual data have been conducted and little research using the data disclosed by MOHW and KCDC [10] has been performed. This study aimed to use the annual data regarding “legal infectious diseases under complete surveillance” disclosed by MOHW and KCDC [10] to determine the risk of infection disasters.

It intended to determine the risk of infection disasters related to the annual outbreak of legal infectious diseases—Group 1 to 4—in South Korea on the basis of the data regarding “legal infectious diseases under complete surveillance” disclosed by MOHW and KCDC

[10]. The period between 2014 and 2018 was reviewed to determine the annual status of legal infectious diseases.

Method

1. Study design

The raw data regarding “legal infectious diseases under complete surveillance” disclosed by MOHW and KCDC [10] were used. On this basis, secondary data analysis was performed to determine the “risk of infection disasters by legal infectious disease outbreak status.”

2. Instruments and subjects

This study used the data regarding each of the “legal infectious diseases” disclosed by MOHW and KCDC [10] to determine the risk of infection disasters between 2014 and 2018. The data from the complete surveillance of legal infectious diseases during the period of five years from 2014 to 2018 were drawn.

The legal infectious diseases are divided into Group 1, 2, 3, 4, and 5 infectious diseases, designated infectious diseases, infectious diseases supervised by WHO, bioterrorism-related infectious diseases, sex-mediated infectious diseases, zoonoses, and medically-related infectious diseases [1, 11].

Among the legal infectious diseases, Group 1 to 4 infectious diseases were included in this study. Since there were raw data regarding Group 1 to 4 infectious diseases among the legal infectious diseases under complete surveillance, as disclosed by MOHW and KCDC [10], these four groups were included in this study. It is mandatory to report any of Group 1 to 4 legal infectious diseases without delay. If a legal infectious disease occurs, it is first reported to the target monitoring agency and then to the department of health at the level of cities, counties, and districts, the department of health at municipal and provincial levels, and KCDC [11].

There were 88,774 cases of Group 1 to 4 legal infectious diseases in 2014, 104,028 cases in 2016, and 170,498 cases in 2018.

3. Ethical consideration and Analysis

This study has obtained the approval of review exemption from the Institutional Review Board (IRB) of C University (Human-008-20190523-1st)(Review Exemption). The data were analysed using an SPSS

WIN 20.0 Version program.

Result and Discussion

1. Changes in trend of legal infectious disease outbreak and mortality

The trend of Group 1 to 4 legal infectious disease outbreak and mortality between 2014 and 2018 was presented in [Table 1], [Figure 1], and [Figure 2]. Between 2014 and 2018, the number of Group 2 legal infectious diseases (492,227) was greatest, followed by Group 3 (159,400), Group 1 (16,907), and Group 4 (2,623). Legal

infectious disease mortality was incongruous with outbreak size: Group 3 (456) resulted in the greatest number of deaths, followed by Group 2 (261), Group 4 (196), and Group 1 (12).

With the increase and decrease in outbreak and mortality of infectious diseases, international cooperation is made to control and cope with infectious diseases [2, 12]. WHO adopted the International Sanitary Regulations to prevent the global spread of infectious diseases in 1951 and the International Health Regulations in 2005 [12]. In 2014, the Global Health Security Agenda (GHSA) presented a vision [2].

Table 1. Changes in trend of legal infectious disease outbreak and mortality

Category		2014	2015	2016	2017	2018	Total
Group 1	Outbreak size	1,816	2,128	5,077	4,875	3,011	16,907
	Number of deaths	1	1	2	3	5	12
Group 2	Outbreak size	70,535	70,446	72,127	98,308	117,811	429,227
	Number of deaths	11	36	23	70	121	261
Group 3	Outbreak size	16,178	18,851	26,208	49,100	49,063	159,400
	Number of deaths	64	33	43	105	211	456
Group 4	Outbreak size	245	561	616	588	613	2,623
	Number of deaths	16	60	19	55	46	196
Total (Outbreak size)		88,774	91,986	104,028	152,871	170,498	608,157
Total (Number of deaths)		92	130	87	233	383	925

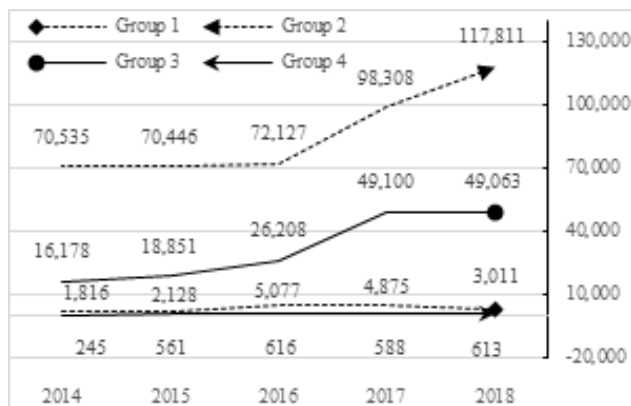


Figure 1. Changes in trend of legal infectious disease outbreak

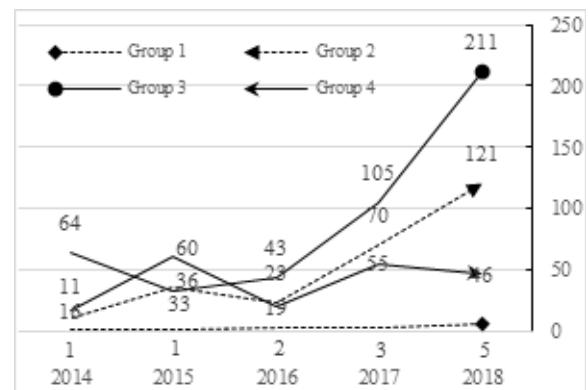


Figure 2. Changes in trend of legal infectious disease mortality

2. Trend of mortality by criteria for Groups 1 and 2 legal infectious disease classification

The changes in the trend of mortality by the criteria for Group 1 and 2 legal infectious disease classification between 2014 and 2018 are presented in [Table 2]. Among Group 1 infectious diseases, hepatitis A (8 cases) had high mortality, but cholera, paratyphoid fever, and bacillary dysentery resulted in no case of death.

Among Group 2 infectious diseases, Pheumococcus (240 cases) and Japanese encephalitis (12) had high

mortality, but diphtheria, pertussis, measles, mumps, poliovirus resulted in no case of death.

Group 1 infectious diseases, which are mediated by water or food and are very likely to have mass outbreak, require making anti-epidemic measures immediately after the outbreak or prevalence; Group 2 infectious diseases require national vaccination [1,11]. Group 1 and 2 infectious diseases have low mortality probably because of the prevention of food mediation and national vaccination. Lee [13] found that the awareness of legal infectious diseases was poor: an average of 6.56 out of 14.

Table 2. Trend of mortality by criteria for Groups 1 and 2 legal infectious disease classification

Category		2014	2015	2016	2017	2018	Total
Group 1	Cholera	0	0	0	0	0	0
	Typhoid fever	1	0	0	0	0	1
	Paratyphoid fever	0	0	0	0	0	0
	Bacillary dysentery	0	0	0	0	0	0
	Enterohemorrhagic Escherichiacoli	0	0	0	0	3	4
	Hapatitis A	0	1	2	3	2	8
	Total	1	1	2	3	5	12
Group 2	Diphtheria	0	0	0	0	0	0
	Pertussis	0	0	0	0	0	0
	Tetanus	0	0	2	0	2	4
	Measles	0	0	0	0	0	0
	Mumps	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
	Poliovirus	0	0	0	0	0	0
	Japanese encephalitis	4	2	3	2	1	12
	Varicella	0	0	0	0	1	1
	Acute hepatitis B	1	0	0	1	2	4
	Haemophilus influenzae type B	0	0	0	0	0	0
	Pheumococcus	6	34	18	67	115	240
Total	11	36	23	70	121	261	

3. Trend of mortality by criteria for Groups 3 and 4 legal infectious disease classification

The changes in the trend of mortality by the criteria for Group 3 and 4 legal infectious disease classification between 2014 and 2018 are presented in [Table 3]. Among Group 3 infectious diseases, *Vibrio vulnificus* septicemia (109 cases), Carbapenem-Resistant Enterobacteriaceae (CRE) (180), and Tsutsugamushi disease (60) had high mortality, but scarlatina, Hansen’s disease, leptospirosis, and anthrax resulted in no case of death.

Among Group 4 infectious diseases, Severe Fever with Thrombocytopenia Syndrome(SFTS)(156 cases) and MERS (38) had high mortality, but pest, Yellow fever, dengue fever, and rabbit fever resulted in no case of death.

Group 3 infectious disease requires continuous monitoring of outbreak and establishment of anti-epidemic measures due to the likelihood of intermittent

prevalence; Group 4 infectious disease is a new type of infectious disease that occurs or is likely to occur domestically or infectious disease prevalent overseas that can possibly be introduced into South Korea [1, 11]. Jang [7] indicated that simply controlling the existing infectious diseases could lead to easy collapse of the national network of anti-epidemic measures due to new types of infectious diseases, which can occur anytime, anywhere. Jeong et al. [14] suggested the need to give systematic education and management concerning vaccination and travel-related precautions prior to business trip and provide continuous control service following business trip according to destination in travel.

The mortality of Group 4 infectious disease was on a sudden increase in 2015. The absence of good control or coping with the introduction of MERS from abroad resulted in 38 cases of death. The outbreak of the infectious disease in 2015 led to the spread of infection disasters. Lee [13] reported that 74.9% of the respondents suggested the need to make anti-epidemic measures against introduction of SARS, SFTS, and MERS into South Korea [13].

Table 3. Trend of mortality by criteria for Groups 3 and 4 legal infectious disease classification

Category		2014	2015	2016	2017	2018	Total
Group 3	Malaria	5	0	1	3	4	13
	Scarlatina	0	0	0	0	0	0
	Hansen’s disease	0	0	0	0	0	0
	Meningococcal meningitis	0	1	0	1	1	5
	Legionella species	0	1	8	17	22	48
	<i>Vibrio vulnificus</i> Septicemia	40	13	12	24	20	109
	Typhus fever	0	0	0	0	0	0
	Murine typhus	0	0	0	0	0	0
	Tsutsugamushi disease	13	11	13	18	5	60
	Leptospirosis	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Anthrax	0	0	0	0	0	0
	Hydrophobia	0	0	0	0	0	0
	Hemorrhagic fever with renal syndrome	3	7	3	0	0	13
	Lues	0	0	0	0	0	0
	Creutzfeldt-jakob disease(CJD)	3	0	6	5	11	25
	Hepatitis C	-	-	-	0	5	5
	Vancomycin resistant staphylococcus aureus	-	-	-	0	0	0
	CRE	-	-	-	37	143	180
	Total		64	33	43	105	211	456

Cont... Table 3. Trend of mortality by criteria for Groups 3 and 4 legal infectious disease classification

Group 4	Pest	0	0	0	0	0	0
	Yellow fever	0	0	0	0	0	0
	Dengue fever	0	0	0	0	0	0
	Viral hemorrhagic fever	0	0	0	0	0	0
	Variola	0	0	0	0	0	0
	Botulism	0	0	0	0	0	0
	SARS	0	0	0	0	0	0
	Avian Influenza virus	0	0	0	0	0	0
	Novel swine-origin influenza A(H1N1)	0	0	0	0	0	0
	Rabbit fever	0	0	0	0	0	0
	Q fever	0	0	0	1	0	1
	West Nile fever	0	0	0	0	0	0
	Lyme disease	0	1	0	0	0	1
	Tick borne encephalitis	0	0	0	0	0	0
	Melioidosis	0	0	0	0	0	0
	Chikungunya Virus	0	0	0	0	0	0
	Emerging infectious disease	0	0	0	0	0	0
	SFTS	16	21	19	54	46	156
	MERS	-	38	0	0	0	38
	Zika virus	-	-	0	0	0	0
Total	16	60	19	55	46	196	

Conclusion

This study aimed to analyze the risk of the infection disasters by legal infectious disease outbreak. Of the legal infectious diseases, Group 1 to 4 infectious diseases were included in this study. Of these, MERS, Group 4 infectious disease introduced from abroad, resulted in 38 cases of death in 2015. It is unclear how to determine the intensity of infection for infectious diseases introduced from abroad. The efforts to supplement infection control facilities in healthcare institutions, supplement professional manpower, improve the manual, and give education and training are expected to help develop a program against infection disasters.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Factors Affecting Nursing Work Performance of Medium Sized Hospital Nurses

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Abstract

Background/Objectives: This study is identifying the factors influencing their nursing work performance and to provide a preliminary data necessary for managing nursing manpower by examining the nursing work performance, job satisfaction, and self leadership of nurses in medium sized hospitals.

Methods/Statistical analysis: This study is a survey was carried out targeting nurses selected by using the convenience sampling method who have been working for more than 6 months in medium sized hospitals. Data analysis was descriptive statistics analysis, t-test, one-way ANOVA, correlation analysis, and multiple regression using SPSS/WIN 22.0 program.

Findings: This study showed that the job satisfaction and self leadership were factors significantly influencing the nursing work performance and the explanation power of job satisfaction and self leadership was 40.4%.

Improvements/Applications: Therefore, it is suggested that a strategy to improve the job satisfaction and self leadership as a continuous intervention strategy that can maximize the nursing work performance is necessary.

Keywords: *Nursing work Performance, Self leadership, Job Satisfaction, Nurses, Medium sized Hospitals*

Introduction

Medium sized hospitals are the secondary medical centers that connect the primary medical centers and the tertiary medical centers according to the health care delivery system in Korea. These small and medium-sized hospitals are located closely to the local community, promoting efficient use of medical resources and savings effect of medical expense. In addition, these hospitals play an important role in health care and provide professional treatment, surgery, and inpatient services. Nurses are important human resources among various members in the hospital organization as well as the largest expert group that accounts for 44.1% of total medical personnel^[1], and the improvement of nurses' competencies is crucial for improving their life satisfaction and producing efficient job performance^[2,3].

However, the nurses in medium-sized hospitals face poor working environments including excessive workload, low wage structure, irregular working hours, and insufficient treatment due to lack of nursing manpower. As a result, their self-esteem has been lowered and their job satisfaction and efficiency in nursing service has been reduced, negatively affecting the organizational performance consequently^[4,5].

In the nursing organization, the nursing competency is connected directly to the nursing performance, and sufficient knowledge, appropriate judgment, and excellent skills lead to the qualitative improvement of nursing, resulting in the successful achievement of the organizational goal. This is because there are many situations that need to be handled promptly and quickly when a nurse cares for a patient^[6]. Improved self-leadership of a nurse changes her/his actions and ideas and expands the influence on himself, creating the ability to control herself/himself and carry out the nursing service initiatively^[7].

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The self-leadership of a nurse motivates herself/himself and helps herself/himself to respect coworkers, accept the goal of the hospital organization and the nursing organization actively and positively and increase his job satisfaction, improving the level of nursing service given to patients qualitatively^[4]. A nurse who has a high job satisfaction is effective for securing nursing manpower which is an important aspect in the manpower management of medium sized hospitals, affecting the improvement of hospital management and enabling the provision of higher quality nursing service^[8].

Therefore, small and medium-sized hospitals should make efforts to invest material resources and provide high quality health and medical services and nursing services based on a strategy to improve the productivity of hospital organization and a sufficient nursing manpower in response to the competition with large-sized hospitals.

The aim of this study is to identifying nursing work performance, job satisfaction, and self leadership level of nurses and analyzing the effects of on the nursing performance.

Method

This study is a descriptive research study to identify the degree of nursing work performance, job satisfaction, and self leadership of nurses in medium sized hospitals and analyzing the effects on the nursing work performance.

This study was conducted targeting at nurses who are working for more than 6 months in medium sized hospitals with more than 150 beds and less than 300 beds. For the research tool, the self leadership was measured developed by Manz^[9] and supplemented by Kim^[10]. This tool consists of 18 questions in six sub areas and a higher score, the higher self leadership level. The tool reliability was carried out by Cronbach's α of Kim^[10] was .87 and in this study was Cronbach's α was .86. For the job satisfaction, the job satisfaction measurement tool for nurses developed by Song^[11] was used and this tool consists of 25 questions in five sub areas and a higher score indicates a higher job satisfaction. The tool reliability was carried out Cronbach's α of Song^[11] was .84 and in this study was Cronbach's α was .92. For the nursing performance, the nursing performance measurement tool developed by Ko^[12] composes of 17 questions in four sub areas and a higher nursing work performance level. The tool reliability was carried out

by Cronbach's α of Ko^[12] was .92 and in this study was Cronbach's α was .91.

The analysis method is as follows.

A. The general characteristics of the target nurses were analyzed using real number and percentage.

B. The degree of nursing work performance, job satisfaction, and self leadership were obtained as average and standard deviation.

C. Nursing work performance, job satisfaction, and self leadership according to general characteristics were analyzed using t-test and one way ANOVA and the Scheffe's test was used for post-hoc analysis

D. Nursing work performance, self leadership, and job satisfaction were analyzed using the Pearson's correlation coefficient.

E. Factors influencing the nursing work performance analyzed using multiple regression analysis and stepwise multiple regression.

Result and Discussion

1. Degree of Nursing work performance, Job satisfaction, and Self leadership of Subjects

Degree of nursing work performance, job satisfaction, and self leadership are shown in [Table 1].

For the nursing work performance, there were 17 questions with 3.54 points on average on a five-point scale. According to the sub areas, the nursing competency showed the highest score, followed by nursing attitude, improvement of nursing service level, and application of nursing process. For the job satisfaction, there were 25 questions with 3.13 points on average on a five-point scale. According to the sub areas, the relationship with coworkers showed the highest score, followed by relationship with senior nurse, job, personnel system, and work environment and welfare. For the self leadership, the score was 3.46 ± 0.40 points on average on a five-point scale. According to the sub areas, the self-compensation showed the highest score, followed by rehearsal, self expectation, constructive thinking, self-criticism, and goal setting.

Table 1. Degree of Nursing work performance, job satisfaction, and self leadership of subjects**(N=176)**

variables	mean \pm SD
nursing work performance	3.54 \pm 0.43
nursing competency	3.64 \pm 0.48
nursing attitude	3.58 \pm 0.49
improvement of nursing service	3.41 \pm 0.57
nursing process application	3.39 \pm 0.60
job satisfaction	3.13 \pm 0.45
job system	3.26 \pm 0.50
work environment and welfare	2.72 \pm 0.67
personnel system	2.82 \pm 0.62
relationship with coworkers	3.53 \pm 0.56
relationship with senior nurse	3.51 \pm 0.63
self-leadership	3.46 \pm 0.40
self-compensation	3.50 \pm 0.55
rehearsal	3.56 \pm 0.59
goal setting.	3.30 \pm 0.65
self expectation	3.69 \pm 0.60
self-criticism	3.34 \pm 0.75
constructive thinking	3.39 \pm 0.57

2. The Difference in Nursing work performance, Job satisfaction, and Self leadership of the Subjects according to General Characteristics

The difference in nursing work performance, job satisfaction, and self leadership of the target nurses according to general characteristics are shown in [Table 2].

Nursing work performance shown in age($F=2.89$, $p=.024$), marital status($t=2.24$, $p=.026$), and position($t=-2.99$, $p=.003$) were statistically significant difference. Job satisfaction shown in the highest level of education($t=-2.13$, $p=.034$), position($t=-2.14$, $p=.033$), work unit($F=4.63$, $p=.004$), and payment($f=4.42$, $p=.013$) were statistically significant difference and the Self leadership shown in age($F=4.65$, $p=.001$) was statistically significant difference.

Table 2. Difference in nursing work performance, job satisfaction, and self leadership of the subjects according to general characteristics ((N=176))

characteristic	Self leadership		job satisfaction		nursing work performance		
	Mean ±SD	t/F (p)	Mean±SD	t/F (p)	Mean±SD	t/F (p)	
Age (years)	under 25	59.89±6.23		78.16±12.81		56.58±5.08	
	26-30(b)	62.67±6.93	4.65 (.001) a<c<e	78.34±9.87	1.21 (.305)	60.79±6.83	
	31-35(c)	60.21±6.92		75.77±11.24		59.12±7.43	
	36-40(d)	62.60±7.53		79.00±11.44		60.46±7.58	
	over 41(e)	68.06±6.78		82.56±13.66		64.06±8.34	
Marital state	married	63.59±3.48		1.94 (.153)		79.38±12.63	1.08 (.128)	61.68±8.48	2.24 (.026)
	unmarried	61.44±6.20		77.50±10.31		51.19±6.20	
Education	university	61.25±6.93	-1.77 (.074)	78.01±10.56	-2.13 (.034)	59.84±7.73	-.58 (.556)
	master&over	68.19±7.53		78.55±12.20		60.49±6.94	
Position	staff nurse	61.94±6.70	-1.73 (.085)	77.56±10.80	-2.14 (.033)	59.57±6.89	-2.99 (.003)
	over charge nurse	64.74±6.94		82.91±13.54		64.35±8.61	
work unit	Medical unit(a)	68.64±6.81	6.98 (.072)	81.86±15.11	4.63 (.004)	61.68±7.88	1.39 (.707)
	surgical unit(b)	60.95±8.44		78.77±8.64		59.45±6.76	
	specialty (ER,OR,ICU)	61.79±6.39		79.39±0.46		59.70±6.75	
	outpatient department(d)	64.03±7.47		72.29±10.66		60.94±8.54	
Career (years)	under 2	61.57±7.42	2.65 (.448)	12.195±2.03	1.92 (.128)	57.28±1.09	6.66 (.083)
	2-5	62.79±5.98		10.040±1.44		59.88±6.33	
	5-10	61.52±6.83		11.356±1.75		61.17±6.98	
	over 10	63.10±8.59		11.436±1.61		61.78±8.40	
payment (won)	under 200(a)	64.75±7.68	1.58 (.207)	71.70±11.23	4.42 (.013)	60.90±6.09	-3.81 (.148)
	200-250(b)	61.75±6.22		78.63±10.87		59.31±7.07	
	over 250(c)	62.83±9.82		80.71±11.72		62.86±8.16	

3. Correlation between Nursing work performance, Job satisfaction, and Self leadership

The correlation between nursing work performance, job satisfaction, and self leadership of the subjects is shown in [Table 3]. Self leadership was statistically

significant correlation with job satisfaction and nursing work performance, the job satisfaction was statistically significant correlation with nursing work performance, and the nursing work performance was statistically significant positive correlation with self leadership and job satisfaction. In other words, the nursing work

performance was higher as the self leadership and the job satisfaction were higher.

Table 3. Correlation between nursing work performance, self leadership, and job satisfaction (N=176)

Variable	self leadership r(p)	job satisfaction r(p)	nursing performance r(p)
self leadership	1		
job satisfaction	.24 ($<.001$)	1	
nursing work performance	.57 ($<.001$)	.40 ($<.001$)	1

4. Factors Influencing Nursing work performance

The factors influencing nursing work performance is as shown in [Table 4]. The self leadership and job satisfaction had a statistically significant influence on nursing work performance, and the explanation power of the model was 40.4%.

Table 4. Factors influencing nursing work performance

	B	SE	β	t	p	VIF
constant	16.56	4.59	-	3.60	$<.001$	-
Age	-.17	.46	-.02	-.36	.714	1.65
married state	-.89	1.04	-.06	-.85	.395	1.46
work position	2.36	1.39	.11	1.69	.092	1.23
Self leadership	.49	.06	.49	8.02	.001	1.09
job satisfaction	.17	.03	.27	4.44	.001	1.08
R ² =.421, Adj R ² =.404, F =24.730, p<.001, Durbin-Watson = 1.902						

Discussion

For nursing work performance, job satisfaction, and self leadership, the score was and 3.54 points, 3.13 points, 3.46 points on average on a five-point scale in this study.

The self leadership of the nurses in medium sized hospitals was lower than the self leadership of the nurses in university hospitals^[13]. The job satisfaction varied between the nurses in general hospitals^[14], university hospitals^[15], so it is difficult to generalize and conclude that job satisfaction depends on the size of hospital.

It is considered that job satisfaction varies according to working environment at a hospital, pay level, and hospital systems. The nursing work performance of the nurses in university hospitals^[16], head nurses in general hospitals^[17], and nurses in intensive care units^[18] showed different results by the size of the hospital, indicating that nursing performance is related to regional difference or the distinctiveness of duties in each department in the hospital.

According to the correlation between nursing work performance, self leadership, and job satisfaction of

the subjects, self leadership and job satisfaction had a positive correlation with nursing work performance. As the self leadership and the job satisfaction were higher, the nursing work performance was also higher. According to other variable factors having a positive correlation with nursing work performance, communication and self leadership had a positive correlation with the nursing work performance of nurses in university hospitals^[7], self leadership and self efficacy had a positive correlation with the nursing work performance of nurses in care hospitals^[19], and self leadership and self esteem had a positive correlation with the nursing work performance of nurses in general hospitals^[20]. There were many precedent studies showing the correlation between various variable factors and nursing work performance, however, it was difficult to find a precedent study for examining the correlation of nursing work performance by applying self leadership and job satisfaction at the same time targeting the nurses in small and medium hospitals, so there was a difficulty in performing a comparison.

According to the influential factors on nursing work performance in this study, there was no significant variable in the general characteristics. However, self leadership and job satisfaction were found to be the significant influential factors on nursing work performance, and the explanation power was 40.4%. The self leadership and job satisfaction^[4] and communication and self leadership^[7] were presented to be the significant influential factors for the nursing work performance of nurses in university hospitals. The self leadership and self esteem^[20] for the nursing work performance of nurses in general hospitals and self leadership for the nursing work performance of nurses in care hospitals were confirmed to be the significant influential factors. Likewise, many precedent studies reported that higher self leadership of a nurse had a significant effect on the nursing work performance, which was consistent with the results of this study.

The nurses in small and medium hospitals face special circumstances that the working environment is not appropriate and there is also a shortage in human resources compared to university hospitals or general hospitals. Therefore, it is necessary to seek various measures that can influence the nursing performance of nurses in medium sized hospitals. The self-leadership allows nurses to motivate themselves internally, improving their ability, enhancing their confidence and will at work, and improving their job satisfaction. This

leads to the enhancement of personal job performance and qualitative patient nursing, becoming the foundation for improving the business performance of the hospital eventually.

Conclusion

To sum up the results, it was confirmed that self leadership and job satisfaction were the factors influencing the nursing work performance. Higher self leadership and job satisfaction had greater influence on nursing work performance. The development of a training program that can help nurses to set a goal by themselves and to provide a service with responsibility and a strategy that can induce active participation is necessary for improving the nurses' self leadership. It is also necessary to properly place the manpower and establish a practical wage structure for improving the nurses' job satisfaction.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Effects of Applying Flipped Learning to Simulation Training in Nursing Students

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Abstract

Background/Objectives: This study was conducted to confirm the effect of applying flipped learning to simulation training of nursing students.

Methods/Statistical analysis: The study was the experiment with pre and post design in single group. The subjects of this study were 88 nursing students who were taking the simulation training course of nursing college. The learning model was designed with a total of 11 programs based on the 'PRTNER' model. Collected data were analyzed using descriptive statistics and paired t-test using SPSS 22.0.

Findings: Although there was no statistically significant difference in the problem solving ability($t=-1.342$, $p=.183$) between before and after applying flipped learning to simulation training, the significant improvement was achieved in self-directed learning ability($t=-2.187$, $p=.031$), communication ability($t=-5.316$, $p<.001$), and satisfaction of instruction($t=-2.830$, $p=.006$). Therefore, using the teaching and learning method with flipped learning, the learning outcomes can be maximized by improving the core competencies that nursing students should have. These results are useful as basic data for the development of teaching and learning methods that can improve the core competencies of nursing students.

Improvements/Applications: Based on this results, we propose the follow-up study to confirm the effectiveness of various teaching and learning methods applying flipped learning to the theoretical curriculum in nursing science.s

Keywords: *Flipped Learning, Nursing Students, Communication Competency, Self-directed Learning, Problem Solving Ability*

Introduction

Recently, due to changes in health care, patient safety is important and patient rights are guaranteed, so nursing students' nursing care during clinical practice is limited, making it difficult to acquire knowledge and in various and complex diseases in clinical practice. Also, because a lot of major knowledge should be delivered in a short time, and there are many lecture-oriented classes centered on teachers, it is difficult to strengthen the core competency required at graduation for nursing college students. The nursing education requires various method

of training that can experience on-the-job-oriented learning^[1], so flipped learning, team based learning, problem-based learning and simulation training have been used for several years, and effectiveness has been evaluated^[2-3].

Simulation exercise training provides nursing students with an opportunity, including safe environment^[4], to learn repeatedly through various scenarios in the situation similar to clinical practice based on high fidelity simulator. Flipped learning means 'learning backwards', and it is a teaching method that enables students to learn outside the classroom by changing the learning order and to experience the transfer of knowledge acquired before the class in various ways^[5]. The flipped learning also has shown to improve

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critical thinking, communication, and self-directed learning through pre-learning, constant interaction and discussion with peers^[5-7]. However, according to the amount of pre-learning and the method of teaching and learning, students' dissatisfaction and limited increase in satisfaction of the class have been reported^[8]. Therefore, simulation and flipped learning can be the effective teaching and learning methods to enhance the learning outcomes. So, it is necessary to apply them to various curriculum subjects and confirm the effects including the limitations. After developing and applying flipped learning method which is the learner-centered teaching method in the course of simulation practice, we confirmed the effect and performed the study to provide the basic data in education.

The specific objectives of the research are as follows. First, it confirms the level of problem solving ability, self-directed learning ability, communication competency and class satisfaction before and after applying flipped learning to simulation training. Second, it compares the difference of problem solving ability, self-directed ability and communication competency before and after applying flipped learning to simulation training.

Method

This study is an experimental study using pretest-posttest design in one group to investigate the effect of nursing student's simulation practice training, applied with flipped learning, on problem solving ability, self-directed ability, communication competency and instructional satisfaction.

The subjects were the students who participated in the simulation exercise course and agreed to participate in the research from department of nursing at D University in J city. The number of the subjects was 88 with the effect size of .30, significance level of .05, and test power of .90 using G*power 3.1.9. However, 95 subjects were selected considering the dropout rate. The final analysis included 88 subjects.

In this study, the effectiveness of the simulation practice education using the flipped learning in nursing students was verified by using the life ability measurement tool^[9] for college students and general adults and the class satisfaction^[10] tool.

For problem solving ability, we used the life ability measurement tool developed by Lee, Jang, Lee, and

Park^[9]. There are 45 questions in total, consisting of the Likert scale. The higher the score, the higher the problem solving ability. In the reliability of problem solving ability, Cronbach's α was .94 at the time of development and .96 in this study.

In evaluation self-directed learning ability, we also used the life ability measurement tool developed by Lee, Jang, Lee, and Park^[9]. There are a total of 40 questions, which are composed of the Likert scale, the higher the self-directed learning ability. In the reliability of self-directed learning ability, Cronbach's α was .95 at the time of development and .95 in this study.

In evaluate communication competency, we used the life ability measurement tool developed by Lee, Jang, Lee, and Park^[9]. A total of 49 questions, which are composed of the Likert, the higher score means better communication competency. In the reliability of communication competency, Cronbach's α was .80 at the time of development and .89 in this study.

In order to evaluate class satisfaction, we used the class satisfaction tool developed by Choi^[10]. There are a total 12 questions indicating the higher the score, the higher class satisfaction. In the reliability of class satisfaction, Cronbach's α was .89 at the time of development and .91 in this study.

In order to improve the learning outcomes of nursing college students through simulation training with flipped learning and to strengthen core competencies, the 'PARTNER' model, the flipped learning teaching and learning model developed by Choi and Kim was used^[11]. In the study, 'PARTNER' model was applied to 6 revised levels of 'Preparation', 'Relevance', 'Team activity', 'Nub lecture', 'Evaluation', and 'Reflection' and the program was performed 11 times in total. First, We analyzed the learner, subject, and simulation practice environment for the learner-centered class in the preliminary stage(pre-class) and developed the simulation practice guide applying the flipped learning. In addition, we have developed preliminary learning materials such as video and handout to help self-directed learning. Second, the pre-learning linkage(In-class) enables quizzes and question-and-answer on the pre-learning so that cooperative learning can be achieved. Third, in the team activity, nursing process and debriefing were applied to simulation exercises according to scenarios to improve learner's problem solving ability, critical thinking ability and communication competency.

The instructor acted as facilitators to help learners collaborate to solve problems and share the knowledge to make up and improve what is lacking. Fourth, at the end of the lesson, the key summary lecture was used to accurately convey the main goal and the core contents on weekly basis. Fifth, various scenarios were applied to perform the mid-term evaluation and the overall evaluation for each team. Finally, in post-reflection, after the weekly lecture was finished, the reflection diary was made to be able to reflect on the contents on team-by-team basis or individually, and the professor gave feedback on it[Table 1].

Table 1. Flipped learning model based on PRTNER model

Process		Details	
Learner Activity		Instructor Activity	
Class preparation	Analysis, design and development	<ul style="list-style-type: none"> • Analysis of learner, subject and simulation practice environment • Lesson design for flipped learning • Development of simulation training guide • Development of scenarios, videos, handout 	
Pre-class	Preparation	<ul style="list-style-type: none"> • Self-directed pre-learning regardless of time and space through videos and handouts for each team or individual 	<ul style="list-style-type: none"> • Notice of weekly learning contents through smartphone app on a weekly basis • Equipment of video and handouts for pre-learning
In-class	Relevance (30 mins)	<ul style="list-style-type: none"> • Quiz and Q & A about pre-learning though collaborative learning 	<ul style="list-style-type: none"> • Feedback on pre-learning and questions
	Team activity (2 hours & 30 mins)	<ul style="list-style-type: none"> • Application of nursing process to simulation practice through various situation scenarios by team • Debriefing 	<ul style="list-style-type: none"> • Role as a facilitator of simulation practice in different scenarios of various situations • Provision of environment for debriefing
	Nub lecture (30 mins)	<ul style="list-style-type: none"> • Summary of weekly learning goals and core contents through Q & A 	<ul style="list-style-type: none"> • Lecture of weekly learning goals and core contents through Q & A
	Evaluation (30 mins)	<ul style="list-style-type: none"> • Mid-term and overall evaluation • Peer evaluation by team 	<ul style="list-style-type: none"> • Instructor evaluation by team
Post-class	Reflection	<ul style="list-style-type: none"> • Post-reflection writing • Student’s opinion writing • Q & A 	<ul style="list-style-type: none"> • Provision of feedback by checking post-reflection logbook • Re-reflection on next week after checking Q & A

This study was conducted from March to April, 2019, and the preliminary survey was carried out by online questionnaires after the orientation of simulation exercise course, and the post-test was carried out by post-question in the same way after the 11th program. To analyze the collected data, the reliability of each tool was measured using the SPSS WINDOW 22.0 program. The general characteristics of the subjects were described using descriptive statistics of frequency, percentage, mean

and standard deviation, and paired t-test was to analyze differences between pre-and-post-experiment.

Considering the ethical side of the subject, this study was reviewed and approved by the Institution Review Board(IRB No: D**-2019-02-002-01), D University at J city, and data were collected. In addition, approval for using the tool in the study was obtained from its developer. The research assistant without conflict of interest explained

the purpose, the method, the outcome, and the potential problems of the study to the subjects and explained that they may wish to remain anonymous and refuse to participate if they do not. The survey was conducted after obtaining the informed consent from subjects who agreed to participate in the study and the complimentary product was provided in return.

Result

In general characteristics of the subject, the average age of the subjects was 22.85(\pm 2.93), and the number of female students was 78(88.6%). In terms of average grades for all semesters, the number of students who received less than 3.0-3.5 points was the highest with 33 students(37.5%), and the number of students with the score below 3.5-4.0 was 30 students(34.1%) [Table 2]. From the effects of simulation training practice

using flipped learning of nursing students, the results of the preliminary survey showed the problem solving ability of 3.53(\pm 0.46), self-directed learning ability of 3.51(\pm 0.45), communication competency of 3.37(\pm 0.33), and class satisfaction was 3.79(\pm 0.63). The results of the follow-up were improved to 3.63(\pm 0.52) for problem solving ability, 3.66(\pm 0.53), for self-directed ability, 3.66(\pm 0.38), for communication competency and 4.05(\pm 0.61) for class satisfaction. Although there was no statistically significant difference in the problem solving ability($t=-1.342$, $p=.183$) of nursing students, before and after applying flipped learning in the simulation training, there were statistically significant difference in self-directed learning ability($t=-2.187$, $p=.031$), communication competency ($t=-5.316$, $p<.001$) and class satisfaction($t=-2.830$, $p=.006$) [Table 3].

Table 2. General characteristics of the subjects

Characteristics	Categories	n(%)	Mean \pm SD
Age	<20-25	78(88.6)	22.85 \pm 2.93
	<25-30	7(8.0)	
	>30	3(3.4)	
Sex	Male	10(11.4)	
	Female	78(88.6)	
Average of all semesters	<2.0-2.5	3(3.4)	
	<2.5-3.0	20(22.7)	
	<3.0-3.5	33(37.5)	
	<3.5-4.0	30(34.1)	
	>4.0	2(2.3)	
Major satisfaction	Not at all	2(2.3)	
	Not satisfied	11(12.5)	
	Satisfied	55(62.5)	
	Very satisfied	20(22.7)	
Preferred teaching method	Instructor-centered lecture	75(85.2)	
	Learner-centered lecture	13(14.8)	

Table 3. Comparison of difference before and after applying flipped learning in simulation exercise course

Variable	Reliability	Pre-test	Post-test	t	p
Problem solving ability	.96	3.53±0.46	3.63±0.52	-1.342	.183
Self-directed learning ability	.95	3.51±0.45	3.66±0.53	-2.187	.031
Communication competency	.89	3.37±0.33	3.66±0.38	-5.316	<.001
Class satisfaction	.91	3.79±0.63	4.05±0.61	-2.830	.006

Discussion

Based on the results of this study, the problem solving ability increased with flipped learning in the simulation training program, but it was not statistically significant. This was different from the one that 5-6 team members could improve their problem solving ability by constant interaction while thinking about what is right and best, what should be improved in order to solve the problem through critical thinking^[5]. Therefore, repeated studies are needed to verify the effect after analyzing other factors influencing problem solving ability.

The self-directed learning ability was significantly improved by flipped learning. It is the same result as Choi and Kim that self-directed ability improved with flipped learning in the basic nursing practice course^[5]. In addition, flipped learning can be the most effective teaching method for self-directed learning ability which is supported by previous researches.^[12-13] Furthermore, it is the result of self-directed pre-study to achieve the learning goal by the members in the preliminary stage and the pre-learning link of the flipped learning method, and active learning based on the learner such as continuous interaction with the peers and discussion. In addition, it seems that the learner performed self-directed nursing process and debriefing to solve the problem of various situation in team activity.

The Communication competency statistically improved after application of flipped learning method to the simulation training. This result is consistent with previous studies that have improved communication competency by flipped learning applied to other curriculums, such as health assessment and adult nursing^[7,14]. This result seems to be attributed to the fact that learners applied continuous cooperative learning and therapeutic communication

method with members to solve the problem of various scenario situations in the simulation practice education using flipped learning.. In addition, as a facilitator, the instructor has been able to make continuous interaction among the members, and the communication competency has been improve by experiencing what was well done, the improvement and the debriefing about what is important in the scenario situation. Therefore, it is necessary to apply the teaching method of flipped learning to the theoretical subject.

The class satisfaction increased significantly after application of the flipped learning which appeared to be ineffective in the study of Choi^[10] college students, but the results of our study are consistent with those of Lee, Han and Je, Nam^[8,15]. The results showed that the learner created the self-directed environment to solve the problem of subjects, and through the class design using the 'PRTNER' model, the continuous interaction with in pre-class, in-class and post-class. However, there were various results in the previous research, so it is necessary to develop various contents about the control of pre-learning amount and the pre-learning method which can be the negative factor in the learning satisfaction.

Conclusion

The study was conducted to confirm that application of flipped learning is effective in the problem solving ability, self-directed ability, communication competency, and class satisfaction in the simulation training of nursing students. The results showed that self-directed learning ability, communication competency, and satisfaction of class were improved after applying simulation training practice with flipped learning. These results, which is meaningful as the basic data, proved that the simulation practice

education applied with flipped learning is effective as the learner-centered teaching and learning method in nursing science and is a learning strategy for strengthening the core competency of nursing students.

The follow-up study is necessary to develop the teaching and learning methods applying flipped learning to various theoretical curriculums besides the practice subjects in nursing while confirming its effect.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Development of Multifunctional Cosmetic Products with Anti-Photoaging Effect

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Abstract

Background/Objectives: Ultraviolet rays induce erythema, allergy, and skin aging. We investigated the anti-photoaging effect of stem-cell culture media and Polygona Multiflora Radix extract (GMF).

Methods/Statistical analysis: An emulsion containing natural GMF and a mixed emulsion containing stem-cell culture medium and Polygona Multiflora Radix emulsion (DMF) were prepared. Photoaging was induced in hairless mice (SKH-1) by irradiation of UVB rays thrice per week for 6 weeks. Pathological changes were examined following 5 or 10 days of emulsion application.

Findings: These mice exhibited typical signs of photoaging including increased epithelial thickness, accumulation of abnormal elastic and collagen fibers, and dermal accumulation of inflammatory and mast cells. Photoaging was significantly inhibited in all experimental groups. The group treated with DMF for 10 days showed similar levels of improvement as those observed in the control group.

Improvements/Applications: Thus, both natural GMF and DMF can reduce wrinkles caused by photoaging. In addition, our findings verify the potential of GMF and stem-cell culture media as ingredients for anti-photoaging cosmetic products.

Keywords: Polygona Multiflora Radix, photoaging, multifunctional cosmetics, stem-cell, Korean herbal

Introduction

Ultraviolet (UV) rays, a major cause of skin aging, cause wrinkle formation, pigmentation, and dermal deformation. Aging induced by UV rays differs from natural aging^[1,2]. Photoaging causes deeper wrinkles than natural aging and accelerates aging by inducing the accumulation of abnormal collagen fibers that leads to reduced skin elasticity^[3]. UV rays increase the synthesis of MMP-1, -3, -9 and -12 enzymes in fibroblasts and epithelial cells, thereby destroying matrix proteins including collagen and elastic fibers. Inflammatory cells gather and release cytokines to signal the production of enzymes required to eliminate UV-damaged cells. During this process, collagen and elastic cells are broken down, thereby promoting aging^[4,5]. Researchers have

been proposing various scientific methods that combine oriental medicine, microbiology, and food science to identify novel functional molecules that can prevent and reduce skin damage due to photoaging. Stem-cell culture media, commonly used in the field of cosmetics, contain active compounds such as proteins, cytokines, minerals, and vitamins that promote stem-cell differentiation and activity. In addition, stem-cell culture media can regulate skin differentiation and immune functions, prevent apoptosis, and treat wounds^[6,7]. Media containing only those substances that are approved to be safe can be used to make highly functional and biocompatible cosmetic products^[8]. Interest in cosmetic products containing natural herbal medicine has increased in Korean as well as in Asian and North American markets. Oriental herbal medicines contain glucose and amino acids involved in the primary metabolism of plants, and secondary substances including phenol, terpenoids, and alkaloids. Oriental herbal medicines have high potential as an ingredient for functional skin-whitening anti-aging

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cosmetic products^{9,10}. In the present study, we prepared multifunctional cosmetic products with stem-cell culture media and natural substances and tested their effect on photoaging in hairless mice.

Method

Polygonia Multiflora Radix extract (GMF), listed in Korean Herbal Pharmacopoeia, was obtained by hot water extraction. A 10% o/w emulsion (GMF) was prepared and used in the experiment. Stem-cell culture media (DCCM4), used as a cosmetic ingredient, listed in the INCI were provided by Eseumedio Co., Ltd. The culture media and GMF were concentrated two-fold to produce a 10% o/w emulsion (DMF) to be used in the final experiment. All reagents used were special grade chemicals.

Six-week-old male and female ICR/HR hairless mice (SKH-1) purchased from Orient. Co., Ltd. were bred for 18 months. The mice had *ad-libitum* access to food and water. The cage conditions were as follows: temperature, $24 \pm 2^\circ\text{C}$; humidity, $50\% \pm 10\%$; and 12:12 day/night cycle. Six experimental groups were formed containing six mice each. The mice were subjected to one of the following treatments: natural aging, photoaging, 5 days of GMF treatment after photoaging, 5 days of DMF treatment after photoaging, 10 days of GMF treatment after photoaging, and 10 days of DMF treatment after photoaging. The study was approved by the Institutional Review Board of Chonbuk National University.

A UVB lamp (Sankyo Denki, Tokyo, Japan) with an emission spectrum of 280–360 nm and a maximum peak at 360 nm was used for UVB irradiation. UVB rays were irradiated on the dorsal skin of the experimental animals thrice per week with a minimal erythral dose (MED) of 60 mJ/cm². The irradiation was performed at 1, 2, and 4 MED at 1, 2, and 4 weeks, respectively, and thereafter for total 6 weeks. Irradiation was not performed for the last 3 days to eliminate the direct effect of UVB rays. An AHA peeling solution was prepared by dissolving 30 g of glycolic acid in 50 mL of distilled water, titrating it with NaOH to pH 3.2, and adjusting the total volume to 100 mL. The solution was stored in a fridge. AHA peeling was performed once for 10 min. After neutralization with PBS and complete drying of the skin, an emulsion corresponding to the designated treatment of each group was applied. The sample was applied twice a day for 10 days, and 200 μL of the cosmetic product was applied to the entire surface of dorsal skin each time. Skin tissues

were extracted at 5 and 10 days after AHA peeling, fixed in 10% neutral formalin, and used in for histological analysis.

To study microstructures on the skin surface following irradiation, skin sections were made and examined at 40 \times , 100 \times , 400 \times , 1000 \times , and 1500 \times magnification using a scanning electron microscope.

A sharp knife was used to obtain skin tissues from the mice. The tissues were fixed in 2.5% paraformaldehyde-glutaraldehyde, washed several times with a phosphate buffer solution (4°C , 0.4 M phosphate buffer, pH 7.4), and fixed in 1% OsO₄. The fixed samples were washed with the same buffer solution, dehydrated (60%–100% ethanol), and substituted with isoamyl acetate. The treated samples were completely dehydrated and placed on a sample holder. The samples were then coated with platinum until their thickness was 20 nm using an ioncoater (IB-5ioncoater, Eiko, Japan) and examined under a scanning electron microscope.

The skin tissues were fixed in a 10% neutral formalin solution at room temperature for 24 hours. They were washed, dehydrated, cleared, infiltrated, and embedded in paraffin. Thereafter, 4- μm sections were prepared and examined under an optic microscope to study changes in the skin tissues. Paraffin blocks were stained using Hematoxylin & Eosin (H&E), Masson trichrome, and Toluidine blue Verhoeff-van Gieson stains. The stained tissue slides were histomorphometrically analyzed using an image program. Tissue thickness, number of inflammatory and mast cells, surface area of collagen and elastin, and distribution and surface area of lamella were quantified.

PASW Statistics 18.0 for Windows (SPSS Inc., USA) was used for all statistical analyses. A one-way ANOVA was performed to compare differences between the experimental groups. For measurements repeated during a certain period, repeated measures ANOVA was used to examine interaction between time and the experimental groups. A post-hoc analysis was performed to confirm statistical significance. Statistical significance was set at $p < 0.05$.

Result and Discussion

1. Changes in epithelial thickness

The skin tissues of SKH-1 hairless mice were stained with H&E, and proliferation of epithelial cells

and epithelial thickness were examined as skin markers. The control group, not subjected to UVB irradiation, had an epithelial thickness of 22.46 μm for the dorsal skin, whereas the photoaging group subjected to 4 weeks of UVB irradiation had an epithelial thickness of 203.38 \pm 23.07 μm , indicating epithelial cell proliferation. After UVB irradiation, GMF and DMF were applied for 5 and 10 days, respectively. Epithelial thickness was 86.19 \pm 12.06, 53.69 \pm 12.60, 69.76 \pm 13.31, and 32.52 \pm 11.02 μm in the GMF-5, DMF-5, GMF-10, and DMF-10 groups, respectively. These treatments reduced epithelial thickness by -40.84%, -67.16%, -62.99%, and -75.58%, respectively. The DMF-10 group showed the highest reduction in epithelial thickness and similar epithelial thickness as that of the control group [Figure 1].

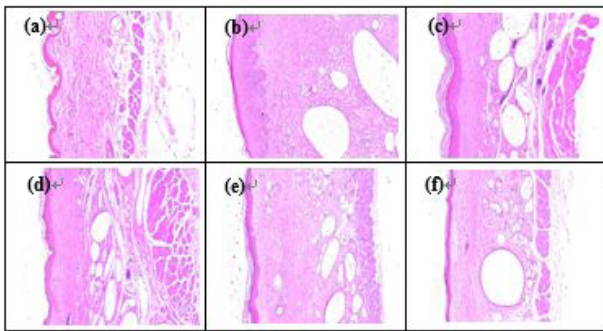


Figure 1. Photographs of histological sections of hairless mice (SKH-1) dorsal back skin by Hematoxylin&Eosin staining (Original magnification: x40, scale bar : 100 μm , a: Intact, b: Aging, c: GMF-5, d: DMF-5, e: GMF-10, f : DMF-10)

The epithelium repeatedly undergoes differentiation and proliferation to act as a barrier. Its permeable membrane minimizes the loss of skin moisture. Abnormal epithelial proliferation, which is a characteristic of photoaging, compromises the skin and causes allergy. When the skin loses its protective function, skin aging and secondary diseases can be induced, which in turn leads to inflammation. Frequent inflammation promotes aging in the surrounding cells^[11]. The reduction in abnormal epithelial proliferation observed in the DMF-10 group indicates that the mixed extract has anti-aging effect.

2. Change in dermal collagen and elastin

The dermis consists of elastic and collagen fibers. Collagen fibers are the major components of the dermis responsible for the elasticity and structural integrity of the skin^[12]. Elastic fibers, which are less abundant than

collagen fibers, contribute to skin elasticity. Skin aging is histologically defined as a decrease in the number of fibroblasts as well as elastin and collagen fibers, resulting in shrinkage of the extracellular matrix^[13,14]. In the present study, we used wrinkle patterns as a marker of photoaging and observed the accumulation of abnormal elastic and collagen fibers.

Collagen networks are destroyed and become dysfunctional due to UV rays. The accumulation of damaged collagen networks induces aging. We performed Masson's trichrome staining to evaluate the number and density of collagen fibers in the dermis [Figure 2]. The control group showed dense and regular patterns of collagen fibers, whereas the photoaging groups showed an irregular and less dense arrangement of collagen fibers due to destroyed collagen fibers. The positive control group and treatment groups showed more dense and regular patterns of collagen fibers compared with those in the photoaging groups. The density of collagen fibers increased as the concentration of emulsion increased. Elastic fibers are degraded in the dermis upon exposure to UV rays. UV rays activate elastase that promote elastic fiber degeneration, destroys the elastic fiber network, and induces neutrophil-mediated inflammation, thereby causing elastosis. We performed Verhoeff's staining to evaluate the number and density of elastic fibers in the dermis [Figure 3].

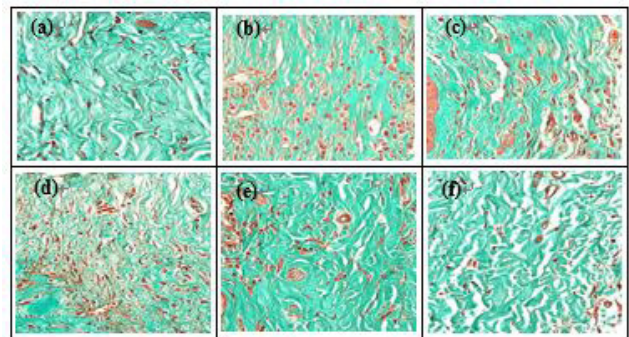


Figure 2. Photographs of histological sections of hairless mice (SKH-1) dorsal back skin by Masson trichrome staining (Original magnification: 200x, Arrow : collagen fiber, scale bar : 100 μm , a: Intact, b: Aging, c: GMF-5, d: DMF-5, e: GMF-10, f : DMF-10)

The control group showed dense and regular patterns of elastic fibers, whereas the photoaging group showed clumped and distorted elastic fibers, resulting in elastosis. The positive control group and treatment groups had reduced size and frequency of defective elastic fibers compared with those in the photoaging groups. The size and frequency of defective elastic fibers

evidently decreased as the concentration of emulsion increased. Table 1 shows changes in the measurements of the markers in the dermis. The level of dermal elastic fibers decreased by -30.48%, -52.96%, -38.58%, and -62.7% following 5 and 10 days of GMF and DMF treatments, respectively, compared with the non-photoaging control group.

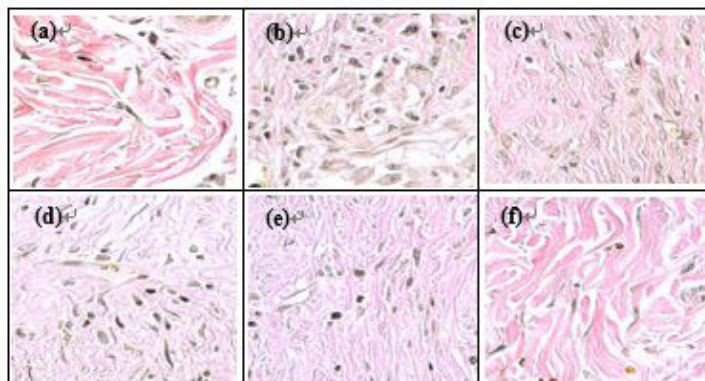


Figure 3. Photographs of histological sections of hairless mice (SKH-1) dorsal back skin by Verboeff-van Gieson staining(Original magnification: 400x, Arrow : elastin fiber, scale bar : 100 μm, a: Intact, b: Aging, c: GMF-5, d: DMF-5, e: GMF-10, f : DMF-10)

Table 1. Histomorphometrical Values Detected on the Intact or UVB Irradiated Hairless Mice Dosal Back Skins-Dermis connective tissues

	Controls		Test materials			
H	Intact	Ag-ing	GMF-5	DMF-5,	GMF-10,	DMF-10
C	52.88±5.96	78.72±4.07**	68.27±4.19*	57.40±6.06**	66.91±3.20*	52.43±4.9**
E	6.45±2.76	17.43±2.56**	12.12±2.24*	8.20±1.87**	10.70±2.27*	6.50±1.32**

(p* < 0.05, p** < 0.01).

H : Histomorphometry

C: Collagen fiber (%/mm²)

E : Elastic fiber (%/mm²)

3. Change in the number of mast cells in the skin

Examined changes in the number of mast cells by staining the skin tissues obtained from SKH-1 hairless mice with Toluidine blue. A total of 19.33 ± 3.27 mast cells were found in the dorsal dermis of mice that were not exposed to UVB rays. On the other hand, the number of mast cells in the dermis significantly increased to 128.17 ± 31.29 in the toluidine photoaging group subjected to 4 weeks of UVB irradiation compared with the control group (p < 0.01). The number of mast cells decreased by -35.37%, -57.61%, -47.85%, and -60.73% following 5 and 10 days of GMF and DMF treatments, respectively. Mast cell overproduction was inhibited in the DMF and GMF

groups. Moreover, UVB-induced mast cell overproduction was significantly inhibited in the GMF group (p < 0.01) [Figure 4].

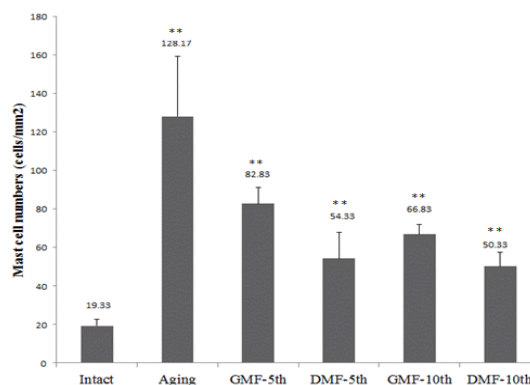


Figure 4. Photographs of histological sections of hairless mice (SKH-1) dorsal back skin by Verboeff-van Gieson staining(Original magnification: 400x, Arrow : elastin fiber, scale bar : 100 μm, a: Intact, b: Aging, c: GMF-5, d: DMF-5, e: GMF-10, f : DMF-10)

4. General characteristics of the subjects

Table 2 shows inflammatory counts. The control group showed almost no inflammatory cells, whereas the number of inflammatory cells significantly increased in the aging group. The number of inflammatory cells decreased following 5 and 10 days of GMF and DMF treatments. Similar results were reported by studies on anti-aging effect in animal skin models of photoaging. Typical characteristics of photoaging including increased epithelial thickness, accumulation of abnormal collagen and elastic fibers, and dermal accumulation of inflammatory and mast cells could be observed

following the induction of photoaging using UVB rays. The normalization of the epithelial thickness may indicate that the GMF and DMF treatments can protect and recover the skin barrier as reported in previous studies^[15]. Normalization of the skin barrier helps alleviate inflammation in the epithelium and dermis. In the present study, 5 and 10 days of DMF treatments significantly inhibited UVB-induced photoaging ($p < 0.01$, $p < 0.05$). Photoaging was more significantly inhibited in the DMF group than that in the GMF group ($p < 0.01$). Thus, GMF and DMF may be useful as ingredients of functional cosmetic products.

Table 2. Histomorphometrical Values Detected on the Intact or UVB Irradiated Hairless Mice Dosal Back Skins-Dermis connective tissues

	Controls		Test materials			
H	Intact	Ag-ing	GMF-5	DMF-5,	GMF-10,	DMF-10
I	42.50 ± 18.88	651 .67 ± 140.28 **	385 .50 ± 114.31 *	214 .00 ± 42.83 **	241 .17 ± 21.66 *	15 9.17 ± 49.18 **

($p^* < 0.05$, $p^{**} < 0.01$)

H : Histomorphometry

I : Inflammatory cell numbers (cells/mm²)

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Conflict of Interest: Nil

Conclusion

We induced wrinkle formation in hairless mice using UVB rays and found that an emulsion containing natural GMF and DMF can improve skin damage due to photoaging. The emulsions inhibited and mitigated the characteristics of photoaging including increased epithelial thickness, accumulation of abnormal elastic and collagen fibers, and dermal accumulation of inflammatory and mast cells. DMF has a significantly higher efficacy than GMF. These results demonstrate that an emulsion containing natural GMF and DMF inhibits the activity of skin aging factors induced by UVB. Thus, GMF and DMF may be used as functional, bioactive materials for anti-photoaging cosmetic products.

Ethical Clearance: Not required

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A Study on Improvement of Quality of Care-givers to Long Term Care Old Age

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Abstract

Background/Objectives: This study is a survey research to identify relationship among organizational commitment, job training satisfaction, and empowerment.

Methods/Statistical analysis: This research analyzed factors affecting satisfaction with college life using 112 nursing school students in S city as research objects. Specifically, this research examined self-resilience, communication capacity, and self-respect. In the results of this study, the organizational commitment of the subjects did not show the significant difference with the job training satisfaction and the empowerment.

Findings: There was significant positive relationship between job satisfaction and empowerment. Therefore, it is necessary to improve the quality by using the correlation between job satisfaction and empowerment.

Improvements/Applications: while this study did not find any relationship between organizational commitment and job training satisfaction, there have been other researches which report that work education improves organizational commitment. Thus, it is necessary to do repetitive researches on organizational commitment and job training satisfaction.

Keywords: *Quality, Care-givers, Job training satisfaction, Empowerment, Organizational Commitment*

Introduction

In Korea, the population aging is under way rapidly. In 2018, as the population over 65 years old occupied 14.3% of entire population, it already entered in aged society and in 2030, it is expected to super-aged society as the population over 65 would be increased to 24.3%^[1]. As the olds in modern age experienced the role loss, reduction of economic power, degradation of physical health and mental health by the aging, and the sense of loss like the death of spouse or friend, they are facing with diverse stress situations^[2, 3]. In addition, for the family and society, the very important issue of care burden by aging is arisen and the protection and care are needed by the lack of health and the independent living ability^[4]. According to the data on the survey analysis

of parents support by Statistics Korea, since the opinion that the living of the elderly over 65 years old should be taken care by the family, government and the society was 35.7%, the opinion that the responsibility for the elderly support would be shared by the family, government and society is increasing trend^[5].

Reflecting this reality, in Korea, the long-term elderly care insurance system is being implemented from July, 2008 and it was intended to promote the health and the stabilization of livelihood in later life by providing the matters on the long-term care benefits for the elderly who are hard to manage the daily living alone for the reason of old age or geriatric diseases, which have been implemented over 10 years^[6]. As the subjects who are using the care institution are increased constantly, the importance of securing the manpower to provide the high quality services is emphasized^[7], and for the quality management, the needs to complement constantly the problems by the low inflow of young manpower, lack of

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systematic educational foundation for the practitioners, low social recognition, etc. are arisen because the care services are repetitive services and career path is limited [8].

Although the poor working environment of the caregivers and the difficulties suffered in the process of services are appealed constantly, in reality, the management system is not sufficient. Since the medical fee system of long-term care system is hard to improve the compensation system or treatment of caregivers and the method to enhance the job satisfaction of caregivers is extremely limited, one of the most effective measures can be to enhance the organizational commitment^[9]. Commitment is defined as the mental and physical exited state that is felt by the people while they are concentrated on that state^[10] and those who are in the state of commitment can regulate their act and environment, work harder than other workers during their services, are have high pride and produce positive results that can exert highest ability^[11]. If such commitment is achieved during the service, diverse desires such sense of achievement, self-respect, self-efficacy, self-development, etc. are satisfied^[12].

While the number of the highly educated elderly, subject of long-term care service is increased and diverse desires are shown, the education level and the age of the caregivers is not limited causing the degradation of service quality^[13]. Foundation of national competitiveness is the human resources having knowledge, skills, motive, etc. and it is important to develop and educate them continuously^[13]. In addition, the research on the factor influencing the empowerment of caregivers^[14] reported that to solve the problem of caregiver's education level, professional skills and to make the caregivers to engage in the service with self-confidence, the constant education through the refresher training or reeducation is needed. Therefore, the systematic measures for the job training of caregivers should be prepared and the research on the effects of job training satisfaction on the organizational commitment and the empower is needed^[13]

Therefore, to enhance the quality of caregivers and to induce their job performance to more effective and positive direction, this study examined the organizational commitment, job training satisfaction and the empowerment.

Method

1. Research Design

This study is a descriptive and investigative study conducted to identify the association and correlation among the organizational commitment, empowerment and job training satisfaction of caregivers.

2. Research Subjects

Study subjects were caregivers working at long term caregiving facilities located in city S. To select subjects, convenience sampling was used to select 139 caregivers working at long term care facilities. These participants understood the objectives of the study and gave their consent to the questionnaire. Excluding^[15] copies of the questionnaire that were not retrieved or that had insufficient responses, the data from 124 subjects were used for final analysis.

3. Research Tool

3.1. Organizational Commitment

To measure the organizational commitment, the measurement items developed by^[15] and used in the research by^[16] was used. To measure the organizational commitment, the sub-level factors were measured with the total 18 questions: 6 questions of affective commitment, 6 questions of continuance commitment and 6 questions of normative commitment and all the questions were measured 5 point-Likert scale: 1 point for 'Not at all' 2 points for 'No', 3 points for 'Normal', 4 points for 'Yes' and 5 points for 'Absolutely yes'. The reliability in this study was Cronbach's $\alpha = .86$.

3.2. Job Training satisfaction

Job training satisfaction was measured using the measurement items with the contents about caregivers job training satisfaction by Ministry of Health and Welfare used in the research by^[17]. The sub-level factors of the job training satisfaction were measured with questions evaluating the satisfaction with 17 sub-level educational contents by 5 job training area composed of the human rights of elderly and vocational ethics, understanding of dementia, safety management of daily living and exercise in elderly, description of health care benefit and system, and related regulations. All the questions were measured 5 point-Likert scale: 1 point for 'Not at all' 2 points for 'No', 3 points for 'Normal', 4 points for 'Yes' and 5 points for 'Absolutely yes'. The reliability in this

study was Cronbach’s $\alpha = .91$.

3.3. Empowerment

To measure the empowerment, the empowerment scale of caregivers developed by^[18] and corrected and complemented by^[19] was used

The detailed domain of empowerment was composed of environmental empowerment, relational empowerment and individual empowerment and they are measured with 5-point Likert scale: 1 point for “Not at all” and 5 points for “Absolutely yes”. It means that the higher the score, the higher the level of empowerment. In this study, the reliability is Cronbach $\alpha = .83$.

3.4. Data Collection

Data for the study were conducted using a self-reported structured questionnaire on caregivers working at long term care facilities in city S, from April 15 to April 30, 2018. To abide by ethical standards, the objectives of the study, an explanation was given on the time it will take to fill out the questionnaire, and details regarding privacy protection of study participants before asking for their voluntary consent. A consent form and signature of caregivers wishing to take part in the study were collected. Participants were told that they are free to withdraw from the study at any point in time. They were also informed that the collected data would be used for no other purpose than this study, and the anonymity of the participants will be upheld. It took approximately 10-15 minutes to complete the questionnaire. Participants were given an explanation that the collected data would not be used for any other purpose than this study.

Result

1. General characteristics of the subjects

The subject was 100% female and age between 40 and 49 was 64% the most. In the marital status, married was 91.9% the most, in the education level, college graduate was 63.7% the most and in the religion, Christian was 64.5%, Catholic was 21.0% and Buddhist was 7.3% in order. In the service period, 2-3 year was 41.1% the most and in the certification acquisition type, the acquisition by qualification test was 90.3% the most. In the health, “So-so” was 50.0% and “Healthy” was 28.2%[Table 1].

Table 1. General characteristics (N=124)

Characteristics	Categories	N (%)
Gender	Female	124(100)
	Male	0(0)
Age(year)	40-49	64(51.6)
	50-59	42(33.9)
	50 upper	18(14.5)
Marital status	Married	114(91.9)
	Single	6(4.8)
	Divorce and Bereavement	4(3.2)
Final education	High school	45(36.3)
	University	79(63.7)
Religion	Christian	80(64.5)
	Catholic	26(21.0)
	Buddhism	9(7.3)
	Etc	1(0.8)
	None	8(6.5)
Work experience	1-2 Year	48(38.7)
	2-3 Year	51(41.1)
	3-5 Year	23(18.5)
	5 Year upper	2(1.6)
Type of Certification	No test /education	12(9.7)
	Acquired by Examination	112(90.3)
Health	Very Health	3(2.4)
	Healthy	35(28.2)
	Normal	62(50.0)
	Unhealthy	24(19.4)

2. Empowerment according to General Characteristics

In the results of analyzing the difference in the empowerment according to general characteristics of the subjects, there was significant difference in the religion ($F=1.97, p=.03$) [Table 2].

Table 2. Empowerment according to general characteristics (N=124)

Characteristics	Categories	N (%)	M±SD	t or F(p)
Gender	Female	124(100)	3.21±0.18	-
	Male	0(0)		
Age(year)	40-49	64(51.6)	3.23±0.16	1.82 (.48)
	50-59	42(33.9)	3.21±0.19	
	50 upper	18(14.5)	3.15±0.22	
Marital status	Married	114(91.9)	3.20±0.18	0.80 (.66)
	Single	6(4.8)	3.36±0.14	
	Divorce and Bereavement	4(3.2)	3.18±0.26	
Final education	High school	45(36.3)	3.17±0.19	1.27 (.24)
	University	79(63.7)	3.23±0.17	
Religion	Christian	80(64.5)	3.17±0.16	1.97 (.03)
	Catholic	26(21.0)	3.32±0.13	
	Buddhism	9(7.3)	3.25±0.24	
	Etc	1(0.8)	2.93±0.00	
	None	8(6.5)	3.17±0.28	
Work experience(years)	1-2	48(38.7)	3.21±0.15	1.31 (.22)
	2-3	5(41.1)	3.22±0.21	
	3-5	23(18.5)	3.20±0.16	
	5 over	2(1.6)	3.11±0.05	
Type of Certification	No test/education	12(9.7)	3.15±0.19	.67 (.79)
	Acquired by Examination	112(90.3)	3.21±0.18	
Health	Very Health	3(2.4)	3.17±0.23	1.59 (1.00)
	Healthy	35(28.2)	3.27±0.17	
	Normal	6(50.0)	3.20±0.17	
	Unhealthy	24(19.4)	3.15±0.20	

3. Degree of the Variable of the Subject

The organizational commitment of the subject was 3.18±0.16, the job training satisfaction was 3.23±0.16 and the empowerment was 3.21±0.18[Table 3].

Table 3. Degree of the Variable of the Subject (N=124)

Variables	M±SD	Min.	Max.
Organizational commitment	3.18±0.16	2.78	3.33
Job training satisfaction	3.23±0.16	2.82	3.52
Empowerment	3.21±0.18	2.71	3.64

4. Relationships among the Study Variable

The organizational commitment of the subjects did not show significant correlation with the organizational commitment ($r=.05$, $p=.589$) and the empowerment($r=.50$, $p=.600$). However, the job satisfaction showed the significant positive correlation with the empowerment ($r=.22$, $p=.016$)[Table 4].

Table 4. Relationships among the Study Variable (N=124)

Variables	Organizational commitment	Job training satisfaction	Empowerment
	r(p)	r(p)	r(p)
Organizational commitment	1	.05(.589)	.50(.600)
Job training satisfaction		1	.22(.016)*
Empowerment			1

Discussion

In the results of this study, the organizational commitment of the subjects did not show the significant difference with the job training satisfaction and the empowerment. However, the job training satisfaction showed the significant positive correlation with the empowerment.

The organizational commitment means that a member of organization has strong desire and pride for the goal of organization and the value creation with high confidence on the his organization^[20]. If the organization commitment is achieved, the positive functions are appeared from the member of organization ^[21], strong belief on the goal and the value of organization is generated and the effort of the individual demanded by organization is made voluntarily^[22].

According to the research on the needs of job training for caregivers and the training plan, to satisfy

their needs and reinforce the expertise, the job training should be implemented^[23], and it reported that in the results of identifying the demand of caregivers for the training, more than 80% of the caregivers working in the elderly nursing home answered that the refresher training is required^[24]. In addition, it reported that for the organizational commitment of caregivers, the job training is needed^[25], and together with the quality improvement and the expertise of the caregivers, diversification of job training is needed ^[26]. Through this preceding research, the job training for caregivers is needed and the job training satisfaction should be enhanced through the reflection of the diverse programs for job training and the demand, based on which, it is deemed that the empowerment can be enhanced

Conclusion

For the limitation of this study and the quality improvement of caregivers in future, the author propose followings.

First, to determine the relations among the organizational commitment, job training satisfaction and the empowerment of the caregivers, the subjects should be expanded and the replication research is required.

Second, to enhance the job training satisfaction of the caregivers, diverse programs and systematic policies are required. The research on them and constant management are required.

Finally, this study is the research to examine the relations among the organizational commitment, job training satisfaction and the empowerment and in future, the research that will analyze their factors is needed

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Factors Affecting the Clinical Competency of Nursing Students in Pediatric Nursing Clinical Practice

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Abstract

Background/Objectives: This study aims to investigate the effects of clinical training stress and clinical training satisfaction on clinical competency during pediatric nursing training in nursing students.

Methods/Statistical analysis: Ninety-one nursing students participated in this study, and data were collected from May 29 to November 10, 2017. The collected data were analyzed using SPSS 22.0.

Findings: This study found that clinical competency had a significant negative correlation with clinical training stress ($r = -.356, p < .001$) and a significant positive correlation with clinical training satisfaction ($r = .524, p < .001$). Clinical training satisfaction ($\beta = .439, p < .001$) and conflict with pediatric patients, a component of clinical training stress ($\beta = -.226, p = .019$), were identified as factors having significant effects on clinical competency during pediatric nursing clinical training.

Improvements/Applications: It is important to plan clinical training while considering the factors affecting it to enhance nursing students' clinical competency during pediatric nursing clinical training.

Keywords: *Nursing students, Clinical practice stress, Clinical practice satisfaction, Clinical competency, Pediatric nursing clinical practice*

Introduction

Clinical practice is a crucial component in cultivating nursing professionals, in that it is a learning process that fosters students' creativity and practical abilities by applying theoretical education to clinical practice [1]. However, the stress students accumulate during clinical training diminishes their interest in clinical training and reduces their learning abilities, ultimately undermining their clinical competency [2]. Many studies have reported the effects of stress and satisfaction with clinical training in all disciplines on clinical competency, which may differ from pediatric nursing training, where the needs and coping skills may differ according to the stage of development [3]. Even though pediatric nursing training has more restrictions than other nursing training programs [4], only a handful of studies have examined pediatric nursing training.

Thus, this study aims to investigate the effects of stress and satisfaction with pediatric nursing training on clinical competency in nursing students to provide baseline data for enhancing the clinical competency of nursing students who provide care for pediatric patients.

Method

1. Study design

This study is a descriptive correlational study investigating the effects of stress and satisfaction with pediatric nursing training on clinical competency in nursing students.

2. Participants

Ninety-two nursing students undergoing pediatric nursing training who provided informed consent to participate were enrolled in this study. The minimum sample size was calculated using the G*Power 3.1.9.2

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software. With a moderate effect size of .15, significance level of .05, and power of .90 for two variables for multiple regression, the required sample size was calculated to be 88. After excluding one questionnaire considered inappropriate, questionnaires from 91 (98.9%) participants were included in the final analysis.

3. Research variables

3.1. Clinical practice stress

Clinical training stress was assessed using the clinical training stress scale developed by Beck and Srivastava (1991) [3] and modified and adapted by Kim and Lee (2005) [5] for use in pediatric nursing training. This 24-item tool comprises five domains: Training and educational environment (5 items), inappropriate role models (6 items), burden of training work (4 items), interpersonal conflict (4 items), and conflict with patient (5 items). Each item is rated on a 5-point Likert scale, with a higher score indicating a higher level of clinical training stress. The Cronbach's alpha in Kim and Lee's (2005) [5] study was .91, and that in our study was .96.

3.2. Clinical practice satisfaction

Clinical training satisfaction was assessed using the clinical training satisfaction scale developed by Cho and Kang (1984) [6] and modified and adapted by Lee et al. (2004) [7] for use in pediatric nursing training. This 31-item tool comprises six domains: Courses (3 items), content (6 items), guidance (9 items), circumstances (7 items), hours (3 items), and evaluation (3 items). Each item is rated on a 5-point Likert scale, with negative-worded items reverse scored, and a higher score indicates a higher level of satisfaction with clinical training. The Cronbach's alpha in Lee et al.'s (2004) [7] study was .89, and that in our study was .92.

3.3. Clinical competency

Clinical competency was assessed using the scale of nursing performance developed by Schwirian (1978) [8] and modified and adapted by Choi (2005) [9] for use in pediatric nursing training. This 45-item tool comprises five domains: Comprehensive nursing (11 items), nursing skills (11 items), teaching/collaboration (8 items), interpersonal relationships/communication (6 items), and professional development (9 items). Each item is rated on a 5-point Likert scale, with a higher score indicating a higher level of clinical competency. The Cronbach's alpha in Choi's (2005) [9] study was .92, and that in our study was .94.

4. Survey method

The study was conducted from May 29 to November 10, 2017, and the participants were informed about the purpose and procedure of the study and the guarantee of anonymity and confidentiality. After guaranteeing that the collected data would be used only for research purposes, written consent was obtained and the participants were informed that the collected data can be withdrawn at any time without any disadvantages.

5. Data analysis method

The collected data were analyzed using the IBM SPSS 22.0 software according to the following analyses:

1) Participants' general characteristics, clinical training stress, clinical training satisfaction, and clinical training competency were analyzed with descriptive statistics.

2) Correlations among participants' clinical training stress, clinical training satisfaction, and clinical competency were analyzed using Pearson's correlation coefficients.

3) The factors that affect clinical competency were identified using stepwise multiple regression analysis.

Result

1. Differences in variables by general characteristics

As shown in Table 1, the mean age was 21.8 years, and the majority of the participants were female ($n = 82$). Altogether 51 participants were third-year students undergoing clinical training in the nursery, while 40 participants were fourth-year students undergoing clinical training in the pediatric ward.

Clinical training stress was significantly higher among fourth-year students, while clinical training satisfaction was significantly higher among third-year students. However, there were no significant differences in clinical competency according to grade level. There were no statistically significant differences in the study variables by sex. The mean clinical training stress score was 2.25 (0.57), and the mean clinical training satisfaction score was 3.81 (0.56). The mean clinical competency score was 3.98 (0.53).

Table 1. Differences in variables by general characteristics**(n = 91)**

Characteristics	Categories	N(%) or Mean(SD)	Clinical practice stress		Clinical practice satisfaction		Clinical competency	
			M (SD)	t(p)	M(SD)	t(p)	M(SD)	t(p)
Gender	Male	9(9.9)	2.02 (0.48)	-1.26(.21)	3.92(0.53)	0.63 (.53)	4.11(0.59)	0.80(.43)
	Female	82 (90.1)	2.27 (0.58)		3.80(0.57)		3.96(0.53)	
Year of study	Third	51 (56.0)	2.04 (0.54)	-4.18 (< .001)	3.93(0.51)	2.22(.03)	4.06(0.52)	1.76(.08)
	Fourth	40 (44.0)	2.51 (0.51)		3.67(0.60)		3.87(0.53)	
Age (years)	-	21.8 (0.87)	2.25(0.57)		3.81(0.56)		3.98(0.53)	

2. Levels of clinical practice stress, clinical practice satisfaction, and clinical competency

The mean scores for each domain for each variable are shown in Table 2.

Table 2. Levels of clinical practice stress, clinical practice satisfaction, and clinical competency (n = 91)

Variables		Min.	Max.	Mean	SD
Clinical practice stress	Environment for clinical practice	1.00	4.60	2.91	0.79
	Inappropriate role models	1.00	4.00	2.24	0.69
	Burden of clinical practice activity	1.00	4.50	2.62	0.74
	Interpersonal conflicts	1.00	4.00	1.76	0.67
	Conflicts with children patients	1.00	3.20	1.68	0.65
Clinical practice satisfaction	Courses	1.67	5.00	4.06	0.77
	Content	2.33	5.00	3.55	0.51
	Guidance	2.22	5.00	3.82	0.75
	Circumstances	2.14	5.00	3.80	0.67
	Hours	1.67	5.00	3.95	0.85
	Evaluation	2.33	5.00	3.95	0.75
Clinical competency	Comprehensive nursing	2.91	5.00	3.97	0.53
	Nursing skills	2.27	5.00	3.97	0.60
	Teaching/collaboration	2.25	5.00	3.87	0.72
	Interpersonal relationship/communication	2.33	5.00	3.97	0.69
	Professional development	2.78	5.00	4.09	0.62

3. Correlations among clinical practice stress, clinical practice satisfaction, and clinical competency

Clinical competency is significantly correlated with clinical practice stress ($r = -.356, p < .001$) and with clinical practice satisfaction ($r = .524, p < .001$), as shown in Table 3.

Table 3. Correlations among clinical practice stress, clinical practice satisfaction, and clinical competency
(n = 91)

Variables	1 r(p)	2 r(p)
Clinical competency1	1	
Clinical practice stress2	-.356(< .001)	1
Clinical practice satisfaction	.524(< .001)	-.542(< .001)

4. Influencing factors of clinical competency

Stepwise multiple regression analysis was performed with clinical competency as the dependent variable and the domains of clinical training satisfaction and clinical training stress as the independent variables to examine the explanatory power of the factors related to clinical competency. The Durbin-Watson statistic was 1.93, confirming no problem of autocorrelation. Tolerance was above 0.1 (0.857), and the variance inflation factor (VIF) was below 10 (1.167), confirming that there was no problem of multicollinearity.

As a result of the regression analysis, the model of the regression equation was appropriate ($F = 20.606, p < .001$), and the explanatory power of the model was 30.3%. The factors affecting clinical competency during pediatric nursing clinical practice were clinical practice satisfaction ($\beta = .439, p < .001$) and conflicts with patient children as a sub-factor of clinical practice stress ($\beta = -.226, p = .019$), as shown in Table 4.

Table 4. Factors influencing clinical competency
(n = 91)

Variables	B	SE	β	t	p
Constant	2.700	.414		6.526	<.001
Clinical practice satisfaction	.416	.090	.439	4.617	<.001
Conflicts with children patients	-.185	.078	-.226	-2.383	.019
Adj. RI = .303, F = 20.606, p < .001					

Discussion

This study aimed to examine the effects of stress and satisfaction with pediatric nursing training on clinical competency in nursing students.

Stress during pediatric nursing training was significantly higher among fourth-year students, while satisfaction with training was significantly higher among third-year students. Considering that clinical stress tends to decline while satisfaction increases as students advance in years of study, our results seem to be attributable not to the difference in years of study but to the difference in the unit where the pediatric nursing training occurs, as third-year students undergo training in the nursery unit while fourth-year students undergo training in the pediatric ward.

The mean clinical training stress score was 2.25, which was lower than that found in Kim et al. [10] (3.16), Kim et al. [5] (3.33), Lee et al. [11] (3.49), and Yang [12] (3.6). Although these studies examined the entire clinical training experience, we limited our study to pediatric nursing training. In our study, satisfaction was the greatest with the courses, suggesting that clinical training involving pediatric patients is less stressful than caring for adult patients. Regarding the mean score for each domain, the score for clinical training environment was the highest and that for conflicts with pediatric patient was the lowest, which was consistent with the results of Yang [12]. Because environment is a major factor contributing to stress [13], clinical training environments should be improved to lower students' stress.

The mean score for clinical training satisfaction was the highest for courses and lowest for content. The high satisfaction with courses is consistent with the finding of Lee et al. [7], and the low satisfaction with content (caring for children) is consistent with the results of Lee et al. [7], Kim et al. [14], and Lee [15]. Therefore, to enhance the content of clinical training, it is necessary to provide opportunities for students to perform problem-focused nursing, as opposed to simple and functional activities.

There were no statistically significant differences in clinical competency during pediatric nursing training according to sex. There were both reports that male students show higher clinical competency than female students [16-18] and that there are no differences by sex [10,19]. Our results may be influenced by children's familiarity with female students, but further studies are needed of sex-specific differences in clinical competency. In terms of the domains of clinical competency, professional development was rated the highest, which is consistent with previous findings [9,16-17,19]. However, unlike previous studies, where comprehensive nursing was rated the lowest [9,16-17,19], teaching/collaboration was rated the lowest in our study. This seems to reflect the recent advances in the clinical teaching environment, whereby comprehensive nursing is faithfully applied.

Clinical competency during pediatric nursing training had a significant negative correlation with clinical training stress and a significant positive correlation with clinical training satisfaction; clinical training stress and clinical training satisfaction were significantly negatively correlated. This suggests that students demonstrate increased clinical competency with decreasing clinical training stress and increasing clinical training satisfaction during pediatric nursing training, which is in line with previous findings^[9,20].

In our study, stress from conflict with pediatric patients and clinical training satisfaction during pediatric nursing training were identified as factors that affect clinical competency, and they explained 30.3% of the variance. This suggests that methods to lower stress while boosting satisfaction should be included in measures to promote clinical competency during pediatric nursing training.

Conclusion

The goal of clinical nursing training is to boost nursing students' clinical competency, so clinical training is a core component of nursing education. Nursing students' stress and satisfaction with clinical training transcend the psychological dimension; they show how supportive the training environment and role have been, and a quality clinical training experience helps students demonstrate their competency in the corresponding nursing practice following the completion of education.

Our findings showed that lowering stress and increasing satisfaction during pediatric nursing training are an important target to promote clinical competency, so subsequent studies should examine this in relation to various forms of training education

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Development Strategy for National Fitness Award 100 via comparison and Analysis of the Korean Government's Health Policy Projects

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Abstract

Background/Objectives: This study aims to offer development strategy for public policies to be implemented more efficiently by conducting comparative analysis of the Ministry of Culture, Sports and Tourism's (MCST's) National Fitness Award 100, Korea's iconic health policy project, with the Ministry of Health and Welfare's (MOHW's) Integrated Health Promotion Program.

Methods: Content analysis was used to compare and analyze the materials on health policies and a group of experts were brought together to devise differentiated development strategies for National Fitness Award 100.

Findings: First, systematic foundation enabling the sharing of professionals, facilities and programs should be built through law revision. Second, a system should be in place to cooperate with relevant agencies dealing with health policies. Third, programs for physical activities should be developed and advanced. Fourth, the participant target should be expanded so that the project can become the foundation of lifetime physical activity. Fifth, promotions and campaigns to facilitate the program should be conducted to attract citizens to National Fitness Award 100.

Conclusion: National Fitness Award 100 program can become a differentiated project through legal revisions and operation system building for the cooperative operation of health policy projects.

Keywords: Health policy project, National Fitness Award, Integrated Health Promotion Program, Development strategy

Introduction

According to the recently announced demographic structure data of Korea, the median age is to increase from 40.9 in 2015 to over 50 in 2033, and even further to 58.7 in 2065, while the aging index will exceed 100 in 2017 and multiply by 4.4 times to 442.3 in 2065^[1].

Such an escalation in the elderly population will boost the overall chronic disease prevalence rate, thereby pushing up the medical expenses of the senior population

and having an absolute impact on the national medical expenses^[2]. This causes an anxiety over social finance.

Above all, Organization for Economic Co-operation and Development's (OECD's) member average of annual medical expenditures were 3.6% in 2003-2009 and 1.4% in 2009-2016. On the contrary, Korea's corresponding figures were 8.5% and 5.7%, increments of 4.9% and 4.3%, respectively^[3], higher than the OECD average. The fact that Korea's health expenditures displayed an upsurge, going against the global trend^[4], exhibits the inevitability of the need to change and revise the current health policy.

The Korean government has shifted its health and medical policy direction from focusing on treatment to

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disease prevention, legislated National Health Promotion Law and implemented health promotion projects since 1998 in order to contribute to national health promotion and expenditure reduction. Starting in 2011, it initiated National Fitness Award 100 under Article 16 Section 2 of the National Sports Promotion Act, and has been expanding the scope of health policies^[5]. Although the two projects differ in the drivers and competent ministries, they operate similar programs in detail such as fitness measurement, exercise prescription, sports classes, etc. with the purpose of promoting national health and fitness^[6], which are mostly pro bono with state funding^[5]. However, an issue was recently raised at the public project operation evaluation that government's investment in similar projects may lead to wasting the budget, calling for discussions among relevant government agencies about the operation and operational reexamination as the issue may hinder the efficient operation and sustainable and effective service for the citizens^[7].

Nevertheless, the controversies and criticisms of similar projects without in-depth and comprehensive analysis of the two projects may actually damage their purposes and values. Such problems may not only make it difficult for the agencies to run the projects but it may also be neglecting and countering the citizens' demands to achieve the fundamental purpose - personal health and happiness.

Therefore, the overlap or difference of the two projects should be judged only after comparing and analyzing them. This research conducts a comparative analysis of National Fitness Award 100, Korea's representative health policy project, and Integrated Health Promotion Program to overcome concerns and problems of overlapping projects and suggest development strategies that could boost the efficiency of government budget spending by allowing the projects to learn each other's strengths and expertise.

Method

1. Subject

This study selected the MCST's National Fitness Award 100, Korea's iconic health policy project, and the MOHW's Integrated Health Promotion Program as the subject according to the research objectives. Relevant reports and papers on the specifics of physical activity projects, meeting materials and activity report on policies and services, comprehensive communication documentaries provided on the websites of related agencies, etc. were collected for analysis.

2. Analysis methods

This research applied content analysis to compare and analyze the detailed project materials regarding physical activities in the National Fitness Award 100, Korea's iconic health policy project, and the Integrated Health Promotion Program. Content analysis, through which the information acquired indirectly on the subject is switched and computed, is useful to analyze secondary qualitative data^[8].

In addition, an expert group (experts on MOHW's Integrated Health Promotion Program policies (2), experts on MCST's National Fitness Award 100 policies (2), on-site experts (4), doctor and professor in public health (2), doctor and professor in physical education (2)) was organized to compare and analyze the two programs and formulate strategies to develop policies. From data collection to its interpretation, the experts discussed to come to a consensus in order to secure the objectivity and integrity of the data.

Result

1. Comparative analysis of National Fitness Award 100 vs Integrated Health Promotion Program

1-1. Project implementation basis and objective

The objective of National Fitness Award 100, based on National Sports Promotion Act Article 16-2, is to conduct sports-for-all activities and certification of fitness by encouraging citizens' voluntary participation in sports for all and supporting scientific fitness management. Integrated Health Promotion Program, based on National Health Promotion Act Article 6, Article 19, Article 19 of the Enforcement Decree of the same Act, Law for Community Health Article 9, aims to practice healthy life, prevent chronic diseases and manage health of vulnerable class^[9].

According to the analysis of project implementation basis, the two projects have different legal grounds: National Sports Promotion Act and National Health Promotion Act. While National Fitness Award 100 supports scientific fitness management and encourages sports-for-all participation through physical activity-oriented program operation, Integrated Health Promotion Program includes physical activities for health management as a part of its entire project.

1-2. Project progress

National Fitness Award 100 built a citizen fitness certification system in 2011 and ran a pilot version of national fitness certification program in order to support scientific fitness management and encourage participation

in sport for all by offering customized exercise prescription service and fitness promotion program. After switching to an official program, the participant range was expanded to senior citizens in 2013 and teenagers in 2014, thereby increasing the number of Citizen Fitness Assessment Centers constantly (43 centers as of 2018). In 2018, on-demand teams (2), National Fitness Award On-Demand Bus (1) and mobile sports activity certification affiliated with private app additionally began operation, extending the support for those marginalized from physical activities. On the other hand, Integrated Health Promotion Program initiated a pilot program at 18 public health centers in 1998, which expanded to all the centers across the country in 2005. Physical activity, in particular, began operation as an individual program of the Integrated Health Promotion Program for local communities in 2013-2015 and was created as a new area on the regional medical information system in 2016

1-3. Project target

National Fitness Award 100 targets youth aged 13 or older, adults and seniors, while Integrated Health Promotion Program is operated for all citizens from infants to the elderly, the disadvantaged group and multicultural families.

According to the project target analysis, the two projects appeared to be different because National Fitness Award 100 targets those aged 13 and over, while Integrated Health Promotion Program provides services to citizens of all ages. The latter, in particular, has a difficulty in drawing the youth because it conducts physical activity programs along with nutrition, anti-smoking, anti-alcoholism, etc. programs.

1-4. Standardization of operation process

As the operational process of National Fitness Award 100 is standardized, anyone who visits Citizen Fitness Assessment Centers will go through identical procedures. Such standardization of the process has been validated and applied via pilot programs and research on national fitness and health promotion that preceded National Fitness Award 100. The process was also standardized because it is important to constantly motivate citizens to take part in sport for all.

However, Integrated Health Promotion Program's operation process for physical activity program has not been standardized. Hence, it takes different forms according to the situations at the public health centers. Among fitness measurement, exercise prescription

and sports classes, the centers either select one or mix multiple services.

1-5. Professionalism of project contents

1-5-1. Professionalism of fitness measurement items and assessment criteria

National Fitness Award 100 categorizes its targets into youth aged 13 or older, adults and the elderly. The experts measure each group's fitness and develop as well as apply the required fitness items themselves. As fitness certification is conducted based on the fitness measurement results, the project guarantees the professionalism of the fitness measurement items and criteria, which are necessary for the scientific fitness management of the citizens, through an objective and valid procedures.

On the other hand, Integrated Health Promotion Program only provides guidelines based on study findings from Establishing Cut-off Point of Physical Fitness by Age in Early Childhood^[10], youth physical activity promotion system (PAPS) manual^[11], Korean national fitness assessment 2011^[13], etc.

1-5-2. Sports and fitness promotion class operation environment

National Fitness Award 100 has two exercise prescriptors and two fitness measurement staff with the state registered sport-for-all instructor certification working at each Citizen Fitness Assessment Center and requires by regulation that an exercise prescriptor has to participate in a fitness promotion class if in operation.

Integrated Health Promotion Program, however, is being operated without any standard in dispatching instructors. Citizen Fitness Assessment Centers were selected because they fulfill the sports facility requirements, enabling them to operate sports programs considering the participant needs. However, Integrated Health Promotion Program has a trouble providing programs according to the user needs because it did not have any facility standards related to sports classes.

1-5-3. Building system to share information and secure big data

National Fitness Award 100 has computerized and managed all the information acquired through the program including the fitness measurement results and assessment levels upon receiving the consent

to collection of personal information. However, as Integrated Health Promotion Program does not have a system in place to share information or secure big data, it cannot gather data to analyze an individual's continued fitness and health management as well as the mid- to long-term effect of the government investment.

2. Development strategies for National Fitness Award 100

2-1. Legal revisions to vitalize physical activities

Most exercise specialists currently working at public health centers vary in terms of the professional education they received on strengthening fitness and have different level of competencies according to the work environment and characteristics^[13]. On the other hand, National Fitness Award 100 specialists are qualified by the government, meaning they have the suitable expertise to teach physical activities. Furthermore, the obligatory regulation that they must be on site at all times enhanced the user safety and satisfaction, thereby boosting re-participation rate. As such, vitalizing physical activities is an important factor affecting health promotion, which is why these instructors should be utilized more widely. Moreover, the law should be revised so that facilities and programs, on top of the instructors, can be discussed for sharing and affiliation. Legal revision will lead to cooperative and affiliated health policies and programs, which will bring about positive effects, save the government budget and become an effective tool to utilize a wide pool of experts.

2-2. Cooperative system building to enable constant physical activity participation

Both programs are merely recommending all participants to work out in their daily lives at the moment. To resolve such issues, National Fitness Award 100 should take advantage of the fact that public health centers are highly accessible and advertise its programs there, while Integrated Health Promotion Program could be advertised through National Fitness Award 100's promotions and campaigns as they are comparatively more well known. In addition, since medical-based basic health examination and dietary consultation are available^[16], measures to prompt physical activities in a safe manner should be conceived

2-3. Development and advancement of physical activity programs

The major reason holding Koreans back from participating in physical or sports activities is lack of time^[14]. To minimize such problem in reality, the On-Demand program operated as a part of National Fitness

Award 100 should be expanded and a system to support the operation of integrated health management should be installed for venues that want to take part.

Meanwhile, the ministries should maintain and step up cooperation with the Ministry of Education to utilize the physical activity promotion system (PAPS) that was introduced to address youth obesity and strengthen fitness. They should also collaborate to advance the health management programs to render them fun and interesting by reflecting teenager characteristics. As the level of youth physical activities, arbitrated by social support, is relevant to those of parents and friends^[15], such factors should be considered when developing programs and devise strategies to constantly update the existing ones.

2-4. Expansion of targets

National Fitness Award 100 only targets citizens who are 13 years old and up, unlike Integrated Health Promotion Program, which provides the service to all nationals. The US and Germany offer President's Challenge and Sports Badge programs, which are similar to National Fitness Award 100, to citizens at the age of 6, while also operating programs for all age groups^[7] to encourage participation in physical activities according to the life cycle.

It is crucial for National Fitness Award 100 to expand its targets to under 13 as the participation in sports during childhood forms a lifetime exercising habit and a foundation for lifetime physical activities. It is also imperative to categorize subjects into more detailed groups in order to achieve its goals. Close cooperation with relevant agencies will be conducive to reducing operational costs for physical activities and maximizing the effect.

2-5. Promotion and vitalization campaign

National Fitness Award 100 consists of fitness certification and fitness promotion classes. The number of citizens participating in the fitness certification started at 4,583 in 2011 and recorded 211,807 in 2017, an increase of 50,685 compared to 2016. As for the fitness promotion classes, 1,250 took part in 2012 and grew to 9,492 in 2017, an increase of 1,928 year-on-year^[14]. As such, the participating population is growing by the year but is still very low when seeing the entire ratio. Therefore, it should attract more participants by collaborating with Integrated Health Promotion Program, which operates with a myriad of public health centers, a much larger number compared to the Citizen Fitness Assessment Centers, hold diverse events and provide various benefits (health mileage) to outstanding participants.

Conclusion

In a nutshell, legislative revision and establishment of operation system for cooperative operation of health policy projects will differentiate National Fitness Award 100. Moreover, such cooperative operation system will drive the development and advancement of the programs that could offer professional physical activity service, one that only National Fitness Award 100 would be capable of providing, resulting in high user satisfaction and motivating sustained physical activities. On top of this, continuing the strategic advertisement and campaign will also play a crucial role in building an environment where National Fitness Award 100 is more prevalent.

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The Factors affecting Burnout of the Small and Medium Hospital Nurses

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Abstract

Background/Objectives: The purpose of this study was to identify the factors affecting burnout among nurses in small and medium sized hospitals.

Methods/Statistical analysis: A Participants in the study were 200 nurses. As the instruments, a subscale of the Professional Life of Quality Scale and structured questionnaire on self-esteem and job satisfaction was used. Data were analyzed using descriptive statistics, and hierarchical regression.

Findings: The mean scores of burnout, self-esteem, compassion satisfaction, and secondary traumatic stress were 2.68 ± 0.63 , 3.48 ± 0.75 , 3.49 ± 0.68 , and 2.77 ± 0.53 respectively. And also, the mean score job satisfaction was 3.53 ± 0.57 . As a result of hierarchical regression analysis, Of the variables added in Model 3, only the reward system was a significant factor affecting burnout. Self-esteem, compassion satisfaction, and secondary traumatic stress were also statistically significant factors affecting burnout.

Improvements/Applications: The current study suggests that in order to solve the burnout of nurses, secondary traumatic stress should be alleviated, and the reward system in hospitals of Korea should be improved.

Keywords: *Burnout, Compassion satisfaction, Secondary traumatic stress, Self-esteem, Job satisfaction*

Introduction

A hospital is a place where various occupations provide medical services and are maintained by professional personnel. In health care environments, there is a growing interest in not only patient care but also service satisfaction and quality of care. Since nurses represent the largest number of staff in hospitals, efficient staff management for nurses is very important. According to the survey by Korean Hospital Nurses Association^[1], the average turnover rate of nurses was 16.8%, and the turnover rate of nurses in small and medium sized hospitals was higher than that of the upper grade general hospital. In upper grade general hospitals, the main causes of turnover were maladjustment, marriage, childbirth. But in small and medium hospitals,

turnover to other hospitals was the main cause^[1]. Hospitals with 200 to 300 beds have a poorer working environment and welfare benefits than upper grade general hospitals, and the high turnover rate of nurses causes the remaining nurses to become overworked. As a result, small and medium sized hospitals continue to lack nurse manpower^[2]. In addition, the overwork and stress of nurses remaining in hospitals can increase burnout.

Burnout is a form of reaction that occurs when one can no longer deal with stress, which causes negative self-concepts, work attitudes, and loss of interest in patients^[3]. This exhaustion can lead to decreased work motivation or work efficiency, which can increase the likelihood of causing medical accidents and lead to frequent absences and high turnover rates^[4].

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Compassion satisfaction is the pleasure of helping others, and it is a pleasant feeling that results from the goodwill of one's colleagues and the ability to help

others^[5]. People with high compassion satisfaction can reduce burnout by acting as a source of strength to continue working even if their work conditions are very dangerous or high in stress^[6]. Traumatic stress has a different response pattern depending on whether the stressor is primary or secondary. Secondary traumatic stress is an emotion that arises from knowing about a traumatic event experienced by another meaningful person^[7]. Lack of adequate treatment for these secondary traumatic stresses causes burnout^[8]. Nurses can experience secondary traumatic stress in contact with patients who have experienced traumatic events^[9].

Another factors affecting burnout is self-esteem. The higher self-esteem, the higher the organizational commitment and job satisfaction, and the lower the intention to turnover^[10]. Brouwers et al^[11] found that high self-esteem could be an effective means of preventing burnout in conflict caused by emotional labor. Jurado et al^[12] also found that the higher the self-esteem, the lower the burnout.

Job satisfaction is a positive influence on job performance as a positive attitude about the job ^[13]. In particular, the job satisfaction of nurses has a positive effect on the reduction of nurse turnover rate, patient satisfaction^[14]. Therefore, job satisfaction can be a factor of job involvement and motivation ^[15], and if job satisfaction decreases, burnout increases ^[16]. Therefore, this study was to identify the factors affecting burnout.

Method

The subjects of the study were two small and medium hospital nurses. To measure burnout,

compassion satisfaction and secondary traumatic stress was used Professional Quality of Life Scale(ProQOL-5) revised by Stamm^[17]. The tool was approved through the website, and the Korean version was used. The self-esteem scale developed by Rosenberg^[18] was used by Jon ^[19], a tool adapted to the Korean situation. The job satisfaction of nurses was assessed the Minnesota Satisfaction Questionnaire (MSQ) Short Form Korean Version developed by the Institute of Vocational Psychology Research at the University of Minnesota^[20]. The tools are composed of sub domain such as work itself, prospects, sense of achievement, reward system, and human relations.

All data were statistically analyzed using SPSS 23.0. Descriptive statistics, t-test, ANOVAs were conducted and hierarchical regression analysis identified the factors affecting burnout. All subjects completed the informed consent form and agreed to participate prior to administering the study. Participants also received information on this study including research aims, possible risks, and collection procedures.

Result

1. General characteristics of the subjects

The sample data consisted of 200 nurses, 11 males (5.5%), and 189 females (94.5%). Of the 200 nurses, 103 nurses (51.5%) did not have a religion, and 48.5% had a religion. Most participants worked 3 shift duty (121, 60.5%).The Burnout showed a statically significant difference according to age group ($F=7.138$, $p=.001$), religion ($t=2.441$, $p=.016$), working style($t=3.048$, $p=.003$) and position ($t=2.572$, $p=.012$).

Table 1. General Characteristics

Variables	Categories	N	%	Mean	SD	t/F(p)
Gender	Male	11	5.5	2.81	.73	.626 (.544)
	Female	189	94.5	2.67	.63	
Age group	21-30	104	52.0	2.82	.59	7.138 (.001)
	31-40	49	24.5	2.66	.69	
	More than 41	47	23.5	2.41	.57	
Religion	Don't have	103	51.5	2.79	.62	2.441 (.016)
	Have	97	48.5	2.57	.62	
Level of Education	College (3yr)	85	42.5	2.74	.63	1.088 (.278)
	University (4yr)	115	57.5	2.64	.63	

Cont... Table 1. General Characteristics

Working style	3 shift work	121	60.5	2.79	.65	3.048 (.003)
	Fixed work	79	39.5	2.52	.57	
Position	Staff nurse	156	78.0	2.74	.63	2.572 (.012)
	Head nurse or manager	44	22.0	2.47	.59	

2. Descriptive statistics and correlations

The mean scores of burnout, self-esteem, compassion satisfaction, and secondary traumatic stress were 2.68±0.63, 3.48±0.75, 3.49±0.68, and 2.77±.53 respectively. And also, the mean score job satisfaction was 3.53±.57 and work itself, prospects, sense of achievement, reward system and personal relations of sub domain were 3.67±.71, 3.40±.86 3.97±.73, 2.72±.68, 3.88±.78 respectively. Burnout was significantly negatively related to self-esteem (r= -.768, p<.001), compassion satisfaction (r=-.732, p<.001).

Table 2. Descriptive Statistics

Variables	Mean ± SD	Min	Max	Range
Burnout	2.68±.63	1	4.40	1-4.40
Self-esteem	3.48±.75	1.40	5	1.4-50
Compassion satisfaction	3.49±.68	1.60	5	1.6-50
Secondary traumatic stress	2.77±.53	1.60	5	1.6-50
Job satisfaction(total)	3.53±.57	1.75	5	1.75-5
Work itself	3.67±.71	1.50	5	1.50-5
Prospects	3.40±.86	1	5	1-5
Sense of achievement	3.97±.73	2.25	5	2.25-5
Reward system	2.72±.68	1	5	1-5
Personal relations	3.88±.78	1.50	5	1.50-5

Table 3. Correlations among variable

	Burn-out	Self-esteem	Compassion satisfaction	Secondary traumatic stress
Self-esteem	-.768**	1		
Compassion satisfaction	-.732**	.647**	1	
Secondary traumatic stress	.422**	-.308*	.799	1

**p<.001, *p<.01

3. Factors influencing the burnout of the nurses

The hierarchical regression analysis was conducted to examine the factors affecting burnout. Model 1 included religion, work style, position and age group. Model 2 added self-esteem, compassion satisfaction, and secondary traumatic stress to Model 1, and Model 3 added 6 subdomain of job satisfaction. Multi collinearity was found to be acceptable through tolerances and VIF. In Model 2, self-esteem, compassion satisfaction and secondary traumatic stress were found to be factors significantly associated with burnout. Theadjusted explanatory power was 77.1% and increased by 69.5% compared to Model 1. Of the variables added in Model 3, only the reward system was a significant factor affecting burnout. Self-esteem, compassion satisfaction, and secondary traumatic stress were also statistically significant factors affecting burnout. Theadjusted explanatory power was 79.0% and increased by 0.5%over Model 2.

Table 4. Factors affecting nurses' burnout

Variables	Model 1		Model2		Model3	
	β	T	β	T	B	t
(constant)		19.00		20.89		20.02
Religion	-.123	-1.79	-.019	-.53	-.012	-.33
Work style	-.137	-1.79	-.020	-.53	-.021	-.55
Position	-.025	-.31	.044	1.11	.031	.77
Age group	-.170	-2.26*	.034	.85	.034	.87
Self-esteem			-.332	-6.56***	-.341	-6.56***
Compassion satisfaction			-.536	-11.06***	-.513	-7.95***
Secondary traumatic stress			.332	8.74***	.344	8.09***
Work itself					0.62	1.03
Prospects					.003	.08
Sense of achievement					-.015	-.26
Reward system					-.111	-2.75**
Personalrelations					-.020	-.47
R ² (adj R ²)	.095(.076)		.779(.771)		.790(.776)	
F (F Sig.)	5.109(.001)		96.370(.000)		58.566(.000)	

***p<.001, **p<.01, *p<.05

Discussion

The burnout experience of nurses not only harms their own health^[21], but also reduces the quality of patient care^[22]. Due to these problems, especially small and medium-sized hospitals with high turnover rates, should be concerned about burnout of nurses.

In present research, the level of burnout was 2.68 point (range 1-5) indicating a moderate level and it was similar to those of Lee's study^[23]. And also, compassion satisfaction, and secondary traumatic stress were similar to of Cho and Park's study^[24]. In addition, the average score of job satisfaction was 3.53 and the reward system had the lowest satisfaction level with an average of 2.72 among the sub scales. These results, the lowest scores in the reward system have been consistently

reported in most other studies measuring nurse job satisfaction^[25-26]. Moreover, the results showed that predictors of burnout were self-esteem, compassion satisfaction, and secondary traumatic stress.

Compassion satisfaction is an emotional reward that nurses can feel, and because it acts as a mitigating factor to reduce burnout^[6], it can be a fundamental factor to improve nursing services. Wagaman and his colleagues found that it was possible to increase empathy through education^[27]. Increased compassion satisfaction can be expected to have a positive impact on patient and hospital organization by increasing the quality of care. In order to increase nurses' empathy satisfaction, nurse' leaders should recognize the importance and impact of compassion satisfaction, and make efforts to increase the empathy satisfaction capability of nurses.

In order to decrease nurses' burnout, it is necessary to mediate factors such as secondary traumatic stress, low self-esteem and compassion satisfaction. Trauma can occur not only for individuals who have directly experienced a traumatic event (primary victims), but also for aid specialists who have been indirectly exposed to trauma while witnessing damage or providing assistance to the primary victim. Nurses who are in close contact with patients who are victims of various traumatic events may experience secondary traumatic stress^[28]. Increased secondary traumatic stress negatively affects a variety of physical and mental health^[29] and leading to increased burnout^[28]. Nursing managers should endeavor to reduce burnout by monitoring secondary traumatic stress.

Previous studies^[10,12] emphasized the importance of self-esteem as a variable to alleviate burnout, and this study supports the results. Lee and Hong^[30] reported that the higher the self-esteem, the more positive the thinking, the higher the achievement and life satisfaction. As a result, it is necessary to increase nurses' self-esteem to reduce burnout.

Of the subscales of job satisfaction added in Model 3, only the reward system was a significant factor affecting burnout. These results mean the importance of compensation as affecting factor for burnout. In the previous study, the rate of turnover was high when the salary satisfaction and job satisfaction of small and medium hospital nurses were very low^[16,26]. Therefore, it is necessary to increase the satisfaction level through appropriate compensation to small and medium hospital nurses.

Burnout is a topic that has been studied for a long time, but it is still an unsolved challenge. As the complexity of society changes, the influencing factor of burnout can also change. Therefore, it is necessary to reinforce the psychological capacity of nurses through educational programs for improving the awareness of individuals and hospital organizations. As a result, the factors affecting burnout were identified as compassion satisfaction, secondary traumatic stress, self-esteem, and reward system. Therefore, in order to reduce burnout of small and medium sized hospital' nurses, it is necessary to develop and apply an intervention program considering these factors.

This study was conducted for nurses working in two hospitals with less than 300 beds, so there are limitations to generalizing these results to all nurses. However,

this study suggests that in order to solve the burnout of nurses, compassion satisfaction and self-esteem should be improved, secondary traumatic stress should be alleviated, and the reward system should be improved. If the nurse managers such efforts, nurses working in hospitals with 200 to 300 beds will help improve their work motivation, provide high quality nursing services, and address the shortage of nursing staffs.

Conclusion

This study was attempted to examine the factors affecting burnout of nurses. The results of hierarchical regression analysis showed that the reward system, Self-esteem, compassion satisfaction, and secondary traumatic stress was a significant factor affecting burnout.

In order to resolve the burnout of a nurse, it should be a review of the compensation system. In addition, efforts to increase compensation satisfaction, self-esteem and to alleviate secondary trauma stress are needed.

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Conflict of Interest: Nil

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Self-efficacy Mediating Effect in Health Communication Campaign

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Abstract

Background/Objectives: This study reflects the unique characteristics of health communication, which is basically based on interactive interactions, and communicates the effects of unintended communication stress and self-efficacy.

Method/Statistical Analysis: The subjects were 295 male and female students attending four-year colleges. Of the 295 respondents, 161 males accounted for 54.6% of the total, and did not focus on specific genders. The mean age was 24.3 year for men and 22.6 years for women. And also for the self-efficacy mediation effect, in Baron and Kenny (1986), the mediation effect was verified through three regression analysis.

Findings: This study is the unintended negative effect that occurs in the health communication campaign. In this relationship between the health communication stress and the effect of the health communication campaign, the stress of the health communication campaign depends on the importance of the stress situation and the control ability. The effects of the health communication campaign appear differently depending on how large the self-efficacy is felt. As the self-efficacy of health communication campaign stress increased, the negative effect of health communication campaign stress on the health communication campaign effect was expected to be smaller. However, the expectation that self-efficacy would play a moderating role in the relationship between health communication campaign stress and health communication campaign effect was not supported but rather mediated. The greater the stress of the health communication campaign, the smaller the effectiveness of the health communication campaign was expected to be. The regression analysis showed that the health communication stress had a negative effect on the goodwill of the health communication campaign.

Improvements/Applications: The purpose of study is to identify the role of self-efficacy in health campaign stress and to reduce the health campaign stress when it becomes a health campaign.

Keywords: *Health Communication, Self-Efficacy, Stress, Health Campaign, Interactive Communication.*

Introduction

The key to researching health communication campaigns is to induce healthy behavioral change through

the efficient transfer of health-related information^[1]. The importance of communication behavior is important because it is the focus of communication for the study of health communication, because communication behavior causes positive or negative health behavior, and furthermore, communication behavior itself is the result of a positive/negative health condition. It should be emphasized^[2].

For example, when people see advertising communications about Starbucks, they can enjoy the pleasure of consumption. For smokers, however,

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quitting campaigns can be stressful as feelings of deprivation, although they may also consider the pleasure or benefits of quitting. In other words, health communication in the public sector, such as a smoking cessation campaign, may have unintended consequences of perceived deprivation of smoking opportunities even if it expresses “the pleasure of non-smoking” as a communication message. Because diseases that cause social illnesses, such as smoking, alcohol, drugs, and drugs, are hard to break when adopted by people forbidding them to use them can cause backlash such as depriving them of their enjoyment^[3]. Context of health communication campaigns are the boomerang effect, which implies the reaction of the audience against the intended response of the persuasion message^[4]. As such, health communication campaigns can result in unintended activation of social systems around them.

Communication stress is unstable due to unintended effects such as confusion, disharmony, boomerang, transmission of worry, loss of sensitivity, and reproof, resulting in unstable conditions and inducing negative advertising reactions, such as fear control reactions or ad meeting attention^{[4][5][6][7][8]}. In other words, even when stress occurs in the communication process, such as an imbalance may cause trouble, difficulty, pain, and fatigue^[9].

Self-efficacy is a belief in one’s ability to take and carry out a set of actions necessary to achieve a given goal, and is a concept that includes specific practical skills^[10]. Self-efficacy is also a conviction of one’s own ability in relation to the performance of a particular task, as well as practical skills, as well as the performance of tasks such as choice of behavior, effort and persistence^{[11][12][13]}.

Bandura’s theory of self-efficacy is based on Social cognitive theory as an explanation between cognitive belief and behavioral change^[14]. Social cognitive theory forms a single model that explains the relationship between past performance experience, self-efficacy, and personal performance^[15]. Looking at the relationship between health communication stress and self-efficacy, one can infer that people’s self-efficacy can play a role in controlling health communication stress. In other words, when a cause of stress occurs, people go through a process to reduce stress. In this process, individuals try to make manual or active control^[16]. In this active regulation, emotional and functional self-efficacy as a social psychological factor can affect the

level of stress by affecting the perception, interpretation, and response to problems^{[17][18]}. This study focuses on the communication stress of consumers, which can contribute to the improvement of the health communication campaign by identifying the unintended effects of the health communication campaign.

Method

The preliminary survey on five health communication campaigns, including cancer, influenza, blood donation, smoking cessation, and AIDS, was conducted for about a week. Determined whether or not. This study was conducted for three weeks based on the variables verified through these preliminary surveys. Hypothesis 1 is a hypothesis about the moderating effect of self-efficacy on the health communication campaign effect. The Intensity of maladaptation due to stress has been shown to be reduced by various buffer factors^[24]. In general, factors that act as stress buffers include personal resources such as internal and external control, self-esteem, and self-efficacy, and environmental resources such as positive social support and active participation in social activities. It is known to have a buffering effect^[25]. In particular, self-efficacy, which is a personal resource among stress buffers, is a factor that affects the behaviors we pursue and choose^{[12][19]}. Accordingly, we set the following hypothesis.

Hypothesis 1 As the self-efficacy for health communication campaign stress increases, the negative effect of health communication campaign stress on health communication campaign effect will be smaller.

Hypothesis 2 is a hypothesis about the effect of stress on health communication campaign on the effect of health communication campaign. Psychological stress means breaking an equilibrium state as an unpleasant emotional state that is assessed to threaten an individual’s well-being by exceeding an individual’s resources or ability to perform^[22]. Understanding stress from an interactive perspective means that stress is not just a stimulus and response but an influence between the individual and the situation^[26]. In general, stress causes negative emotions such as depression, triggers mental and physical diseases, and adversely affects mental health^[27]. Communication stress is an unintended negative effect of communication situations that leads to a negative perception of health communication^[4].

In other words, communication stress can lead to negative advertising reactions such as fear control

reactions and ad skepticism, resulting in unstable conditions beyond human coping limits^{[4][5][6][7][20]}. Avoiding complaints about TV campaigns can lead to poor TV campaign activity, leading to negative sentiment for TV campaign^[21]. For these psychological imbalances, people may perceive communication problems as they perceive difficulties, difficulties, pain, and fatigue^[9].

Hypothesis 2 The greater the stress of the health communication campaign, the less effective the health communication campaign will be.

The measurement of self-efficacy must be measured by a micro analytical approach that includes three dimensions: level, strength and generality^{[12][15]}. In the Table 1 below, the Counselor Activity Self-Efficacy Scale (CASES), which measures three types of self-efficacy: assistance technology self-efficacy, session management self-efficacy, and counseling difficulty self-efficacy.

Table. 1: Questionare of Self-efficacy

Category	Questionare
Exploration Technology	I understand the message that this health communication ad appeals.
	I can clarify the thoughts and feelings appealed by this health communication ad.
	I can understand clearly and concisely what this health communication ad appeals.
	I pay attention to what this health communication ad appeals.
Activity Technology	I can present or teach information about this health communication advertisement.
	I can tell others the suggestions, directions, and advice of behavior that this health communication ad suggests.
	I can watch this health communication ad and suggest some things to do and tasks for the future.

Stress is important in how subjective perception is perceived^[22]. Stress perception measures include behavioral stress in the physical stress of the CMI

(Cornel Medical Index). The communication ability scale was modified according to the research subject's situation. So, Stress Questionare is devided four factors. First, Body factors. The questionnaire is as follows: This health communication ad gets frustrating. This health communication ad will dry your throat or mouth. This health communication ad makes your eyes tired easily. This health communication ad makes me feel vomited. Second is Action factor. The questionnaire is as follows: This health communication ad increases the number of mistakes. This health communication ad increases the amount of alcohol you drink. This health communication ad immerses you in more than you need. And Psychological factor. The questionnaire is as follows: This health communication ad seems frustrating. Last Questionare factor is emotion. The questionnaire is as follows: If you look at this health communication advertisement, you might be easily excited or angry. This health communication ad depresses and depresses easily. This health communication ad is annoying to do something. The communication effect's communication ability scale was modified according to the research subject's situation. The communication effect is attractive Factor. The questionnaire is as follows:

This health communication ad is favorable. This health communication ad is beneficial. This health communication ad is attractive. I like this health communication ad. This health communication ad is amazing.

Result and Discussion

The subjects were 295 male and female students attending four-year colleges. Of the 295 respondents, 161 males accounted for 54.6% of the total, and did not focus on specific genders. The mean age was 24.3 year for men and 22.6 years for women.

In the Table 2, following is the correlation between the descriptive statistics and the composite variables of the composite variables created by the arithmetic mean of the response values for each construct and dimension.

Table 2: Descriptive Statistics of Main Variables

Variable	Item	Average	Standard Deviation	Male Average	Female Average	t-value
Stress	11	2.23	1.09	2.31	2.13	1.424
Self-Efficacy	6	5.01	1.28	4.84	5.21	-2.547**
Attractiveness	6	4.18	1.52	4.13	4.25	-.727

***: p<.01, **: p<.05

In the Table 3, Correlation was found to be significantly correlated between the dimensions that compose the same construct. Likely, the effect of communication, which is the dependent variable, showed positive correlation with self-efficacy.

Table 3: Correlation Analysis of Key Variables

Variable	Self-Efficacy	Attractiveness
Stress	-.250***	-.293***
Self-Efficacy		.381***

***: p<.01, **: p<.05

According to the below the Table 4, 5 the results show that the stress on health communication, the independent variable, is less influenced on the attractiveness of the health communication campaign, which is dependent on the third regression than on the second regression (β -.381, $p < 0.01$). .275, $p < 0.01$), and the conditions of mediating effects, indicating that self-efficacy had a mediating effect on the relationship between the health communication campaign stress and the effect of the health communication campaign^[23].

Table 4: Intermediate Effect Analysis 1 Results for Validation of Hypothesis 1

Dep. V. \ Ind. V	Self-efficacy	Attractiveness
Intercept	5.659***	5.033***
Stress	-.293***	-.381***
F	19.498***	27.554***
R ²	.062	.086

***: p<.01, **: p<.05, *: p<.1

Table 5: Intermediate Effect Analysis 2 for Verification of Hypothesis 1

Dep. V \ Ind. V	Attractiveness	
Intercept	5.033***	2.973***
Stress	-.381***	-.275***
Self-efficacy		.364***
F	27.554***	33.592***
R ²	.086	.187

***: p<.01, **: p<.05, *: p<.1

In the Table 6, to test hypothesis 2, the regression analysis of the health communication stress with the positive variable as the dependent variable showed that the health communication stress had a negative effect

on the good feeling ($\beta = -.381$). Hypothesis 2 that the effectiveness will be small is supported.

Table 6: Regression Analysis Results for Hypothesis 2

Dep.V \ Ind.V	Attractiveness
Intercept	5.033***
Stress	-.381***
F	27.554***
R ²	.086

***: p<.01

Conclusion

The purpose of this study is to investigate the health communication stress as an unintended effect generated when the health communication campaign is executed, and to contribute to the improvement of the health communication campaign.

Hypothesis 1 examines the effects of health communication stress perception and self-efficacy on the effectiveness of health communication campaigns. Specifically, as the self-efficacy for health communication campaign stress increases, the negative effect of health communication campaign stress on health communication campaign effect is expected to be smaller. This hypothesis is to find out the moderating effect of self-efficacy that induces stress not to be felt in the relationship between health communication campaign stress and health communication campaign effect. Three regressions were used to verify the mediating effect. As a result of regression analysis to verify the mediating effect, self-efficacy meets all the conditions of the mediating effect. In other words, it can be said that the higher the self-efficacy has the function of filtering the stress of the health communication campaign. These results indicate that self-efficacy plays a mediating role in the relationship between health communication campaign stress and health communication campaign effect. In other words, Hypothesis 1, which expected self-efficacy to play a moderating role in the relationship between health communication campaign stress and health communication campaign effect, was not supported. And also Health, disease, and health-related issues are a hot topic in various sectors of society, such as health care decision-making in public institutions such as the government, and private institutions such as hospitals and corporations. In other words, problems

related to health, disease, and medical care have a major impact on public well-being, and finding appropriate solutions to them is of concern to all members of society. Efforts have been made to utilize health communication as one of the appropriate solutions to this concern, and this research has been conducted as part of the effort. In other words, this study first examines the relationship between health communication and stress, a key factor in health, disease, and medical care.

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The Dual Mediating Effects of Self-esteem and Hope in the Relationship between Boss's Incivility and Life Satisfaction

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Abstract

Background/Objectives: The purpose of this study was to examine the double mediation effects of self-esteem and hope on how a boss's incivility affects life satisfaction in 339 Korean workers.

Method/Statistical Analysis: SPSS Win. 25.0 and PROCESS macro for SPSS version 3.4 were used for descriptive statistics analysis, reliability analysis, correlation analysis, and double mediation effect analysis.

Findings: First, Pearson correlation analysis showed statistically significant correlations between a boss's incivility, life satisfaction, self-esteem and hope. Second, PROCESS macro analysis showed that a boss's incivility negatively affected self-esteem and life satisfaction, self-esteem positively influenced hope and satisfaction with life, and hope positively influenced the satisfaction with life. Third, in the relationship between a boss's incivility and life satisfaction, self-esteem and hope were double-mediators.

Improvements/Applications: This result is expected to contribute to the formation of a new workplace culture in Korea as a new model in which self-esteem and hope mediate how a boss's incivility affects life satisfaction.

Keywords: *Boss's Incivility, Life Satisfaction, Self-esteem, Hope, Mediation effect, PROCESS macro.*

Introduction

Many companies around the world are concentrating on creating a good corporate culture in order to create a "workable workplace." Since the workplace is where hierarchies exist, it is necessary to form a smooth relationship between the supervisor and the subordinates in order to form a proper organizational culture, and the core of the relationship is 'incivility'. Nevertheless, research on this is not active in Korea,

perhaps because, even if the boss speaks unfairly in the organization, employees are allowed to implicitly avoid the response and are reluctant to expose it to the outside world^[1]. Incivility is a violation of mutually respectful norms, a weak robbery with no clear intention to harm others^[2]. Examples of incivility include criticizing others, spreading negative stories about others, checking on or e-mailing during meeting times, and publicly disparaging others. That is, incivility is a different concept from deviations, such as abuse, aggression, bullying, and mobbing. Already in 2010, the World Health Organization^[3] raised the severity of incivility-related issues in most organizations around the world, especially the physical and mental problems caused by incivility in the workplace.

Incivility in the workplace is important because incivility may seem seemingly mild, but it causes severe stress on the victim^[4] and harms the physical

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and psychological health of the individual, because it tends to spread quickly within organizations as if it were transmitted^[2]. This is called the organizational incivility spiral, and victims of incivility develop negative emotions, revenge, and aggression, which sometimes leads to intense violence and aggressive behavior beyond incivility^[2]. In particular, contact with the boss is avoided in the course of performing the job, and the boss is the most influential person in the workplace^[5]. Since the findings suggest that incivility offenders are three times more likely to be in a higher position than victims^[6], it is worth paying attention to superior's incivility.

Office workers' incivility is closely related to life satisfaction, and workplace incivility decreases employee satisfaction with life^[7], and the incivility and psychological well-being are negatively interrelated^[8]. Life satisfaction is a very subjective value judgment and the feeling of fullness in daily life^[9] and is defined as the satisfaction and dissatisfaction with life, happiness, unhappiness, and feelings of individual well-being^[10].

The variables expected to pass through the incivility and life satisfaction paths of the superior are self-esteem and hope. Self-esteem is related to a positive or negative evaluation of one's own self and to the degree of respect for oneself^[11]. Self-esteem has been proven numerous times to be a powerful variable influencing life satisfaction^[12-14]. People with high self-esteem are satisfied with themselves, because they see themselves as valuable and capable, whereas those with low self-esteem are not satisfied with themselves because they are valued and incapable. In particular, workers with high self-esteem had positive feelings about their jobs^[15] and had higher job satisfaction than did those who did not^[16]. The incivility of the boss is based on the subjective judgment that the victim feels. Therefore, the self-esteem of office workers is thought to mediate between the incivility and life satisfaction of supervisors.

Hope, on the other hand, is a positive characteristic that contributes to an individual's setting and pursuing goals^[17], an agency thinking that leads to motivation and pathways thinking that leads to the perception of the ability to create a variety of pathways to achieve that goal^[18]. People with high hopes are less depressed, more active, and more confident and challenging to achieve their goals^[19]. In addition, even if they face difficulties, they focus on achieving their goals and synchronize themselves, which lowers their negative emotions and

increases their life satisfaction^[20]. In Korea, there was a positive correlation between hope and life satisfaction^[21], and among the predictors of happiness, self-esteem had the highest relative influence, followed by hope^[22]. It was demonstrated that hope is closely related to life satisfaction.

There are some accumulated studies that analyze indirect effects using self-esteem and hope as mediators. Specifically, self-esteem had a mediation effect on the relationship between stress and adaptation to school life^[23], and between parental abuse and school violence^[24]. Hope also mediated the relationship between job stress and happiness^[25], between efficacy and adaptation of migrant women^[26], and between parenting stress and child happiness^[27].

Therefore, this study aimed to examine the dual mediation effects of self-esteem and hope on the effect of a boss's incivility on life satisfaction, and to provide a new model for improving the satisfaction with life for employees.

Method for Research

- 1. Model for Research:** This study used model 6, a serial mediating-effect analysis method of PROCESS macro ver. 3.4. The research model was set based on previous studies is shown in [Figure 1].

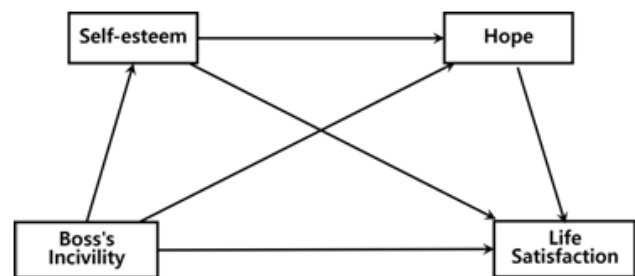


Figure 1. Conceptual Research Model

- 2. Survey subject and data collection method:** The subjects were 339 people in D city in Chungcheongnam-do. The subjects were 173 women (51.0%) and 166 men (49.0%). The ages were 45 (13.3%) in their 20s, 128 (37.8%) in their 30s, and 166 (49.0%) in their 40s or older.
- 3. Research tools**
 - (a) Boss's Incivility:** The incivility of the superiors was measured by modifying and supplementing some items in the organization-incivility scale of Cortina et al.^[28]. This measure is a total of

five questions, and each item was converted to a 5-point Likert scale, and the higher the score, the more the incivility of the boss was experienced. In this study, the superior-incivility reliability of Cronbach’s α was .907.

- (b) **Self-esteem:** Self-esteem measurements were taken from Rosenberg^[29]. This scale consists of a total of 10 questions and a 5-point Likert scale. The higher the score, the higher the level of respect for self. In this study, the reliability level for self-esteem was Cronbach’s α of .826.
- (c) **Hope:** Hope was measured by the scale of Snyder et al.^[30] revised and validated for Korea by Choi et al.^[31]. This scale is composed of four agency thinking and four pathways thinking. In this study, the reliability of the hope Cronbach’s α was .889.
- (d) **Life satisfaction:** Life satisfaction was measured using three items of life satisfaction among the short-term happiness scale (COMOSWB) developed and validated by Seo and Koo^[32]. Each item measures the satisfaction with life in personal, relational, and group aspects. It uses a 7-point Likert scale. The higher the score, the higher the satisfaction with life. In this study, Cronbach’s α was .874.

4. **Data Analysis:** SPSS PC + Win. 25.0 and SPSS PROCESS macro 3.4 were used to analysis descriptive statistics, frequency analysis, reliability analysis, correlation analysis, and mediation effect analysis.

Results and Discussion

Table 1. Correlation and Descriptive Statistics

	Boss’s Incivility	Life Satisfaction	Self-esteem	Hope
Boss’s Incivility	1			
Life Satisfaction	-.323**	1		
Self-esteem	-.291**	.466**	1	
Hope	-.212**	.498**	.683**	1
M	2.353	4.184	3.597	3.545
SD	1.066	0.867	0.498	0.540

**p < .01

1. **Correlation and descriptive statistics:** We used Pearson’s analysis to find the correlations between variables. The result is shown in [Table 1]. There was a statistically significant correlation between each pair of variables. There was a statistically significant relationship between life satisfaction, self-esteem, and hope, but a negative relationship with superior incivility. The mean of self-esteem, hope, and life satisfaction (7-point scale) exceeded the middle score, but the incivility mean of the boss was less than the middle value.

2. Model Verification:

Verification of multiple mediation effects: In order to verify the dual mediation effects of self-esteem and hope between boss’s incivility and life satisfaction experienced by office workers, we analyzed the model number 6 of the PROCESS macro for SPSS. We used bootstrapping to verify the mediation effects. We set up 5,000 samples and set the confidence interval to 95%. The analysis results are shown in [Figure 2] and [Table 2].

First, the incivility of the superiors in the mediating model had a negatively significant effect on self-esteem ($\beta = -.1361, p < .001$), but not the hope ($\beta = -.0073, p > .05$). Self-esteem had a significant positive effect on hope ($\beta = .7366, p < .001$). In other words, experiencing the boss’s incivility in the workplace not only negatively affects the worker’s self-esteem, but also lowers the hope by the lower self-esteem.

Second, the incivility of superiors in the dependent-variable model had a statistically significant negative effect on life satisfaction ($\beta = -.1626, p < .001$), but self-esteem ($\beta = .3144, p < .01$) and hope ($\beta = .5328, p < .001$) had a significant positive effect on life satisfaction. This suggests that incivility in organizations decreases employees’ satisfaction with life^[7] and has a negative relationship between incivility and psychological well-being^[8].

Third, the total effect of the path between the boss’s incivility and life satisfaction was $\beta = -.2627 (p < .001)$, but when the parameters were introduced, the direct effect of the path between the boss’s incivility and life satisfaction decreased to $\beta = -.1626 (p < .001)$; therefore, self-esteem and hope double mediated the relationship between superior incivility and life satisfaction.

Fourth, the magnitude of the overall indirect effect was -.1001 in the relationship between supervisor’s

incivility and life satisfaction, which was significant. In addition, M1 was -.0428, and there was no '0' in the 95.0% confidence interval. M2 was -.0039 with '0' in 95% confidence interval, so there was no mediation effect. As a result of verifying the size of the dual mediation effect, M1 & M2 is -.0534, and there is no value of '0' in 95% confidence interval. Therefore, the dual mediation effects were verified.

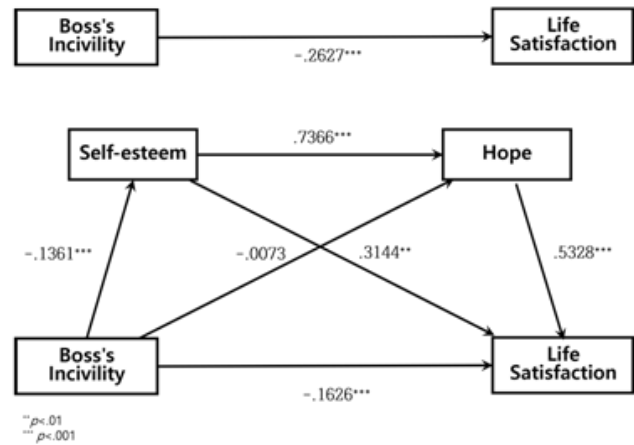


Figure 2. Effect size for each path

Table 2. Analysis of the dual mediation effects of self-esteem and hope on the relationship between supervisor's incivility and life satisfaction

Mediating variable model 1 (DV: Self-esteem)						
Variables	β	SE	t value	p	LLCI*	ULCI**
Constant	3.9174	.0629	62.2379	.0000	3.7936	4.0412
Boss's Incivility	-.1361	.0244	-5.5851	.0000	-.1840	-.0882
Mediating variable model 2 (DV: Hope)						
Variables	β	SE	t value	p	LLCI*	ULCI**
Constant	.9124	.1844	4.9493	.0000	.5498	1.2751
Boss's Incivility	-.0073	.0211	-.3471	.7287	-.0488	.0342
Self-esteem	.7366	.0451	16.3177	.0000	.6478	.8253
Dependent variable model (DV: Life satisfaction)						
Variables	β	SE	t value	p	LLCI*	ULCI**
Constant	1.5474	.3478	4.4489	.0000	.8632	2.2316
Boss's Incivility	-.1626	.0385	-4.2286	.0000	-.2382	-.0870
Self-esteem	.3144	.1101	2.8563	.0046	.0979	.5309
Hope	.5328	.0994	5.3616	.0000	.3373	.7282

Total effect of X on Y					
Effect	se	t	p	LLCI*	ULCI**
-.2627	.0419	-6.2675	.0000	-.3452	-.1803
Direct effect of X on Y					
Effect	se	t	p	LLCI*	ULCI**
-.1626	.0385	-4.2286	.0000	-.2382	-.0870

Indirect effect of X on Y				
Paths	Effect	Boot SE	Boot LLCI*	Boot ULCI**
Total indirect effect	-.1001	.0270	-.1575	-.0513
Boss's Incivility (X) → Self-esteem(M1) → Life satisfaction (Y)	-.0428	.0186	-.0829	-.0098
Boss's Incivility (X) → Hope(M2) → Life satisfaction (Y)	-.0039	.0117	-.0275	.0191
Boss's Incivility (X) → Self-esteem(M1) → Hope (M2) → Life satisfaction (Y)	-.0534	.0147	-.0864	-.0279

*LLCI = boot the lower bound of the indirect effect within the 95% confidence interval, **ULCI = boot the upper bound of the indirect effect within the 95% confidence interval.

Conclusion

This study was intended to investigate the dual mediation effects of self-esteem and hope on the effects of supervisor's incivility on life satisfaction in Korean office workers.

First, according to the Pearson correlation analysis, superior incivility was negatively correlated with life satisfaction, self-esteem and hope, and life satisfaction, self-esteem, and hope were positively correlated.

Second, as a result of analyzing the mediation effect, the incivility of the boss had a negative effect on self-esteem and life satisfaction, and self-esteem had a positive effect on hope and life satisfaction. Hope also positively influenced life satisfaction.

Third, by bootstrap, we found a dual mediation effect of self-esteem and hope on the relationship between incivility of superiors and life satisfaction. In other words, the incivility of supervisors experienced by office workers directly affects life satisfaction, but it also affects life satisfaction through dual mediation of self-esteem and hope.

This study verified the theoretical validity of incivility, which is still in the early stages of research, by analyzing the dual mediation effects on the relationship between supervisor's incivility and office workers' life satisfaction. On the other hand, by empirically analyzing the dual mediation effects of self-esteem and hope, we identified the paths that affect life satisfaction when experiencing the incivility of the supervisor. Therefore, it is necessary to develop and apply an effective worker program that can increase self-esteem and hope, which have been proven to be mediators. In addition, incivility is likely to occur in organizations consisting of two or more people. Therefore, incivility research, which is focused on service occupations, should be expanded to more diverse subjects.

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Study on Minimum Transmission Dose for Establishing X-Ray Imaging

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Abstract

Background/Objectives: When acquiring medical images using X-ray, optimal medical imaging quality must be achieved with minimal exposure of the x-ray generator.

Method/Statistical Analysis: The experiment was conducted based on the exposure conditions that are mainly used in the clinic. The exposure conditions of Hand, Skull, and Chest examinations were determined as the test subjects, and X-Rays were exposed to each partial phantom. The original data was obtained by exposing X-Rays three times for each phantom, and the values of the pixels were analyzed using the Image J program.

Findings: As the transmitted dose increased, the pixel value increased in proportion to the average intensity. As the X-ray exposure conditions were reduced, the maximum, minimum, and average values of the entire pixel were lowered. In step 1, which is the basic exposure condition of Hand, the average value of all pixels was reduced from 818.311 in step 5, which was the lowest exposure condition. Similar reductions were observed in the skull and chest exposure. When the pixel value is viewed as the transmitted dose value, it is confirmed that the pixel value of the image reflects the transmitted dose value. Signal-to-noise ratios varied with exposure conditions.

Improvements/Applications: These results alone made it difficult to find the optimal transmission dose for making images. Additional measurements of the doses exposed at each step will yield better results. Later we will continue to study through more diverse and accurate experiments.

Keywords: *Pixel value, Radiation dose, Transmission dose, Exposure dose, Histogram.*

Introduction

The use of medical radiation can benefit society as well as patients. However, inadequate use of radiation can pose a risk to the patient. Therefore, proper protection and management of medical radiation has been proposed. The principle of medical radiation shielding lies in the justification and optimization of actions^[1-2]. Justification is determined by careful judgment when the

benefit of the purpose of the test can be obtained more than the damage to the patient due to the radiological test^[3]. And optimization is to keep the exposure dose as low as possible while obtaining optimal results from radiography applied to the patient. Radiologists who use medical radiation to examine patients will need ongoing effort and research^[4-5].

In addition, due to the accident of a nuclear power plant, the public's interest in radiation is increasing and anxiety is rising. The radiologist is an expert in the field of radiation, and it is desirable to use the radiation as safely as possible and to reduce the exposure dose to the patient to solve the anxiety caused by the test^[6].

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X-ray is a non-invasive technique that provides image information in the human body, and is currently a

large part of the medical imaging field^[7-8]. Since the use of X-rays is indispensable for the diagnosis of diseases in the human body, optimal medical image quality need to be obtained with minimal exposure of the X-ray generator when acquiring medical images^[9-10].

Digital X-ray equipment has a broader range of dynamic range and linearity of dose than film-screen system, and this reduces the resampling rate and enables consistent image quality through adjusting the gray scale.

However, since the image quality can be maintained even when excessive dose is used, efforts are needed to reduce the radiation dose of patient by radiologist, and related studies and research on the improvement of the performance of the digital detector for dose reduction have been continuously reported^[11].

Therefore in this study, we will analyze some conditions of x-ray examinations currently used in the clinic and examine how the image quality deteriorates as the exposure conditions are lowered^[12]. In addition, the goal of this study is to find the exposure conditions that can be inspected without degrading the image quality while decreasing the exposure conditions step by step.

Method

The subjects were the exposure conditions of Chest, Hand and Skull that are currently used in the clinical trial. The standard was used as the exposure conditions that are commonly used, and the experiment was performed by reducing kVp and ma in five steps. Subject to be imaged for each exposure condition was used as a Kyotokagaku body phantom PBU-50. The equipment used in the study was DR-GEM GXR-C40SD X-ray. Raw data of the image obtained as a result of the test was obtained and analyzed by Image J program.

In order to see the reproducibility of the x-ray equipment before the experiment, 10 x-ray exposures were performed without a phantom in a 35 * 35cm field.

All 10 times were set as the same exposure condition. The purpose of the Image J program is to determine the mean, standard deviation, and to determine whether similar values are produced under the same exposure conditions.

Original images are obtained under five exposure conditions using the human body phantom of Chest, Hand and Skull. Analyze raw data using Image J program. Set the part with phantom as the region of interest and the part without phantom in the background and measure it.

Hand exposure condition 1 is 50kVp 100mA 5mAs. Hand exposure condition 2 is 48kVp 100mA 4mAs. Exposure condition number 3 is 46kVp 100mA 3.2mAs. Exposure condition number 4 is 44kVp 100mA 2.5mAs. The final exposure condition number 5 is 42kVp 100mA 1.6mAs. The original data is obtained by exposing three times for each exposure condition.

Skull exposure condition 1 is 70kVp 200mA 12.8mAs. Skull exposure condition 2 is 65kVp200mA 10mAs. Exposure condition number 3 is 60kVp200mA 8mAs. Exposure condition number 4 is 55kVp200mA 6.4mAs. The final exposure condition number 5 is 50kVp200mA 5mAs. The original data is obtained by exposing three times for each exposure condition.

Abdomen exposure condition 1 is 85kVp 200mA 32mAs. Abdomen exposure condition 2 is 80kVp200mA 25mAs. Exposure condition number 3 is 75kVp200mA 20mAs. Exposure condition number 4 is 70kVp200mA 16mAs. The final exposure condition number 5 is 65kVp200mA 12.8mAs. The original data is obtained by exposing three times for each exposure condition.

Result and Discussion

The results of the first reproducibility test showed no significant difference in all 10 times [Figure 1]. Therefore, the reproducibility of the equipment was determined to be reliable.

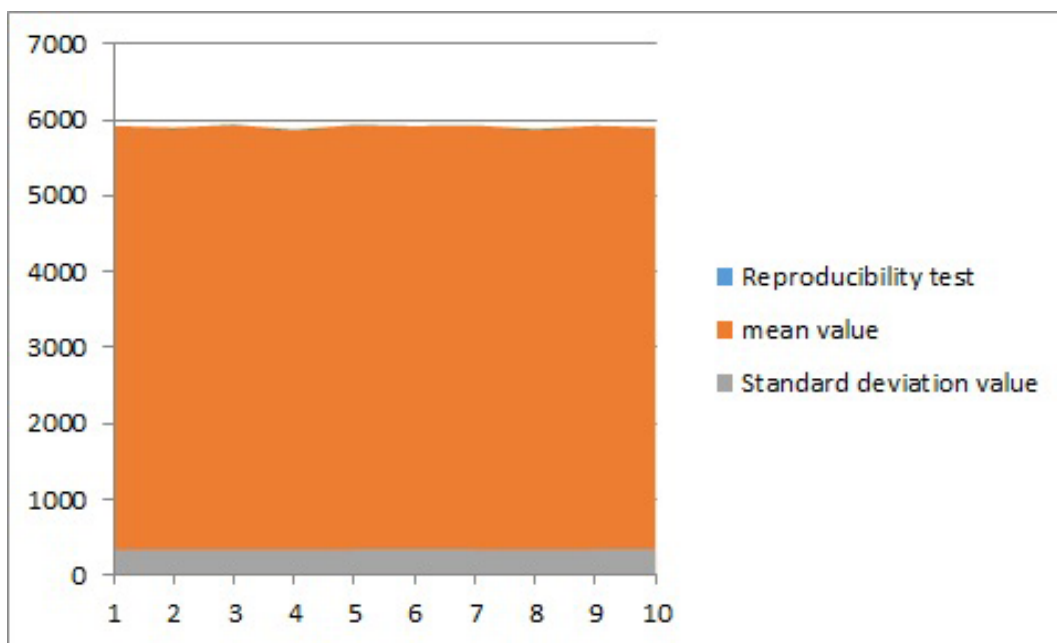


Figure 1. Reproducibility test

The results under Hand and abdomen exposure showed that the average value of all pixels decreased as the dose decreased. The average pixel value was reduced 33.42% when a 2 times the exposure conditions in the first time exposure conditions. When changing from exposure condition 2 to exposure condition 3, the average pixel value decreased by 55.42% based on condition 1. The change from exposure 3 to exposure 4 decreased 71.86% based on condition 1. In the last five exposure conditions, the average pixel value decreased by 85.35% based on the first exposure condition.

Even under abdomen exposure conditions, as the dose decreased, the average value of all pixels decreased. The average pixel value was reduced 20.77% when a 2 times the exposure conditions in the first time exposure conditions. When changing from exposure condition 2 to exposure condition 3, the average pixel value decreased by 39.00% based on condition 1. The change from exposure 3 to exposure 4 decreased 56.15% based on condition 1. In the last five exposure conditions, the average pixel value decreased 74.16% based on the first exposure condition [Figure 2].

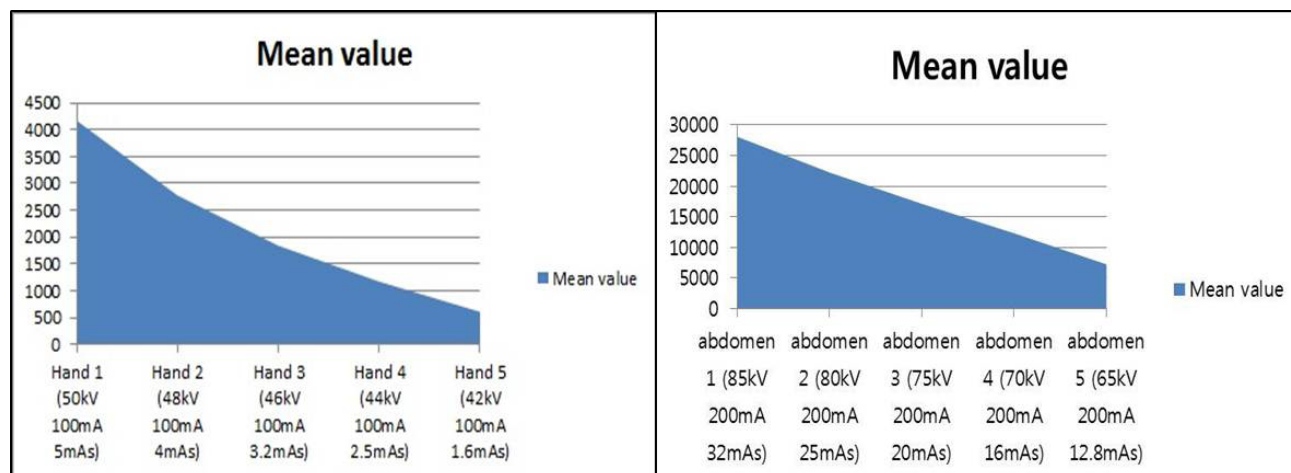


Figure 2. Hand and Abdomen mean value

When visually assessing the five-stage image, the difference between the fourth and fifth exposure conditions of the hand was significantly different [Figure 3].

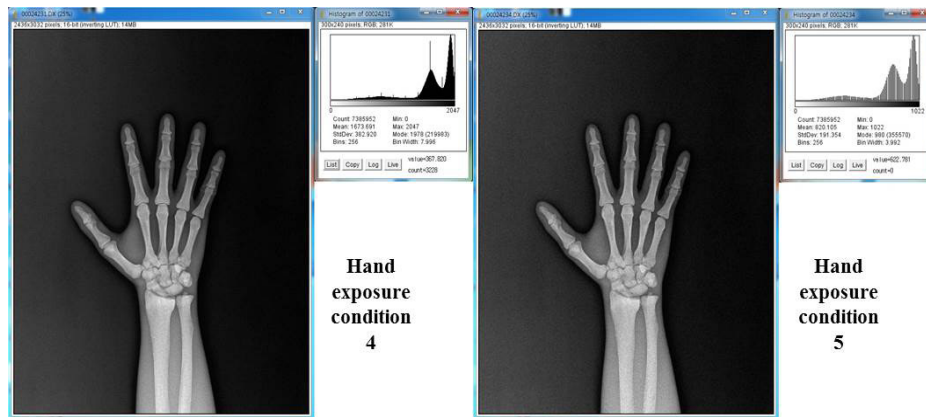


Figure 3. Visual evaluation of Hand images

When evaluated by visual observation of the image of 5 showed a definite difference between image Abdomen second exposure condition, and the third exposure condition [Figure 4].

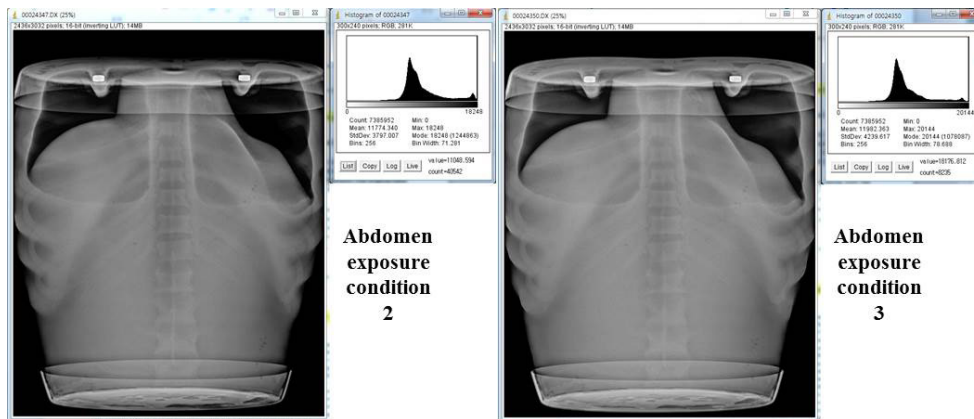


Figure 4. Visual evaluation of Abdomen images

[Table 1] shows the skull exposure condition, as the dose decreased, the average value of all pixels decreased. The average pixel value was reduced 41.88% when a 2 times the exposure conditions in the first time exposure conditions. When changing from exposure condition 2 to exposure condition 3, the average pixel value decreased

66.58% based on condition 1. When changing from exposure 3 to exposure 4 it was 81.68% decrease based on condition 1. In the last five exposure conditions, the average pixel value decreased by 85.78% based on the first exposure condition.

Table 1. Skull exposure condition mean value

Exposure Condition	Mean Value	Percent Ratio
skull 1 (70kV 200mA 12.8mAs)	31310.00	100%
skull 2 (65kV 200mA 10mAs)	18195.17	41.88% decrease
skull 3 (60kV 200mA 8mAs)	10462.85	66.58% decrease
skull 4 (55kV 200mA 6.4mAs)	5733.41	81.68% decrease
skull 5 (50kV 200mA 5mAs)	4451.10	85.78% decrease

When visually assessing the five-stage image, the difference between the fourth and fifth exposure conditions of the Skull was significantly different [Figure 5].

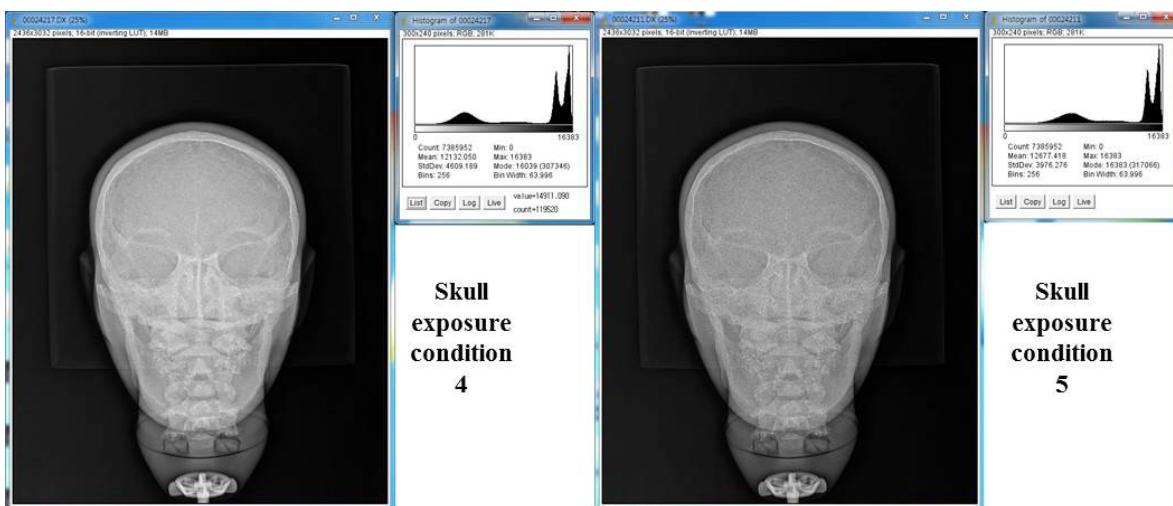


Figure 5. Visual evaluation of Skull images

Discussion

As a result of this study, it was confirmed that the pixel value decreased as the exposure dose decreased. It was also found that the value of the pixel reflected the amount of transmitted X-rays. In the case of the hand examination condition, it can be seen that the fourth condition is the most optimal condition in the visually determined image. In the abdominal examination condition, the second condition before the image suddenly deteriorated was the optimal condition to reduce and obtain the dose. In the case of Skull examination, the fourth condition was found to reduce the transmission dose and obtain a good image.

However, further experimentation will be required for these data to be reliable. The reduced transmission dose can be measured with a dosimetry to compensate for the reliability. In addition, more cases of data can be obtained to ensure the reliability of the data.

Conclusion

The X-ray ray imaging equipment used in the medical field differs from each manufacturer and the performance of each component, so the X-ray dose required to acquire an appropriate image is different. In addition, since the transmission dose is different for each site, it is necessary to adjust the exposure conditions.

When examining the change of the pixel value according to the change of the exposure condition, it was

found that the pixel value reflects the dose. In this study, the change of pixel value according to the change of exposure condition and percent reduction of pixel value by condition were analyzed and confirmed. When the image was evaluated by the pixel value and the naked eye, the fourth exposure condition in the Hand and the fourth exposure condition in the Skull were found to be good conditions. And in Abdomen, the second exposure condition was good. However, with these results alone, it is difficult to find the optimal transmission dose to make an image. I will continue to study through more accurate experiments later.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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The Effect of Verbal and Non-verbal Violence Experienced at Clinical Training Institutions on Major Satisfaction of Dental Hygiene Students

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Abstract

Background/Objectives: This study investigated Department of Dental Hygiene students' experiences of verbal and nonverbal violence during their clinical training, and the effects of these experiences on their training site satisfaction and major satisfaction.

Method/Statistical Analysis: The present study involved 80 students of the Departments of Dental Hygiene of the B, S, and D Colleges in Chungnam who had experience of on-site clinical training. The subjects were asked to answer a questionnaire that included questions about their demographic characteristics, their experience of verbal and nonverbal violence. Independent samples t-test was used to analyze differences in clinical training satisfaction and major satisfaction between experience of verbal and non-verbal violence at clinical training sites.

Findings: Regarding the effect of experiences of verbal and nonverbal violence on the clinical training satisfaction, the clinical training satisfaction score was 2.95 out of 5 among the students who had experienced verbal violence, while it was 3.88 among those who had not experienced verbal violence. In addition, the clinical training satisfaction score was 2.85 out of 5 among the students who had experienced nonverbal violence, while it was 3.68 among those who had not experienced nonverbal violence. Regarding the effect of the experience of verbal and nonverbal violence on the major satisfaction, the major satisfaction score was 3.58 out of 5 among the students who had experienced verbal violence, while it was 4.05 among those who had not experienced verbal violence. In addition, the major satisfaction score was 3.33 out of 5 among the students who had experienced nonverbal violence, while it was 4.04 points among those who had not experienced nonverbal violence, indicating that the major satisfaction was higher in the students who had not experienced nonverbal violence, although the difference between the two groups was not significant.

Improvements/Applications: The results showed that a significantly high ratio of dental hygiene students had experienced violence, but that they had failed to react positively. Therefore, various efforts and countermeasures must be implemented to reduce the violence that may occur during clinical training.

Keywords: *Clinical training, Dental hygiene, Major satisfaction, Non-verbal violence, Verbal violence.*

Introduction

Violence in medical settings basically refers to violence occurring in a medical institution during the work time. It can include injury, assault, rape, and indecent assault, which are criminal offenses. Verbal abuse may be considered verbal violence in a broad sense. Violence in medical settings may be directed at patients or medical workers. In the case of violence directed

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at medical workers, the attacker may be a patient, a caregiver, or a fellow medical worker. Violence directed at a fellow medical worker includes violence between physicians, nurses, and medical technicians, between nurses, and between physicians. Therefore, violence in medical settings can take various forms^[1].

The ratio of medical workers who have experienced violence in healthcare and medical settings has been increasing continuously over the last few years. A 2016 report about healthcare and medical workers revealed that 47.6% of workers in hospitals and medical institutions had experienced verbal abuse, assault, or sexual violence, with verbal abuse representing the highest rate (41.0%). The report also showed that in incidents of verbal abuse and assault, most of the attackers were patients, caregivers, physicians, or the workers' superiors.

Dental hygienist is the most common of the dental occupations in dental institutions^[2]. As dental hygienists' work requires close interactions with patients, caregivers, dentists, and their superiors, they are the most exposed to violence in dental settings. Experiences of violence in medical institutions have been known to cause post-traumatic stress disorder or emotional instability, with symptoms of avoidance, hyperarousal, sleep disorder, emotional paralysis, and dissociation, eventually resulting in an increase in reassignment or turnover^[3,4].

Students undergoing on-site training at dental institutions may also be subject to the violence described above. Healthcare and medical educational institutions provide students with on-site clinical training at actual medical institutions to help them develop relevant practical capabilities. The Departments of Dental Hygiene of four-year-course colleges that foster dental hygienists also let them participate in on-site clinical training programs for about one year to learn the actual tasks of dental hygienists and the work performed at dental institutions. In those dental institutions, violence may take place between dentists, dental hygienists, and nurse aids, as well as between patients or caregivers and the dental institution workers. Participating students who experience verbal or nonverbal violence feel anger, sadness, discomfort, and frustration^[5,6]. Moreover, these experiences may reduce their training site satisfaction and even their department satisfaction, causing them to discontinue their college life or to change majors.

This study investigated Department of Dental Hygiene students' experiences of verbal and nonverbal violence during their clinical training, and the effects of

these experiences on their training site satisfaction and major satisfaction.

Method

The present study involved 80 students (juniors and seniors) of the Departments of Dental Hygiene of the B, S, and D Colleges in Chungnam who had experience of on-site clinical training. [Table 1] shows the subjects' demographic characteristics. Their average age was 21.08 years. There were 69 female students (97.2%) and only 2 male students (2.8%). At the time of their clinical training, 39 (54.9%) of the respondents were sophomores and 32 (45.1%) were juniors or higher.

Table 1. Demographic characteristics of study subject

	N	%
Age	21.08±1.32*	
Gender		
Female Students	69	97.2
Male Students	2	2.8
Grade at the time of clinical training		
Sophomores	39	54.9
Juniors or Higher	32	45.1

* Mean and standard deviation

The subjects were asked to answer a questionnaire that included questions about their demographic characteristics (gender, age, and grade), their experience of verbal and nonverbal violence, the size of the hospital where their training was provided, the degree of verbal and nonverbal violence experienced, the attackers in the incidents of verbal and nonverbal violence, their clinical training satisfaction, and their major satisfaction. The subjects were asked open-type questions to allow them to describe their experiences of verbal and nonverbal violence. Data were analyzed using SPSS (Windows version 19, SPSS INC) program. Independent samples t-test was used to analyze differences in clinical training satisfaction and major satisfaction between experience of verbal and non-verbal violence at clinical training sites and the significance level was set at 0.05.

Result

As shown in [Table 2], 33 subjects (46.5%) had experienced verbal violence. With regard to the size of the hospital where the training was provided, 13 subjects (39.4%) had experienced verbal violence in university hospitals, 10 (30.3%) in dental hospitals, and 14 (42.4%)

in dental clinics, indicating that verbal violence had been experienced in dental clinics the most. In verbal violence incidents, the attackers had been dentists for 9 subjects (27.3%), dental hygienists for 23 subjects (69.7%), and patients or caregivers for 9 subjects (27.3%), indicating that in most verbal violence incidents, the attackers were the trainees' superiors.

Table 2. Subjects' experiences of verbal violence

	N	%
Experiences of verbal violence		
Yes	33	46.5
No	38	53.5
The size of the training hospital		
University hospital	13	39.4
Dental hospital	10	30.3
Dental clinics	14	42.4
Attackers of verbal violence		
Dentist	9	27.3
Dental hygienists	23	69.7
Patients of caregivers	9	27.3

As shown in [Table 3], 22 (31.0%) of the subjects had experienced nonverbal violence. With regard to the size of the hospital where the training was provided, 4 subjects (18.2%) had experienced nonverbal violence in university hospitals, 6 (27.3%) in dental hospitals, and 13 (59.1%) in dental clinics, indicating that just like verbal violence, nonverbal violence had been experienced in dental clinics the most. In nonverbal violence incidents, the attackers had been dentists for 4 subjects (18.2%), dental hygienists for 15 subjects (68.2%), and patients or caregivers for 4 subjects (18.1%), indicating that in most nonverbal violence incidents, the attackers were the trainees' superiors.

Table 3. Subjects' experiences of nonverbal violence

	N	%
Experiences of non-verbal violence		
Yes	22	31.0
No	49	69.0
The size of the training hospital		
University hospital	4	18.2
Dental hospital	6	27.3
Dental clinics	13	59.1
Attackers of non-verbal violence		
Dentist	4	18.2
Dental hygienists	15	68.2
Patients of caregivers	4	18.1

With regard to the effect of experiences of verbal and nonverbal violence on the clinical training satisfaction, [Table 4] shows that the clinical training satisfaction score was 2.95 out of 5 among the students who had experienced verbal violence, while it was 3.88 among those who had not experienced verbal violence, indicating that the training satisfaction was significantly lower in the students who had experienced verbal violence ($p = 0.007$). In addition, the clinical training satisfaction score was 2.85 out of 5 among the students who had experienced nonverbal violence, while it was 3.68 among those who had not experienced nonverbal violence, indicating that the training satisfaction was lower in the students who had experienced nonverbal violence, although the difference between the two groups was not significant ($p = 0.089$). With regard to the effect of the experience of verbal and nonverbal violence on the major satisfaction, [Table 4] shows that the major satisfaction score was 3.58 out of 5 among the students who had experienced verbal violence, while it was 4.05 among those who had not experienced verbal violence, indicating that the major satisfaction was significantly higher in the students who had not experienced verbal violence ($p = 0.026$). In addition, the major satisfaction score was 3.33 out of 5 among the students who had experienced nonverbal violence, while it was 4.04 points among those who had not experienced nonverbal violence, indicating that the major satisfaction was higher in the students who had not experienced nonverbal violence, although the difference between the two groups was not significant ($p = 0.079$).

Table 4. Experiences of Violence on Clinical Training Satisfaction and Major Satisfaction

	Clinical training satisfaction		Major satisfaction	
	M±SD	p*	M±SD	p*
Experiences of Verbal Violence				
Yes	2.95±1.33	0.007	3.58±1.02	0.089
No	3.88±0.78		4.05±0.59	
Experiences of non-verbal violence				
Yes	2.85±1.14	0.026	3.33±1.23	0.079
No	3.68±1.09		4.04±0.51	

*p-value was calculated by independent samples t-test

Discussion

The present study was designed to investigate the verbal and nonverbal violence experienced by Department of Dental Hygiene students during their on-

site clinical training, and the effects of the experience of violence on the students' clinical training satisfaction and major satisfaction, in order to consider the violence experienced by students at dental institutions during their training and to offer them the necessary support. Most Department of Dental Hygiene students prepare themselves in their college to make sure they are equipped with the essential skills before undergoing on-site training at dental institutions. However, because students who are new to clinical settings are less experienced and lack the communication skills and empathy needed, they are less capable of forming relationships with dentists, dental hygienists, and patients. In addition, while students are continuously exposed to new environments as they frequently move between departments for training, they have little time to adapt. Therefore, students are particularly vulnerable to violence at clinical sites^[7].

The present study on the verbal and nonverbal violence experienced by Department of Dental Hygiene students showed that 46.5% of the students had experienced verbal violence during their clinical training and 31.0% had experienced nonverbal violence. The attackers in verbal violence incidents had most frequently been dental hygienists (69.7%), followed by dentists (27.3%) and others (27.3%). The attackers in nonverbal violence incidents followed the same prevalence order: dental hygienists (68.2%), dentists (18.2%), and others (18.1%). It is likely that dental hygienists were the most frequent attackers in both verbal and nonverbal incidents because they provide direct instructions and teachings to Department of Dental Hygiene students in dental institutions. The results of the present study also revealed that experiences of verbal and nonverbal violence had a significant effect on the clinical training satisfaction and the major satisfaction. The clinical training satisfaction and major satisfaction of the students who had experienced verbal or nonverbal violence were significantly lower than those of the students who had not experienced violence. These results are similar to those of previous studies that showed that the various types of violence experienced by nursing students at clinical training sites cause the students pain and may affect their attitudes toward the nursing profession they have chosen^[3-6]. Trainees exposed to violence may be negatively affected in their career identity due to the sense of isolation, stress, and negative impression of the organizations they may develop^[8].

Students participating in clinical training undergo on-site training as learning students. As their on-site roles are not as clear as those of the actual dental hygienists, their self-esteem and morale may be easily lowered by verbal violence. When facing violence, students show immediate emotional reactions in the following order: anger, shock, impression, sadness, anxiety, shame, helplessness, doubt of self-worth, desire to quit, and sense of loss. This indirectly reveals that students lack stress control skills and have difficulties communicating and expressing emotions. The negative emotions caused by the violence they experience may have a negative effect on their college curriculum, resulting in maladaptation to the dental hygienist profession. Therefore, from a mental health perspective, the effects of violence on individuals should never be underestimated. In particular, additional support needs to be provided to help prepare students for difficult situations and teach them to manage them^[9]. Keely argued that having sufficient knowledge and skills to protect oneself from violence may minimize the damage caused by violence at hospitals^[10]. This suggests that education to prevent violence is necessary. However, the online safety education provided to students focuses on the physical environment of clinical settings. Therefore, the regular curriculum also needs to include strategies to prevent and deal with violence in human relationships.

The orientation provided to the students before their participation in training must include information to understand the violence that can occur at clinical training sites and to identify the types of violence and how to report incidents. Students must be assured that they can receive ex-post supports such as counseling and reporting, and that incidents can be handled appropriately without causing them prejudice. In addition, the college training managers must evaluate the on-site training environments and communicate closely with the people in charge of the training programs provided at the institutions.

Conclusion

The present study investigated the verbal and nonverbal violence experienced by department of dental hygiene students during their on-site clinical training, and the effects of experiences of violence on the students' clinical training satisfaction and major satisfaction. The results showed that a significantly high ratio of dental hygiene students had experienced violence, but that they had failed to react positively. Therefore, various efforts

and countermeasures must be implemented to reduce the violence that may occur during clinical training.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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The Claim State of Dental Institutions for Payment from the NHIC

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Abstract

Background/Objectives: This study was performed to identify the causes that affect care benefits expense claim work of dental health insurance to provide basic data on efficient dental health insurance claim.

Method/Statistical Analysis: The study was conducted in the survey of Korean dental medical institution workers. The chi-square test was conducted to analyse the difference according to the health insurance claim method and the difference in health insurance reception result. A logistic regression analysis was conducted to verify the factors affecting the charge of health insurance claims.

Findings: Compared to the case of the absence of a dental hygienist, in case of 2 people, the probability of being in charge of a claim increased by 8.275 times ($p = .001$), and in case that the number of dental hygienists is 3 people or more, the probability of being in charge of a claim increased by 5.524 times ($p = .005$). Compared to the case of 1-4 employees, in case of more than 10 employees or more, the probability of being in charge of a claim is reduced by 0.119 times ($p = .002$). In the work experience, the probability of being in charge of a claim in case of more than 5 years and less than 10 years was 1.505 times higher than in case of less than 5 years ($p = .001$), and that of the case of more than 10 years was 6.440 times higher ($p < .001$).

Improvements/Applications: The introduction of a qualification system for the dental health insurance claim professional can reduce the burden on insurance claims by dental institutions.

Keywords: Claim status, Dental institution, Health insurance, National Health Insurance, Korea.

Introduction

Health insurance system is a social security system that prevents an excessive burden on households due to disease or injury and ensures that appropriate medical services are provided and the people ordinarily pay an insurance fee, and the National Health Insurance Service that is the insurer manages and operates them and provides insurance benefits if needed [1]. The health

insurance system adopts a third-party payment system where the medical provider does not request the full cost of medical treatment to the medical consumer but request it to Health Insurance Review and Assessment Service. For the payment method for medical expense, both Fee-for-service that is to pay a medical fee by setting a price for each medical treatment provided by a medical provider and case-payment that is a system that bears a predetermined amount of medical expenses for some disease groups such as payment implants and payment dentures have been applied [2].

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In Dental Health Insurance, with the start of tooth sealant in 2009, the attention and knowledge on the criteria for calculating care benefits expense are required according to that the insurance coverage of resin dentures, partial dentures, metal dentures, scaling, dental

implants, etc. has been expanded and the importance of knowledge about the criteria for calculating care benefits of dental insurance claimants has been reported [3,4]. The expansion of insurance coverage in dental health insurance has an effect on reducing the consumer's burden on medical use, which leads to an increase in medical consumption and it has a positive influence on dental management [5].

Although the importance of accurate claims in insurance claims by medical institutions has been emphasized through various studies [3,5-7] related to the claim actual status and knowledge level for care benefits expense of claim professional workforce, the error in application continues to occur due to the unskilled knowledge of the work related to the health insurance claim. Dental hygienists' understanding about the change of system according to expand the insurance coverage of dental health insurance and their accurate calculations regarding insurance claim affect the competitiveness enhancement of dental management and in a broad sense, the stabilization of insurance finances [8]. As the work importance of dental hygienists in charge of insurance claims is rising with the increase of the use of medical services due to the expansion of insurance coverage, alternatives on the provider side will be necessary for the quality of medical service and the efficient management of insurance claim work. Therefore, this study was performed to identify the causes that affect care benefits expense claim work of dental health insurance to provide basic data on an alternative for continuous and efficient dental health insurance claim professional workforce management.

Method

The study was conducted for 2 months from July to August 2015 in the survey of Korean dental medical institution workers. A total of 400 questionnaires were distributed and 333 questionnaires (83.3%) except for 67 questionnaires which had insufficient responses were analyzed. The questionnaires, which had a total of 23 questions, consisted of 8 general questions and 13 questions for the actual status of the dental health insurance claim. For the survey, the questionnaire was revised and supplemented after a preliminary survey with 20 questionnaires.

Statistical analysis was performed using SPSS WIN 21.0 program. The frequency and percentage of the subject's sociodemographic characteristics, the characteristics of medical institutions and the actual status of dental health insurance claims were calculated, and a chi-square test was conducted to analyze the difference according to the health insurance claim method and the difference in health insurance reception result. A logistic regression analysis was conducted to verify the factors affecting the charge of health insurance claims. The statistical significance level was set to .05.

Result and Discussion

The general characteristics of the study subjects are shown in Table 1. The occupation was dental hygienists 82.9% and nursing assistants 10.8%. The age was 59.4% under 30 years old, 28.2% under 30 - 40 years old. The work experience was 39.3% for less than 5 years, 31.5% for less than 5 ~ 10 years. The number of employees was 31.2% under 5 people, 42.6% under 5-10 people.

Table 1. General characteristics of the study subjects

Variables		N	%
Working area	Seoul	121	36.3
	Incheon/Gyeonggi-do	91	27.3
	Daejeon/Chungcheong-do	106	31.8
	Other	15	4.5
Occupation	Dental doctors	7	2.1
	Dental hygienists	276	82.9
	Nursing assistants	36	10.8
	other	14	4.2
Age	≤ 29	198	59.4
	30-39	94	28.2
	≥ 40	41	12.3
Work experience	≤ 4	131	39.3
	5-9	105	31.5
	≥ 10	97	29.1
Number of employees	≤ 4	104	31.2
	5-9	142	42.6
	≥ 10	83	26.1
Claim method	Exclusive claim	265	79.6
	Agency claim	68	20.4
Monthly claim amount	≤ 499	109	32.7
	500-899	115	34.5
	≥ 900	109	32.7

Table 2. Health insurance claim method according to the characteristics of medical institution

		Claim Method		P
		Exclusive Claim	Agency Claim	
Number of employees	≤4	72(69.2)	32(30.8)	.006
	5~9	118(83.1)	24(16.9)	
	≥10	75(86.2)	12(13.8)	
Number of Dental hygienists	None	5(18.5)	22(81.5)	.000
	1	33(63.5)	19(36.5)	
	2	32(78.0)	9(22.0)	
	≥3	195(91.5)	18(8.5)	
Monthly claim amount	≤ 499	74(67.9)	35(32.1)	.000
	500-899	90(78.3)	25(21.7)	
	≥900	101(92.7)	8(7.3)	
Total		265(79.6)	68(20.4)	

Table 2 shows that the result of analyzing the difference in the health insurance claim method. After dividing the health insurance claims into two groups, Exclusive claim and agency claim, as a result of analyzing the difference according to the number of claims, the number of hospital workforce and the number of dental hygienists, all three items were statistically significant.

Table 3. Health insurance claim reception result according to differences in health insurance claims

Variables		Claim Method		P
		Exclusive Claim	Agency Claim	
Field of cuts	Oral surgery	17(8.6)	4(8.3)	.921
	Conservation/Restoration	21(10.6)	7(14.6)	
	Endodontic treatment	20(10.1)	5(10.4)	
	periodontal treatment	127(64.1)	30(62.5)	
	general practice	13(6.6)	2(4.2)	
Itmes of cuts	Examination fee	27(12.7)	4(10.8)	.708
	Performance fee	159(75.0)	26(70.3)	
	Prescription fee	13(6.1)	4(10.8)	
	Material fee	13(6.1)	3(8.1)	
Main causes for cuts	Do not know the evaluation principle	37(15.0)	9(13.8)	<.001
	Because the chart contents according to the treatment do not fit the evaluation principle	85(34.6)	14(21.5)	
	Lack of program skills	10(4.1)	1(1.5)	
	The lack of evaluation criteria and the relevant latest information'	87(35.4)	15(23.1)	
	etc	27(11.0)	26(40.0)	
Improvements	Securing claim workforce and time	86(36.8)	15(23.4)	<.001
	Facility equipment and program	15(6.4)	2(3.1)	
	Simplification of claim and administrative procedures	44(18.8)	23(35.9)	
	Education to enhance employees' skills	88(37.6)	19(29.7)	
	etc	1(0.4)	5(7.8)	
Total		234(100.0)	64(100.0)	

Table 3 shows that the results, as a result of analyzing the cuts field, cuts items, the main causes of cuts, and claims improvement according to differences in health

insurance claims method, it was analyzed that there was a statistically significant difference in the main causes of cuts and claims improvement.

A multivariate logistic regression analysis was conducted to analyze factors affecting the charge of claim work. (Table 4.) The status of the responsibility of health insurance claim work was statistically significant in the number of dental hygienists (2, 3 people or more), the number of employees (10 people or more), the claims amount (more than 9 million won), and the work experience (more than 5 years and less than 10 years, more than 10 years). Compared to the case of the absence of a dental hygienist, in case of 2 people, the probability of being in charge of a claim increased by 8.275 times ($p = .001$). In the work experience, the probability of being in charge of a claim in case of more than 5 years and less than 10 years was 1.505 times higher than in case of less than 5 years ($p = .001$), and that of the case of more than 10 years was 6.440 times higher ($p < .001$).

Table 4. Factors affecting the charge of claim work

Variables		OR(95% CI)	P
Number of Dental hygienists	None	Reference	.002
	1	2.17(0.67-7.09)	.198
	2	8.28(2.39-28.67)	.001
	≥3	5.52(1.70-17.99)	.005
Number of employees	≤4	Reference	.005
	5-9	0.72(0.37-1.39)	.329
	≥10	0.28(0.12-0.63)	.002
Age	≤29	Reference	.147
	30-39	0.53(0.22-1.28)	.156
	≥40	1.00(0.31-3.23)	.996
Monthly claim amount	≤499	Reference	.057
	500-899	1.84(0.97-3.48)	.062
	≥900	2.22(1.13-4.36)	.021
Work experience	≤4	Reference	.000
	5-9	2.77(1.51-5.11)	.001
	≥10	6.44(3.33-12.45)	.000

Discussion

As hospital management deteriorated recently, the number of hospitals which rely on health insurance claims rather than non-payment medical treatment or surgery increased [9]. As the coverage of insurance benefits gradually increases by expanding the insurance coverage of tooth sealant, which was previously a non-payment treatment item, and applying the dentures, one-time tooth scaling a year, and dental implants of the elderly as insurance benefits, health insurance treatment is recognized as a factor that can enhance the competitiveness of dental management [10].

Whether or not the health insurance system has been satisfactory and there have been no financial problems should be reviewed and whether or not the finances were reasonably managed should also be reviewed [11]. Additionally, as there are also a number of difficulties related with health insurance in dental institutions [12], to compensate for this, institutional review should be made to ensure that health insurance claim work can be performed independently and professionally [13], by recognizing the need for professional claimants with whom the effectiveness of treatment can be increased in the clinic, and by cultivating medical treatment claim professionals who are dedicated to health insurance claims to enhance the quality of medical services through coordinating the workforce [14].

The study of Oh [15] that the reason for making the agency claim is due to the time loss and complicated administrative procedures experienced when making the exclusive claim. As noted in the study of Kim and Jung [13], it is necessary to cultivate medical treatment claim professionals who are dedicated to health insurance claim works in order to enhance the quality of medical services by recognizing the need for professional claimants to increase the efficiency of medical practitioners in the clinic, and by performing efficiently and effectively the medical insurance claim works which are currently requested at medical institutions, and reducing medical practitioners' treatment works.

Moreover, it is also needed to provide special expertise to dental hygienists because there are many views that dental hygienists are the most suitable people for the professional management of health insurance claim work and self-examination work in dental care institutions [16].

In terms of the claims improvement, in the Exclusive claim, 'education to enhance employees' skills' 37.6% and 'securing claim personnel and time' 23.4% were high. In the agency claim, 'simplification of claim and administrative procedures' 35.9%, and 'education to enhance employees' skills' 29.7% were shown high. This is the same result as the study of Yoo [4] that insurance claims were not made properly due to lack of time, workforce and lack of knowledge of health insurance in dental institutions. In the study of Park [17], it was described that dental clinics emphasized the need for systematic education of not only the claimants but also employees with explaining the difficulties of claim

works and health insurance-related education would help them execute their works.

As a dental health insurance claim work is not just a job, but establishes a credible trust with patients and provides medical services, and further affects hospital management performance, need for intensive insurance claim education is required^[17]. Thus, as dental hygienists are in a position to calculate accurately the medical expenses, the role of dental hygienists is emphasized to prevent any possible revenue cuts, and with awareness of the insurance fee system of dental hygienist, to claim promptly the medical services provided to patients by the hospital without errors and omissions^[18].

Therefore, as suggested in the study of Ahn^[19], it is necessary to consider being able to exert their abilities after employment in the hospital by selecting professional dental hygienists for dental insurance claims with introducing the dental health insurance claim professional qualification system as a national qualification system. The introduction of the qualification system can reduce the burden on insurance claims by dental institutions, and it is considered that the dental hygienists can exert their abilities to enter into the Health Insurance Review and Assessment Service later after building their clinical career as professional dental hygienists for dental insurance claims.

Conclusion

The introduction of a qualification system for the dental health insurance claim professional can reduce the burden on insurance claims by dental institutions. Furthermore, it is considered that the efficiency of claim work will be inclined if professional dental hygienists are actively made to work in the field of dental insurance claims. Therefore, a foundation for cultivating claim professionals should be established, and it is believed that, for this purpose, it is necessary to introduce a private-centered claim professional qualification system as a national qualification system.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Measurement and Analysis of Exposure Dose According to Radiological Survey Films of Dental Hygiene Students in Oral Imaging Practice

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Abstract

Background: The class of oral imaging practice in undergraduate course of the department of dental hygiene is very important to enhance work performance of dental hygienists' radiologic examination after students graduate.

Method: We divided inside and outside of 8 exposure dosimeters into shielded ones and unshielded ones, performed irradiation 1,000 times, 2,000 times and 3,000 times respectively and compared and analyzed depth dose, shallow dose and accumulation dose.

Findings: The accumulation dose of shielded ones examined 1,000 times, 2,000 times and 3,000 times was 0.1 msv, which doesn't exceed 1 msv of normal person's dose limit and 50 msv of occupational dose per year by International Commission on Radiological Protection Recommendation. All of the examinations were safe results regardless of frequency, and when they were unshielded, it was 1.23 msv at 1,000 times of examination, 29.25 msv at 2,000 times and 40.26 msv at 3,000 times, which indicates the higher the frequency is, the higher the exposure dose, showing the importance of shield.

Improvement: We intend to provide a basic resource that in the undergraduate course of the department of dental hygiene, learning radiologic examination technique through actual mutual practice rather than pandom practice in the irradiation practice is more effective and safer.

Keywords: Department of dental hygiene, dental hygienist, oral imaging, examination practice, exposure dose, shield.

Introduction

According to Article 2, Clause 1, Section 6 of Enforcement Decree of the Act on Medical Articles, etc., dental hygienists can perform radiography for oral diagnosis at health agency or medical institution that has radiation generating device for diagnosis suitable for safety management standards^[1]. and the radiography at dental institution is mostly done by dental hygienists.^[2]

Kim^[3] claimed that dental hygienists play a main role at dental clinics as staff of radiography, and as the level of their knowledge and attitude is higher, the level of radiography defense behavior is higher. Lee^[4] revealed in the research on radiation safety management that the

level of knowledge about radiation safety management is higher, the level of the attitude and behavior is higher, and the level of the attitude is higher, the degree of behavior is higher in the relation among the knowledge, attitude and behavior of radiation safety management.

However, the use of radiation in the medical field provides critical benefits in diagnosis and treatment, but it can't be denied that there are damages caused by radiation exposure^[5].

The exposure by dental radiation is remarkably lower than other diagnostic medical radiographic inspections, but the frequency is very high^[6].

Therefore, when irradiation is done, the choice of radiation generating device and irradiation dose is needed according to the purpose, irradiated part, and patient's characteristics, and the understanding on the physical property of radiation along with the knowledge and experience required in the application to device and technique should be accumulated^[7].

The clinical performance ability, an important performance index of the dental hygiene education, is a critical part to evaluate the performance ability as a dental hygienist after a student graduates. The clinical practice education is an integrated form of all curriculums and becomes direct education for a dental hygienist's duty and responsibility by giving the behavior change in the knowledge, technique and attitude that a student acquires^[8].

Thus, this study is intended to reveal dental hygiene students obey safety levels of exposure dose, perform safety regulations, and the accumulation dose is safe in their performance as radiation workers, and to provide a basic resource that in the undergraduate course of the department of dental hygiene, learning radiologic examination technique through actual mutual practice rather than pandom practice in the irradiation practice is more effective and safer.

Method

- 1. Measurement tool:** We implemented an experiment using 8 personal exposure dosimeters offered by Seoul Radiology Services for research purpose from January 1 to March 31, 2019. After attaching each number to the exposure dosimeters for distinction in order to reduce errors during the experiment, we irradiated and performed a radiation exposure experiment using rootapex shooting equipment in the oral imaging laboratory of Sunmoon University.
- 2. Measurement method:** We measured the exposure dose by dividing the exposure dosimeters in the root apex shooting room inside the oral imaging laboratory of Sunmoon University into inside and outside.

The exposure dosimeters in the room were divided into 3 shielded ones and 3 unshielded ones, and 2 exposure dosimeters were set out of the door to find the amount of exposure dose out of the room with the doors closed during the X-ray irradiation.

Regarding the frequency of irradiation, the 3

exposure dosimeters inside of the room were divided into 1000 times, 2000 times and 3000 times for accumulation irradiation, and the exposure dose was measured in the exposure dosimeters with the irradiation completed by a professional interpretation company.

- 3. Analysis of date:** For the exposure dosimeters with the irradiation completed, we requested a professional interpretation company to compare and analyze exposure dose according to shielded and unshielded ones, and the frequency of shooting by dividing into depth dose, shallow dose and accumulation dose for precise analysis of exposure dose.

Result and Discussion

In dental medicine, radiographic inspection is useful in the diagnosis of oral diseases and the establishment of treatment plan, and as demands of orthodontics, denture and dental implant increase nowadays due to the improvement of income, the areas of radiographic inspection are expanded from intraoral radiography to external-oral radiography, panoramic radiography and digital radiography^[9].

Accordingly, the clinical practice education to reinforce the field performance ability of dental hygienists, which are oral health specialists, is essential. The clinical training of the department of dental hygiene curriculum is the process that students actually perform the theory and practice that they learn during the undergraduate course at the dental clinic. Through this clinical training education, students can form their occupational values and improve capability as an oral medical specialists^[10]. Yang and Moon^[11] reported in their research that when the satisfaction level of clinical training is high, autonomic and responsible learning is performed, along with effective and efficiency clinical training education.

This study experimented the actual accumulation exposure dose and the importance of shielding by repeating irradiation based on 1,000 times of irradiation done during the radiation practice process, and compared and analyzed whether the irradiation act and exposure dose during the practice sessions during undergraduate course are safe. The results are as follows.

- 1. Comparison of exposure dose levels according to irradiation accumulation frequency:** In the result of irradiation 1,000 times, 2,000 times and

3,000 times, the levels of directly irradiated shallow exposure dose are 1.22 msv, 32.98 msv and 43.18 msv respectively, and those of depth dose are 1.23 msv, 29.25 msv and 40.26 msv in the same condition. [Table 1, Table 2, Table 3].

2. Comparison of exposure dose levels according to shielding: In the result of comparing the change of accumulation exposure dose levels according to shielding at irradiation of 1,000 times, 2,000 times

and 3,000 times, when they were shielded, it was 0.1 msv according to irradiation frequency change, which indicates there is no change in levels, but there was a drastic change in the level of exposure dose when they were unshielded. In other words, the accumulation exposure dose irradiated 1,000 times was 1.23 msv, 2,000 times was 29.25 msv and 3,000 times was 40.26 msv, so as the frequency is higher, the levels of accumulation exposure dose are higher. [Figure 1].

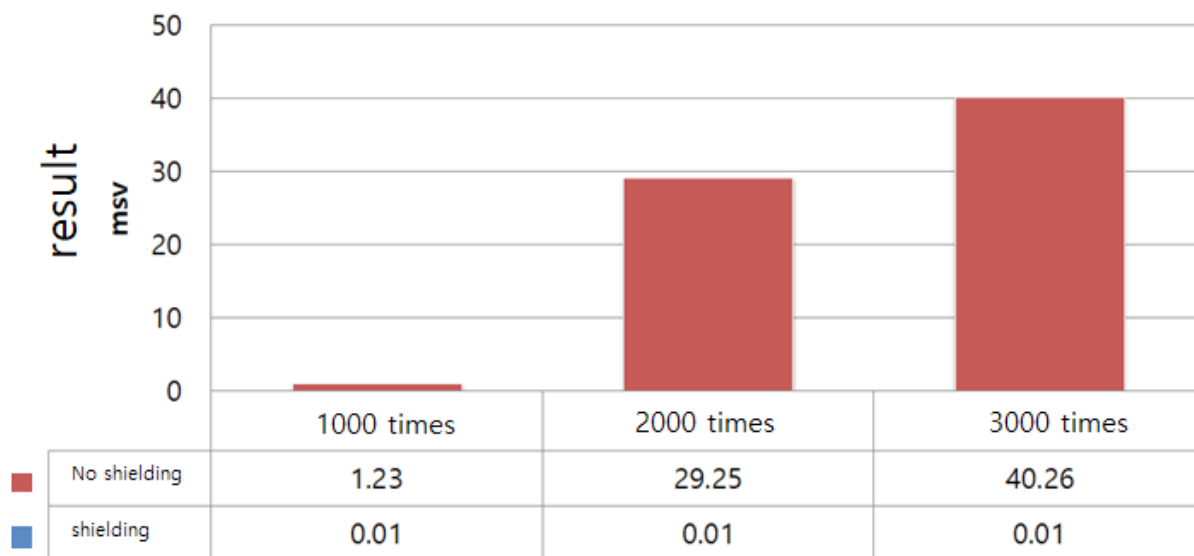


Fig. 1. Comparison of the cumulative measurement result figures among the results measured by radiation under different shooting conditions

Table 1. Exposure dose investigated 1000 times in radiation with different filming conditions

	Shallow	Depth	Yearly accumulation
No shielding	1.22	1.23	1.23
shielding	0.01	0.01	0.01
outside	0.02	0.02	0.02

Table 3. Exposure dose investigated 3000 times in radiation with different filming conditions

	Shallow	Depth	Yearly accumulation
No shielding	43.18	40.26	40.26
shielding	0.01	0.01	0.01
outside	0.02	0.02	0.02

Table 2. Exposure dose investigated 2000 times in radiation with different filming conditions

	Shallow	Depth	Yearly accumulation
No shielding	32.98	29.25	29.25
shielding	0.01	0.01	0.01
outside	0.02	0.02	0.02

Nuclear Safety And Security reinforced the safety management system on frequent visitors such as radiation safety education, implement of medical examination and maintenance of radiation exposure dose record by reflecting opinions that it is necessary to improve the safety management system for frequent visitors of radiation management zones as it revised Nuclear Safety Act in April, 2016^[12-14].

Regarding overseas cases, International Commission on Radiological Protection recommends at ICRP 103 to classify the degree of risk of radiation work areas instead of classifying radiation workers and frequent accessors to maintain the management function for protection of radiation workers with occupational exposure, which means it recommends to reorganize radiation safety management system of frequent accessors by reflecting the degree of hazard of radiation access areas where students perform shooting practice^[15-16].

According to the recommendation of International Commission on Radiological Protection(ICRP 60), the limit of exposure dose of normal people at planned exposure situations is 1 mSv per year, and occupational exposure shouldn't exceed maximum 50 mSv for one year, and the exposure limit is average 20 mSv for five years^[17-18].

Therefore, workers who work in radiation controlled areas where medical radiologic equipment is operated are strictly managed by having them wear personal exposure dosimeter regardless of their work type^[19].

This study confirmed that the actual accumulation exposure dose occurring in the training process of undergraduate course is within the safety level in the experiment of accumulation exposure dose based on the actual radiation exposure amount of personal exposure dosimeter that students wear during the radiology practice course in accordance with the radiation safety system.

Conclusion

This study researched the exposure dose of dental hygiene students during the oral imaging clinical practice course. Due to the regulation of Nuclear Safety Act, undergraduate students are not allowed to shoot directly at the mutual practice, so they do pandom practice, and directly shoot at the clinical field after they graduate. Even though both supervisors and students must execute radiation safety education, and the oral imaging practice is done in the safe environment under the management supervision, accurate practice and training for radiography in the undergraduate course are needed to reduce unnecessary radiation exposure dose in the clinical field, so I did the experiment of exposure dose in order to confirm that the accumulation exposure dose shot at the pandom during the oral imaging practice is the safe level.

In addition, the experiment is done by being divided into shielding and unshielding to highlight the importance of shielding at the clinical practice and the clinical field.

The result shows that the accumulation dose of shielded ones examined 1,000 times, 2,000 times and 3,000 times was 0.1 msv, which doesn't exceed 1 msv of normal person's dose limit and 50 msv of occupational dose per year by International Commission on Radiological Protection Recommendation. All of the results were safe results regardless of frequency, and when they were unshielded, it was 1.23 msv at 1,000 times of examination, 29.25 msv at 2,000 times and 40.26 msv at 3,000 times, which indicates the higher the frequency is, the higher the exposure dose, showing the importance of shield.

The result of measuring exposure dose generating during the clinical practice shows that it is safe level to human body. The safety education for management of radiation exposure should be done from the school training courses to prevent radiation mistake or unnecessary radiation exposure. This study can be provided as a resource for revision of Nuclear Safety Act into actual irradiation for students to practice. Furthermore, there should be various comparison experiments and actual surveys on exposure dose based on the guidelines of dental clinicians' exposure safety management.

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Source of Funding: Self

Conflict of Interest: Nil

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The Effect of Action Observation Training Combined with Intrinsic Muscle Stimulation on the Upper Limb of Function in Stroke Patients

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Abstract

Background/Objectives: The aim of this study was to investigate the effect of action observation training combined with intrinsic muscle stimulation intervention on the function of upper extremity in patients with stroke.

Method/Statistical Analysis: Twenty-two stroke patients were prospectively randomized to action observation training with intrinsic muscle stimulation group (N = 11) or action observation (N = 11). The upper limb of motor function and sensory function were evaluated before intervention, and intervention was performed 3 times a week, 40 minutes, 4 weeks, and the same evaluation was performed after intervention. The outcome measure was used by manual function test and sensory test.

Findings: The results of this study showed that there was a significant difference in the test within the group. There was statistically significant difference in manual function test and sensory test in the inter body test.

Improvements/Applications: This study demonstrated that action observation training combined with intrinsic muscle stimulation significantly improves the function of patients with stroke.

Keywords: Stroke, Upper extremity, Intrinsic muscle stimulation, Action observation, Sensory.

Introduction

Stroke is a sudden interruption of blood supply to a part of the brain owing to infraction or rupture of the blood vessels. It causes various impairments in physical, cognitive, or emotional functions [1]. Up to 80% of stroke survivors have upper limb dysfunction, and the burden of upper limb injury after stroke is still high. [2]. The recovery of the upper limb function of stroke patients is very difficult, most patients have limitations

in functional movements such as reaching, grasping, and ability to activities daily living. Each year after a stroke, upper extremity dysfunction is associated with the quality of life, anxiety, and prejudice of a health-related individual.[3]. Recovering upper limb function is considered to be a very important factor in improving occupation ability and overall physical abilities as well as activities daily living performances[4]. Therefore, many therapists have applied various neurological interventions for the maximal recovery of the upper extremity functions of people with hemiplegia. Including the promotion of alternative movements, aerobic exercise, somatosensory stimulation, action observation training, constraint-induced movement therapy, task-oriented training, bilateral arm training, brain stimulations, mental practice, mirror therapy, virtual reality etc.[5]. Movement and somatosensory awareness can be improved in a variety of ways, including techniques such as sensory

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reeducation, tactile kinesthetic guiding, repetitive sensory practice or desensitization [6]. The intrinsic muscle of a hand is provided stability of the fingers, and the size and amount of muscle in the hand are small, but it generates a strong force equivalent to about 50% of the grasping strength of the hand [7]. Observation training is a method of repeatedly tracing an activity or activity performed by another person, or observing an activity or activity appearing in the image and imitating an observed activity or activity [8]. Action observation therapy facilitates physical training for motor memory formation and is based on mirror neurons, which were first described in monkeys [9]. In previous studies, action observation training using visual information to provide goal-oriented activities and motivational information has a positive effect on upper extremity function of stroke patients. In addition, intrinsic muscle stimulation by providing various sensory information also has a positive effect. However, there has been no research on the combination of motion observation through visual perception and intrinsic muscle stimulation training through somatosensory. The purpose of this study was to investigate the effect of action observation training combined with intrinsic muscle stimulation on the upper limb of function and muscle activity in stroke patients.

Method

1. Subjects: In this study, 22 patients who were admitted to B clinic in Gyeonggi province were randomly assigned to two groups. The specific criteria of the subject are as follows: (1) Adults receiving a stroke diagnosis from a rehabilitation doctor, (2) Shoulders and wrists, hand joints and painlessness, (3) Those who have no problem with visual perception, (4) Communication difficulties, (5) Those who have no problem with their visibility (4) Those who have voluntarily participated in this study with the consent

2. Materials:

(a) Upper limb of motor function: The Manual Function Test (MFT) was developed for the evaluation and analysis of hand, and upper limb dysfunction. A total of 32 items were examined. Three major areas were assessed for upper extremity function (4 items), gripping (2 items), and finger manipulation (2 items) [10].

(b) Upper limb of sensory function: In this study, sensory evaluation was used for three subjects (2-point discrimination test, proprioception test,

stereognosis test) for the affected arm. For each sense, two points were set to exactly match the position and type of the stimulus, one point to match either one of the position or type of the stimulus, and zero points if the position or type of the stimulus were different. [11].

3. Method: Twenty-two stroke patients were prospectively randomized to action observation training with intrinsic muscle stimulation group (N = 11) or action observation (N = 11). In the experimental group, 40 min of action observation training with intrinsic muscle stimulation and 40 min of action observation training in the control group were performed. Both groups received general physical therapy and occupational therapy for 30 minutes per day, five days a week, for 4 weeks.

(a) Action observation training with intrinsic muscle stimulation on experimental group:

The action observation video presented four daily activities. The video duration for each subtask was 3-4 minutes, and the video duration for one assignment was 12-15 minutes. The video showed that the object was manipulated using one or two hands according to the task, and after the observation, the subjects were asked to imitate the movement [8]. The intrinsic muscle stimulation training was applied in this study was modified and supplemented by referring to the contents suggested by Sue Raine et al [12]. This training was consisted of specific activation of lumbricals, specific activation of abductor digiti minimi, and specific activation of thenar eminence. The experimental group was treated for intrinsic muscle stimulation after observing action observation for 15 minutes in table 2.

(b) Action observation training on control group:

The control group observed only 30 minutes of action observation without intrinsic muscle stimulation training in [Table 1].

Table 1. Intervention program

Variables	Intrinsic muscle stimulation training	Action observation training
Intervention	specific activation of lumbricals,	Observing the action
	specific activation of abductor digiti minimi	Following the action
	specific activation of thenar eminence	

4. Statistical Analysis: The result analysis of collected data was statistically processed using SPSS 18.0 program for Windows. The general characteristics of the study subjects were descriptive statistics and frequency analysis, and the data collected through the study were tested for normality, indicating that all variables were normal distributed. Paired t-tests were performed for pre and post-treatment in the experimental and control groups, and independent t-tests were performed for comparison between the experimental and control groups. All statistical significance was set at 0.05

Result and Discussion

1. General characteristics of experimental subjects:

The general characteristics of the participants in this study are as follows. According to gender, there were 5 males (45.5%) and 6 females (54.5%) in the action observation training group combined with intrinsic muscle stimulation and there were 5 males (45.5%) and 6 women (54.5%) in the action observation training group without intrinsic muscle stimulation. The causes were 6 patients (54.5%) with cerebral hemorrhage and 5 patients (45.5%) with cerebral hemorrhage in the action observation training group combined with intrinsic muscle stimulation and 6 patients (54.5%) with cerebral hemorrhage, Five cerebral infarctions (45.5%) in the action observation training group without intrinsic muscle stimulation. Paralyzed patients had left hemiplegia (45.5%) and right hemiplegia (54.5%) in the action observation training group combined with intrinsic muscle stimulation and left hemiplegia (45.5%) and right hemiplegia (54.5%) in the action observation training group without intrinsic muscle stimulation.

2. Comparison of results before and after intervention of experimental groups:

The MFT of the experimental group showed a significant improvement from 11.69±7.21 points before intervention to 13.69±7.2 points after intervention (p <.05). The 2-point discrimination of the experimental group showed no significant improvement from 0.45±0.52 points before intervention to 0.73±0.47 points after intervention (p >.05).The proprioception of the experimental group showed significant improvement from 0.45±0.52 points before intervention to 0.91±0.54 points after intervention (p <.05).The stereognosis of the experimental group showed no significant improvement from 0.55±0.52 points before

intervention to 0.82±0.6 points after intervention in [Table 2] (p >.05).

Table 2. Comparison of results before and after intervention in experimental group (N = 22)

Variables	Pre-test	Post-test	p
Manual function test	11.69±7.21	13.69±7.2	.02*
2 point discrimination	0.45±0.52	0.73±0.47	.08
Proprioception	0.45±0.52	0.91±0.54	.01*
Stereognosis	0.55±0.52	0.82±0.6	.08

The values are mean (standard deviation), *p<0.05 by paired t-test

3. Comparison of results before and after intervention of control groups:

The MFT of the experimental group showed no significant improvement from 11.69±7.21 points before intervention to 13.69±7.2 points after intervention (p >.05). The 2-point discrimination of the experimental group showed no significant improvement from 0.36±0.5 points before intervention to 0.64±0.67 points after intervention (p >.05).The proprioception of the experimental group showed no significant improvement from 0.64±0.5 points before intervention to 0.73±0.47 points after intervention (p >.05). The stereognosis of the experimental group showed no significant improvement from 0.45±0.52 points before intervention to 0.55±0.52 points after intervention in [Table 3] (p >.05).

Table 3. Comparison of results before and after intervention in control group (N = 22)

Variables	Pre-test	Post-test	p
Manual Function Test	11.62±7.2	12±7.09	.17
2 point Discrimination	0.36±0.50	0.64±0.67	.08
Proprioception	0.64±0.50	0.73±0.47	.34
Stereognosis	0.45±0.52	0.55±0.52	.34

The values are mean (standard deviation)

Discussion

The prognosis for recovering upper extremity dysfunction in stroke patients is poor and only 20% of patients report some upper limb function [13]. As a therapeutic intervention that is widely used in clinical practice to improve upper limb function, it is based on cerebral plasticity. (robot training), task-specific training, virtual reality training, somatosensory training, imagery training, etc. are being applied in various forms[14]. Action observation training is a method of imitating and repeatedly training movement by observing other

people's goal-oriented activities or observing activities appearing in the video [15]. Intrinsic muscle stimulation of hands is a principle that strengthens the ability to modify movement in the physiological aspect based on the theory of motor learning and provides the basis for eliciting the change of functional performance of hand through treatment [7]. Treatment using these tasks is a treatment that causes changes in the nervous system by patients with disabilities performing their tasks on their own [16]. The purpose of this study was to investigate the effect of action observation training combined with intrinsic muscle stimulation on the upper limb of function and muscle activity in stroke patients. In the study of the change in upper limb of motor function before and after intervention experimental group showed statistically significant difference in MFT ($p < .05$) and control group did not show statistically significant difference ($p > .05$). In previous studies, lumbricals and interossei, which are intrinsic muscles of the hands, play an important role in generating the shape and holding force of the hands [12]. Action observation training has been shown to be helpful for the upper limb function and activities daily living in stroke patients [17]. The visual stimulus of observing and imitating behavior is thought to influence the pre-shaping of the hand when it reaches the object. Intrinsic muscle stimulation based on direct sensory stimulation within the body is considered to have a positive effect by making the hand easier and more efficient as anticipatory postural adjustments. In the study of the change in upper limb sensory function before and after intervention experimental group showed statistically significant difference in proprioception ($p < .05$) and control group did not show statistically significant difference ($p > .05$). In the study of the change in upper limb sensory function before and after intervention experimental group did not show statistically significant difference in 2-point discrimination ($p > .05$) and control group did not show statistically significant difference ($p > .05$). In the study of the change in upper limb sensory function before and after intervention experimental group did not show statistically significant difference in stereognosis ($p > .05$) and control group did not show statistically significant difference ($p > .05$). Unlike other parts of the body, the human hand and upper limbs have a large number of sensory receptors, which play an important role in processing a lot of information and delivering real-time body information to the central nervous system [18]. In previous research, training was carried out to improve the senses and to improve motor control. Training was conducted to distinguish between object and texture

through tactile sensation, to discriminate joint position, and to discriminate the weight of an object. The functional improvement was reported [19]. This suggests that intrinsic muscle stimulation is a factor that improves sensory function of the upper limb as in this study. Action observation also mimics elements of movement, such as proprioception, by imitating it. Observation alone is difficult to influence. The limitation of this study was that the study period of 4 weeks had difficulty in demonstrating the effectiveness of the intervention and the number of subjects was small due to the difficulty in recruiting the subjects meeting the selection criteria. In future studies, it is necessary to specify the upper extremity function and to prove the effect of action observation and intrinsic muscle stimulation on the recovery of upper extremity function.

Conclusion

The aim of this study was to investigate the effect of action observation training combined with intrinsic muscle stimulation intervention on the function of upper extremity in patients with stroke. First, there was a statistically significant difference in manual function test in the action observation training group with intrinsic muscle stimulation ($p < .05$), but there was no statistically significant difference in the action observation training group without intrinsic muscle stimulation ($p > .05$). Second, there was statistically significant difference in sensory function in the action observation training group with intrinsic muscle stimulation after intervention ($p < .05$). There was no statistically significant difference between action observation training group without intrinsic muscle stimulation ($p > .05$).

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Recognition of Health and Non-Health Care Related College Students on the Safety Management of Dental Radiography

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Abstract

Background/Objectives: The aim of this paper is to provide basic data for preparing measures to improve the level of behavior for the dental radiation workers' safety management on the radiation usage.

Method/Statistical Analysis: The survey was conducted over a 15-day period from October 30, 2018 to November 13, 2018. A total of 300 copies of the questionnaire were distributed, of which 237 were collected, except 63, which were incompletely prepared. The questionnaire used for this study was modified and supplemented with reference to Park's questionnaire. The questionnaires used in the survey consisted total of 27 questions which were 5 general characteristics questions, 8 items related to radiation exposure knowledge.

Findings: The highest level of radiation exposure anxiety was 41 (65.1%) out of 123 health related students said 'do not fear', where 56 (58.9%) out of 114 non-health related students said 'normal' so that non-health related students had higher anxiety on radiation exposure and there was a significant difference. The questionnaire on radiation safety management was the highest among the total 123 health related students, with 71 (57.7%) said 'do not have it', 30 (24.4%) said 'do not know well', 22 (17.9%) said 'have it'. Among the 115 non-health related students, the highest was 57 (49.6%) with 'do not have it', 53 (46.1%) with 'do not know well', 5 (4.3%) with 'have it' so that safety management was not well managed in dental hospitals and there was a significant difference.

Improvements/Applications: Therefore, radiation workers need education and the importance of education related to radiation defense.

Keywords: Recognition, Health, Non-health, dental radiography, safety management.

Introduction

The average life span of humans was 67.2 years for males and 77.5 years for females as of the 1990s. However, in 2016, the average life expectancy of Koreans was 79.3 years and 85.4 years^[1]. As life extends, interest

in health has increased, and medical radiation has been used to protect health from diseases, and medical radiation equipment has also been advanced that is used for diagnosis, treatment and research^[2]. In addition, radiography performed for the objective determination of the disease has become an important role for the accurate determination of the disease. As the demand for prosthetics and implants increases in the dental field, such radiography techniques rapidly increase in the proportion of intraoral radiography, panorama radiography, digital radiography, and etc., so that accurate diagnosis and treatment can be made using radiological equipment. As a result, the quality of medical care as well as the diagnosis using radiography are becoming more

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common^[3-6]. Although, the Chernobyl nuclear accident in 1986, and the recent Fukushima nuclear accident in March 2011 have increased public awareness of radiation and fear of exposure. However, despite the increased anxiety about radiation exposure, most dental offices lack the manpower assigned to radiography, and there is a lack of awareness of radiation protection equipment and explanation of exposure during radiation treatment. Prior research papers on the degree of awareness of safety management of radiography include the patient's awareness^[7] of dental digital radiography, the current status and use of dental radiation in Korea, and the knowledge^[8], attitudes and behaviors^[9] of radiation protection of dental workers has been reported. However, research on radiation safety management of university students is insufficient. Therefore, this study grasped the knowledge, attitude, and behavior of radiation safety management for health and non-health care, measured the degree of anxiety of radiation exposure, and analyzed the relationship between them. The aim of this paper is to provide basic data for preparing measures to improve the level of behavior for the dental radiation workers' safety management on the radiation usage.

Method

This study collected data by distributing a self-reported questionnaire to 300 university students in health and non-health related students who live in Busan. The survey was conducted over a 15-day period from October 30, 2018 to November 13, 2018. A total of 300 copies of the questionnaire were distributed, of which 237 were collected, except 63, which were incompletely prepared. The questionnaire used for this study was modified and supplemented with reference to Park's questionnaire^[10]. The questionnaires used in the survey consisted total of 27 questions which were 5 general characteristics questions, 8 items related to radiation exposure knowledge, 4 items related to dental radiography experience, 2 items related to dental radiography awareness, four items related to dental radiography exposure anxiety, and 4 items on dental radiation safety.

Frequency and crossover analyzes were used to identify general characteristics of respondents. The significance level was $\alpha < 0.05$. For data analysis, SPSS 24.0 (IBM SPSS statistics) was used to analyze general characteristics and frequency of radiation therapy purposes. Recognition of radiographic needs was analyzed by chi-square test.

Results and Discussion

The gender distribution of 238 subjects was 55 males (23.2%) and 182 females (76.8%), with 53.6% more women. The most common age distribution was 214 (90.3%) for 20-24 years old, followed by 19 (8%) for 25-29 years old, 2 (0.8%) for 30-34 years old, and 2 (0.8%) over 35 years old in order. By marital status, 234 singles (98.7%) were the majority and 3 (1.3%) were married. According to the final education, 217 high school graduates (91.6%) were the most, 16 college graduates (6.8%), and 4 others (1.7%). By occupation, there were 122 health related students (51.5%) and 115 non-health related students (48.5%) [Table 1].

Among the 143, 41 patients (28.7%) were treated with dental caries, 38 patients (26.6%) for basic checkup, 38 patients (26.6%) for correction, and 24 patients (16.8%) for others, and 2 patients (1.4%) for implants [Table 2].

In the health field, 73 of the 123 students (59.3%) said 'do not know well about radiation awareness', which was the highest, followed by 35 students (28.5%) said 'know about radiation awareness', 9 students (7%) said 'do not know anything about radiation awareness', and 6 students (5%) said 'know about the radiation awareness very well'. In the non-health related students, 86 out of 115 (74.8%) said 'do not know well about radiation awareness', which was the highest, followed by 19 (16.5%) said 'do not know anything about radiation awareness', 9 (7.9%) said 'know about radiation awareness', and 1 (0.9%) said 'know about the radiation awareness very well' ($p < 0.001$) [Table 3].

Table 1. General Characteristics of Subjects

		N(%)
Gender	Male	55(23.1)
	Female	183(76.9)
Age	20-24	215(90.3)
	25-29	19(8)
	30-34	2(0.8)
	Over 35	2(0.8)
Marital Status	Single	234(98.3)
	Married	4(1.7)
Final Education	High School Graduates	218(91.6)
	University Graduates	16(6.7)
	Others	4(1.7)
Occupation	Health Related	123(51.7)
	Non-health Related	115(48.3)
Total		238(100)

Table 2. Purpose of radiation therapy

Sort	N(%)
Basic Checkup	38(26.6)
Implants	2(1.4)
Dental Caries Treatment	41(28.7)
Correction	33(26.6)
Others	24(16.8)

Out of 123 in health related students, 109 (69.0%) said ‘yes’ 3 (50%) said ‘no’, and 11 (14.9%) said ‘do not know’, where out of 115 in non-health related students, 49 (31%) said ‘yes’, 3 (50%) said ‘no’, and 63 (85.1%) said ‘do not know’ (p<0.001). As a result of the knowledge of ‘radioprotective substance’, within

the health related students, 58 (81.7%) said ‘yes’, 29 (56.9%) said ‘no’, and 36 (31%) said ‘do not know’ where with the non-health related students, 13 (18.3%) said ‘yes’, 22 (43.2%) said ‘no’, 80 (69%) said ‘do not know’ (p<0.001). On ‘Natural radiation’ knowledge degree within health related students, 99 (63.9%) said ‘yes’, 5 (62.5%) said ‘no’, 19 (25.3%) said ‘do not know’ where with the non-health related students out of 115, 56 (36.1%) said ‘yes’, 3 (37.5%) said ‘no’, and 56 (74.7%) said ‘do not know’ (p<0.001). The knowledge of radiation intensity in health related students, 80 (64%) said ‘yes’, 20 (58.8%) said ‘no’, and 23 (29.1%) said ‘do not know’, where in non-health related students, 49 (31%) said ‘yes’, 3 (50%) said ‘no’, and 63 (58.1%) said ‘do not know’ (p<0.001) [Table 4].

Table 3. Radiation Awareness of Subjects

Sort	Radiation Awareness					p-value
	Know it Very Well	Know it Well	Do not Know	Do not Know Anything	Total	
Health Related	6(85.7)	35(79.5)	73(45.9)	9(32.1)	123(51.7)	<0.001
Non-health Related	1(14.3)	9(20.5)	86(54.1)	19(67.9)	115(48.3)	
Total	7(100)	44(100)	159(100)	28(100)	238(100)	

Table 4. Radiation Exposure Knowledge

Sort		Radiation exposure knowledge				p-value*
		Yes	No	Do not know	Total	
Radiation sensitivity of the human body	Health related	109 (69)	3 (50)	11 (14.9)	123 (51.7)	<0.001
	Non-health related	49 (31)	3 (50)	63 (85.1)	115 (48.3)	
	Total	158 (100)	6 (100)	74 (100)	238 (100)	
Radiation protective material	Health related	58 (81.7)	29 (56.9)	36 (31)	123 (51.7)	<0.001
	Non-health related	13 (18.3)	22 (43.1)	80 (69)	115 (48.3)	
	Total	71 (100)	51 (100)	116 (100)	238 (100)	
Natural radiation	Health related	99 (63.9)	5 (62.5)	19 (25.3)	123 (51.7)	<0.001
	Non-health related	56 (36.1)	3 (37.5)	56 (74.7)	115 (48.3)	
	Total	155 (100)	8 (100)	75 (100)	238 (100)	
Radiation intensity	Health related	80 (64)	20 (58.8)	23 (29.1)	123 (51.7)	<0.001
	Non-health related	49 (31)	3 (50)	63 (85.1)	115 (48.3)	
	Total	129 (100)	23 (100)	86 (100)	238 (100)	

Table 5. Awareness of the Need for Dental Radiography

Sort	Radiography awareness					p-value*
	Very need	Need	Normal	Do not need	Do not need it at all	
Health related	21(75.0)	52(65.8)	43(39.8)	6(37.5)	1(14.3)	<0.001
Non-health related	7(25.0)	27(34.2)	65(60.2)	10(62.5)	6(85.7)	
Total	28(100)	79(100)	108(100)	16(100)	7(100)	

Table 6. Radiation Exposure Anxiety

Sort	Radiation exposure anxiety						p-value
	Do fear very much	Do fear	Normal	Do not fear	Do not fear at all	Total	
Health related	4(57.1)	21(61.8)	39(41.1)	41(65.1)	18(46.2)	123(51.7)	0.029
Non-health related	3(42.9)	13(38.2)	56(58.9)	22(34.9)	21(53.8)	115(48.3)	
Total	7(100)	34(100)	95(100)	63(100)	39(100)	238(100)	

Among the 123 health related students, the highest was 52 (65.8%) said 'need', followed by 43 (39.8%) said 'normal', 21 (75.0%) said 'very need', 6 (37.5%) said 'do not need', and 1 (14.3%) said 'do not need it at all' where among the 115 non-health related students, 65 (60.2%) for 'normal' which was the highest, followed by 27 (34.2%) said 'need', 10 (62.5%) said 'do not need', 7 (25%) said 'very need', and 6 (85.7%) said 'do not it at all' ($p < 0.001$) [Table 5]. Among the 123 health related students, the highest was 41 (65.1%) said 'Do not fear', followed by 39 (41.1%) said 'normal', 21 (61.8%) said 'Do fear', 18 (46.2%) said 'Do not fear at all, and 18 (46.2%) said 'do fear very much'. Whereas among the 115 non-health related students, 56 (58.9%) for 'normal' which was the highest, followed by 22 (34.9%) said 'do not fear', 22 (53.8%) said 'do not fear at all', 13 (38.2%) said 'do fear', and 3 (42.9%) said 'do fear very much' ($p = 0.029$) [Table 6].

Among the 123 health related students, the highest was 71 (57.7%) said 'do not have it', followed by 30 (24.4%) said 'do not know well', and 22 (17.9%) said 'Have it', where among the 115 non-health related students, 57 (49.6%) for 'do not have it' which was the highest, followed by 53 (46.1%) said 'do not know well', and 5 (4.3%) said 'have it' ($p = 0.001$).

Radiography has become an integral part of modern medicine for accurate diagnostic and therapeutic purposes. In addition, anyone who handles radiation is interested, but most people are not properly trained in radiation safety management because they have neglected their attention due to lack of knowledge or underestimation of self-confidence and risks in handling radiation.^[9]

The purpose of this study is to investigate the exposure knowledge, experience, exposure anxiety, safety management, radiographic consciousness and awareness of radiation in health and non-health related students, and the main areas collected through surveys to compare the awareness of radiation safety management are as follows:

The radiation awareness of the study subjects was 52 (65.8%) of the health related students said 'know it well, and 65 (60.2%) of the non-health related students were 'normal' so that health related students is highly recognized about this matter. This is considered to be high because the health related students have more opportunities to access radiological expertise through lectures and exercises than non-health related students.

The anxiety about radiation exposure was 41 (65.1%) in the health related students and 56 (58.9%) in the non-health related students in which health related students' result was slightly higher. It is thought that this is because the knowledge of radiation in health related students is higher, so that effective dose will not reach the level that can cause disorder in human body.

There was a statistically significant difference in the awareness of radiation safety management among the 81 (81.4%) health related students and 100 (55.2%) non-health related students which shows non-health related students was significantly higher than the others. The majority of the respondents between these two groups answered 'Do not know well'. This is because non-health related students do not know radiation shielding well unless the dentist explains about it. The health related students are the future radiation workers, so the awareness of radiation defense is high, but it is not actually managed by dental hospitals. Therefore, we need to plan education or program on radiation defense to defend against radiation safety management.

In this study, there are limitations in the interpretation and utilization of results due to the following limitations. Since the survey target was selected from some universities located in Gyeongnam, Busan, it was difficult to represent the whole group. There is a limitation that uncertainties exist in the evaluation of the criteria. However, based on the contents of this paper, the training program for radiation defense in dental hospitals and the importance and necessity of radiation defense can be trained to raise the awareness of radiation safety management by radiation workers in the future. It may

be possible to provide a guideline for the preparation of such a plan.

Conclusion

In this study, questionnaires were distributed from October 30 to November 13, 2018 to grasp the knowledge, attitudes and behavior of radiation safety management in Busan, Gyeongsangnam-do, by measuring the degree of radiation anxiety and analyzing their relevance, the collected data were obtained using the SPSS 24.0 statistical program and the results are as follows:

1. The radiation awareness was highest among 123 health related students, with 52 (65.8%) said 'know it well' and the highest among the 115 non-health related students with 65 (60.2%) said 'normal' so that health related students showed higher radiation awareness and there was a significant difference ($p < 0.001$).
2. In radiological consciousness, it was the highest among the 123 health related students with 52 (65.8%) said 'need', and the highest among non-health related students with 65 (60.2%) said 'normal' so that health related students showed higher radiographic consciousness and there was a significant difference ($p < 0.001$).
3. The highest level of radiation exposure anxiety was 41 (65.1%) out of 123 health related students said 'do not fear', where 56 (58.9%) out of 114 non-health related students said 'normal' so that non-health related students had higher anxiety on radiation exposure and there was a significant difference ($p < 0.029$).
4. The questionnaire on radiation safety management was the highest among the total 123 health related students, with 71 (57.7%) said 'do not have it', 30 (24.4%) said 'do not know well', 22 (17.9%) said 'have it'. Among the 115 non-health related students, the highest was 57 (49.6%) with 'do not have it', 53 (46.1%) with 'do not know well', 5 (4.3%) with 'have it' so that safety management was not well managed in dental hospitals and there was a significant difference. ($p < 0.001$).
5. As a result of examining the radiation knowledge of the subjects, out of the total 123 health related students, 109 (69.0%) said 'yes', 3 (50%) said 'no', and 11 (14.9%) said 'do not know', where out of 115

non-health related students, 49 (31%) said 'yes', 3 (50%) said 'no', and 63 (85.1%) said 'do not know'.

In this study, the non-health related students had lower radiation knowledge and higher exposure anxiety than health related students. Therefore, radiation workers are considered to be in need of education and the importance of education related to radiation defense.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Relationship between Pain-induced Temporomandibular Joint Pain According to Cell Phone Use Frequency

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Abstract

Background/Objectives: The purpose of this study is to investigate whether the use of mobile phone is related to the pain of the jaw joints.

Method/Statistical Analysis: This study was designed as a cross-sectional survey. The purpose of this study was to explain the research objectives of 304 university students in Busan and the data was collected using the convenience sampling method. Of the total 304 subjects, 300 were included from the questionnaire, except for four who were inappropriate to use the data.

Findings: The general characteristics of the subjects were 227 females (75.7%) and 73 males (24.3%) among the 300 respondents. In the index of pain of the joint with the average number of calls per day, 44 people (14.7%) for less than 1 time, 36 people (12%) for 1 to 2 times, 100 (33.3%) for 3 to 4 times, 106 (35.3%) for 4 to 5 times, 14 people (4.7%) for more than 5 times, and analyzed the pain index according to the average number of calls per day showed a significant difference in pain index for 'hard food' ($p = 0.019$) and 'discomfort during closing' ($p = 0.037$). Jaw joint pain index was significantly different between male and female, 4.62 points and 4.35 points, respectively ($p = 0.001$). However, there was no significant difference from other joint pain symptoms.

Improvements/Applications: It was difficult to generalize the results to all university students because the study was limited to university students in some universities in Busan area. In addition, it is necessary to consider other factors of pain in the joint, and further study on cell phone and joint pain through the diversification of the sample area and the increase in the number of samples is considered. However, it is hoped that it can contribute as a basic data for more systematic epidemiological studies for all citizens in the future.

Keywords: Temporomandibular joint, pain, cell phone, Frequency, Joint noise.

Introduction

Recently, with the development of information technology at home and abroad, the use of mobile phones is increasing rapidly. 63.6% of the general public in Korea use smartphones, and the first time smartphones were

used in 2011 was 47.8%^[1]. Compared to 40% of total distributed smartphones in Korea, the utilization rate is somewhat higher, but considering that the survey targets 15 to 49 years old and are major cities by region, it can be seen that 3 out of 5 adults live in major cities using a smartphone^[2]. In addition, it is analyzed that the rapid spread of smartphones has been continued since 2010 and 2011 are almost equally proportioned^[3]. As society becomes more sophisticated, specialized, and more competitive, societal stress increases and more patients complain of symptoms of jaw joint disorder. Recently, as patients acquire information about the disease of the jaw joint through various media and increase their interest,

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the demand for treatment of the jaw joint disorder is increasing and the share of dental sector is expected to increase. Frequent use of mobile phones can cause temporomandibular disorders if the habits of talking on the phone between the chin and shoulders, jaw-gripping habits, bad posture, etc. Temporomandibular disorders (TMD) is a generic term that includes many clinical problems in the masticatory and temporomandibular joint sites and refers to a complex of several disorders that occur in the chewing system^[4]. In addition, the causes of temporomandibular disorders include direct facial trauma such as traffic accidents, beatings and shocks, bad habits such as cracking, dent bites, poor posture, lip or cheek bites, occlusion or malocclusion, stress, depression, and anxiety. Psychological factors, such as these various factors act in combination, causing, persisting and worsening temporomandibular disorders. The main symptoms of temporomandibular disorders are clinical features such as pain and discomfort in the jaw or masticator muscle, pain in occlusion, limitation and impairment of mandibular movement, and joint noise^[5]. The most common of these is pain, which can be painful to the masticatory muscles or dislocations (the area corresponding to the front of the ear)^[6]. The causes of temporomandibular disorders have a variety of factors, of which five major factors are occlusion, trauma, emotional stress, influx of deep pain, and dysfunctional activity^[7]. In other words, the symptoms of temporomandibular disorders and oral facial pain are very diverse, the causes are also very complex, and interest and research on temporomandibular disorder diseases continue^[8]. However, there have been many reports on the prevalence and specific analysis of temporomandibular disorders, but few studies have investigated the relationship between cell phone usage and temporomandibular pain. Therefore, the purpose of this study is to investigate whether the use of mobile phone is related to the pain of the jaw joints.

Method

This study was designed as a cross-sectional survey. From November 3, 2018 to November 10, 2018, the purpose of this study was to explain the research objectives of 304 university students in Busan and the data was collected using the convenience sampling method. Of the total 304 subjects, 300 were included from the questionnaire, except for four who were inappropriate to use the data.

Mention the statistical details, the number of

samples used, statistical tools/software used/SD/level of significance, repeatability etc.

Self-investigated questionnaire using structured questionnaire, the general subjects, the presence of traumatic trauma and treatment experience, subjective symptoms of temporomandibular joint and habits related to temporomandibular joint health, and diaphragmatic disorder related to temporomandibular disorder were identified.

The questionnaire used in this study included 7 questions about general matters, 2 questions about trauma and presence of treatment experience, 23 questions about subjective symptoms of temporomandibular joints, and 20 related habits related to temporomandibular health. A total of 53 questions consisted to 1 item of opening disorder related to temporomandibular disorder.

Statistical analysis of the collected data was done using IBM SPSS Statistics 24 program. The general subjects were calculated by frequency analysis, and the pain index according to gender, daily call volume, and average weekly talk time was calculated by One-Way ANOVA.

Results and Discussion

The general characteristics of the subjects were 227 females (75.7%) and 73 males (24.3%) among the 300 respondents. The number of respondents was 209 (69.7%) under 18-20 years old and 91 (30.3%) under 21-33 years old. The distribution of mobile phone usage by type was 211 students (70.3%) who frequently use SNS during the day, 73 students (24.3%) who did not, and 16 students (5.3%) who do not know. Average number of calls per day was 14 (4.7%) for less than 1 time, 106(35.3%) for one to two times, 100 (33.3%) for three to four times, 36 (12%) for four to five times, and 44 (14.7%) for more than five times. The average weekly talk time on cell phones was 105 people (35%) under two hours, 69 people (23%) between two to three hours, 58 people (19.3%) between three to four hours, 19 people (6.3%) between four to five hours, and 48 people (16%) for more than five hours [Table 1].

Table 1. General Characteristics of Subjects

			%
Gender	Male	73	24.3
	Female	227	75.7
Age	Between 18 to 20	209	69.7
	Between 21 to 33	91	30.3

			%
Possession of a mobile phone	Yes	300	100
	No	0	0
SNS usage	Frequent use	211	70.3
	Do not use	73	24.3
	Do not know	26	5.3
Call count	Less than 1 time	14	4.7
	1 to 2 times	106	35.3
	3 to 4 times	100	33.3
	4 to 5 times	36	12
	More than 5 times	44	14.7
Average talk time per week	Less than 2 hours	105	35
	Between 2 to 3 hours	69	23
	Between 3 to 4 hours	58	19.3
	Between 4 to 5 hours	19	6.3
	More than 5 hours	47	16.0

In the index of pain of the joint with the average number of calls per day, 44 people (14.7%) for less than

1 time, 36 people (12%) for 1 to 2 times, 100 (33.3%) for 3 to 4 times, 106 (35.3%) for 4 to 5 times, 14 people (4.7%) for more than 5 times, and analyzed the pain index according to the average number of calls per day showed a significant difference in pain index for ‘hard food’ ($p = 0.019$) and ‘discomfort during closing’ ($p = 0.037$) [Table 2]. Jaw joint pain index was significantly different between male and female, 4.62 points and 4.35 points, respectively ($p = 0.001$). However, there was no significant difference from other joint pain symptoms [Table 3].

In the case of pain in the joints according to the average weekly talk time, 106 less than 2 hours (35%), 69 between 2 to 3 hours (23%), 58 between 3 to 4 hours (19.3%), 19 between 4 to five hours (6.3%), and 48 for over 5 hours (16.0%). As a result of analyzing the pain index of the joint according to the average weekly talk time, there was a significant mean difference between group in ‘Joint noise’ ($p = 0.050$) [Table 4].

Table 2. Joint pain in accordance with the average number of calls per day

Sort	Average number of calls per day					p-value*
	Less than 1 time	1 to 2 times	3 to 4 times	4 to 5 times	More than 5 times	
	n = 44	n = 36	n = 100	n = 106	n = 14	
Inconvenience when yawning	4.16±1.14	3.83±1.06	4.02±1.01	3.97±1.09	4.29±1.77	0.605
Joint noise	4.07±1.32	3.47±1.13	3.58±1.18	3.61±1.36	3.86±1.88	0.206
Opening disorder	4.64±0.65	4.19±1.04	4.42±0.88	4.57±0.78	4.57±1.74	0.162
Jaw joint pain	4.36±0.89	4.14±1.13	4.32±0.97	4.32±0.86	4.64±1.65	0.588
Jaw discomfort	4.43±0.90	4.11±1.01	4.28±0.89	4.40±0.81	4.57±1.60	0.364
Jaw joint stiffness	4.45±0.82	4.14±0.99	4.29±0.89	4.41±0.81	4.64±1.45	0.299
Hard food	4.09±1.01 ^a	3.33±1.04 ^a	3.84±1.04 ^a	3.94±0.92 ^a	3.86±1.83 ^b	0.019
Chin shift during opening and closing	4.48±0.95	4.06±0.98	4.20±1.04	4.38±0.93	4.57±1.70	0.206
Discomfort while closing	4.61±0.75 ^a	4.28±0.74 ^a	4.48±0.72 ^a	4.26±1.02 ^a	4.86±1.35 ^b	0.037

*p-value was calculated by One-Way ANOVA, ^{ab}Duncan’s post-hoc test; No significant differences in the same characters.

Table 3. Jaw joint pain index by gender

Sort	Gender		p-value*
	Male n = 73	Female n = 227	
Inconvenience when yawning	4.21±1.10	3.95±1.09	0.861
Joint noise	3.86±1.31	3.60±1.29	0.880
Opening disorder	4.58±0.78	4.45±0.93	0.182
Jaw joint pain	4.40±0.96	4.30±0.98	0.981
Jaw discomfort	4.58±0.81	4.26±0.94	0.078
Jaw joint stiffness	4.48±0.81	4.31±0.92	0.399
Hard food	4.14±1.07	3.76±1.04	0.383
Chin shift during opening and closing	4.38±0.98	4.28±1.04	0.803
Discomfort while closing	4.62±0.57	4.35±0.96	0.001

*p-value was calculated by t-test

Table 4. Joint pain index according to weekly average talk time

Sort	Weekly average talk time on the phone					p-value*
	Less than 2 hours	2 to 3 hours	3 to 4 hours	4 to 5 hours	More than 5 hours	
	n = 105	n = 69	n = 58	n = 19	n = 47	
Inconvenience when yawning	3.94±1.26	4.00±1.04	4.02±0.91	3.95±0.97	4.21±1.10	0.845
Joint noise	3.57±1.47	3.64±1.25	3.52±1.17	3.74±0.99	4.08±1.20	0.050
Opening disorder	4.58±1.02	4.42±0.79	4.33±0.85	4.42±0.96	4.60±0.77	0.219
Jaw joint pain	4.31±1.10	4.28±0.95	4.22±0.96	4.21±1.08	4.54±0.71	0.571
Jaw discomfort	4.40±1.01	4.19±0.91	4.14±0.95	4.21±0.92	4.69±0.59	0.457
Jaw joint stiffness	4.43±0.98	4.28±0.82	4.12±0.90	4.26±0.99	4.60±0.74	0.888
Hard food	3.95±1.10	3.75±1.01	3.50±1.03	3.68±1.06	4.25±0.96	0.095
Chin shift during opening and closing	4.38±1.10	4.17±1.06	4.03±0.96	4.16±1.07	4.71±1.02	0.192
Discomfort while closing	4.50±0.94	4.16±1.01	4.26±0.72	4.37±0.96	4.79±0.54	0.472

*p-value was calculated by One-Way ANOVA

In recent years, the prevalence of pain disorders in the neck and shoulders has increased due to inadequate sedentary work^[9]. In addition, studies have been linked to the occurrence of temporomandibular disorders^[10], and a study on the change in the prevalence of jaw joint disorders in Korean has shown that the prevalence of jaw joint disorders gradually increases over the last three years^[11]. Therefore, the purpose of this study was to investigate the relationship with the jaw joint pain according to the frequency of cell phone use. According to the study, the average number of calls per day was 44 people (14.7%) for less than 1 time, 36 people (12%) between 1 to 2 times, 100 people (33.3%) between 3 to 4 times, 106 people (35.3%) between 4 to 5 times, 14 people (4.7%) for more than 5 times. In other words, the average number of call per day was 180 or more (60%). The higher the volume, the more significant differences there were between 'hard food' and 'discomfort during closing'. The higher the number of phone calls per day, the more relevant the pain in the jaw joints. The most significant difference in symptom of 'discomfort during closing' in the pain of the joints by gender seems to be because women reach puberty earlier than men and this affects the teeth. Average weekly talk time was 106 people (35%) for under 2 hours, 69 people (23%) between 2 to 3 hours, 58 people (19.3%) between 3 to 4 hours, 19 people (6.3%) between 4 to 5 hours, and 48 people (16.0%) for more than 5 hours. As the average weekly talk time increased, the question 'I feel pain when I opened my mouth or closed' was found to be significantly related. The average weekly talk time is

increasing, indicating that you are experiencing joint pain. However, it was difficult to generalize the results to all university students because the study was limited to university students in some universities in Busan area. This study examined the use of mobile phones and the pain related to the jaw joints through a limited number of university students in Busan. As a frequency of use of mobile phones increased, we expected that the pain of the jaw joints would vary. However, the lack of questionnaire questions resulted in disappointing results. In addition, it is necessary to consider other factors of pain in the joint, and further study on cell phone and joint pain through the diversification of the sample area and the increase in the number of samples is considered. However, it is hoped that it can contribute as a basic data for more systematic epidemiological studies for all citizens in the future.

Conclusion

The purpose of this study was to examine 300 university students in Busan to investigate the association with the incidence of pain the jaw joint as the frequency of cell phone usage increases by using SPSS WIN 24 to analyze and the results are as follows:

1. In the index of pain of the joint with the average number of calls per day, 44 people (14.7%) for less than 1 time, 36 people (12%) for 1 to 2 times, 100 (33.3%) for 3 to 4 times, 106 (35.3%) for 4 to 5 times, 14 people (4.7%) for more than 5 times, and analyzed the pain index according to the average

number of calls per day showed a significant difference ($p < 0.05$) in pain index for 'hard food' ($p = 0.019$) and 'discomfort during closing' ($p = 0.037$)

2. Jaw joint pain index was significantly different between male and female, 4.62 points and 4.35 points, respectively ($p = 0.001$). However, there was no significant difference from other joint pain symptoms.
3. In the case of pain in the joints according to the average weekly talk time, 106 less than 2 hours (35%), 69 between 2 to 3 hours (23%), 58 between 3 to 4 hours (19.3%), 19 between 4 to five hours (6.3%), and 48 for over 5 hours (16.0%). As a result of analyzing the pain index of the joint according to the average weekly talk time, there was a significant mean difference between group in 'Joint noise' ($p = 0.050$).

Ethical Clearance: Not required

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Conflict of Interest: Nil

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The Effects of Nursing Ethics and Major Satisfaction on Patient Safety Management Activities of Nursing Students

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Abstract

Background/Objectives: The purpose of this study is to determine the relationships between nursing ethics, major satisfaction, and the patient safety management activities of nursing students and find the factors that affect the patient safety management activities of nursing students.

Method/Statistical Analysis: This is a descriptive research study for which 240 participants were selected from nursing students in Jeollabuk-do and Jeollanam-do. Data were collected from March to April 2019. Descriptive statistics, independent t-test, one-way ANOVA, Pearson correlation coefficient and multiple regression were used for analysis.

Findings: This study confirmed that factors of nursing ethics and major satisfaction directly affect the patient safety management activities of nursing students.

Improvements/Applications: The purpose of this study is to identify the correlation between nursing ethics, major satisfaction, and patient safety management activities, to understand what factors affect patient safety management activities, and to develop programs for improving the students' nursing ethics.

Keywords: *Nursing students, nursing ethics, patient safety management activities, major satisfaction, correlation.*

Introduction

Patients and people who care for them who visit medical institutions expect to receive high-quality treatment in a safe environment without accidents or side effects^[1]. The number of patients who are injured or die in hospitals due to increasing medical technologies and complex procedures^[2]. Such patient safety accidents include all kinds of accidents that occur without protecting the safety of patients, including all kinds of errors, mistakes and accidents that occur in hospitals^[3].

Patient safety accidents have emerged as a major threat to patients, and the number of incidents has become an important issue in terms of medical quality management^[4]. In order to prevent patient safety accidents, systematic activities are needed to prevent and manage the occurrence of various errors, including medical accidents. Nursing ethics is being newly emphasized by expanding the rights of patients and strengthening their responsibility for the rights of patients by raising the medical awareness of patient safety^[5].

Ethical issues are becoming more important due to extended life expectancy as a result of the development of medical technology, shortage of health care resources, and the conflicts with sociocultural and religious norms^[6]. In addition, with the revision of the 2017 Medical Law, health care professionals' ethics are included in conservative education, emphasizing the importance of

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ethical literacy, and the nursing community emphasizes the ethical thinking of students by emphasizing nursing ethics^[5]. Since nurses have basic responsibilities to promote the health of subjects, prevent illness, restore health and alleviate pain^[7], nursing students are encouraged not only to have human dignity but also morality and clear nursing ethics with knowledge and literacy education^[8]. If nursing students are fully aware of the need for nursing ethics and patient safety management and practice proper knowledge, they will be able to play a role in strengthening ethical nursing and patient safety after graduation^[9].

Major satisfaction refers to the level of satisfaction with a major determined by an individual based on a job and the evaluation from the people around him or her. It is influenced by various factors. The higher the level of satisfaction with their major, the clearer their thoughts on their career and the more comfortable they are in their decisions^[10]. As discussed above, if a nurse has the right decision making, clear nursing ethics with satisfaction with his or her major, he/she is expected to actively conduct patient safety management. Prior studies on nursing ethics, major satisfaction, and patient safety activities are inadequate. The purpose of this study was to investigate the effects of ethics and major satisfaction of nursing students on patient safety management activities, and to present basic data for improving ethics, major satisfaction, and the patient safety management activities of nursing students

Method

This is a descriptive research study to identify the factors affecting the ethics of nursing students in safety management activities. For this, 240 participants were recruited from nursing students in Jeollabuk-do and Jeollanam-do. Sufficient information about this study was given to them and the students who agreed to participate in this study were selected. The data were collected from March to April 2019. In order to protect the study subjects, the contents and purpose of the study were explained, and a consent form was signed only if they agreed to participate in the study. We also discussed privacy, anonymity, and the possibility of withdrawing from the research. The students who participated in the survey were given a gift.

Structured questionnaires were used as a study instrument, which included the general characteristics, nursing ethics^[3], and patient safety management

activities^[4] of nursing students. General characteristics consisted of gender, age, marital status, motivation to enter, friendship, and religion. For ethical awareness, the ethical awareness measuring tool devised by Jang Deok-pil was used^[11]. There was a total of 30 questions in three areas consisting of 10 questions on ethics for patients, 10 questions on professional work, and 10 questions on ethics for partners. The tool ranged from 1 point not at all to 4 points at all times, with higher scores indicating higher ethical awareness. In this study, Cronbach's α was .77. The inverse of the measurement tool was inverted.

The Major Satisfaction Index was used a 34-item satisfaction survey made by Kim & Ha^[12] was used by Lee^[13]. The higher the score on the 5-point Likertscale, the higher the major satisfaction. In this study, Cronbach's α was .94.

In order to measure patient safety management activities, a tool developed by Lee^[14] and revised and supplemented by Lee^[15] was used. A total of 17 questions consisted of five on patient confirmations, two oral prescriptions, five on medicines, one on surgery/procedure, one on infection control, two on fall prevention, and one on pressure control. This tool used a 5-point Likertscale ranging from "not at all" to "very yes much," meaning that the higher the score, the higher the performance of the individual's patient safety management activities. Reliability with Cronbach's α was .95 in this study. The inverse of the measurement tool was inverted.

The collected data were statistically analyzed using IBM SPSS Statistics 18.0. A descriptive statistical method was used to calculate the general characteristics, frequency, percentage, mean and standard deviation of subjects' characteristics. Differences in nursing ethics according to the general characteristics of the subjects were analyzed by independent t-test and ANOVA. The correlation between subjects' nursing ethics and patient safety management activities was calculated using the Pearson correlation coefficient. Finally, hierarchical multiple regression analysis was used to identify the factors affecting patient safety management activities.

Result and Discussion

1. **Differences in Nursing Ethics by General Characteristics:** According to the general characteristics of the subjects, the degree of patient safety management activities was determined by

Admission ($F = 2.834, p = .025$), and Relationship ($t = 5.036, p = .001$), Prospects for Nursing ($t = -2.508, p = .013$), Ethical Education Experience ($t = -2.615, p = .009$) showed a difference. In contrast, there were no statistically significant differences

among gender ($t = -.394, p = .694$), age ($F = .852, p = .467$), marital status ($t = 1.695, p = .091$), religion ($t = 1.939, p = .054$), and achievement ($F = .386, p = .081$) [Table 1].

Table 1. Differences in Nursing Ethics by General Characteristics (N = 240)

Characteristics	Categories	N()	M±SD	t or F	p
Gender	Man	59	4.04±.57	-.394	.694
	Women	181	4.08±.60		
Age	20-24	163	4.04±.60	.852	.467
	25-29	47	4.10±.63		
	30-34	10	4.32±.58		
	35 or more	20	4.13±.41		
Marital Status	Single	219	4.09±.59	1.695	.091
	Married	21	3.86±.55		
Religion	Have	140	4.13±.59	1.939	.054
	None	100	3.98±.58		
Motive for admission	Invitation around	32	4.09±.50	2.834	.025*
	Employment	103	3.93±.61		
	Aptitude	72	4.20±.55		
	Volunteer	18	4.20±.62		
	Other	15	4.21±.63		
Relationship	Very good	2	4.38±.87	5.036	.001**
	Good	8	3.94±.41		
	Moderate	79	4.11±.58		
	Bad	103	3.91±.59		
	Very bad	48	4.07±.59		
Achievement	Very good	10	2.82±.20	.386	0.81
	Good	47	2.85±.23		
	Moderate	95	2.83±.22		
	Bad	66	2.87±.27		
	Very bad	22	2.83±.23		
Prospects for Nursing	Good	215	1.69±.46	-2.508	.013*
	Bad	25	1.44±.50		
Ethical Education Experience	No	81	3.93±.56	-2.615	.009**
	Yes	159	4.14±.60		

2. Description statistics of the measured variable:

The Nursing Ethics score was 2.84 (SD = .23), which was similar to that of Song [8]. It was similar to the results of Yun & Kim [16], which studied nursing college students. The patient's Major Satisfaction score was 3.76 (SD = .71), similar to

Whang's [17] report (3.71). The mean score for Patient Safety Management Activities was 4.07 (SD = .59), which was similar to that of Song [8] based on clinical nurses. The study of nursing students by Song & Moon [18] was 3.96 and Kim & Oh's [19] showed 3.99; the subjects here were slightly higher. [Table 2].

Table 2. Description statistics of the measured variable (N = 240)

Variable	M±SD	Minimum value	Maximum value
Nursing Ethics	2.84±.23	2.23	3.80
Major Satisfaction	3.76±.71	1.00	5.00
Patient Safety Management Activities	4.07±.59	2.88	5.00

3. Correlations between Nursing Ethics, Major Satisfaction and Patient Safety Management Activities: Correlation analysis was conducted for nursing ethics, major satisfaction, and patient safety management activities, including motivation for admission, experience of ethics education, and relationships. The results are as follows.

Patient safety management activities and Motive for Admission ($r = .138, p = .033$), safety management activities and Ethical Education Experience ($r = .167, p < .001$), patient safety management activities and Prospects for Nursing ($r = .191, p = .003$), patient safety management activities and Nursing Ethics ($r = .484, p < .001$), patient safety management activities and Major Satisfaction ($r = .431, p < .001$), Major Satisfaction and relationship ($r = .131, p = .042$), major Satisfaction and Motive for Admission ($r = .208, p < .001$), Major Satisfaction and Prospects for Nursing ($r = -.245, p < .001$), Major Satisfaction and Nursing Ethics ($r = -.428, p < .001$), Nursing Ethics and Major Satisfaction ($r = .150, p < .02$), Nursing Ethics and Prospects for Nursing ($r = -.189, p = .003$) were all statistically significant correlations. Shown [Table 3].

Table 3. Correlations between Nursing Ethics and Patient Safety Management Activities (n = 240)

Variable	Rel	MA	EEE	PN	NE	MS	PMA
	r(p)	r(p)	r(p)	r(p)	r(p)	r(p)	r(p)
Rel	1	-.006(.923)	.118(.068)	-.091(0.16)	.033(.613)	.131*(.042)	.086(.185)
MA		1	.05(.437)	-.015(.823)	.150*(.02)	.208**(<.001)	.138*(.033)
EEE			1	-.081(.211)	.111(.086)	.109(.092)	.167**(<.001)
PN				1	-.189**(.003)	-.245**(<.001)	-.191**(.003)
NE					1	.428**(<.001)	.484**(<.001)
MS						1	.431**(<.001)
PMA							1

Correlation is significant at the 0.01 level., Rel: Relationship, MA: Motive for Admission, EEE: Ethical Education Experience, PN: Prospects for Nursing, NE: Nursing Ethics, MS: Major Satisfaction, PMA: Patient Safety Management Activities

4. Factors Influencing Patient Safety Management Activities: In order to identify factors affecting the patient safety management activities of nursing college students, patient safety management activities were the dependent variables, and motivation for admission, ethical education experience, prospects of nursing jobs, and nursing ethics all showed a significant correlation with patient safety management activities. In addition, multiple regression analysis was conducted using major satisfaction as the explanatory variable.

As a result of testing the multicollinearity between the variables included in the regression analysis, the tolerance limit was .58 and the variation information factor was 1.76, so there was no multicollinearity problem. This 1.82 confirms that there is no auto correlation.

The results showed that the nursing ethics ($\beta = .35, p < .001$) and major satisfaction ($\beta = .25, p < .001$) of nursing students had a positive effect on the patient safety management activities of nursing students ($F = 178.65, p < .001$), and the explanatory power of the model was 20.9% [Table 4].

Table 4. Factors Influencing Patient Safety Management Activities (n = 240)

Variable	B	SE	β	t	p
NE	.887	.153	.352	5.799	<.001**
MS	.211	.052	.251	4.045	<.001**
MA	.016	.033	.027	.49	.625
PN	-.042	.044	-.055	-.967	.335
EEE	.119	.069	.095	1.728	.085
Adjusted R2 = .309. F = 20.919. p < .001					

NE: Nursing Ethics, MS: Major Satisfaction, MA: Motive for Admission, PN: Prospects for Nursing, EEE: Ethical Education Experience

Discussion

In the case of a patient safety accident in a hospital, the impact is not only directly related to the patient's life, but is also a legal issue. However, the accidents that may occur with patients can be prevented by medical institutions and their workers by reducing or eliminating risks. Therefore, systematic patient safety management activities are very important for nurses and an important factor in determining the quality of care^[20].

The purpose of this study was to investigate the effects of ethics and major satisfaction of nursing students on patient safety management activities, and to present basic data for improving the ethics, major satisfaction, and patient safety management activities of nursing students.

The relationship between nursing ethics and the patient safety management activities of nursing students was positively correlated with statistically significant results. In other words, the higher the ethics of nursing students, the higher the performance of patient safety management activities. This is consistent with Song's results measured for clinical nurses using the same tool^[8]. Nursing students should be trained in correct and positive nursing ethics with the right education so that they can be more actively involved in patient safety management. They should also be provided with clear and positive nursing ethics to ensure proper patient safety management activities.

The relationship between major satisfaction and the patient safety management activities of nursing students was positively correlated with statistically significant results. In other words, the higher the major satisfaction of nursing students, the higher the performance of patient safety management activities.

As a result, this study confirmed that factors of nursing ethics and major satisfaction directly affect the patient safety management activities of nursing students. This implies that it is necessary to develop strategies for educational programs to improve students' nursing ethics.

It is difficult to compare the effect of major satisfaction on patient safety management activities in this study with previous studies. However, the direct effects of higher nursing ethics and higher degree of major satisfaction were found to improve patient safety management. Based on this, the development

of education programs and other programs to improve nursing ethics is needed.

Conclusion

This is an explanatory study to identify factors that affect the ethics of nursing students in safety management activities.

As a result, it was found that nursing ethics and key satisfaction factors have a direct impact on nursing students' patient safety management activities.

As a result of this study, it is necessary to develop programs that can improve the degree of satisfaction and inspire the right ethics by acquiring the right values and beliefs for nursing students. We also need to develop strategies for patient safety management programs to prevent life-threatening safety accidents.

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The Effects of Maternity Video and Simulation Based Education on Critical Thinking, Interpersonal Relationship, Self Leadership and Major Satisfaction

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Abstract

Background/Objectives: In this study, the clinical nursing skills of nursing students are strengthened through delivery video training and delivery simulations based on the difficulties in labor training, so that critical thinking, interpersonal ability, self-leadership, and major satisfaction could be analyzed.

Method/Statistical Analysis: The purpose of this study is to investigate the effects of video teaching and simulation training on nursing college students. The subjects of this study were 170 out of 178 participants excluding eight dropouts in the G city nursing department in the J area. Structured questionnaires were used as learning tools including general characteristics, critical thinking, interpersonal relationships, self-leadership and major satisfaction. Data were collected from September 2018 to April 2019 and technical statistics, t-test, and paired t-test were conducted.

Findings: Critical thinking($t = -4.53, p = .000$), interpersonal relationship($t = -2.89, p = .005$), self-leadership ($t = -3.00, p = .004$), and major satisfaction($t = -2.31, p = .023$) are all significant, and simulation is more effective than video, and critical thinking, interpersonal relationship, self-initiative, and major satisfaction are positively correlated. The simulation education was significantly lower in the subdomain than the education.

Improvements/Applications: The simulation of training in childbirth showed significant differences in critical thinking, interpersonal relationship, self-leadership, and majors in video education.

Keywords: Video, simulation, critical thinking, interpersonal relationships, self-leadership, majors satisfaction.

Introduction

Nursing education is nurturing professional nurses to meet increasing demand for better medical quality. Nursing theory education and practice education are provided to nursing students so that they can combine their skills in order to work to meet changes in medical

environments. Among them, clinical training is essential for nursing science in order to have the knowledge, skills, and attitudes necessary for nursing practice. However, appropriate fields of practice cannot be secured or there are difficulties for nursing students to have sufficient opportunities for training due to the recent increases in the entrance quota of nursing departments and the enhancement of patients' rights^[1-2]. Since fields of practices where observation and firsthand nursing activities are limited have been increasing due to increases in the number of nursing students participating in training institutions, clinical training is carried out centering on indirect activities. Medical environments require more diverse and active nursing

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practices because patients' diseases are becoming more complicated and the number of critically ill patients is increasing. Although theory education should combine practice education to fill the shortcomings of theory education, at least 70% of practice education in the field is noninvasive nursing such as vital signs and observations and even securing the opportunities for observations is becoming difficult. As for maternal nursing science, although the Korean Accreditation Board of Nursing Education currently requires that maternity nursing science practice should be delivery room practice, it is difficult to obtain firsthand experience in delivery room practice in clinical training unlike other subjects of clinical training because personal privacy is regarded important in the case of delivery room practice. Furthermore, due to the recent increase in male students, opportunities for not only delivery room practice but also other subjects of maternity nursing science practice became scarce. Therefore, measures that can replace practices should be prepared for nursing education that will enable nursing students to efficiently respond in the nursing of subjects.

Simulation education enables students to obtain firsthand experience in virtual reality by preparing simulation practice rooms similar to the environment of hospitals in the school. It enables repeated practices in safe environments so that students' fear of practice due to insufficient training or situations where the patient can be damaged due to the lack of skills can be reduced thereby improving students' confidence as well as helping the improvement of students' knowledge, critical thinking, satisfaction, and clinical nursing practice competency. Since simulation-based training is run in teams, simulation education is helpful not only for personal skills and theories, but also the development of team competencies as nurses. Simulation education can be said to be capable of reducing differences from clinical training in environments very similar to clinics and improving readership, interpersonal ability, and satisfaction as nursing students.

Recently, studies on simulation education have been conducted steadily, but studies that compared simulation education with other education have been hardly conducted. There was a study that compared videos and simulations focusing on respiratory distress cases^[3] and a study that examined the effects of videos regarding childcare takeover and simulation-based training^[4], but no simulation education on maternity nursing science practice could be found. Therefore, this study aims to identify the effects of simulation education and provide

basic data for the expanded application of simulation education thereby contributing to the improvement of the quality of education.

Method

The study was a group of pretested posttest designs. Video training was conducted in the 2nd semester of 3rd grade before simulation training. Simulation training was conducted for 4 hours in the 1st semester of 4th grade. This class was conducted as a simulation exercise by a team of 6 students or less using the Noell Early Childhood Simulator. In G city of J province, 170 nursing students were recruited except 8 dropouts. We chose students who gave them enough information about the study and agreed to participate in the study. Data is collected from September 2018 to April 2019. Researchers have fully explained that before participating in this study, students with negative emotions, such as impulse control and difficulty with depression, can stop participating. Immediately. In addition, the researchers were careful in case some subjects may need treatment or guidance depending on the results of the survey.

The critical thinking ability was measured using the critical thinking ability measuring tool developed by Yoon (2004) for nursing students^[5]. Higher scores mean higher levels of critical thinking. The interpersonal ability was used by the interpersonal change scale, which was revised by Moon^[6] and higher scores mean better interpersonal relationships. Self-leadership used Self-leadership questionnaire developed by Manz (1986)^[7] as a modified version by Kim(2007)^[8] to measure self-leadership level. The higher the score, the higher the self-leadership Key satisfaction scores were measured on a 5-point scale, with 18 items written by Ha (2000).^[9]

SPSS WIN 23.0 Version program is used for data analysis. General characteristic of the subject is used for frequency analysis and descriptive statistic, paired t-test and Pearson's correlation was used for analysis.

Result and Discussion

1. **Difference of Communication Ability after Simulation-Based Education Program:** The average score for critical thinking skills was 7.07 ($t = -4.531, p = .000$), 5.98 for interpersonal relationships ($t = -2.893, p = .005$), and 3.47 for Self-Foldership ($t = -3.000, p = .004$), major satisfaction increased 3.34 points ($t = -2.313, p = .023$). Simulation-based training programs influenced critical thinking skills more than video. [Table 1].

Table 1. The Difference between video training and simulation-based training program (N = 170)

	Video	Simulation	P-D	t	p
CT	91.54±8.90	98.61±10.65	-7.07±14.22	-4.531	.000***
IA	91.90±14.82	97.88±13.06	-5.98±18.82	-2.893	.005**
SL	55.04±8.19	58.51±7.57	-3.47±10.54	-3.000	.004***
MS	59.49±8.64	62.83±8.86	-3.34±13.15	-2.313	.023**

Unit: cm, ***: p<0.005, **: p<0.05, CT: Critical thinking, IA: Interpersonal ability, SL: Self-leadership, MS: Major satisfaction

2. Difference between critical thinking after video and simulation program: There was a significant difference in critical thinking (t = -4.531, p = .000). Prudence (t = -1.75, p = .001), sound skepticism (t = 1.17, p = .031), systematic (t = -3.32, p = .002) and

intellectual passion/curiosity (t = -2.87, p = .023) showed significant differences, and intellectual integrity (t = 1.786, p = .078), objectivity (t = -2.89, p = .507), and reliability (t = -0.62, p = .711) were significant. Showed no difference [Table 2].

Table 2. Difference of critical thinking after simulation-based education program (N = 170)

	Video	Simulation	P-D	t	p
Critical thinking	91.54±8.90	98.61±10.65	-7.07±14.22	-4.531	.000***
Intellectual fairness	8.28±1.05	7.98±1.05	.30±1.54	1.786	.078*
prudence	13.07±1.74	14.01±1.88	-.94±2.48	-1.75	.001***
Objectivity	11.80±1.38	11.65±1.52	.14±1.98	-2.89	.507
healthy skepticism	13.75±2.25	14.51±2.22	-.76±3.17	1.17	.031**
Systematicity	6.23±1.40	6.94±1.37	-.71±2.01	-3.32	.002***
Intellectual eagerness/Curiosity	7.31±1.30	7.39±1.21	.48±1.80	-2.87	.023**
Self Confidence	6.03±0.85	6.09±0.67	.06±1.04	-0.62	.711

Unit: cm, ***: p<0.005, **: p<0.05

3. Differences in Interpersonal Ability After Video and Simulation Education Program: There was a significant difference in the mean scores of interpersonal competences (t = -2.893, p = .005). Sensitivity (t = -2.48, p = .015), communication (t = -2.57, p = .012), intimacy (t = -2.29, p = .025),

openness (t = -2.92, p = .005) significant differences were found in and comprehension (t = -2.92, p = .005), satisfaction (t = -1.97, p = .052), reliability (t = 1.80, p = .076). There was no significant difference in [Table 3].

Table 3. Interpersonal ability After Video and Simulation Training (N = 170)

	Video	Simulation	P-D	t	p
Sensitivity	11.49±2.21	12.19±1.74	-.706±2.56	-2.48	.015**
Communication	14.71±2.86	15.73±2.31	-1.02±3.63	-2.57	.012**
Trust	10.94±2.34	11.53±2.06	-.59±2.99	-1.80	.076*
Intimacy	11.16±2.27	11.84±2.03	-.69±2.73	-2.29	.025**
Openness	14.16±2.79	15.33±2.52	-1.18±3.69	-2.92	.005**
Under Standing	14.70±2.65	15.75±2.15	-1.05±3.274	-2.92	.005**
Interpersonal Ability	91.90±14.82	97.88±13.06	-5.98±18.82	-2.893	.005***
Satisfaction	14.75±2.27	15.49±2.51	-.75±3.45	-1.97	.052*
Sensitivity	11.49±2.21	12.19±1.74	-.706±2.56	-2.48	.015**

Unit: cm, ***: p<0.005, **: p<0.05

4. Differences in self-leadership after Video and Simulation Program: The mean score of self-leadership was 55.04±8.19 pre-intermediate to

58.51±7.57 post-intervention behavioral strategy ($t = -2.65, p = .010$), cognitive strategy ($t = -2.83, p = .006$) was significantly different [Table 4].

Table 4. Self-leadership After Video and Simulation Training (N = 170)

	Video	Simulation	P-D	t	p
Selfleadership	55.04±8.19	58.51±7.57	-3.47±10.54	-3.000	.004***
Behavioral Strategy	32.92±5.39	34.98±4.78	-2.06±7.09	-2.65	.010**
Cognitive strategy	22.12±3.36	23.53±3.43	-1.41±4.54	-2.83	.006**

Unit: cm, ***: $p < 0.005$, **: $p < 0.05$

Discussion

Few studies measured the effects of video training and simulation-based training using the same tools. The findings of a study conducted by Park and Lim^[4] showed no significant difference in takeover confidence, problem-solving ability, or takeover ability. In a study conducted by Kim et al^[3], the effects of video training were shown to be more significant on nursing performance, readiness, nursing assessment, and nursing intervention. Findings are regarding classes centered on performance and skills and the core of educational programs is not skills but critical thinking, interpersonal ability, self-leadership, and major satisfaction, differences according to the contents of classes should be also considered.

Critical thinking was statistically identical to the results of Kim et al.^[9] The research conducted by Kim & Yu.^[10] who measured the effectiveness of simulation-based teaching method using the same tool, showed the same results as the results of this study because there were no significant differences in subareas. . The tools used were not the same, but objectivity, confidence and intellectual fairness. Kim & Kim^[11], in a study on the effectiveness of simulation learning with problem-based learning, showed an increase in the mean score, unlike this study, but the difference was not significant. The study of Lee.^[12] impact on critical thinking, communication, and clinical practice skills in nursing students differed only in intellectual fairness and objectivity. The significant difference is considered to be due to improvement through peer review.

In interpersonal competence, the research conducted by Kang et al^[13] showed the same results as the above findings, although the tools used were not identical,

but there were significant differences in interpersonal competence through simulation training^[14] and the results of measuring the effects of e-learning and simulation showed the same significant difference as this study. Important differences shown in the subarea. Sensitivity, communication, intimacy, comprehension, and openness are considered due to the fact that simulation training is more like real practice than video. Due to the fact that video and simulation training are not real clinical practice, a slight difference in satisfaction and reliability is taken into account.

The research conducted by Kim and Song^[15] on major satisfaction showed a significant difference in the self-leadership created by simulation education, consistent with the above findings. The significant differences in behavioral strategy and cognitive strategy, which are sub-areas, are considered attributable to the fact that unlike video training, simulation education was carried out in teams so that the students could become a leader to solve problems in situations.

Conclusion

This study was conducted to examine nursing students' critical thinking, interpersonal ability, self-leadership, and major satisfaction after conducting video training and simulation training so that the findings of this study can be used as basic data later in revising the direction of guidance of maternity nursing practice. Although nursing students complete maternity nursing practices together with maternity nursing science, there are problems such as the lack of training institutions, poor training environments, and the phenomenon of avoiding male student training. Therefore, educational programs that can supplement the training should be

operated. Therefore, the students who started the training were educated on the shortcomings of practices through videos in classes, and thereafter, those parts that could not be practiced and those parts that were insufficiently practiced were educated through simulations.

The findings of this study showed significant differences in critical thinking, interpersonal ability, self-leadership, and major satisfaction between video education and simulation education consistently with previous studies. The study findings in some subareas were consistent with those of previous studies but those in other subareas were not. This is considered attributable to the effects of differences in the compositions and contents classes and the characteristics of students and professors who participated in the classes. In particular, interpersonal ability, self-leadership, and major satisfaction were not studied very much as variables after the simulation education programs and were not compared among different educational programs. Therefore, the foregoing variables should be studied later because teaching-learning method that will enable students to learn the knowledge and skills the most efficiently instead of practices should be selected.

Based on the findings of this study, simulation-based educational programs can be said to be appropriate education and learning method that can fill the shortcomings of practices because they provide students with experiences of firsthand playing professional roles and studying and thinking things necessary for the roles in advance instead of practices in which they just observe what others do. In addition, simulation-based educational programs are considered helpful in clinical fields after graduation because they affect interpersonal ability, self-leadership, and major satisfaction. Recently, diverse teaching and learning method have been presented, smart education using diverse electronic devices and applications has been strengthened, and integrated simulation education programs have been operated. Therefore, this researcher wishes to propose studies to develop diverse and appropriate nursing education method, studies of diverse variables of such nursing education method, and studies of education method.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Differences of Muscle Activities of Various Bridge Postures Using Thera-band on the Stable Surface

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Abstract

Background/Objectives: This study was conducted to compare and analyze the muscle activity of vastus lateralis, muscle vastus medialis, spinal erector muscles and gluteus maximus muscle using the EMG measuring device and suggest effective results of the bridge exercise when conducting the bridge exercise with various bridge postures using resistance of Thera-band on the stable support surface.

Method/Statistical Analysis: In order to examine the difference in the muscle activity of vastus lateralis, vastus medialis, erector spinae and gluteus maximus, a total of 3 exercises were conducted by each different posture; the normal bridge posture, the hip adduction bridge posture using the resistance of Thera-band and the hip abduction bridge posture using the resistance of Thera-band. The measured results of the experiment was analyzed by repeated measure analysis of variance

Findings: The results showed that muscle activity was all higher when conducting the bridge exercise using the resistance of Thera-band for vastus lateralis, vastus medialis, erector spinae and gluteus maximus, In the hip adduction bridge posture, vastus lateralis and vastus medialis showed significant difference, and in the hip abduction posture, gluteus maximus showed significant difference compared to the normal bridge posture.

Improvements/Applications: It is considered that the hip abduction bridge exercise and the hip adduction bridge exercise using the resistance of Thera-band can help stabilize the body.

Keywords: Bridge exercise, Thera-Band, Hip Adduction, Hip Abduction, Muscle activity.

Introduction

More than 50% of the modern people are often experiencing low back pain in their lifetime. The strength of the body stabilization muscle is weakened by the decrease of physical activity. And there is a lot of time for the modern people sitting in abnormal posture for a long time and having excessive tension, which also weakens gluteus maximus muscle, the one of the strong hip joint extensor^[1,2,3]. According to Sahrman and Van

Wingerden, the weakening of gluteus maximus muscle, declines and function cause instability and dysfunction of the hip joint and excessive activity of spinal erector muscles^[4,5,6]. Therefore, exercise for the body stabilization muscle has been applied for the lumbar region and the back pain. It has been recognized as an effective exercise therapy for the low back pain and prevention^[7,8]. The muscles related to the body stabilization maintain the center of body and stabilize the back when body is moving^[9]. Previous studied that exercise for the body stabilization restores muscle and moving control ability, especially stabilizes erector normal muscle and gluteus maximus muscle are strengthened and more effective for balance. In particular, gluteus maximus muscle is the most strong muscle among the muscles related to the body stabilization exercise and improves stabilization of joints and delivers power to pelvis from

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lower body at initial contact because direction of fibers is vertical on sacroiliac joint and it plays an important role in daily lives^[7,8,10]. O. Sullivan and Moon reported that the body stabilization exercise protects the spine from repetitive damage, increases stability, reduces pain relief, dysfunction and improves muscle strength to restore balance and exercise control capacity. It is more effective than preservation treatment^[11,12,13]. In recent days, bridge exercise is recommended interventions for the low back pain among various exercise treatments^[9]. The bridge movement is a closed chain exercise that increases strength by strengthening of the vastus lateralis muscle, vastus medialis muscle, erector spinae and gluteus maximus muscle. It also increases the stability of the body including the spine and lumbosacral region. Everyone can easily learn and practice therefore it is used often. As it activates local muscle fatigue and global muscle, it helps muscular cooperation^[7,9,14]. Some studies reported that resistance exercise of the closed chain exercise which strengthens the lower body with Thera-band is very effective and resistance exercise using the Thera-band is the most effective way to improve the balance of activities of daily living^[14,15]. As Thera-band has elasticity, it can avoid the risk of excessive exercise and easily used by anyone to do exercises. It has advantages of stability and practical and effective results in improving muscle strength^[16,17]. Likewise, there are many studies on the effect of the bridge exercise to reduce the back pain but studies on various bridge postures on the stable support surface using thera-band is insufficient. The purpose of this study is to compare the changes of muscle activity such as vastus lateralis, vastus medialis, erector spinae and gluteus maximus muscle depending on various bridge posture.

Table 1. Study subjects general characteristic (n=17)

Division	Mean Value
Gender (M/F)	8/9
Age	21.4±1.12
Height	167.5±6.19
Weight	63.2±13.39

Method

The subjects of this study were healthy men and women. As a total of 17 subjects had no medical history of knee, ankle, hip joint and spine (8 men, 9 women). Before they participate in this study, the subjects were

fully explained the content and purpose of the study and received the consent to participate in the experiment. The normal characteristics of the study subjects are as follows [Table 1]. Before the exercise, bridge exercise was conducted in a lying position after attaching the electromyogram pad to the regions of vastus lateralis, vastus medialis, erector spinae and gluteus maximus muscle for the experiment measurement. Exercise was divided into three types and normal bridge exercise on the stable support surface, bridge exercise in the hip joint posture, and bridge exercise in the hip open posture were conducted for 10 seconds for each exercise. When the bridge exercise was conducted, both arms of the subject were placed 30 degrees far from each body. Both toes were facing forward, and the width of both feet was between 15cm. The angle of the knee was bent at 90 degrees and scapula, lumbar, pelvis, hip knee and ankle were made straight. The bridge exercise is to lift the hips and lumbar with bending the knee at 90 degrees when lying down and facing ceiling. It promotes the stability of the body including the spine and lumbosacral range. They were guided to make a smooth slope and keep lifting foot from the ground when lifting waist and hip and they kept making their scapula, lumbar, pelvis, hip, knee and ankle straight. First, the width of the feet was fixed to about 15cm before the exercise on the stable surface and both of arms angle was at 30 degrees, the normal bridge posture without Thera-band was measured. Secondly, the bridge posture of the hip adduction was measured by giving resistance using Thera-band under the same conditions. Thirdly, the bridge posture of the hip abduction was measured by giving resistance using Thera-band under the same conditions. In this study, we used OQUS100 (Zero WIRE EMG, Noraxon) to measure the muscle activity of vastus lateralis, vastus medialis, erector normal and gluteus maximus muscle. The sampling rate was 1,024 Hz when measuring the surface EMG. In order to remove the noise, 60Hz band stop filter and 10 to 500Hz band pass filter were used. The EMG signal was amplified by 1785 times. Signals of the collected muscle activity were recorded by full wave rectification and root mean square (RMS). For data analysis, SPSS 20.0 version program was used. And one way repeated measured test and Bonferroni was used to examine the difference between individual interventions according to muscle activity during various bridge exercises using Thera-band on the stable support. Statistical significance level was set to p<.05.

Table 2. Differences muscle activities of various bridge postures using Thera-band on the stable surface

	NBE	HDBT	HABT	F
VLO	10.31±3.92	15.06±6.00	12.05±5.53	8.98*
VMO	12.89±4.42	19.84±8.81	12.53±4.09	8.05*
ES	84.52±53.66	83.77±50.93	100.18±52.72	0.81
GM	41.05±24.02	43.35±33.53	91.02±59.30	6.24*

*p<.05, average±standard deviation, VLO : Vastus lateral Oblique, VMO : Vastus medialis Oblique, ES : Erector Spinae, GM : Gluteus Maximus, NBE: Normal Bridge exercise, HDBT: Hip Adduction Bridge exercise using Thera-Band, HABT : Hip Abduction Bridge exercise using Thera-Band

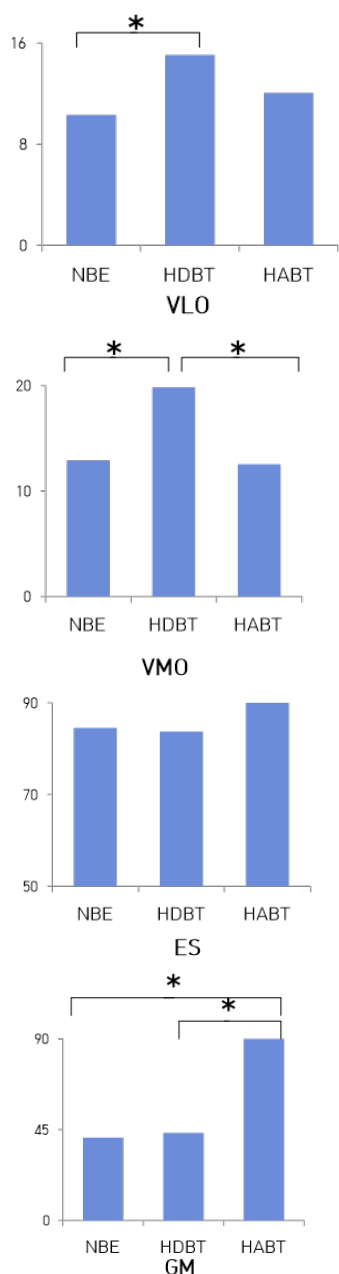


Fig. 1. Different of muscle activity among the positions

Result

There was statistically significant difference between NBE and HABT (p<.05) but there was no statistically significant difference between NBE, HABT, HDBT and HABT (p>.05)[Table 2][Figure 1]. Difference of activity level of vastus lateralis depending on various bridge postures using Thera-band. There was statistically significant difference between NBE and HDBT, HDBT and HABT (p<.05), but there was no statistically significant difference between NBE and HABT (p>.05) [Table 2] [Figure 1]. There was no statistically significant difference between NBE and HDBT, HDBT and HABT, NBE and HABT (p>.05)[Table 2] [Figure 1]. There was statistically significant difference between NBE and HABT, HDBT and HABT (p<.05) but there was no statistically significant difference between NBE and HDBT (p>.05) [Table 2] [Figure 1].

Discussion

In this study, the muscle activity of vastus lateralis, vastus medialis, erector spinae and gluteus maximus was measured and analyzed using resistance of Thera-band on the stable support.. As a result of the bridge exercise using Thera-band, there was a significant difference between NBE and HDBT in vastus lateralis. However, Vastus medialis, there was significant difference between NBE, HDBT and HDBT and HABT. There was no significant difference between NBE, HDBT, and HABT in erector spinae. And there was a significant difference between NBE, HABT and HDBT, HABT in gluteus maximus muscle. Therefore this study recorded about high muscle activity when conducting HDBT and HABT. The vastus lateralis and vastus medialis related to knee extension among quadriceps femoris is the strongest muscle. In the study, the bridge exercise in HDBT showed higher muscle activity than the bridge exercise in NBE or HABT. The bridge exercise in HDBT showed more activation rather than the bridge exercise in NBE and HABT because it tightens hip and hip adduction. Therefore it is considered that the muscle activity of vastus lateralis and vastus medialis is increased. Quadriceps femoris that is related to the bridge exercise conducted by many precedent researches is the main muscle that maintains the normal posture of the knee joint and stabilizes the hip joint, as it contracts the hip joint adductor muscles when exercising, it increases vastus lateralis muscle and vastus medialis muscle. It is reported that it is more effective to increase muscle activity when exercising the hip joint adductor muscle and

abduction activity^[9,15,18,19]. The erector spinae stretches the body and acts against gravity when conducting the bridge exercise, therefore the muscle activity of each muscle is not different from other muscles. And it is considered that the muscle activity of gluteus maximus muscle was increased and the muscle activity of erector spinae was decreased. Both of them had interaction for each other. The bridge exercise is useful for increasing the lower part of spine, lumbar vertebrae, abdominal muscle, pelvis, hip joint extensor strength and motor control ability, the activation of abdominal muscle acts an effective element to stabilize the pelvis toward the pulling force of hip joint muscles and the power of the body goes to the lower part and hip joint muscles when pelvis is stabilized^[20]. As gluteus maximus stretches the body like the erector spinae and acts a role of the hip joint extension and external rotation, muscle action was stronger when conducting HABT rather than NBE and HDBT. This was consistent with the results of previous studies which suggested that muscle pulling direction can increase the amplitude of muscle activity because it is to be optimized when in horizontal line with the muscle fibers. It also helps prevent damage of the local muscles such as spine, joints, and ligaments. This exercise is a basic exercise for the body stabilization exercise practicing on a normal mat by drawing up a knee at 90 degrees. It is an important exercise to make a posture of drawing up knee with loading weights on both feet. As it develops the control of sitting and standing, it is widely used as a useful exercise for improving muscle strength^[13]. However, there was no significant difference when all muscles exercise were conducted in various bridge postures using the resistance of theraband. This is because there can be difference in muscle activity depending on the existence and nonexistence of the resistance of theraband when exercising with Thera-band. When conducting exercise in NBE on the stable support, it maintains a more normal posture because of no resistance. However, HDBT and HABT use more strength against resistance and have difficulty in maintaining posture and balance. Therefore, It is believed that muscle activity of vastus lateralis, vastus medialis, erector spinae and gluteus maximus was more increased. In addition, when conducting exercise in NBE without resistance of theraband on the stable support, it uses less strength rather than the muscle activity of vastus lateralis, vastus medialis, erector spinae and gluteus maximus when conducting exercise in HDBT and HABT. This study suggests some limitations. First, the noise of the signal may be generated according to

the muscle movement or the fine movement due to the characteristics of the surface EMG measurement when having the bridge exercise. Second, in this study did not focus on one gender of the subjects, therefore there can be difference of muscle activity depending on gender. It is expected to have a study on differences of muscle activity for the same gender in future studies.

Conclusion

This study was carried out to investigate the changes of muscle activity on various bridge postures using the resistance of Thera-band on the stable support during the bridge exercise. The results showed that VLO and VMO when conducting exercise in HDBT increased muscle activity. And GM when conducting exercise in HABT increased muscle activity than NBE. Therefore, it is expected that it will be a more effective bridge exercise method if use necessary intervention method for each posture to increase activity of certain muscle.

Ethical Clearance: This study was approved by the Institutional Review Board (IRB) of Sunmoon University. (SM-201804-026-1).

Source of Funding: Self

Conflict of Interest: Nil

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A Comparison of Muscle Activity Depending on Shoulder Joint Flexion Angle When Conducting Kettle Bell Swing

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Abstract

Background/Objectives: The kettle bell exercise is effective in improving the strength and physical strength of the whole body as a popular exercise for modern people. The purpose of this study was to compare the muscle activity of Biceps femoris, Vastus medialis oblique, Erector spine and Anterior deltoid depending on shoulder joint flexion angle when conducting kettle bell swing.

Method/Statistical Analysis: The kettle bell exercise is effective in improving the strength and physical strength of the whole body as a popular exercise for modern people. The purpose of this study was to compare the muscle activity of Biceps femoris, Vastus medialis oblique, Erector spine and Anterior deltoid depending on shoulder joint A total of 30 healthy men and women who agreed to participate in the study were the subjects. All of the kettle bell swing starting positions were conducting with flexion knee about 50° and the whole body. The shoulder flexion angle was set 90°, 140°, 180° and the end position was the same as the starting position. For comparison of the muscle activity depending on shoulder joint angle, One-way Repeated ANOVA was used and Bonferroni method for post-test.

Findings: Biceps femoris showed significant differences at all degrees ($P < .05$). And vastus medialis oblique and anterior deltoid showed significant difference at 90°, 140°, 180°. And there was no significant difference between 140° and 180° ($p > .05$). There was no significant difference in the spinal erector muscle ($p > .05$).

Improvements/Applications: Therefore the muscle activity degree for each muscle was clearly different depending on the shoulder angle.

Keywords: Kettle bell, kettle bell swing, muscle activity, exercise, peak value.

Introduction

In the modern industrialized society, physical labor work has become rare due to technological advance and sedentary style of living has spread widely^[1]. Therefore the average amount of daily physical activity in humans has decreased dramatically over the past century^[1]. However, regular physical activity is essential for the prevention of health problems such as chronic

diseases. It is known that physical exercise is beneficial to the body in various ways^[1]. People are getting more recognized on how health care impacts on the quality of life. The World Health Organization defined the health as “a dynamic and complete state of physical, mental, social, and spiritual well-being and absence of disease.” It means absence of physical anomalies and active physical activity. Physical activity does a positive influence on physical health and is an essential factor for health promotion as it is also effective in mental health. Especially kettle bell training has been very popular by the strength and conditioning community in recent years. Fitness experts and coaches often suggest that kettle bell training is an excellent way to develop explosive strength^[2]. Manocchia et al study stated that the kettle bell is an effective way to improve physical

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fitness and has the effects of increased body strength. And the kettle bell is not only limited to athletes' sport training^[3]. Basically, the kettle bell swing is technically a simple and full-body exercise^[4]. Also the kettle bell exercise reduces neck and shoulder pain and back pain, improves muscle strength, hips and waist, pelvic muscle strength and endurance^[5-6]. Among the studies related to the kettle bell exercise, studies on the swing type have been conducted for comparison of peak force and muscle activity^[7-8]. A study on peak values in three swings of shoulder height, overhead, and Indian club swing did not measure muscle activity even though the shoulder joint flexion or abduction angle was different for each type^[7]. In the study comparing the muscle activity of each type; kettle bell arm swing (Swing), arm swing style snatch (Snatch), arm clean (Clean) were not classified according to the shoulder joint flexion angle^[8]. Studies on observation of the muscle activity of the whole body including the upper limb and the lower limb according to arm lifting angle with flexion shoulder are lacking. Thus, this study is to investigate the most effective type of kettle bell swing by comparing the muscle activity of various parts according to the shoulder joint flexion angle.

Method

This study subjects were 30 healthy male and female adults in S university located in Asan, Chungnam. They had no medical history or visiting for shoulder, knee or back pain. All the subjects voluntarily participated through advertisement invitation and were finally selected after confirming that they meet the following criteria. The subjects should have meet the following criteria. 1) Those who did not visit the hospital due to shoulder, knee, and back pain 2) Those who have no pain or discomfort when moving shoulder, knee or waist 3) Those who did not get surgery on shoulder, knee or waist. 4) Those who have no inflammatory, degenerative joint or connective tissue disease 5) Those who have musculoskeletal disease in shoulder, knee, or waist. The physical characteristics of the subjects were as follows. In this study, a total of 30 subjects (15 men and 15 women) were randomly selected and the muscle activity of Biceps femoris, Vastus medialis oblique, Erector spine and Anterior deltoid when conducting kettle bell swing depending on shoulder joint flexion 90°, 140° and 180°. The weight of kettle bell was 8kg for male and 4kg for female. For the starting position, they bent the hips and knees slightly at degree 50°. They left up kettle bell at shoulder flexion angle and the shoulder flexion angle

was 90°, 140° and 180°. After 3 times of shoulder joint flexion angle and 3 minutes of rest time, they moved on the next experiment. The end position was the same as the starting position.

And the peak value of muscle activity of each muscle was found when conducting kettle bell exercise. In order to examine the muscle activity of Biceps femoris, Vastus medialis oblique, Erector spine and Anterior deltoid, EMG (Zero WIRE EMG, EMG OQUS100, Italy, 2009) was used. The collected EMG analog signals from 4 channels were converted to digital signals by MP150 system and the study is analyzed using EMG software myoresearch 1.06.44 software. The sampling rate of EMG signal was set to 1,000Hz and the subsequently smoothed by a RMS filter of 50ms. In order to examine the muscle activity of the subjects' shoulder joint flexion depending on 90°, 140°, 180° when conducting kettle bell swing, surface EMG was attached on each muscle. The attachment part is as follows. 1) The EMG attachment part of Biceps femoris is 15cm below the ischial tuberosity. 2) The EMG attachment part of Vastus medialis oblique is attached to the inner oblique direction of the center line from 2cm above the knee bone. 3) The EMG attachment site of Erector spine is attached on the outside of neural spine 3cm far from lumbar vertebrae number 4 and 5. 4) The EMG attachment part of Anterior deltoid is attached 3.5cm below the front of the acromion. For precise measurement, electromyography was performed to clean the attachment part before attaching surface electrode adherence. It minimized skin resistance and wiped the electrode attachment part by alcohol cotton. In order to analyze the data of this study, SPSS 22.0 version program was used. And one-way repeated ANOVA was used to compare the muscle activity depending on shoulder joint flexion angle and post-test was conducted with Bonferroni. The statistical significance level of this study was set at $p < .05$.

Result

The EMG signals of the muscles was measured depending on 90°, 140°, 180° flexion when conducting kettle bell swing. As a result, there was significant difference between the muscle activity of lower limbs muscle and deltoid muscle depending on flexion angle ($p < .05$). The peak value of Biceps femoris was $284.93 \pm 133.65\%$ when flexion shoulder joint at 90° and $404.66 \pm 143.23\%$ when flexion shoulder joint 140°. And $356.80 \pm 164.48\%$ when flexion shoulder joint 180°. All flexion shoulder joint showed significant differences

($p < .05$). The peak value of vastus medialis oblique was $619.47 \pm 130.26\%$ when flexion shoulder joint at 90° , $680.45 \pm 120.65\%$ when flexion shoulder joint at 140° and $718.77 \pm 144.34\%$ when flexion shoulder joint at 180° . All flexion shoulder joint showed significant differences ($p < .05$). However, flexion angle 140° and 180° had no significant differences ($p > .05$). The peak value of anterior fiber of deltoid muscle was $507.15 \pm 206.03\%$ when flexion shoulder joint at 90° , $596.91 \pm 206.46\%$ when flexion shoulder joint at 140° , $623.01 \pm 190.94\%$

when flexion shoulder joint at 180° . All flexion shoulder joint showed significant differences ($p < .05$). However, flexion angle 140° and 180° had no significant differences ($p > .05$). The peak value of the erector spine was $389.75 \pm 204.35\%$ when flexion shoulder joint at 90° , $428.51 \pm 181.92\%$ when flexion shoulder joint at 140° and $446.59 \pm 148.56\%$ when flexion shoulder joint at 180° . All flexion shoulder joint showed no significant differences ($p < .05$). [Table 1] [Figure 1].

Table 1. EMG of muscles depending on shoulder joint flexion 90° , 140° and 180° when conducting kettle bell swing

	90°	140°	180°	F
Biceps femoris	284.93±133.65	303.66±143.23	356.80±164.48	6.42*
Vastus medialis oblique	619.47±130.26	680.45±120.65	718.77±144.34	12.81*
Erector spine	389.75±204.35	428.51±181.91	446.59±148.56	1.40
Anterior deltoid	507.15±206.03	596.91±206.46	623.01±190.94	11.79*

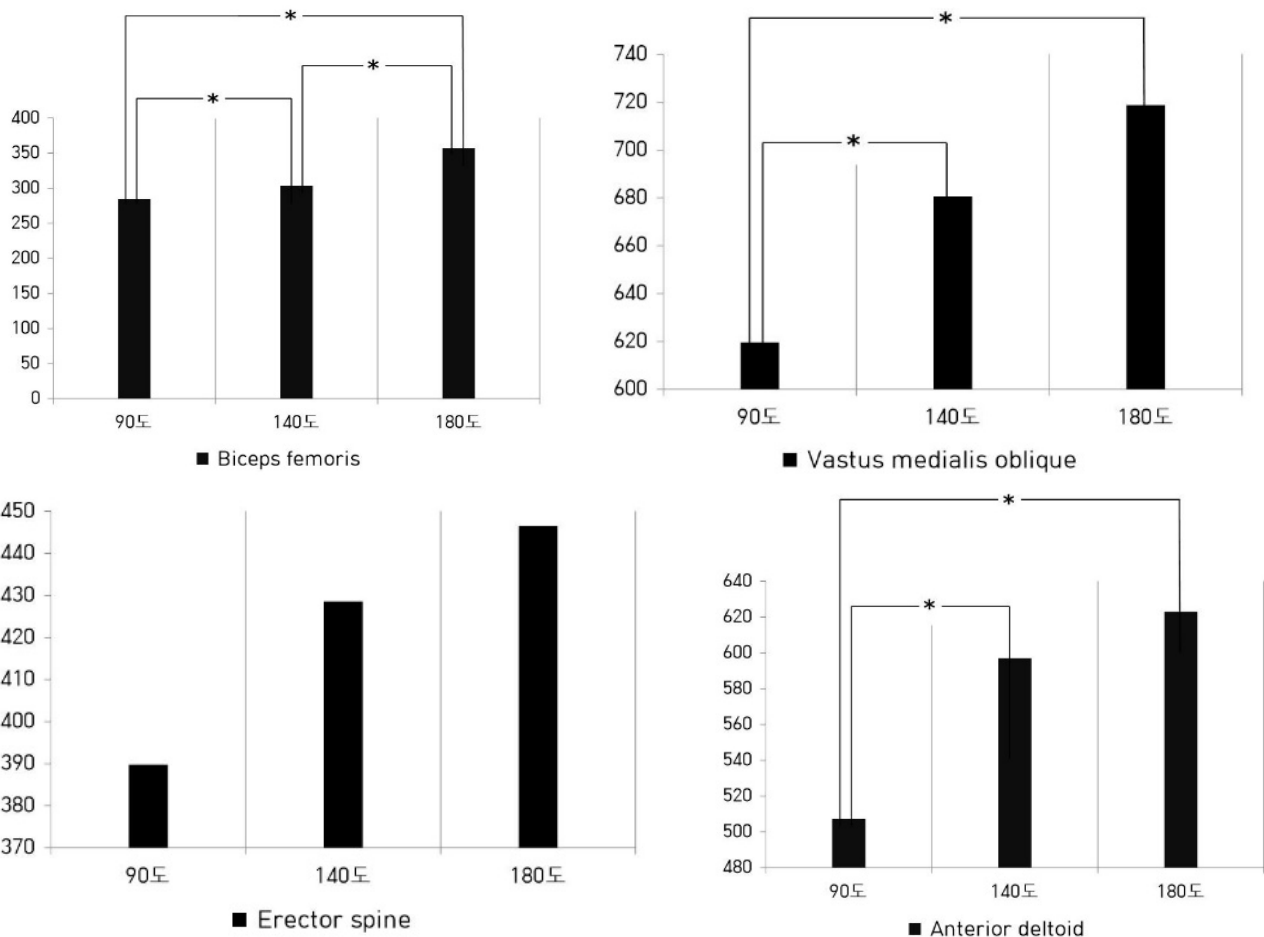


Figure 1. Comparison of muscle activity depending on shoulder joint flexion angle

Discussion

This study compared the muscle activity of various muscles when conducting kettle bell swing depending on the change of shoulder joint flexion angle. As a result, there was a statistically significant difference in Biceps femoris, Vastus medialis oblique, Erector spine and Anterior deltoid depending on shoulder joint flexion angle. In biceps femoris, as shoulder joint increased, the signal intensity of the EMG signal was higher. And vastus medialis oblique and anterior deltoid showed higher muscle activity at flexion angle 140° and 180° rather 90°. There was no significant difference between 140° and 180° flexion of vastus medialis oblique and anterior deltoid. The study on peak values according to three swing method of Bullock et al suggested that shoulder height kettle bell swing; SKS, overhead kettle bell swing; OKS, indian club swing; ICS resulted that SKS was shorter in cycle than OKS and vertical impacts were relatively low^[7]. And this study measured foot flexion of the ankle joint, extension of the knee joint and extension of the hip joint using Visual 3D (C-Motion, Bethesda, Maryland, USA) when conducting kettle bell exercise. As a result, SKS and OKS showed greater maximum force in foot flexion of the ankle joint and extension of the hip joint compared to ICS. And vertical ground reaction force was also greater^[7]. In this study, the shoulder joint flexion angle was divided into 90°, 140° and 180° to conduct kettle bell swing. The study was conducted to find the effects of kettle bell swing depending on shoulder joint flexion size. Bullock's et al similarly studied the swing type by dividing into three. However OKS and ICS was similar in terms of flexion shoulder maximumly when considering kettle bell swing and focusing on shoulder joint movement. Therefore there was lack of examining muscle activity depending on flexion angle. The kettle bell exercise is for whole body but this study was insufficient to examine various muscles depending on swing type by measuring the peak value of the lower part of muscles. For this reason, this experiment was conducted. The study above showed that the cycle time of OKS was 34% longer than that SKS and ICS. This study also showed that the operation time of the swing with shoulder joint flexion at 180° was the longest. And the peak value of OKS was higher than that SKS when the hip joint was opened. This study showed that the muscle activity of biceps femoris which opens the hip joint was higher at 140° than 90° and was also higher at 180° than 140°. The results were similar to the previous studies. According to Studies by McGill and Marshall said healthy subjects did kettle bell

swing with both hands and resulted in an activation of MVIC (maximal voluntary isometric contraction) of $70.1\% \pm 23.6\%$ ^[5]. This was within 50% to 60% of MVIC which is proposed to be stimulating enough to muscle strengthening^[9-11]. This suggests that the swing method with both hands is more effective than the one-handed swing. Therefore, this study was designed as a swing method with both hands. And the most effective and responsible reaction was measured by dividing shoulder flexion angle into three stages rather than simply focusing on swing with both hands. Lyons et al measured the muscle activity of biceps femoris, anterior deltoid and posterior deltoid, spinal erector muscle, vastus lateralis, external oblique abdominal muscle and gluteus maximus muscle^[8]. In particular, the spinal erector muscle showed greater muscle activity in the swing type than the Snatch type^[8]. Since the Kettle bell exercise method of this study was also the swing, it measured the EMG of the spinal erector muscle when conducting kettle bell swing. However, there was no difference in the effect according to the height of the shoulder joint because it was the intervention method using the similar type. In the hip joint exercise, the muscle activity of biceps femoris was also measured when conducting the kettle bell swing. As he subject of this study was the result of muscle activity depending on shoulder joint flexion angle, it measured the anterior fiber of deltoid muscle and the EMG signal of biceps femoris which is one of the important factors in the kettle bell swing exercise and stretches knee. Especially, vastus medialis oblique is the weakest physiologically as an inner support surface and muscle weakness appears first^[12]. The weakening of vastus medialis oblique breaks the balance of the muscular development of biceps femoris and responds outsider support surface and decreases inner power when stretching knee joint. Therefore it can cause PFPS (Patella Femoral Pain Syndrome) and subluxation of knee bone. Since the role of vastus medialis oblique is important, the study examined which position causes the highest muscle activity when conducting the kettle bell swing. As a result, it is considered that vastus medialis oblique increases momentum in range of shoulder joint angle over 90 degree and causes the higher muscle activity. Therefore, it can be applied effectively to patients with PFPS. The limitation of this study is that subjects were all healthy 20s' generation people but not various ages or professionals. Therefore it is difficult to generalize the result of the study. And the subjects' fat mass, body fat percentage, muscle mass, and normal exercise status were not taken into considerations. The

experiment group was divided into each gender without considering weight differences. Because the subjects exercised kettle bell of the same weight, it caused the limitation. It would be possible to suggest better results if the limitation of this study is to be removed in future studies.

Conclusion

The results of this study showed significant difference in the muscle activity of biceps femoris, vastus medialis oblique, erector spine and anterior deltoid but no significant difference in the erector spine. Therefore the muscle activity degree for each muscle was clearly different depending on the shoulder angle. The kettle bell exercise of various shoulders joint is recommended on basis of the results of the study.

Ethical Clearance: This study was approved by the Institutional Review Board (IRB) of Sunmoon University SM-201805-043-2.

Source of Funding: Self

Conflict of Interest: Nil

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Change in Lower Extremity Muscle Activity with Visual and Noises During Walking

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Abstract

Background/Objectives: In this study, four conditions of visual and noises were examined to determine the inferior limb muscle activity after walking for 10 minutes on a treadmill.

Method/Statistical Analysis: Nine males and nine females, who agreed to participate in the study, were recruited. Participants were asked to walk on a treadmill for 10 minutes on each of the four conditions (a), (b), (c), and (d) depending on visual acuity and noise. Electromyograph was used to measure and compare muscle activity.

Findings: There was no significant difference in biceps femoris muscle ($p > .05$). The comparison of the tibialis anterior muscle resulted in a significant difference between the conditions a-c, a-d, b-c and b-d ($p < .05$). This indicates that conditions in those visually impaired became more vital in comparison to those that were not visually impaired. The muscle activation by condition was $d > c > b > a$, followed by de-conditioned vision and dB was the highest when it was higher 90. The comparison of the lateral gastrocnemius muscle resulted in a significant difference between the a-c, b-c and b-d conditions ($p < .05$). This indicates that conditions without vision have become more vital than those with vision. The muscle activation by condition was $d > c > b > a$, followed by de-conditioned vision and dB was the highest when it was > 90 . The comparison of the medial gastrocnemius muscle showed that not all four conditions differed significantly ($p > .05$).

Improvements/Applications: There was significant difference in muscle activity between TA, LGM than when vision was blocked, that the muscle activity has improved when walking over 90 dB than 60 dB.

Keywords: Gait, Visual, Noise, Treadmill, Electromyography.

Introduction

Walking is a routine human activity and a continuing event involving multiple systems simultaneously including the nervous system, sensory motor, musculoskeletal, and visual vestibular systems^[1,2]. Walking is a very complex behavior, and normal walking should precisely control limb movements,

posture and strength, a very complex process involving the entire nervous system^[1,3,4]. Human walking is one of the most common forms of exercise, but it is important to understand what specific functions of the leg can be used to perform effective walking^[5,6]. Increasing walking speed increases leg muscle activity and energy consumption^[2,7]. Visual deprivation of gait stability reduces dynamic stability and increases dependence on somatosensory and vestibular systems to control gait stability^[4,8]. Walking is a beneficial means of transportation for individuals and communities and provides health benefits that improve balance, improve bone growth and improve mobility^[2,9]. Today, the use of trade mills is used as a tool for rehabilitation and exercise as well as gait assessment, and trade mill training has become an important therapeutic

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intervention in neurological rehabilitation over the last few years^[2,10]. The difference between walking on the ground and walking on the trade track is that people can choose speed, walk shorter or wider, and spend less time at the swing^[11]. According to preliminary studies, only 90% of the information about the human brain is transmitted to the eye^[12]. Obstructing other parts of the visual field, including the peripheral vision, has an important effect on gait dynamics^[13,14]. Vision provides information about the environment from a distance and plays a crucial role in mobility in maintaining stability and path when visually recognizing the environment on the move. In order to adjust the foot spacing and foot position and to control the walking speed, it is important to visual recognition of self motion, limb position, and limb movement^[15]. Auditory information affects the sensory motor control of gait. During walking, people are accustomed to body-related and environmental sounds, and the reduction of auditory information using active noise reduction has surprisingly improved walking stability when using active noise reduction compared to normal walking^[16]. In addition, auditory noise has been shown to have additional effects on postural stability independent of vision^[17]. Viljanen et al show that people with poor hearing are at high risk of falls and are partially explained by poor posture. For safe mobility, hearing information on the environment is important^[18]. Previous studied physiological decline in visual, auditory, physical stability and muscle strength can mitigate accident risk and lead to slower defensive responses^[19]. Hafström et al have shown that visual perception is important for controlling multiple senses in posture and contributes to spatial direction and self-motion perception^[20]. Saucedo et al also provides essential sensory information to maintain dynamic stability during human motion^[21]. Negahban et al report that hearing and vestibular systems are closely related anatomically and physiologically^[22]. In previous studies, there have been studies to confirm the effects of visual, noise, and gait, but no studies have been done to confirm the gait activity of the gait with visual and noise. The purpose of this study was to investigate the effect of muscle activity on the gait during gait with respect to noise and visual acuity in healthy adult males and females.

Method

The subjects of this study were 18 healthy adult students (9 males and 9 females) who were admitted to S university in Asan city, Chungnam. The general

characteristics of the participants are shown in [Table 1]. The study participants consisted of those who agreed to participate in the study, and the muscle activity was measured in the dominant foot direction. The EMG QUS100 (Zero Wire EMG, Italy, 2009) was used to measure muscle activation, with the biceps femoris muscle, the anterior tibial muscle, the lateral gastrocnemius muscle, and the medial gastrocnemius muscle. EMG was attached to each muscle after shaving to reduce skin resistance of EMG. When measuring the surface EMG, the sampling rate was 1024 Hz, the EMG signal was 1785 times, the bandpass filter was 20 to 500 Hz, and the notch filter was 60 Hz. The collected EMG signals were recorded in root mean square (RMS). In this study, one person participated in all four conditions and selected the subjects without musculoskeletal diseases according to four conditions according to the presence of visual block and decibel size. The test items were height, weight, and dominant foot. Before the experiment, subjects were instructed about the purpose of the experiment and the study procedure, and the same clothes were worn for the same settings of all the subjects. The first condition is that the eyes are not blocked on the treadmill and that you are walking at a comfortable speed for 10 minutes under 60dB. During walking, the gaze was directed toward the front. The second condition is that you do not block your eyes and you walk for 10 minutes at 90dB. During walking, the gaze was directed toward the front. The third condition is that you are walking at a comfortable speed for 10 minutes in an environment where the time is blocked and the decibel is below 60dB. SPSS/PC ver. 22.0 for windows program (SPSS INC, Chicago, IL). Each mean and standard deviation were calculated to see the characteristics of subjects, and one-way repeated measures ANOVA was used to see the activity of each leg muscle according to the conditions. A significant level of analysis of all statistics was set at $p < .05$.

Result

Four conditions on the treadmill in the environment where the time is not blocked, the environment is 60dB or less, the time is not blocked, the environment is 90dB or more, the time is blocked, the decibel is 60dB or less, the time is blocked and the time is over 90dB. First, the results of biceps femoris muscle, there was no significant difference in all four conditions ($p > .05$) Second, the results of tibialis anterior muscle, there was a significant difference between the conditions of a-c, a-d, b-c and b-d ($p < .05$)[Table 2][Figure 1]. $d > c > a > b$ are shown

in [Table 2][Figure 1]. Third, The results of lateral gastrocnemius muscle, there was a significant difference between the a-c, b-c and b-d conditions ($p < .05$) [Table 2]][Figure 1] and $d > c > a > b$ are shown in [Table 2] [Figure 1]. Fourth, the results of medial gastrocnemius muscle, there was no significant difference in all four conditions ($p > .05$) [Table 2] [Figure 1].

Table 1. Subject characteristics (n = 18)

Characteristic	Value	
Gender	Male	n = 9
	Female	n = 9
Age (Year)	21.61±2.57	
Height (cm)	166.72±7.35	
Weight (kg)	61.22±13.67	
Dominant foot	Right	n = 16
	Left	n = 2

Table 2. Comparison of the four conditions and the muscle maximum

	60db with Visuala	90db with Visualb	60db without Visualc	90db without Visuald	F
BP	17.20±16.72	12.13±6.62	10.98±5.84	11.18±6.92	1.64
TP	16.26±4.89	17.03±7.00	14.28±4.87	13.93±4.72	5.72*
LGP	13.81±7.08	14.12±7.61	11.56±5.64	11.53±4.90	3.09*
MGP	21.80±11.69	33.70±54.46	17.85±10.00	18.22±9.23	2.05

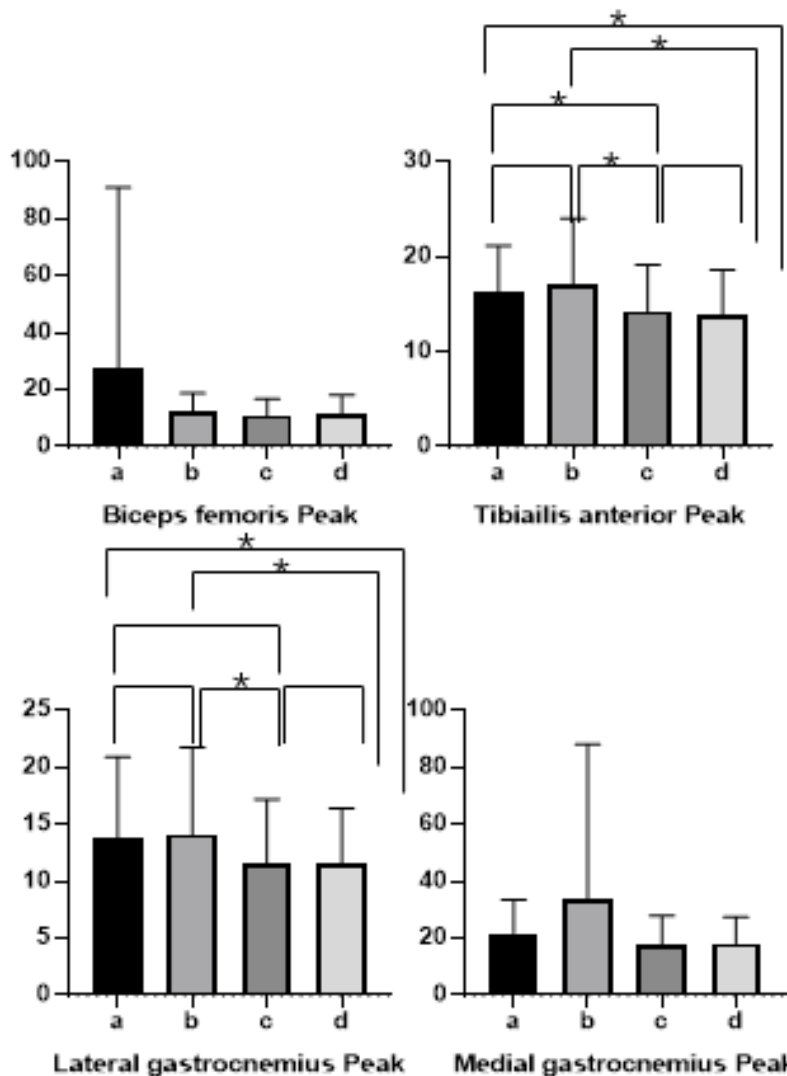


Figure 1. Comparison of the four conditions and the muscle maximum

Discussion

The purpose of this study was to investigate the change of muscular activity of the lower extremity muscles according to visual and loudness in human walking. As a result, there was a significant difference ($p > .05$) between the mean and peak values of the tibialis anterior muscle group and the peak value of the lateral gastrocnemius muscle group ($p > .05$) and the mean value and peak value of biceps femoris muscle and medial gastrocnemius muscle. There was no significant difference in the mean value of lateral gastrocnemius muscle. Mendonça et al attempted to observe the effect of a rhythmic signal while walking on a treadmill, because walking with his or her gait as an auditory cue synchronized with hearing cues, There was no difference between the effects of gait or music stimulation. This means that it is not effective to use his/her gait as an auditory clue and to use musical stimulation as an auditory cue^[23]. In this study, musical stimulation due to difference in decibel influences muscle activity during gait. Do not. Saucedo et al reported that the decrease in stability due to visual deprivation during treadmill walking is similar among age groups. This suggests that visual deprivation, regardless of age, reduced gait stability^[21]. In general, it is consistent with the study that muscle activation is more likely to occur when walking under conditions of walking without visual intervention than when walking with visual interception. However, when there is a difference in visual intercept, not all muscles show significant differences. There was no significant difference between biceps femoris muscle and medial gastrocnemius muscle. In this study, muscle activity showed the highest value when the time was blocked at the maximum value of tibialis anterior muscle and lateral gastrocnemius muscle. Hamacher et al reported that hearing information has an effect on walking control and improved walking stability when using active noise elimination compared to normal hearing. As a result, noise reduction is required to improve walking stability^[16]. This is consistent with the results of our study that the condition of noise removal resulted in low muscle activity. Sejdic et al studied the effect of music appreciation on walking. Walking is accomplished through neural control systems such as visual, vestibular, and proprioceptive systems, and walking with music leads to a more unstable stride interval sequence than with no music. This means that walking with music is unstable walking^[24]. In this study, we prove that the effect of muscle activity is affected by presenting unstable walking factors. Karim et al reported

that the presence of sound significantly improved walking ability when sight was limited. This proves that noise enhances walking ability in time-interrupted conditions^[25]. Palm et al indicate that visual information improves posture stability. In the 75-80 dB auditory information, the postural control is not deteriorated without visual input, but maintains postural stability^[26].

Conclusion

The purpose of this study was to investigate the effect of muscle activity on the gait during gait with respect to noise and visual acuity in healthy adults. When the walking time was not blocked, the TA muscle activity was improved compared to when the time was blocked. Noise was not significantly different in the four muscles during walking. In conclusion, the condition that does not block the visual acuity during walking will help to activate the anterior tibialis anterior muscles. The results of this study showed that muscle activity was not related to noise. Rather, it showed that muscle activation was decreased when the eyes were blocked. Therefore, it is recommended to use visual factor rather than auditory factor for muscle activation.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Immediate Changes of Shoulder External Rotation Exercise of Various Angle on the Distance of Subacromial Space

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Abstract

Background/Objectives: This study was conducted to examine the distance of the subacromial space when conducting external rotation according to the shoulder joint abduction angle

Method/Statistical Analysis: The study subjects were 40 volunteer participants. The abduction angle of the shoulder joint was set 0°, 45°, 90° and 120° with 10 subjects per angle as a total of 4 groups and the examined changes the subacromial space when conducting external rotation before and after. Ultrasonography was used for the measurement, and the measurement part was the subacromial space.

Findings: 0° and 45° did not show any significant difference before and after exercise. But At 90 degree, there was significant difference, pre-exercise was 10.0±0.92 and post-exercise was 10.3±0.95 (p<0.05). And at 120 degree, there was significant difference, pre-exercise was 11.5±2.62 and post-exercise was 12.05±2.51 (p<0.05).

Improvements/Applications: The distance changes according to the posture cannot be found. Because it was conducted with normal subjects, it seems to have a heavy burden to apply to patients with shoulder injury. There is a limit to generalize toward all patients. Exercise period for muscles was short. Future studies may provide better results if intervention is conducted for a long period of time in various postures and patients.

Keywords: *Subacromial space, external rotation, abduction, acromion, ultrasonography.*

Introduction

The shoulder joint is the largest range of motion in the body and it is anatomically prone to instability between the acromion and the humeral head. Therefore, shoulder disease is one of the most frequently occurring musculoskeletal diseases^[1]. The most common cause of shoulder pain is rotator cuff(RCD), impingement syndrome, bursitis, and tendonitis^[2]. Shoulder pain and

stiffness may impair work or leisure activities and cause burden on both the patient and society. Most shoulder pain does not go away in a few weeks or months and causes discomfort for long periods of time^[3,4]. In particular, impingement syndromes covers the half^[5]. Shoulder impingement syndrome refers to a disease that causes pain due to repeated trauma or compression on subacromial bursa, biceps brachii long head tendon and rotator cuff tendon which through the subacromial space becomes narrowed^[6-9]. Recently, the distance of the subacromial space is related to the functional disturbance from shoulder disease and the suffering of the patient^[9]. Exterior factors affecting the distance of the subacromial space include scapular rotation, shoulder rotation range, length of pectoralis minor muscles, thorax curve and load which are subject to rehabilitation program^[10]. The supraspinous muscle tendon goes through the

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subacromial space, and the reduction in the distance of the subacromial space causes impingement in moving the arms^[11]. In this course, collision under the acromion causes damage to the rotator cuff^[12]. According to the value of this defect, the damaged force in the shoulder joint is noticeable^[13]. In general, exercise using external rotation is most well known and commonly used for strengthening the rotator cuff for rehabilitation and prevention of injury^[11,14]. In order to increase the subacromial space, it is described that the shoulder internal/external rotation resistance exercise should be regularly conducted in various ways for strengthening the rotator cuff of shoulder impact syndrome patients^[14]. In addition, the strengthening of infraspinatus muscle helps some patients to prevent collision syndrome by increasing the subacromial space^[11]. It has also been found that the subacromial space changes with the angle of the shoulder abduction and the activity degree of shoulder abductor muscles^[15]. The more gradually the shoulder abducted, the more gradually the scapula upward rotation^[16]. Sliva and Thomas studied on the relation between the scapular position and the distance of the subacromial space. They reported that the elevation of acromion during upward rotation increases distance of the subacromial space^[17,18]. In another study, it is compared with the shoulder abduction at 90 and the external rotation with abduction together, as a result, the subacromial space was wider when having the external rotation with abduction together. In the case of a group, it is compared with giving constant load and non load. And the distance of the subacromial space was wider when there was constant load group than non load group^[19]. Ultrasonography shows a successful image in evaluating the rotator cuff. In addition, it can clearly focus on where you want to measure^[20]. As such, exercising external rotation is effective in expanding the subacromial space. In particular, it is proved that it is more effective to carry out the external rotation exercise with the shoulder abduction at 90 degree rather than no abduction. However, there is a lack of research on external rotation due to various abduction angles. Thus, this study was conducted to examine the effect of external rotation on the subacromial space at various angle of shoulder abduction through the subjects those who do not have any shoulder joint damage.

Method

This study was conducted on 40 healthy male and female students attending S University in Asan, Chungnam. The subjects were selected as those who

had no pain or discomfort of shoulder disease, nor undergone previous shoulder surgery. After determining their health status, subjects who are able to move their arms more than 120° abduction and external rotation were selected. This study provided the

participants with sufficient explanation and understanding of the purpose and method of the study. They participated in the study voluntarily. And the general characteristics of the subjects are shown in [Table 1]. 40 subjects were randomly assigned to the 0 degree group, the 45 degree group, the 90 degree group, and the 120 degree group according to shoulder abduction angle. In this study, dumbbells were used as exercise equipment. When conducting exercise depending on different loads, 2kg (4lb) showed the largest muscle activity. In the previous paper, the target of male only conducted experiment with 4kg (6lb). Based on this, the load applied to the subjects of all groups. It was set to 6lb for male and 4lb for female. And experiments were conducted on the dominant side. The 0 degree group, the 45 degree group, the 90 degree group, and the 120 degree group used the protractor to conduct three sets of external rotation exercises 10 times at each shoulder joint abduction angle [Figure 1] An experiment was conducted using metronome to measure the speed of all subjects' movements at the same speed. Measurements were carried out with the shoulder abduction angle at 0 degree sitting in the chair. For accuracy, the mean value was calculated by repeating the measurement three times before and after exercise according to the corresponding angle. For measurement tool, ultrasonography (eZono 3000, Germany, 2011) was used for the measurement, and the measurement part was the subacromial space. The length between humeral head and acromion was measured. The frequency was 7~10MHz and the image was fixed at a depth of 3cm. The position of the probe was parallel to the flat part of acromion and humeral head and located in slightly behind the upper side and middle of acromion. Data were analyzed using the IBM SPSS ver.20.0 statistical program. One-way analysis of variance (ANOVA) was used for the normality test to determine the difference in subacromial space depending on shoulder joint abduction angle. In addition, the study was conducted using LSD as a post test to examine the difference before and after intervention in group. The significance level (p) was set 0.05 for all statistical tests.

Result

The results of this study was no significant difference

between groups as a result of the external rotation according to shoulder joint abduction angle ($p > 0.05$). As a result of comparing the results before and after the external rotation exercise depending on shoulder abduction angle (0° , 45° , 90° , 120°) [Table 2], 0° and 45° did not show any significant difference before and

after exercise. But At 90° degree, there was significant difference, pre-exercise was 10.0 ± 0.92 and post-exercise was 10.3 ± 0.95 ($p < 0.05$). And at 120° degree, there was significant difference, pre-exercise was 11.5 ± 2.62 and post-exercise was 12.05 ± 2.51 ($p < 0.05$).

Table 1. General characteristics of the study subjects (N = 40)

	0° group	45° group	90° group	120° group	F
Height	163.7±7.84	165.9±9.78	162.7±6.29	172.2±11.44	2.22
Weight	58.9±8.29	60.7±9.78	58.1±9.56	66.9±11.88	1.60
Age	22.3±2.90	21.4±1.07	22.6±1.95	21.9±1.70	0.66

Table 2. Before and after external rotation motion depending on shoulder joint abduction angle

	0° Exercise Group	45° Exercise Group	90° Exercise Group	120° Exercise Group	F
Before Exercise	10.5±1.15	10.5±0.52	10.0±0.92	11.5±2.62	1.715
After Exercise	10.6±1.17	10.7±0.96	10.3±0.95	12.05±2.51	2.315
t	-1.66	-1.09	-4.21*	-4.89*	

* $p < 0.05$

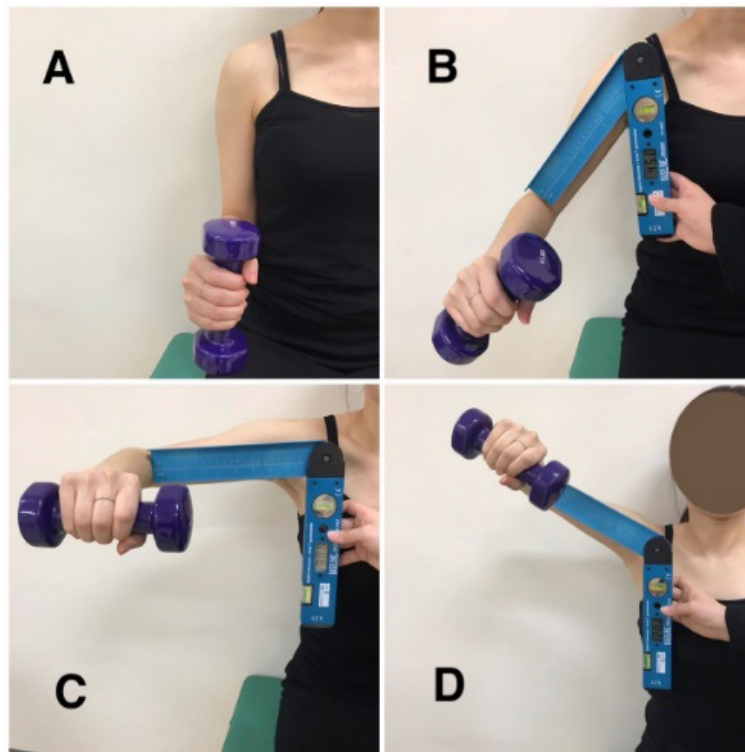


Figure 1. Four Positions of Shoulder Joint abduction A : 0° , B : 45° , C : 90° , D : 120°

Discussion

Recently, shoulder disease among musculoskeletal diseases is one of the most frequent diseases^[1]. In particular, shoulder impingement syndrome and rotator

cuff tear are the most common^[5]. For those patients, the distance of the subacromial space is considered clinically important. The subacromial space causes a source of interference when moving arms. In this process, the

interference is repeatedly generated and causes rupture of supraspinatus tendon which passes through the space. Therefore eventually, it causes inflammation or damage^[21]. This suggests that it is necessary to focus on broadening the subacromial space when planning a treatment program^[22]. The measurement consists of various method and instruments^[23]. Sasiponganan measured the subacromial space using clinical radiography and magnetic resonance imaging (MRI)^[24] and Lochmuller measured the subacromial space using 3D computer image. The subacromial space is reported as three dimensional space within the human body^[25]. However, it is only possible to be measured in a two-dimensional space for radiation measurement, and it is difficult to change the posture of the patient when measuring the subacromial space and it is risky to exposure of radiation. Ultrasonography can move during measurement and use fast^[20]. The shoulders of 40 subjects were measured in sitting position. The external rotation was measured at 0 degree, 45 degree, 90 degree and 120 degree. The women subjects received 4lb dumbbell and the men subjects received 6lb dumbbell. As a result, there was no significant difference between the groups because it was instant effect. It should have carried out for a long time in order to activate the muscles. However, as the shoulder abduction angle increases more than 90 degrees, the subacromial space tends to increased. Therefore, it is considered that as the angle increases, the space can be increased. In the comparison group, there was a significant difference at shoulder joint abduction 90 degrees and 120 degree when conducting external rotation exercise. Celeste et al. have reported that reinforcement of adductor muscle such as latissimus dorsi and the teres major when abduction shoulder joint may be effective for the treatment of subacromial pain syndrome^[26]. Alizadehkhayat et al. have said that the muscle activity of latissimus dorsi muscle, muscle teres major and rotator cuff increases when conducting external rotation at 90 degree rather than 0 degree from shoulder abduction^[27]. It is considered that there is no significant difference because there was low activity of muscle in 0 and 45 degree compared to 90 and 120 degree. According to this study, the effect of adductor muscle of eccentricity and strengthening exercise of adductor muscle and rotator cuff pulls humeral head down. There were limitations in this study. First, it was not measured in various postures such as prone and supine and the measurement was made only in the sitting position. Therefore the distance changes according to the posture cannot be found. Second, because it was conducted with

normal subjects, it seems to have a heavy burden to apply to patients with shoulder injury. Therefore, there is a limit to generalize toward all patients.

Conclusion

In the conclusion, there was no significant difference between the groups and there was no significant difference at 0 degree and 45 degree 120 degree. Based on this study, it is considered that the patients with shoulder pain impingement in the subacromial space, and the space was increased by mechanically moving the shoulder bone head downward with the most effective rotator cuff at 120 degree in the group. However there was a significant difference at 90 degree and 120 degree. Especially, there was a big difference in 120 degree. Based on this study, it is considered that the patients with shoulder pain impingement in the subacromial space, and the space was increased by mechanically moving the shoulder bone head downward with the most effective rotator cuff at 120 degree.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Effects of Balance Training Using a Wii Fit Balance Board on Balance, Gait and Activities of Daily Living in Patients with Parkinson Disease: A Pilot, Randomized Controlled Trial

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Abstract

Background/Objectives: This study examined the effects of balance training using a Wii Fit balance board on the balance, gait, and activities of daily living in patients with Parkinson disease.

Method/Statistical Analysis: Our study included 15 patients with Parkinson disease who scored 2–3 on the Hoehn and Yahr scale and underwent occupational therapy. Participants were randomly assigned to two groups: the experimental group with 8 patients or the control group with 7 patients. All subjects in two groups received traditional occupational therapy (TOT) for 30 min/day, 3 times a week, for 8 weeks, and the participants in the experimental group additionally received a balance training using a Wii Fit (BTWF) for 30 min per session. All patients in both groups were evaluated using the Berg balance scale (BBS), the time up & go test, and the modified Barthel index.

Findings: The experimental and control groups showed significant improvements in all outcome measures after intervention. In particular, the experimental group showed a more significant improvement in the BBS score than the control group.

Improvements/Applications: BTWF could be effectively used to improve the balance of Parkinson's disease patients in the clinic.

Keywords: *Activities of daily living, Balance, Gait, Parkinson disease, Wii Fit.*

Introduction

Parkinson disease is a progressive retrograde motor disability caused by degeneration of the substantia nigra and lack of dopamine generation^[1]. Common symptoms of Parkinson's disease are hypokinesia, tremor, bradykinesia, postural instability, rigidity, and disequilibrium^[2].

Gait and balance disturbance are common in patients with this condition^[3], and they have concerns about falling because their movements and functional ability are impaired^[4]. They also lack self-confidence regarding functional movements and postural balance, compared to healthy people^[5], because of which they cannot perform activities of daily living (ADL) independently and their quality of living is decreased^[6-7].

Over the last few decades, several studies have reported a variety of rehabilitation therapies that mediate the symptoms associated with Parkinson's disease^[8]. Rehabilitation exercise, in particular, increased the balance and lower extremity strength and prevented depression of Parkinson's patients^[9-11].

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Among them, virtual reality (VR) therapy using Wii Nintendo is becoming popular nowadays because it efficiently improves function of people with Parkinson disease. This intervention is affordable, accessible, and is fun and interesting to patients, so their motivation and concentration toward exercising are better^[12].

Previous studies showed that therapeutic exercise training using a Wii Fit balance board has a positive effect on balance, cognitive function, gait, and actual ADL in patients with Parkinson disease^[13-15]. Mhatre et al.^[13] reported that Nintendo Wii™-based exercise and cognitive-training (VR games) effectively improves gait ability and balance function in the individual with parkinson disease. Further, Hertz et al.^[14] reported that the Wii Nintendo Virtual Reality system is effective in improving motor function, depression, and ADL in patients with parkinson disease.

However, Santos et al.^[16] reported that Nintendo Wii intervention had no additional positive-effects on conventional exercises in functional mobility, and balance of patients with parkinson disease. According to a recent systematic review, most previous studies were performed without the control groups and the research conducted by randomized controlled trials (RCT) study design is insufficient^[12].

Therefore, the present study aimed to assess the effects of balance training using a Wii Fit balance board on balance, gait, and ADL in individuals with Parkinson disease.

Method

We recruited 15 subjects with Parkinson disease who were undergoing occupational therapy at in-and out-patients rehabilitation hospital. The inclusion criteria were (1) age exceeding 30 years and a diagnosis of idiopathic parkinson disease, (2) moderate motor impairment (a Hoehn and Yahr scale score of 2–3), (3) having been on the same medication for management of neurologic or other reasons for longer than 2 weeks, (4) ability to walk longer than 50 m independently with or without orthosis, and (5) a score exceeding 24 on the Mini–Mental State Examination. The exclusion criteria were (1) other orthopedic or neurological problems, (2) cardiac problems, (3) migraine or dizziness, (4) participation in any regular exercise program or other rehabilitation programs, and (5) auditory and/or visual deficits. All subjects participated in this study were informed about the procedure and consented to the

study. Our study was approved by the Institutional Review Board of Gachon University (1044396-201708-HR-136-01). Also, present study is in accordance with the Declaration of Helsinki.

The Berg balance scale (BBS), time up & go test (TUG), and modified Barthel index (MBI) were used to evaluate balance, gait, and ADL in both groups. All outcome tests were performed under blinded condition by a physical therapist with minimum 5 years of experience. In order to perform more accurate measurements, the measurer was trained and checked on the measurement method used in this study one week before the test.

The BBS was used to assess subjects' balance. It has 13 categories and a total score of fifty six. Higher score indicates a better balance. It is known that the risk of falls is higher and orthosis is required when the score is lower than 45^[17]. The intra-rater reliability of this test is $r = .97$ and its inter-rater reliability is $r = .98$ ^[18].

The TUG was developed to improve objectivity and reliability, and it was performed by determining the time required to stand up from a chair, walk comfortably for three meter, and then return to the chair. The rater used a stopwatch and checked the time between when the subject stood up from the chair until they sat back down on the chair. The intra-rater reliability of this test was found to be $r = .99$ and its inter-rater reliability was $r = .98$ ^[19].

The MBI was used to evaluate ADL. This tool has 10 categories and the scores range from zero to one hundred. A score of 0 indicates complete dependence, while 100 indicates complete independence while performing modified ADL. The intra-rater reliability of the MBI is $r = .89$ and the inter-rater reliability is $r = .95$ ^[20].

Fifteen participants were randomly assigned and divided into the experimental group ($n = 8$) and the control group ($n = 7$) after a pre-test evaluation. Every subject underwent traditional occupational therapy (TOT) for 30 min/day, 3 times a week, for 8 weeks, but the experimental group had an additional 30 min of balance training using Wii Fit (BTWF) per session.

The BTWF consists of three games: a bubble game, a ski game, and a marble game. In the initial session, all subjects were trained to learn how to use the Wii Fit balance board. The occupational therapist informed the therapeutic goals of these games and provided feedback

at all sessions. Subjects are assigned 10 min for each game with 5-10 min of rest in between games. Subjects wore a safety belt during the training. If necessary, subjects used static walkers for balance and safety. The control group received TOT. TOT consisted of ADL training targeting basic activity, repetitive training, stretching, range of motion (ROM) of the upper and lower limbs.

SPSS version 23.0 was used for all statistical analyses. The Wilcoxon-signed rank test was performed to compare dependent variables within the groups before and after intervention. The Mann-Whitney U test was used to compare differences in the dependent variables between the groups. A p-value of <0.05 was considered statistically significant.

Result and Discussion

- 1. General characteristics:** No significant differences were found between the groups ($p>0.05$) in any parameter [Table 1]. The findings from the BBS, TUG test, and MBI before the interventions did not differ significantly between the groups ($p>0.05$) [Table 2].
- 2. Difference for BBS, TUG, MBI within groups:** The both groups showed a significant difference in every evaluation after the intervention ($p<0.05$) [Table 3].
- 3. Change score of BBS, TUG, MBI between two groups:** The change in the BBS findings was higher in the BTWF group than in the TOT group ($p<0.05$). No significant between-group differences were found in the findings of the TUG test and MBI ($p>0.05$) [Table 4].

Table 1. General characteristics

	Experimental Group (n = 8)	Control Group (n = 7)	p
Age (Year), Mean±SD	63.38±5.37	62.14±5.55	.601
Gender, n (%)			
Male	5 (62.5)	5 (71.4)	.714
Female	3 (37.5)	2 (28.6)	
Hoehn & Yahr Scale, Mean±SD	2.63±0.52	2.71±0.49	.724
Onset Duration (Months), Mean±SD	11.50±4.28	11.57±4.58	.907
K-MMSE, Mean±SD	27.88±1.55	28.00±1.91	.860

BTWF: Balance training using Wii Fit; TOT: Traditional occupational therapy, K-MMSE: Korean Mini-Mental State Examination, SD: standard deviation.

Table 2. Comparisons of BBS, TUG, MBI before intervention

	Experimental Group (n = 8)	Control Group (n = 7)	p
BBS (score)	43.88±3.80	45.00±3.79	.484
TUG (sec)	21.09±3.58	20.86±3.05	.817
MBI (score)	78.63±7.19	79.71±6.26	.519

BTWF: Balance training using Wii Fit; TOT: Traditional occupational therapy, BBS: Berg Balance Scale, TUG: Time Up & Go test, MBI: Modified Barthel Index, SD: standard deviation.

Table 3. Difference for BBS, TUG, MBI within groups

	Experimental Group (n = 8)		p	Control group (n = 7)		p
	Pre	Post		Pre	Post	
	Mean±SD	Mean±SD		Mean±SD	Mean±SD	
BBS (Score)	43.88±3.80	46.38±3.81	.011*	45.00±3.79	46.29±4.39	.024*
TUG (Sec)	21.09±3.58	19.82±3.56	.012*	20.86±3.05	20.08±3.00	.018*
MBI (Score)	78.63±7.19	89.00±5.35	.012*	79.71±6.26	89.43±3.21	.018*

* $p<0.05$, BTWF: Balance training using Wii Fit; TOT: Traditional occupational therapy, BBS: Berg Balance Scale, TUG: Time Up & Go test, MBI: Modified Barthel Index, SD: standard deviation.

Table 4. Change score of BBS, TUG, MBI between two groups

	Experimental Group (n = 8)	Control Group (n = 7)	P
	Mean±SD	Mean±SD	
BBS (Score)	2.50±0.93	1.29±0.95	.031*
TUG (Sec)	-1.27±0.67	-0.77±0.70	.165
MBI (Score)	10.38±3.85	9.71±4.23	.725

*p<0.05, BTWF: Balance training using Wii Fit;TOT: Traditional occupational therapy, BBS: Berg Balance Scale, TUG: Time Up & Go test, MBI: Modified Barthel Index, SD: standard deviation.

Discussion

Our findings showed significant improvements after the interventions in both the BTWF and TOT groups. The former showed better improvements in BBS findings than the TOT group did, although the difference in the findings of other tests were not considerable. Thus, BTWF can improve the balance of patients with Parkinson disease. The experimental group got higher scores on the TUG test and MBI than the control group did, but the difference was not significant. This can be explained by a few reasons.

First, the sample size in this study was small. Second, BBS and ADL are strongly related^[21], and the categories of MBI are related not only to the functions of lower extremities but also to those of upper extremities, such as feeding, personal hygiene, and dressing^[20]. A difference in the MBI score indicates a difference in upper extremity function. However, we did not evaluate upper extremity function in this study. Lastly, we did not control for Parkinson disease drugs, although none of the subjects reported using Parkinson disease drugs.

It has been reported that in hospitals, occupational therapy is not usually administered for improving lower extremity function or balance but for improving upper extremity function. Our findings indicate that using Wii Fit is a good way to effectively improve upper extremity function as well as balance and lower extremity function. There are some benefits to using virtual reality devices like Wii Fit. They cost less than other VR programs and are easy to use at home^[12]. There is a high chance of people with Parkinson disease have depression, and this increases fatigue and helplessness^[6,11]. Depression is not just a psychological problem; it limits motivation for rehabilitation. Their confidence, social participation, and quality of life are decreased because of this problem. Although the subjects' motivation or depression was not evaluated, Wii Fit is expected to positively affect

depression or rehabilitation training by promoting patients' interest.

Present study has limitations. First, because of the limited subjects, the changes in test findings before and after the intervention were not clear. Further, patients with scores of 2 or 3 on the Hoehn and Yahr scale may not represent all patients with Parkinson disease. Lastly, we did not follow up the subjects after the study, so we could not evaluate how long the effects exist. Further studies are required to overcome these limitations.

Conclusion

This study examined the effects of balance training using a Wii Fit balance board on the balance, gait, and ADL in people with Parkinson disease. In conclusion, BTWF for 8 weeks is more effective than TOT in improving the balance of people with Parkinson disease. Next studies are needed to examine motivation, satisfaction, or quality of life as well as physical function among people with parkinson disease who are administered BTWF, and more patients should be included for long-term effects.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Antibacterial Activity of Essential Oils Against *Streptococcus Mutans*

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Abstract

Background/Objectives: The purpose of this study was to investigate the antimicrobial activity against bacteria in oral cavity by selecting tea tree and pepper, which are natural essential oils with aroma suitable for oral use

Method/Statistical Analysis: *Streptococcus mutans* (*S. mutans*) was used for the antibacterial activity measurement after subculture in brain heart infusion (BHI; Sigma-Aldrich, St. Louis, MO, USA). Tea tree and peppermint essential oil concentrations of 0.5%, 1%, 5%, 10%, 20% and 30% were divided into 5×10^5 colony forming units; CFUs/ml diluted *S. mutans* 10ul, BHI 900ul, 10% Tween 20 90ul was applied to prepare the final 1mL to check the CFUs according to 24h at 37°C to evaluate the antimicrobial effect.

Findings: The CFUs of the essential oils of tea tree and peppermint showed a reduction of 10^{-6} in 30% tea tree compared to the control without natural essential oil, 30% Peppermint showed 10^{-8} deaths. Although the difference in natural essential oils is different, it is shown that the higher the concentration of the essential oil, the higher the bacterial death.

Improvements/Applications: Peppermint and tea tree essential oils were found to be antimicrobial. Especially, tea tree essential oil has excellent antimicrobial activity compared to peppermint essential oil.

Keywords: Essential oils, Antibacterial activity, *Streptococcus mutans*, Oral health, Dental caries.

Introduction

The oral cavity is a space that is always invasive due to saliva and has an environment suitable for bacteria to reside. More than 700 kinds of bacteria exist in the oral cavity of these people by being involved in oral health and morbidity^[1].

Dental caries is the most common oral disease^[2]. It is a multi factorial disease, caused by harmful changes

in bacterial ecology due to the formation of bio films that adhere to the tooth surface^[3]. In the past decades, many reports around the world have shown an overall decline in tooth decay. However, recent studies have shown a surprising increase in caries prevalence, especially in the underprivileged^[4].

Streptococcus mutans (*S. mutans*) is related to dental caries^[5]. *S. mutans* can colonize the oral cavity, and bacterial bio film formation. There are other microorganisms with the ability to interact and this ecosystem to survive in the acidic environment in the colony^[3].

Dental caries are caused by an imbalance between demineralization and remineralization of tooth structure. Acid bacteria ferment dietary carbohydrates to produce organic acids to dissolve tooth enamel and disintegrate tooth tissue^[6].

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The extent of the pH fall is affected by a number of factors, including the composition of the micro flora, as well as the type and frequency of sugar intake^[7]. *Streptococcus mutans* produce glucosyltransferase (GTF) enzymes, which are recognized as virulence factors in the pathogenesis of caries. GTF enzymes synthesize extra cellular glucans and contribute significantly to the formation of polysaccharides in dental plaque matrices. Sucrose-dependent mechanism of plaque formation is based on GTF produced by *Streptococcus mutans*^[8].

It is known that this microorganism is involved not only in smooth surface caries, but also in fissure and in muscle caries^[9-11].

The use of topical antimicrobial agents, widely used to prevent dental caries^[12], the effect is exhibited by reducing the number of bacteria or inhibiting the formation of bacterial membrane at the tooth surface, but it causes side effects such as tooth coloring^[13-14], substances with low toxicity to humans and the environment are required and studies on natural substances capable of satisfying this is actively conducted^[15].

Oral treatment agents used to kill or inhibit microorganisms in the oral cavity by chemical method, prevent oral cleanliness, bad breath removal, and prevent dental caries and periodontal disease^[16]. Oral treatment of chemicals contributes to the suppression of oral microorganisms, but due to side effects, continuous oral hygiene management requires the development of natural oral products that can be safely used for a long time without side effects^[17]. Recently, interest in natural products for the prevention of dental caries or periodontal disease associated with dental plaques is increasing, and as the resistance to antibiotics has increased, interest in natural antibiotics as a new next-generation antibiotic material has increased^[18].

Essential oil refers to volatile substances that are physically separated from fragrant plants. In general, essential oils are named after the extracted plant and have been called essential oils as the essence of taste and aroma^[19].

Essential oil has been used for a long time since ancient times and is mainly used as fragrance, cosmetics, perfume, soap, detergent, spice^[20]. Antimicrobial, anti-inflammatory, antifungal, antiviral and anti-cancer effects of Essential oil have recently been reported, and they have been applied to various industrial fields such as

animal feed, insecticide, dental products and alternative medicine^[21-23].

These materials have various scents and show useful bio active effects by their unique ingredients, but they contain odors that are inappropriate for use, and despite their excellent effects, they have been considered somewhat limited in clinical treatment including oral diseases^[18].

Peppermint, called 'mint' has been used by the Egyptians and Romans in its digestive system for history and is known as the "mate of the intestines." Peppermint is the antipathetic medication equivalent to aspirin in medicine. The main ingredient, menthol, helps to cool the skin and muscles, and has a strong local analgesic effect, which is used as a pain relief and massage oil or cream for the neck. The oral effect has a refreshing feeling, which prevents bad breath and has excellent sterilizing effect^[24-27].

Tea tree was introduced to Europe around 1927 and quickly gained attention due to its disinfectant properties. It is the most powerful immunostimulant with antibacterial, antiviral and anti fungal effects. It activates leukocytes to establish a line of defense against invading organisms. It is also effective against viral diseases such as chickenpox, shingles, herpes and warts, and fungal diseases and candida rhinitis. It is also widely used for sore throats and mouth gargles, and boosts immunity, so doctors in France use it as an aid to immune systems such as AIDS and cancer^[24-27].

Therefore, in this study, we tried to investigate the antibacterial activity against oral bacteria by selecting tea tree and peppermint, which are natural essential oils with fragrance suitable for oral use.

In addition, as part of the interest in the new generation of antimicrobial materials, by confirming the value of tea tree and pepper essential oil extracted from plants as a natural antimicrobial agent against oral bacteria, it provides the possibility of being used as an oral disease treatment agent. The purpose of this study is to present practical basic data on the prevention and treatment of oral infectious diseases.

Method

Two natural essential oils, tea tree and peppermint, refined in Kaput, England, were purchased through Dong-seong science. *S. mutans* (KCTC 3065/ATCC 25175)

was used for the antibacterial activity measurement after subculture in brain heart infusion (BHI; Sigma-Aldrich, St. Louis, MO, USA). *S. mutans* was diluted at a 5×10^5 ratio, which was anaerobically incubated at 37°C for 24 h.

Tea tree and peppermint essential oil concentrations of 0.5%, 1%, 5%, 10%, 20% and 30% were divided into 5×10^5 colony forming units; CFUs/ml diluted *S. mutans* 10ul, BHI 900ul, 10% Tween 20 90ul was applied to prepare the final 1mL to check the CFUs according to 24h at 37° C to evaluate the antimicrobial effect.

Result and Discussion

CFUs according to the essential oil concentrations of refined tea tree and peppermint are *S. mutans* (control;

8.8×10^{11}), Peppermint CFUs are 0.5% (1.6×10^{10}), 1% (8.0×10^9), 5% (1.5×10^9), 10% (2.5×10^8), 20% (2.4×10^7), and 30% (9.5×10^5). In contrast, the tea tree's CFUs were 0.5% (5.4×10^9), 1% (3.4×10^9), 5% (3.8×10^8), 10% (1.4×10^7), 20% (8.2×10^4), and 30% (2.3×10^3) [Figure 1].

Compared with the control without natural essential oil, the 30% tea tree showed a 10^{-8} reduction, and the 30% peppermint showed 10^{-6} death [Figure 2].

The difference in the antibacterial effect of natural essential oils was shown, but as the concentration of % was increased, it showed higher killing of bacteria. Also, tea tree showed higher antibacterial effect than peppermint.

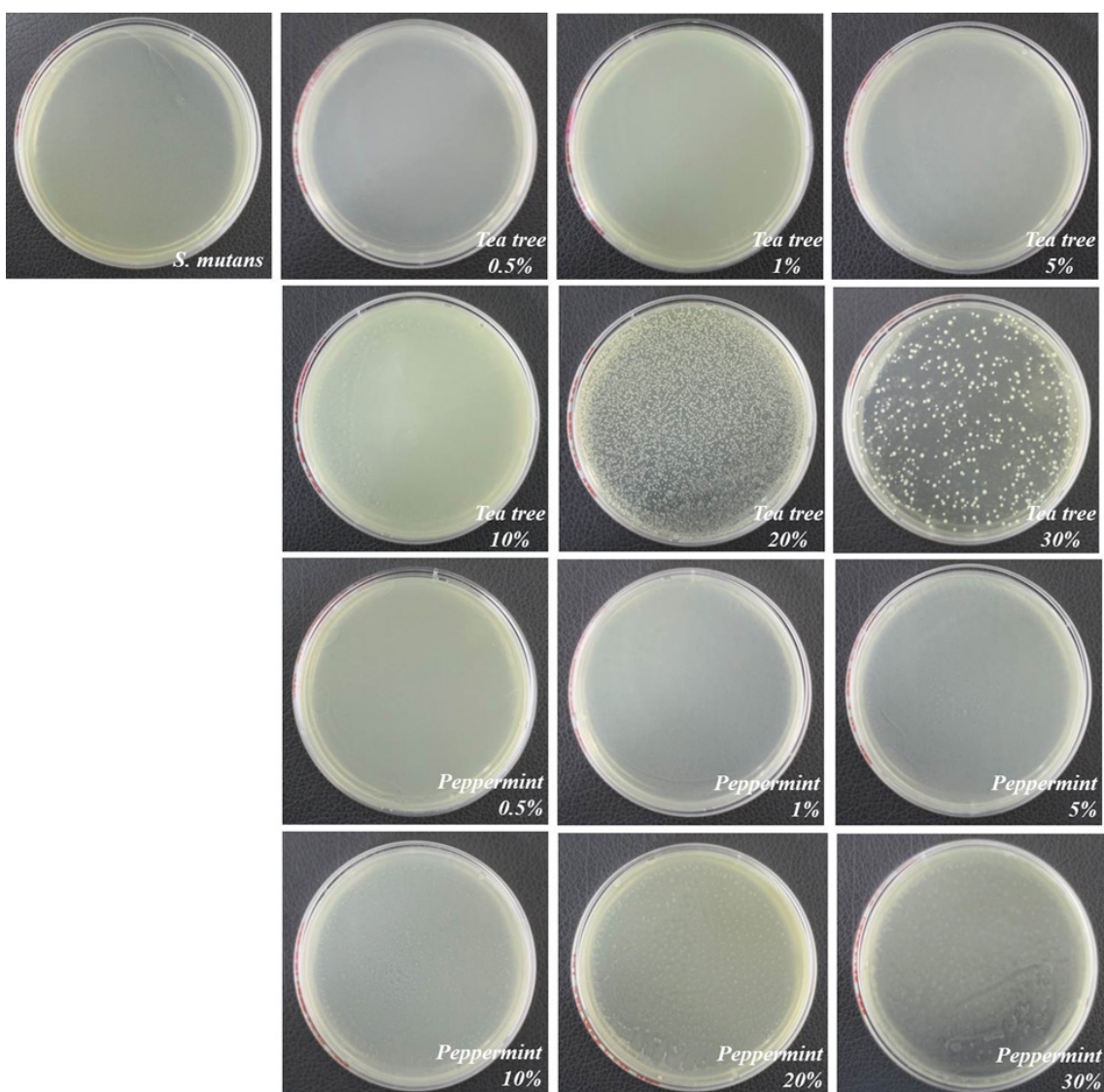


Figure 1. Antibacterial effect of various concentrations of essential oils on *S. mutans*

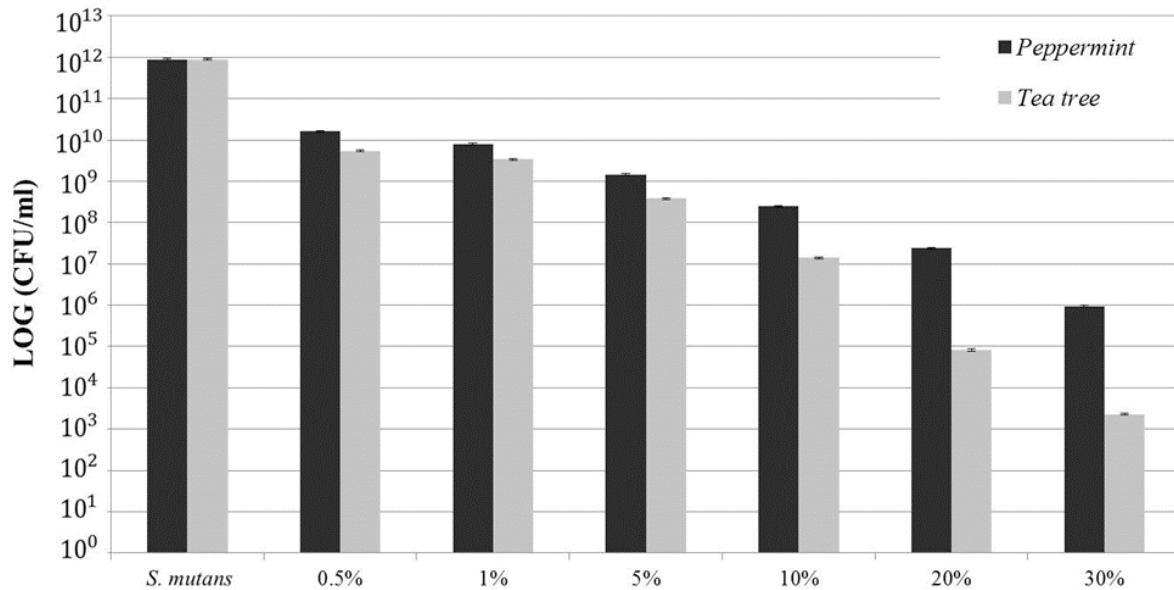


Figure 2. The survival rate of CFU by application of essential oils on *S. mutans*

Discussion

Essential oils are known to destroy bacteria by destroying their cell walls and disrupting their enzymatic activity^[28]. Essential oil also reduces oral bacteria by preventing the colonization of Gram-positive bacteria that cause plaque, slowing the replication of bacteria and removing endotoxins from Gram-negative bacteria^[28]. Essential oil used in this experiment showed antimicrobial effect against oral bacteria.

In addition, because of comparing the effects of aroma oil mixed with tea tree, lemon, and peppermint with the experiment group, tantum and saline, the degree of bad breath was significantly lower in the experimental group^[29]. After providing oral care using aroma solution of tea tree, peppermint and lemon, the concentration of bad breath and volatile sulfur compounds decreased significantly^[30].

S. mutans is a Gram-positive bacterium, discovered by Clark in human caries lesions in 1924, that breaks down monosaccharides and fructose to produce organic acids, causing demineralization of teeth and causing dental caries, it is known as a major causative agent of dental caries by actively producing lactic acid in acidic environment due to its acid resistance^[31].

Previous studies have shown that the use of natural extracts in oral treatments has the effect of inhibiting

S. mutans^[16], this results showed similar results to this study showing antibacterial effect.

In addition, there was a significant difference in the antibacterial effect of natural essential oils, but as the concentration was increased, the bactericidal effect of higher bacteria appeared. Comparing the effects of different types of aromatic oils, tea tree was found to have a higher antibacterial effect even at lower concentrations than peppermint.

Therefore, based on the results of this study, if various types of research are conducted in the future, it is expected that next-generation antibacterial materials using essential oils can be developed for the prevention and treatment of infectious diseases in the oral cavity.

Conclusion

The purpose of this study was to investigate the antimicrobial effects on oral bacteria by selecting tea tree and peppermint, which are natural essential oils with fragrance suitable for oral treatment.

As a result of this study, the following suggestions are made.

First, it is necessary to repeat research to confirm the antibacterial effect using various essential oils.

Second, it is suggested to carry out an iterative study to confirm the antibacterial effect according to the concentration difference of various essential oils.

Third, continuous attention is needed to develop next-generation antimicrobial materials that use essential oils as a natural oral treatment that can be safely used for a long time without side effects.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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A Study on the Emotional Intelligence of Optometrist

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Abstract

Background/Objectives: This study was designed to look into the actual state of optometrist's emotional intelligence, and thereby to provide fundamental material for the public's better eye health through the development of optometrist's emotional intelligence.

Method/Statistical Analysis: The study subjects comprised 175 optometrist, of whom 96 were men (54.85%) and 79 were women (45.15%). They were asked to answer an online questionnaire survey in order to assess their emotional intelligence. The collected data on their emotional intelligence were compared and analyzed using SPSS 18.0 at a significance level of 0.05.

Findings: The optometrist's emotional intelligence scores were analyzed according to their general characteristics. In respect of sex, men scored 3.26 and women 3.24. Regarding age, those younger than 25 scored 3.13, those aged between 25 and 29 scored 3.33, those aged between 30 and 39 scored 3.18, and those aged 40 and older scored 3.25. As a function of marriage, the study subjects who were married scored 3.22 and those who were not scored 3.30. Regarding education, those who had graduated from college scored 3.11, those who had graduated from a 4-year university scored 3.37, and those who had graduated from graduate school or higher scored 3.48. According to the employment type, those who were regularly employed scored 3.29, those who were irregularly employed scored 2.82, and those who had part-time jobs scored 3.33.

Improvements/Applications: The differences in optometrist's emotional intelligence were analyzed according to their general characteristics. Their emotional intelligence was found to differ significantly according to their education, employment type, and salary. All the types of emotional intelligence had statistically significant correlations. Optometrist who were men and older, those who had a higher education level and monthly pay, and those with more experiences of turnover tended to have more emotional intelligence.

Keywords: *Optometrist, emotional intelligence, self-emotion appraisal, others' emotion appraisal, regulation of emotion, use of emotion.*

Introduction

Humans have a spirit, a body, and a mind, with the latter divided into reason and sensitivity. Reason is

humans' essential attribute that differentiates them from other animals. As opposed to reason, sensitivity is the ability to trigger senses in response to changing stimuli and refers to the human characteristic of reacting to and feeling the influence of external forces^[1] In order to have a right approach to one's value in the social community and to live a life of truth, it is necessary to harmonize reason and sensitivity. Emotion based on sensitivity is a mental feeling. Emotional regulation and expression are essential to maintain and develop human relationships and live a happy life. As today's society has very complicated and diverse relationships,

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it is hard for people to express their emotions in society. At their workplaces, where they spend a lot of time, individuals' emotional regulation and expression are distorted and suppressed in relationships with their seniors, coworkers, and customers. There have been active studies and surveys on emotional regulation, emotional expression, and emotional labor at work. As medical professionals, optometrist are exposed to many conflicts in their relationships with their seniors (medical doctors), coworkers (nurses, nurse aides, optometrist), and customers, so that they experience emotional labor^[2-3].

Customers who visit optical shops and hospitals require a high-quality service and high satisfaction. In addition, they want a customized service. They have high requirements since they visit these places on account of their physical inconvenience and pain. Therefore, optometrist need to perform their medical work to live up to customers' expectations and meet their needs, which entails harder emotional labor. Accordingly, optometrist' emotional disharmony leads to work stress. The emotional labor increased by the emotional distortion can lower their customer service level^[4-5]. Optometrist need to regulate and express their emotions well on the job. Therefore, they need emotional intelligence to regulate and use their emotions appropriately based on their understanding of their own emotions and others'. Emotional intelligence means the "intelligence of the mind" to regulate self-emotion and have smooth relationships with other people^[6].

Optometrist with high emotional intelligence can control their emotions and their customers', to identify various types of emotions, and to regulate their self-emotions and others' emotions effectively to improve their job efficiency. In addition, optometrist can use their emotions and develop themselves further to plan their life and achieve their goals.^[7]

This study conducted a questionnaire survey to analyze the actual emotional intelligence state of optometrist, who are exposed to high emotional labor. Thereby, it aimed to provide fundamental material to help understand the occupation of optometrist, who are responsible for the public's eye health, and to offer a chance to improve optometrist' emotional intelligence and allow them to provide better eye health services.

Method

An online questionnaire survey on emotional

intelligence was conducted on 175 optometrist (96 men: 54.85%, 79 women: 45.15%) from January to July 2019. The questionnaire consisted of four items (self-emotion appraisal, others' emotion appraisal, the regulation of emotion, and the use of emotion), each of which comprised three questions.^[8] All the questions in the questionnaire were answered on a 5-point Likert scale (5: strongly agree, 4: agree, 3: somewhat agree, 2: somewhat disagree, 1: disagree, 0: strongly disagree). The full score for each item was 15 points, and the mean was based on the three questions. The collected data were applied to SPSS 18.0 at a significance level of 0.05 in order to compare and analyze optometrist' emotional intelligence.

The questionnaire on optometrist' emotional intelligence used in this study comprised four categories: self-emotion appraisal (I fully and truly understand what I feel, I understand my own emotions well, I always know whether I am happy or not), others' emotion appraisal (I fully understand others' emotions, I am excellent at observing others' emotions, I am always able to know my coworkers' emotions based on their behavior), regulation of emotion (I can control my own emotions well, I always come down from my anger easily when I am very upset, I control my emotions well), and use of emotion (I always establish my goals and do my best to achieve them, I always motivate myself, I always tell myself that I am competent). Optometrist' emotional intelligence was classified into these four types in order to compare and analyse their emotional intelligence.

Result and Discussion

Optometrist' general characteristics are presented in Table 1. Among the 175 optometrist, there were 96 men(54.85%) and 79 women (45.15%). By age, 24 were younger than 25 (13.7%), 75 were aged 25-29 (42.9%), 41 were aged 30-39 (23.4%), and 35 were aged 40 and older (20.0%). Regarding marriage, 115 were unmarried (65.7%) and 60 were married (34.3%). Regarding education, 82 had graduated from college (46.9%), 82 from a 4-year university (46.9%), and 11 from graduate school or higher (6.3%). Regarding the type of employment, 153 were regularly employed (87.4%), 16 were irregularly employed (9.1%), and 6 were employed part-time (3.4%). Regarding the monthly pay, 11 earned under 1.5 million KRW (6.3%), 50 earned between 1.5 million and 2 million KRW (28.6%), 51 earned between 2 million and 2.5 million KRW (29.1%), 47 earned between 2.5 million and 4 million KRW (26.9%), and

16 earned over 4 million KRW (9.1%). Regarding the turnover experience, 60 had had no experience of turnover (34.3), 36 had experienced turnover once (20.6%), 16 had experienced turnover twice (9.1%), 23 had experienced turnover three times (13.1%), and 40 had experienced turnover four times or more (22.9%). Optometrist's emotional intelligence differed significantly according to their education, employment, and monthly income ($p < 0.05$). Self-emotion appraisal is one's ability to understand one's own emotions accurately and to express them well; others' emotion appraisal is one's ability to understand and empathize with others' emotions well; the regulation of emotion is one's ability to make the best selection in a given situation based on reasonable conduct and thinking, rather than to express emotion in the situation, and thereby to control one's own emotions to behave properly; the use of emotion is one's ability to set one's own goals for an issue by organizing and using one's own emotional information, and thereby to do one's best concretely through motivation.^[8-9]

Table 2 shows the correlations in optometrist's emotional intelligence. All types of emotional intelligence had statistically significant correlations ($p < 0.05$).

Table 3 presents optometrist's emotional intelligence according to sex and age. Others' emotion appraisal and the regulation of emotion were statistically significantly different ($p < 0.05$). As an optician is a medical service occupation, in terms of others' emotion appraisal, women showed more emotional intelligence in understanding customers' emotions through empathy than men, while men showed more reasonable judgment and context awareness in somewhat difficult customer relationship situations than women. In the categories of self-emotion appraisal, regulation of emotion, and use of emotion, men showed somewhat higher emotional intelligence than women. Women only showed more emotional intelligence than men in the others' emotion appraisal category.

Others' emotion appraisal was statistically significantly different. The emotional intelligence increased with the age. Therefore, age was a very important positive factor ($p < 0.05$). In Kim et al.'s study on the emotional intelligence of employees in customer service centers, the use of emotion decreased with the age. The present study found an opposite result. Given the occupational characteristics of optometrist, the older they get, the lower their workload and the more time

they have. Therefore, it is judged that the use of emotion positively influenced the emotional intelligence.^[10] Table 4 presents optometrist's emotional intelligence according to marriage and education. The use of emotion was statistically significantly different ($p < 0.05$). Married optometrist has more responsibilities as family members than unmarried ones. Therefore, they organize and use emotional information to establish their own goals, motivate themselves, and do their best. This concrete activity is judged to influence their use of emotion positively. Married optometrist had higher self-emotion appraisal and use of emotion, whereas unmarried ones showed higher others' emotion appraisal and regulation of emotion. As a result, marriage was found to influence optometrist's emotional intelligence differently.

Others' emotion appraisal and the use of emotion were statistically significantly different ($p < 0.05$). The higher educated the optometrist were, the more they set goals, had a clear vision, did their best to take concrete action through motivation, and increased their use of emotion. However, their appraisal of others' emotions was somewhat low.

In other categories of emotional intelligence, the higher educated the optometrist were, the more emotional intelligence they had. As a result, a higher education was found to influence optometrist's emotional intelligence positively. Table 5 presents optometrist's emotional intelligence according to their type of employment and monthly income. The self-emotion appraisal and use of emotion were statistically significantly different ($p < 0.05$). Regularly employed optometrist had somewhat more emotional intelligence. This is due to their senses of stability from regular employment and of responsibility.

Others' emotion appraisal, the regulation of emotion, and the use of emotion showed a statistically significant difference ($p < 0.05$). In all categories of emotional intelligence, the emotional intelligence increased with the monthly income. A high-income influences optometrist's job satisfaction. Therefore, it is judged that it leads to the expansion of empathy with customers' emotions, reasonable thinking rather than direct emotional expression, and responsible behavior to elect the best course of action and choice in each situation. In addition, a greater use of emotion is judged to influence optometrist's goal awareness and motivation, which encourages them to do their best.

Table 1. Optometrist’ general characteristics

Variable	Division	Number (%)	Mean	SD	p
sex	Male	96(54.85)	3.26	.652	.87
	Female	79(45.15)	3.24	.470	
Age	< 25	24(13.7)	3.13	.730	.36
	25-29	75(42.9)	3.33	.470	
	30-39	41(23.4)	3.18	.450	
	40 and older	35(20.0)	3.25	.770	
Marriage	Married	115(65.7)	3.22	.590	.38
	Unmarried	60(34.3)	3.30	.550	
Education	College	82(46.9)	3.11	.650	.00
	University	82(46.9)	3.37	.439	
	Graduate school or higher	11(6.3)	3.48	.668	
Type of employment	Regularly	153(87.4)	3.29	.511	.00
	Irregularly	16(9.1)	2.82	.879	
	Part-time	6(3.4)	3.33	.789	
Monthly pay	Under 1.5 million KRW	11(6.3)	2.82	1.070	.00
	Between 1.5 million and 2 million KRW	50(28.6)	3.18	.364	
	Between 2 million and 2.5 million KRW	51(29.1)	3.28	.523	
	Between 2.5 million and 4 million KRW	47(26.9)	3.26	.614	
	Over 4 million KRW	16(9.1)	3.65	.503	
	Once	36(20.6)	2.99	.217	
	Twice	16(9.1)	3.28	.558	
	Three times	23(13.1)	3.12	.640	
	Four times or more	40(22.9)	3.34	.668	

Table 2. Optometrist’ emotional intelligence

Variable	Self-emotion appraisal	Others’ emotion appraisal	The regulation of emotion	The use of emotion
Self-emotion appraisal	1			
Others’ emotion appraisal	.241 .001	1		
The regulation of emotion	.219 .004	.232 .002	1	
The use of emotion	.324 .000	.252 .001	.333 .000	1

Table 3. Optometrist’ emotional intelligence according to sex and age

Variable			Self-emotion appraisal		Others’ emotion appraisal		The regulation of emotion		The use of emotion	
			M	SD	M	SD	M	SD	M	SD
Sex	Male	96(54.85)	3.41	.978	3.14	.844	3.21	1.052	3.28	.907
	Female	79(45.15)	3.30	.713	3.54	.586	2.89	.670	3.23	.874
	Total	175	3.36	.860	3.32	.762	3.07	.911	3.26	.890
p			.42		.00		.03		.76	
Age	< 25	23(13.7)	3.11	.740	3.92	.875	2.92	.788	3.19	.900
	25-29	75(42.9)	3.41	.706	3.49	.581	3.20	.805	3.22	.772
	30-39	41(23.4)	3.39	.773	3.30	.686	2.80	.806	3.24	1.038
	40 and older	35(20.0)	3.39	1.256	3.00	1.000	3.20	1.218	3.40	.956
	Total	175	3.36	.860	3.32	.762	3.07	.911	3.26	.890
p			.50		.02		.08		.77	

Table 4. Optometrist’ emotional intelligence according to marriage and education

Variable			Self-emotion appraisal		Others’ emotion appraisal		The regulation of emotion		The use of emotion	
			M	SD	M	SD	M	SD	M	SD
Marriage	Married	96(54.85)	3.41	.978	3.14	.844	3.21	1.052	3.28	.907
	Unmarried	79(45.15)	3.30	.713	3.54	.586	2.89	.670	3.23	.874
	Total	175	3.36	.860	3.32	.762	3.07	.911	3.26	.890
p			.42		.00		.03		.76	
Education	College	82(46.9)	3.25	.893	3.16	.687	2.92	.885	3.10	.964
	University	82(46.9)	3.44	.806	3.52	.707	3.20	.820	3.31	.754
	Graduate school or higher	11(6.3)	3.61	.964	3.03	1.270	3.24	1.514	4.06	.841
	Total	175	3.36	.860	3.32	.762	3.07	.911	3.26	.890
p			.42		.00		.03		.76	

Table 5. Optometrist’ emotional intelligence according to type of employment and monthly income

Variable			Self-emotion appraisal		Others’ emotion appraisal		The regulation of emotion		The use of emotion	
			M	SD	M	SD	M	SD	M	SD
Employment	Regularly	153(87.4)	3.42	.816	3.34	.739	3.09	.890	3.33	.845
	Irregularly	16(9.1)	2.75	1.112	3.08	1.029	2.90	1.094	2.54	1.017
	Part-time	6(3.4)	3.44	.689	3.33	.516	3.11	1.047	3.44	.958
	Total	175	3.36	.860	3.32	.762	3.07	.911	3.26	.890
p			.01		.43		.73		.00	
Monthly income	Under 1.5 million KRW	11(6.3)	3.06	1.163	2.52	1.058	2.58	1.165	3.12	1.241
	Between 1.5 million and 2 million KRW	50(28.6)	3.34	.541	3.41	.523	2.95	.800	3.03	.805
	Between 2 million and 2.5 million KRW	51(29.1)	3.39	.886	3.50	.654	3.07	.795	3.17	.684
	Between 2.5 million and 4 million KRW	47(26.9)	3.39	.896	3.23	.742	3.01	.958	3.39	.997
	Over 4 million KRW	16(9.1)	3.42	1.250	3.29	1.160	3.92	.839	3.96	.797
	Total	175	3.36	.860	3.32	.762	3.07	.911	3.26	.890
p			.82		.00		.00		.00	

Conclusion

In terms of general characteristics, optometrist' emotional intelligence differed significantly according to their education, employment type, and monthly income. All types of emotional intelligence had statistically significant correlations. In terms of emotional intelligence according to sex, others' emotion appraisal and the regulation of emotion were statistically significantly different. Men had somewhat more emotional intelligence than women. In terms of emotional intelligence according to age, others' emotion appraisal showed a statistically significant difference. The emotional intelligence increased with the age. In terms of emotional intelligence according to marriage, the use of emotion was statistically significantly different. In terms of emotional intelligence according to education, others' emotion appraisal and the use of emotion were statistically significantly different. The emotional intelligence increased with the level of education. In terms of emotional intelligence according to the type of employment, the self-emotion appraisal and use of emotion were statistically significantly different. In terms of emotional intelligence according to the monthly income, others' emotion appraisal, the regulation of emotion, and the use of emotion were statistically significantly different. The emotional intelligence increased with the monthly income. In terms of emotional intelligence according to the turnover experience, the self-emotion appraisal, others' emotion appraisal, and the regulation of emotion were statistically significantly different. The emotional intelligence increased with the turnover experience.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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The Effect of Cardiac Arrest Simulation Training Using Mechanical CPR Device on Chest Compression Quality of Paramedics in Pre-Hospital

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Abstract

Background/Objectives: It is to establish a transport plan in a situation where it is difficult to maintain the quality of CPR due to the building structure by measuring the difference in quality of CPR in the field and transport process of pre-hospital cardiac arrest patients.

Method/Statistical Analysis: For this purpose, simulated CPR training for OHCA patients who were not seen in the field was performed on the 78 EMT trainees enrolled in firefighter school in K region. The simulated training was performed by dividing them into two groups such as one group using manual CPR and the other group using mechanical CPR (LUCAS2™) in the stage of field and the transport composed of stairs and corridors in a four-story building.

Findings: The quality of chest compression implemented at the field does not satisfy all the requirements of the guideline, but provided sufficient depth and rate of the pressure. The values of the measured CPR quality showed that CPR in the transport was lower than that in the field. The chest press quality was lower- in particular the depth of chest press was about 20mm lower and it did not meet the 2015 Guidelines of the CPR Association in Korea. On the other hand, the group using LUCAS2™ in the transport stage showed steady and even press depth and appropriate press and relaxation without degradation of the quality comparing to CPR in the field, all guidelines are satisfied. Although there is much controversy about the improvement of chest compression quality using CPR devices leading to improved survival rates, the use of CPR devices should continue to be considered in these unstable environments.

Improvements/Applications: Conclusively, in the transport process where there are structural difficulties, the group using LUCAS2™ could meet the Guidelines of the CPR Association when performing CPR which plays important role in increasing revival rate of OHCA patients. It can be the ground of using mechanical CPR devices in the future.

Keywords: Pre-Hospital Cardiac Arrest, OHCA, CPR quality, Mechanical CPR device, LUCAS, Chest compression quality.

Introduction

The most important thing in pre-hospital cardiac arrest is high quality cardiopulmonary resuscitation

(CPR). The guidelines of the Korean Association of Cardiopulmonary Resuscitation (KACPR), revised in 2015, recommend the 5 cm depth of chest compression and suggest a rate of 100-120 times per minute in adult cardiac arrest patients. They suggest that cessation of chest compressions should be minimized to less than 10 seconds, and the artificial respiration should not be excessive [1].

In Korea, the person in charge of CPR at the pre-hospital level is 119 paramedics. Given the low bystander

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CPR in Korea, 119 paramedics' CPR skills are very important, and the ability cultivation for paramedic's professional CPR play a significant role in improving the survival rate of cardiac arrest patients.

This study is designed to reveal differences in the quality of CPR at fields and transport stages, particularly in structurally poor buildings, and to identify the effectiveness of mechanical CPR devices. The domestic research on the transport stage is very poor compared to efforts to improve CPR quality at the field and the hospital, and as a result of that, the situation is that the planning for proper transport of paramedics is also not organized. Due to various complex structure of building types, the quality of the manual chest compressions during the transfer process is likely to decrease [2]. In addition, when cardiac arrest occurs in complex, high-rise building types, the most big problem is the time delaying for that paramedics contact the patient and do the initial CPR, and it is highly likely that they will not be able to provide high quality CPR in process of transfer to the hospital and the process of transfer to the hospital and the overall transfer time will likely be long [3-4]. Therefore, it is desirable to establish a transport plan accordingly and to use additional equipment if possible, in order to reduce the quality degradation of pre-hospital CPR at poor fields and to provide stable and consistent high-quality CPR [5-6]. In particular, it is necessary to discuss the application of a mechanical CPR device in a step, corridor, or ambulance, where the quality of the chest compression is inevitably structurally low [7].

There are many pros and cons of idea on the effectiveness mechanical CPR device. The 2015 guideline ofKACPR describes that when mechanical CPR devices were applied to patients with pre-hospital cardiac arrest, they showed almost the same figure in short-term and long-term survival rates, and that there was no evidence that they should replace manual CPR in both the method of the load distribution belts applied and the piston method that presses the sternum [8-10]. Some of research shows that patients have more internal damage compared to manual CPR, as a result of the experiments with equipment like mechanical CPR device [11]. However, these results are an example of CPR in a typical environment. We cannot exclude the characteristics of the Korean living environment, which accounts for 60% of apartments where is poor for transporting patients. Therefore, although there were no significant differences in typical CPR procedures, the separate studies on device application in poorly

structured buildings or other unfavorable conditions for patient transport are required. Significant improvement in survival rate and brain function recovery rate will be done if high quality chest compressions are possible during the transport stage from the field to the ambulance. Therefore, full-scale discussions on the application of CPR devices in poor conditions are required.

Method

Object of Study: The object of study is consisted of 55 firefighter and 23 new firefighter. The experiment was conducted on a total of 13 groups.

This study is organized into the team CPR simulation practice regular courses in the organization's curriculum. The researchers worked in the organization and have explained the purpose and effectiveness of the study directly to the objects of study. The additional training on the effectiveness and feedback of this study were given to the object of this study, and the face-to face consent from the study participants on the use of the result of study were obtained.

2. Study Design and Tool:

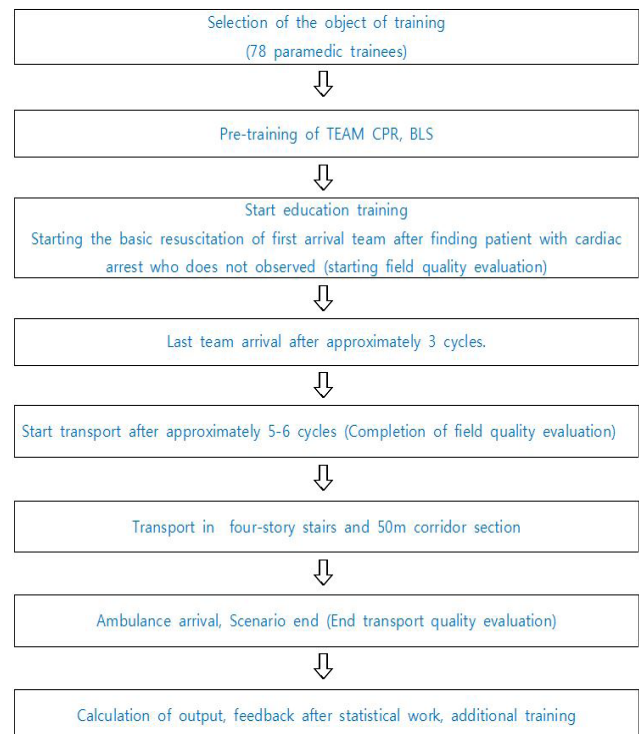


Figure 1. Study Design

In figure 1, assumption that emergency paramedics are dispatched, the scenario-type training method that provide the situation of pre-hospital cardiac arrest and perform the CPR are applied.



Figure 2. Descending through the stairs using a long spine plate

In figure 2, each team deal with the same situation of total one time, and the required time is about between 10 minutes and 15 minutes each. The scenario is a situation of cardiac arrest that has not been observed in a four-story building, and it will be divided into a case where CPR is performed in the field for about 10 minutes and perform the manual chest compressions during transport and a case that perform the chest compression using the

mechanical CPR device. The transport was carried out using an ambulance stretcher for a distance about 50 meters to the ambulance after descending through the stairs using a long spine plate in a four-story building. All team evaluators consisted of the 6 members which are 3 first arrival team and 3 last arrival team, and each team's scenario have applied the same basic resuscitation scenario.



Figure 3. Descending through the stairs using a mechanical CPR device

In figure 3, three of the 13 teams are ordered to use a mechanical CPR device (hereinafter referred to as “LUCAS2”) at the transfer stage to descend the stairs, pass the corridor, and transfer to the ambulance.

The training was conducted by one scenario with the field and transport, and the 26 data values were extracted from total 13 groups by pausing and restarting at stage of the end of the site and beginning of the transport in order to separate the data for numerical comparison.

The equipment such as LUCAS2 (PHYSSIO CONTROL, USA) and Resusci Anne Simulator TM (Laerdal, Norway) were used.

Result and Discussion

Quality comparison of manual chest compression in the field/transport stage: In the field, the depth and compression rate were 58.7 mm and 118.8 per minute. However, the figure was slightly lower in complete chest recoil rate and the exact compressive rate, which can be interpreted as excessive compression exceeding 60 millimeters.

In the transport stage, the speed of the chest compressions did not decrease with 119 times per minute, but the mean compressive depth was reduced by approximately 25 mm from approximately 58.7 mm at the field to 33.43 mm in transit (p<0.05). In addition,

the exact compressive rate was also reduced from approximately 37.4% to 11.7% (p = 0.031).

This is consistent with the prior assumption that the quality of the chest compressions in the transport stage will be significantly lower than at the field stage.

In the transport stage, it is shown the significantly lower chest compressive depth than in the field. Fixing patients on mobile stretchers and transporting them to stairs or corridors has fundamental limitations in implementing quality chest compressions due to structural limitations, no matter how hard paramedics try. The resuscitation rate of the patient can be greatly reduced [12]. Therefore, if it needed to transport for a long time from the field to ambulance, the mechanical CPR device should be used or another tactical transport method should be considered.

Table 1. Quality of manual cardiopulmonary resuscitation in field and transport stage

Variable	Field		In transit		t	p
	M	SD	M	SD		
Mean chest compressive depth (mm)	58.7	2.8	33.4	5.6	10.597	0.000**
Complete chest recoil rate (%)	40.8	18.3	93.7	7.8	-7.001	0.000**
Exact chest compression rate (%)	37.4	26.2	11.7	9.1	2.451	0.031*
Chest compression (/min)	118.8	2.1	119.2	2.4	-0.352	0.731

*: p<0.05, **:p<0.001

Quality comparison of LUCAS chest compression in the field and transport stage: By recording mean 52.5 mm in field and also 53.0mm in transport, comparison results of chest compressions showed no statistically significant difference.

This is consistent with the prior hypothesis as a result from the mechanical characteristics of automatic cardiopulmonary resuscitation devices.

Table 2. Quality of mechanical cardiopulmonary resuscitation in field and transport stage

Variable	Field		In transit		t	p
	M	SD	M	SD		
Mean chest compressive depth (mm)	52.5	0.7	53.0	1.4	-0.447	0.698
Complete chest recoil rate (%)	89.0	2.8	95.0	1.4	-2.683	0.115
Exact chest compression rate (%)	86.5	4.9	96.0	1.4	-2.610	0.121
Chest compression (/min)	101.0	0.0	101.0	0.0	1.259	0.335

*: p<0.05, **: p<0.001

Quality comparison of chest compression of manual/LUCAS2 in transport stage: When comparing manual CPR and LUCAS2 in the transport stage, the mean chest compressive depth of LUCAS2 was 53.0mm and manual CPR was 33.4mm. The mean chest compressive depth of LUCAS2 in the transport stage is statistically significant difference compared to manual CPR ($p < 0.002$) by recording the pressure depth and the number of pressures. In addition, LUCAS2 had better figures than manual CPR in the section of complete chest compressive rate (M-CPR 11.71%, LUCAS2™ 96.00% $p < 0.005$). It can be seen that LUCAS2 provides significantly higher quality chest compression than manual chest compressions at the transport stage in side of chest compressive depth.

When comparing manual CPR and LUCAS2 in the transport stage, the mean chest compressive depth of LUCAS2 was 53.0mm compared that the mean chest compressive depth of manual CPR was 33.4mm. The mean chest compressive depth of LUCAS2 in the transport stage is statistically significant difference compared to manual CPR ($p < 0.002$) by recording the pressure depth and the number of pressures consistent with the guidelines. In addition, LUCAS2 had better figures than manual CPR in the section of complete chest compressive rate ($p < 0.005$). It can be seen that LUCAS2 provides significantly higher quality chest compression than manual chest compressions at the transport stage in side of chest compressive depth, complete chest recoil rate, exact chest compressive rate.

Table 3. Quality comparison of chest compression of manual/CPR device in transport stage

Variable	Field		In transit		t	p
	M	SD	M	SD		
Mean chest compressive depth (mm)	33.4	5.6	53.0	1.4	-4.664	0.002*
Complete chest recoil rate (%)	93.7	7.8	95.0	1.4	-0.221	0.832
Exact chest compression rate (%)	11.7	9.1	96.0	1.4	-12.421	0.000**
Chest compression (/min)	119.2	2.4	101.0	0.0	10.137	0.000**

*: $p < 0.05$, **: $p < 0.001$

The chest compressive depth of manual CPR at stable field was recorded to the mean 58.7 mm, and the chest compressive speed was recorded to 18 times per minute. This is in accordance with the standard “The depth of chest compression should be about 5 cm [13], and not more than 6 cm [14]. The speed is suggested 100 ~ 120 times per minute and this can be said that the chest compression of the appropriate quality is made. However, there were many cases of excessive pressure of more than 60 mm and the many trainees were generally tended to show incomplete relaxation. This is an area that needs to be improved by education. In the transport stage, it is shown the significantly lower chest compressive depth than in the field. This suggests that serious problems may occur with coronary artery blood flow rate and cerebral blood flow rate in patients [15]. Fixing patients on mobile stretchers and transporting them to stairs or corridors has fundamental limitations in implementing quality chest compressions due to structural limitations, no matter how hard paramedics try [7].

Conclusion

As a result of this study, the field stage recorded the depth and speed of meeting the 2015 guideline of Korean Association of Cardiopulmonary Resuscitation. In comparison, the transfer stage, which consists of stairs and corridors, had a quality deterioration in chest compressive depth of about 20 mm. This suggests that there is a structural limitation where high quality CPR is difficult to take in the transport stage, which becomes a factor to reduce blood flow pressure in patients with cardiac arrest and thus reduces survival rate. On the other hand, the mechanical CPR device provided a constant chest compressive speed and depth without any quality deterioration in the transport stage compared to manual CPR.

In conclusion to sum up, paramedics cannot maintain proper CPR quality through manual CPR in the transport stage, and in such situations, mechanical CPR device can help maintain the quality of CPR. This pattern is similarly

shown in precedent studies comparing manual CPR and mechanical CPR in structurally difficult situations such as latest stairs and corridors. Therefore, the results of this study have a same position as the conclusions and suggestions of precedent studies, and at least in order to maintain quality of CPR in the transport stage, mechanical CPR device should be actively considered.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Actual Pressure Ulcer Awareness of a Person in Charge of Pressure Ulcer Management

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Abstract

Background/Objectives: The aging population due to increases of average life expectancy elderly population is perceived a serious problem in the medical sector. The objective of this study was to determine the degree of awareness of pressure ulcer in nurses in charge of pressure ulcer management in medical institutions and to provide basic data for setting guidelines.

Method/Statistical Analysis: A survey and analysis were conducted on 40 nurses in charge of nursing care at a nursing hospital. The survey tool was developed by quoting a pressure ulcer prevention management tool developed by Moore and Price. The survey was conducted in a face-to-face manner, explaining the purpose of the study directly. A total of five questions are recognized as pressure ulcer management, and the reliability is Cronbach's $\alpha = .785$ and consisted of a five-point Likert scale. The general characteristics are gender, age, work experience, Education, and hospital size of nursing hospital, with total five questions and reliability being Cronbach's $\alpha = .654$.

Findings: "How much do you know about the pressure ulcer?" showed the highest 'Yes' of 30%. In the pressure ulcer management knowledge section, "Do you know about changing your bed posture at least every two hours?" showed the highest 'very yes' of 82.5%. "Do you know the standard of management when a pressure ulcer occurs?" showed 45.0% of 'Yes' and "Do you know the factors involved in the pressure ulcer?" with 47.5%. "Do you know about the relationship between humidity and temperature among the factors involved in the pressure ulcer?" showed 57.5% (23).

Improvements/Applications: The results of this study show the degree of pressure ulcer management by nursing hospital nurses in charge of the pressure ulcer management. Knowledge of the pressure ulcers was high, but low awareness of the factors involved in the management standards emerged. It is expected that this data will be used as basic data for setting up education and management measures for the management of the pressure ulcers in the future.

Keywords: Pressure ulcer, pressure ulcer management awareness, nurse, nursing hospital, pressure ulcer prevention.

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Introduction

With increase of the average life expectancy, the number of senior citizens in Korea is also increased. Currently, there are 7,684,919 senior citizens aged 65 years or older in Korea, accounting for 14.9% of the total population^[1]. Older adults are at higher risk of

developing pressure ulcer even under small external pressures^[2], with a high percentage of muscles, having chronic diseases, and physical conditions such as sensory disorders. Baths are defined as ulcers caused by chronic or repetitive pressure on bone projections or soft tissues, causing problems in blood circulation locally due to a reduction in oxygen supply and nutrient delivery to the area^[3]. With respect to the aging population, the number of elderly patients with various diseases in medical institutions is increasing and the number of high-risk patients with pressure ulcers is expected to increase. Among various health factors of the elderly admitted to the nursing home, pressure ulcer is a frequent condition. Proper treatment after the onset of pressure ulcer is important. Its prevention is very important^[4]. Older adults are often impaired by cognitive function and lack of mobility, resulting in lower self-power. In addition, their skin's sensory function is degraded, making them vulnerable to the development of pressure ulcer^[5].

In the study by Lee Min-jeong (2010), 45 percent of the hospitalized patients who had pressure ulcers, 10 percent of the elderly nursing homes, and 10 percent of the households in general hospitals were found to have pressure ulcers. In addition, the time of the menopause was 47% within four days of hospitalization^[6] and Lim Kyung-choon (1995) on average took 5.6 days after hospitalization^[7]. In order to prevent pressure ulcers, systematic and active nursing care should be implemented immediately after hospitalization. Although all medical personnel are required to participate in the management of the pressure ulcer, especially since the nurse plays a central role in the management of the pressure ulcer, keeping an eye on the risk factors of the pressure ulcer and performing the pressure ulcer care directly^[8,9].

Much of the care of patients is now managed by medical institutions, away from caregivers. Various pressure ulcer nursing method and their effects have been presented in various research or educational literature. However, in actual medical institutions, basic physical change method, number of times, dressing method according to the level of the pressure ulcer, and materials used vary by department. Sometimes nursing care is being performed without knowing the theoretically exact basis. Thus, it is important to understand the care knowledge of pressure ulcer management personnel so that their knowledge of the pressure ulcer management personnel can be improved and accurate management can be implemented.

Most of preceding studies have tried to verify the effectiveness of preventive interventions such as change of body position or massage. However, studies on nursing knowledge or mediating nursing by nurses in charge of pressure ulcer managements are insufficient^[10]. If the importance of pressure ulcer therapy is recognized by a clinical nurse, pressure ulcer care could be improved^[11]. However, even if nurses in nursing hospitals have low knowledge of it, their active attitude toward it is an important predictor in preventing pressure ulcer^[12]. To increase the performance for the prevention of pressure ulcer, knowledge of pressure ulcer prevention and management consciousness of pressure ulcer nursing are very important. Thus, it is important to increase the performance of pressure ulcer nursing.

Therefore, the objective of this study was to determine the degree of awareness of pressure ulcer in nurses in charge of pressure ulcer management in medical institutions and to provide basic data for setting guidelines.

Method

Subject: The research targets were selected three nursing hospitals in U-city, Korea and conducted a survey on the recognition of pressure ulcer management by a nursing care nurse who directly manages patients at a nursing home. A total of 60 copies of questionnaire were distributed and 45 (66.6%) were recovered. After excluding 5 with insufficient response, a total of 40 were finally analyzed.

Method: The questionnaire used in this study was approved by the Institutional Bioethics Committee (MJH 2019-03-003-006). It was a questionnaire developed by researchers with modifications to the pressure ulcer prevention performance tool developed by Moore and Price. After researchers directly explained survey questions to nursing care nurses at nursing homes, they received consent from study subjects and conducted the survey.

A total of five questions were recognized for the management of pressure ulcers in this study. Its reliability had Cronbach's α of .785. It was evaluated with a five-point Likert scale. General characteristics were gender, age, work experience, academic background, and the hospital bed size of the medical institution, with a total of five questions for reliability. Its Cronbach's α was .654.

Data analysis was performed using IBM SPSS Statistics, Version 23 to correlate with frequency analysis. Statistical significance was within the range of 95% ($p < 0.05$).

Result

Population and Social Characteristics of the Subjects: [Table 1] The subjects of this study were a total of 40 bedside nurses in three nursing hospitals in U city. Nurses in charge of bed sores were examined in 20 patients (50%) in hospital A, 10 patients (25%) in hospital B and 10 patients (25%) in hospital C. The most common age group was 45-54 years old with 16 patients (40%), and 35-44 years old with 14 patients (35%). In terms of educational background, university graduates had the most 32 students (80%). Work experience was 15 (37.5%) in 10-19 years and 20-29 years respectively.

Management awareness of bedsores: [Table 2] The management recognition level of the person in charge of the pressure ulcer management is analyzed.

In response to “How much do you know about the pressure ulcer?” showed 52.5% (21 person) say “very yes” and 30.0% (12 person) say “yes”.

“Do you know about changing your bed posture at least every two hours?” showed 82.5% (33 person) for “Very yes”, 17.5% (7 person) for “Yes”

“Do you know the standard of management when a pressure ulcer occurs?” showed 45 percent (18 person), 42.5% (17 person) for “Very yes” and 12.5 percent in “ordinary” (5 person).

“Do you know the factors involved in the pressure ulcer?” showed 47.5 percent of “very yes” (19 person), 35.0% of “yes” (14 person), and 17.5% of “ordinary” (7 person).

“Do you know about the relationship between humidity and temperature among the factors involved in the pressure ulcer?” showed 57.5% in “yes” (23 person), 17.5% in “very yes”(7 person), 22.5 percent in “ordinary” (9 person) and 2.5 percent in “no” (1 person).

Correlation between Demographic Sociology and Pressure Recognition: [Table 3] The correlation between demographic characteristics and pressure ulcer management awareness showed a static correlation of “Do you know about changing bed rest every two hours at least?” ($r = .348, p < .05$). “Do you know the

standard of management when a pressure ulcer occurs?” showed a static correlation ($r = .357, p < .05$). “How much do you know about the pressure ulcer?” showed a static correlation ($r = .406, p < .05$). “Do you know about the relationship between humidity and temperature among the factors involved in the pressure ulcer?” showed a static correlation ($r = .418, p < .05$).

Table 1. Demographic characteristics (N = 40)

Section		N	%
Hospital	A Hospital	20	50.0
	B Hospital	10	25.0
	C Hospital	10	25.0
Age	under 25 years of age	1	2.5
	25 years old-34 years old	7	17.5
	35 years old-44 years old	14	35.0
	45 years old-54 years old	16	40.0
	55 years old or older	2	5.0
Education	College graduate	3	7.5
	University Graduation	32	80.0
	Master’s degree	5	12.5
Work experience	5 years or less	1	2.5
	5 to 9 years	7	17.5
	10 to 19 years	15	37.5
	20 to 29 years	15	37.5
	More than 30 years	2	5.0

Table 2. Management awareness of pressure ulcers (N = 40)

Section		N	%
How much do you know about the pressure ulcer?	Very yes	21	52.5
	Yes	12	30.0
	Ordinary	6	15.0
	No	1	2.5
	Not at all	0	0
Do you know about changing bed rest every two hours at least?	Very yes	33	82.5
	Yes	7	17.5
	Ordinary	0	0
	No	0	0
	Not at all	0	0
Do you know the standard of management when a pressure ulcer occurs?	Very yes	18	45.5
	Yes	17	42.5
	Ordinary	5	12.5
	No	0	0
	Not at all	0	0

Section		N	%
Do you know the factors involved in the pressure ulcer?	Very yes	19	47.5
	Yes	14	35.0
	Ordinary	7	17.5
	No	0	0
	Not at all	0	0
Do you know about the relationship between humidity and temperature among the factors involved in the pressure ulcer?	Very yes	7	17.5
	Yes	23	57.5
	Ordinary	9	22.5
	No	1	2.5
	Not at all	0	0

Table 3. Correlation between Demographic Sociology and Cognitive Pressure Recognition

	a	b	c	d	e	f	g	h
a	1							
b	.890**	1						
c	.343*	.349*	1					
d	.020	.060	.299	1				
e	.068	.019	.348*	.424**	1			
f	.017	0.195	.357*	.614**	.218	1		
g	.011	.151	.406**	.494**	.185	.883**	1	
h	.036	.040	.418**	.275	.216	.433**	.391**	1

*p<.05, **p<.001, a: Age., b: Work experience., c: Education., d: How much do you know about the pressure ulcer?, e: Do you know about changing bed rest every two hours at least?, f: Do you know the standard of management when a pressure ulcer occurs., g: Do you know the factors involved in the pressure ulcer?, h: Do you know about the relationship between humidity and temperature among the factors involved in the pressure ulcer?

Discussion

The purpose of this study was to improve the quality of patient care including bed sores prevention and ultimately improve the quality of nursing care by analyzing the pressure of bed sores in nursing hospital.

In demographic characteristics of study subjects, nurses in charge of patients with pressure sores graduated most from university which showed positive correlation with pressure management awareness. Nurses aged between 20 and 29 years had the most work experience. In this study, the total work experience of more than 10 years was 80.0%, and in the study of Kim Mi-young (2016), 36.2%^[13] were more than 10 years and 24.9%^[14] were found to be working experience. It is highly confident because of its experience and understanding of patient care, and it will be able to show self-efficacy and stable nursing as shown by Kim Yeon-jung's^[15]. The ages were 45-54 years old, and as the results of the

study by Roh Kyung-min and Myung-sook Lee (2016) showed that the higher the age, the more career, and the lower the turnover to other organizations^[16]. It is considered to be.

Demographic characteristics and bed sore management awareness showed a positive correlation. The higher the results and position of Song Sung Sook (2017), the higher the quality of nursing services and the analysis of bed sore nursing was high due to the nature of being dedicated to nursing work with attention and responsibility from the manager's position^[17].

In the management awareness of nurses with pressure sores, Kwon Eun-sook (2005) showed that there was a significant difference in the management awareness of nursing home care by the characteristics of the subjects depending on the place of work and interest in bedsores^[18]. There were significant differences according to the environment^[19]. The necessity of regular education was consistent with the results of the questionnaire according to the management guidelines and programs for patients with pressure sores in medical institutions. Therefore, it is necessary to develop qualitative efforts for nursing care by developing programs to increase education and nursing capacity.

Conclusion

In this study, the conclusions of the study on the condition of bed sore management awareness of bed sore management were as follows.

First. In terms of demographic characteristics, the age of nurses in charge of patients with pressure ulcers was the highest in 45 to 54 years, and the academic background was the highest in college. Nurses showed the most work experience between 20 and 29.

Second, the level of awareness of the pressure ulcer management was high, but low awareness of the factors involved in the management standards appeared.

Third, academic background showed awareness of pressure ulcer management and static correlation.

As such, the results of this study are expected to be used as basic data for the establishment of education and management guidelines, by analyzing the effects of the pressure ulcer management by the person in charge of the pressure ulcer management at the nursing home by identifying the degree of the pressure ulcer management.

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Conflict of Interest: Nil

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The factors affecting on Turnover Intention of Nurses

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Abstract

Background/Objectives: Many medical institutions are struggling with nurse turnover rate which is increasing. Therefore, in this study, factors that affect the turnover intention of nurses was attempted to identify.

Method/Statistical Analysis: The study was conducted to 250 nurses working at general hospitals with more than 500 sickbeds located in Seoul from Feb 1 to Feb 28, 2019. The general characteristics of the subjects and the reasons for turnover were calculated by frequency and percentage, and the factors affecting turnover were acquired from the mean and standard deviation. A logistic regression analysis was conducted to identify the factors affecting turnover.

Findings: In terms of the number of turnovers, 58.1% was 1 time, 29.0% was 2 times, 9.7% was 3 times, and 3.2% was 4 times. For the question of whether there is a turnover intention, 42.9% answered 'yes' and 57.1% answered 'no', and the side with the answer 'no' was higher. Reasons for turnover by logistic regression analysis showed a significant difference in the 20s, single, 4-6 years of career nurses, adequacy of pay, and shift work. This shows a desire that nurses who are free from family members, who have a basic career and can easily access despite turnover into any hospital organization, and can build their careers, hope to receive proper pay they expect, and hope to work in the day time on weekdays free of physical physiological difficulties caused by shift work.

Improvements/Applications: The factors affecting the turnover intention of hospital nurses need to be made at the level of the hospital organization as well as the efforts of the nursing department.

Keywords: Turnover, Job immersion, Job stress, Job satisfaction, Clinical Nurse, Korea.

Introduction

Organizations incessantly strive to achieve their goals, and individuals would like to attain their goals through the organization^[1]. Modern hospital organizations have diverse human resources for efficient treatment of subjects, which complicates the organization and there is a possibility of conflict caused by heterogeneity between occupations^[2]. As the

turnover intention is the act of voluntary departure or transfer of members of the organization, exploring other jobs, or thinking about turnover^[3], the high turnover rate of members of the organization are regarded as an important indicator of organizational and workforce management. As nurses are the most important human resources of the hospital and they can affect the competitiveness and efficiency of the hospital, it is very significant to have a sufficient number of nurses^[4,5]. With the characteristic of the organization that supports for providing high quality professional care to patients^[6], the nursing work environment means the degree of nurses' participation in hospital policy, the adequacy of workforce and resources for professional nursing practices, establishing a foundation for providing quality care, and an environment that forms a cooperative

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relationship for solving problems [7]. It was mentioned that this positive nursing work environment leads to an improvement in the quality of nursing, which causes to increase job satisfaction and decrease job burnout of nurses, which affects the turnover intention [8]. Moreover it was reported that job immersion and job satisfaction of nurses have an effect on the turnover intention [9]. Nurses' job immersion affects job satisfaction [10-13] and nurses who have low job satisfaction experience absence from work and turnover [9]. Verbal violence was also reported to lead to incline nurse turnover rate [14]. Nurse's pay, furthermore, was reported to affect the turnover intention [6,15-16]. However, in another study, it was found that low pay has no significant effect on turnover intention or turnover [17].

Many medical institutions are struggling with nurse turnover rate which is increasing [19]. The high turnover rate of nurses has been pointed out as a negative factor that inhibits good quality nursing care [20]. Previously, a study regarding job satisfaction, job stress, empowerment, organizational commitment and burnout has been progressed to identify the turnover and turnover intention of nurses [9-10,21]. However, in order to understand the turnover phenomenon of nurses, rather than concentrating on the process or cause of turnover, there is a need arises to consider the process and causes by which turnover does not occur [5,22-23]. Therefore, in this study, factors that affect the turnover intention of nurses was attempted to identify.

Method

For the study, after explaining the purpose of the study and requesting consent to a total of 250 nurses working at general hospitals with more than 500 sickbeds located in S city from Feb 1 to Feb 28, 2019, the questionnaires were distributed to them and answered in a self-filled method. 238 out of 250 questionnaires were collected and 210 questionnaires except for unsatisfactory responses were analyzed. The questionnaire consisted of 7 general questions, 2 questions for turnover intention, and 2 questions for factors related to turnover. The data collected in the study were analyzed using the SPSS/WIN 21.0 program as follows. The general characteristics of the subjects and the reasons for turnover were calculated by frequency and percentage, and the factors affecting turnover were acquired from the mean and standard deviation. A logistic regression analysis was conducted to identify the factors affecting turnover. The statistical significance level was set to .05.

Result and Discussion

Table 1 showed that the average age of nurses was 31.8 years old, with 55.7% in the 20s, and in terms of marital status, 67.6% was single. As for the educational background, associate degree was 40.5%, bachelor's degree was 53.3%. Regarding career, 34.8% was less than 2 years, and 34.3% was more than 9 years, and the average of career was 7.7 years. In terms of the type of residence, it was shown that 64.3% was a residence with family. Regarding position, general nurses were 73.3%. As for the working department, it was found that wards were the highest at 31.4%. Concerning turnover experience, 32.9% had turnover experience and 67.1% had no experience. In terms of the number of turnovers, 58.1% was 1 time, 29.0% was 2 times. For the question of whether there is a turnover intention, 57.1% answered 'no'.

Table 1. General characteristics of the subject

Variables		N	%
Age	20s	117	55.7
	30s	53	25.2
	40s and above	40	19.0
Marital status	Single	142	67.6
	Married	68	32.4
Education	Associate degree	85	40.5
	Bachelor's degree	112	53.3
	Master's degree	13	6.2
Career	~2 years	73	34.8
	3~4	29	13.8
	5~6	21	10.0
	7~8	15	7.1
	9~	72	34.3
Residence	With family	135	64.3
	Single	57	27.1
	Others	18	8.6
Position	Temporary nurse	33	15.7
	General nurse	154	73.3
	Nurse manager	19	9.0
	Head nurse	4	1.9
Department	Ward	66	31.4
	Intensive care unit	53	25.2
	Surgery recovery room	12	5.7
	Emergency room	16	7.6
	Outpatient	15	7.1
	Others	48	22.9
Turnover experience	Yes	69	32.9
	No	141	67.1

Variables		N	%
Turnover number	1 time	36	58.1
	2 times	18	29.0
	3 times	6	9.7
	4 times	2	3.2
Turnover intention	Yes	90	42.9
	No	120	57.1
Turnover reason	Working environment	67	31.9
	Shift work	60	28.6
	Workload	44	21.0
	Pay	24	11.4
	Welfare Benefits	12	5.7
	Nurse's status	3	1.4
Total		210	100.0

Table 2 showed that as for factors affecting turnover, in the case of age, it was shown that having turnover

intention was 29.8 ± 7.3 , no turnover intention 33.2 ± 9.9 . In the case of marital status, it was shown that when single, having turnover intention was 78.9%, no turnover intention was 59.2%, and when married, having turnover intention was 21.1%, no turnover intention was 40.8%. In the case of education background, it was shown that when associate degree and above having turnover intention was 36.7%, no turnover intention was 43.3%, and when bachelor's degree, having turnover intention was 61.1%, no turnover intention was 47.5%, and when master's degree and above, having turnover intention was 2.2%, no turnover intention was 9.2%. In the case of career, it was shown that having turnover intention 6.0 ± 6.5 , no turnover intention 9.0 ± 8.5 . According to the residence type, it was shown that when residence with family, having turnover intention was 55.6%, no turnover intention was 70.8%, and in other types, having turnover intention 44.4%, no turnover intention 29.2%.

Table 2. Factors affecting turnover

Variables		Yes	No	P
		N(%) or M±SD		
Age		29.8±7.3	33.2±9.9	.004
Marital status	Single	71(78.9)	71(59.2)	.000
	Married	19(21.1)	49(40.8)	
Education	Associate degree	33(36.7)	52(43.3)	.040
	Bachelor's degree	55(61.1)	57(47.5)	
	Master's degree	2(2.2)	11(9.2)	
Career		6.0±6.5	9.0±8.5	.004
Residence type	With family	50(55.6)	85(70.8)	.020
	Other types	40(44.4)	35(29.2)	
Department	Ward	31(34.4)	35(29.2)	.370
	Intensive care unit	26(28.9)	27(22.5)	
	Surgery recovery room	3(3.3)	9(7.5)	
	Emergency room	5(5.6)	11(9.2)	
	Outpatient	4(4.4)	11(9.2)	
	Other	21(23.3)	27(22.5)	
Position		1.9±0.6	2.0±0.6	.039
Turnover experience	Yes	30(33.3)	39(32.5)	.510
	No	60(66.7)	81(67.5)	
Turnover number		1.8±0.9	1.5±0.7	.149
Turnover reason	Pay	17(18.9)	7(5.8)	.020
	Workload	15(16.7)	29(24.2)	
	Welfare	7(7.8)	5(4.2)	
	Shift work	19(21.1)	41(34.2)	
	Work environment	31(34.4)	36(30.0)	
	Nurse's status	1(1.1)	2(1.7)	
Total		90(100.0)	120(100.0)	

As for the turnover reason, it was shown that in the workload, having turnover intention 16.7%, no turnover intention 24.2%, and in the shift work, having turnover intention 21.1%, no turnover intention 34.2%, and in the work environment, having turnover intention 34.4%, no turnover intention 30.0%, and in the nurse's status, having turnover intention 1.1%, no turnover intention 1.7%.

Table 3 showed that reasons for turnover by logistic regression analysis showed a significant difference in the 20s, single, 4-6 years of career nurses, adequacy of pay, and shift work. This shows a desire that nurses who are free from family members, who have a basic career and can easily access despite turnover into any hospital organization, and can build their careers, hope to receive proper pay they expect, and hope to work in the day time on weekdays free of physical physiological difficulties caused by shift work.

Table 3. Reasons for turnover by logistic regression analysis

Variables		OR(95% CI)	p
Age	20s	3.1(1.37-6.81)	.006
	30s	2.0(0.80-4.86)	.141
	40s and above	Reference	
Marital status	Single	2.6(1.38-4.81)	.003
	Married	Reference	
Education	Associate degree	3.5(0.73-16.75)	.118
	Bachelor's degree	5.3(1.12-25.04)	.035
	Master's degree	Reference	
Career	~3	1.9(1.03-3.47)	.039
	4~6	3.2(1.34-7.45)	.009
	7~	Reference	
Residence	With family	0.5(0.29-0.91)	.023
	Others	Reference	
Position	Temporary nurse	3.8(1.21-12.25)	.023
	General nurse	2.1(0.77-5.54)	.148
	Manager or head nurse	Reference	
Department	Ward	1.1(0.54-2.40)	.733
	Intensive care unit	1.2(0.57-2.71)	.594
	Surgery recovery room	0.4(0.10-1.78)	.244
	Emergency room	0.6(0.18-1.94)	.381
	Outpatient	0.5(0.13-1.68)	.244
	Others	Reference	
Turnover experience	Yes	1.0(0.58-1.86)	.899
	No	Reference	
Pay is a turnover reason	Yes	3.8(1.49-9.51)	.005
	No	Reference	
Workload is a turnover reason	Yes	0.6(0.31-1.26)	.188
	No	Reference	
Welfare benefits is a turnover reason	Yes	1.9(0.59-6.32)	.272
	No	Reference	
Shift work is a turnover reason	Yes	0.5(0.27-0.97)	.040
	No	Reference	
Work environment is a turnover reason	Yes	1.2(0.68-2.20)	.494
	No	Reference	
Nurse's status is a turnover reason	Yes	0.7(0.06-7.43)	.739
	No	Reference	

Discussion

Nurses are currently working in health and medical institutions are 45.5% as of 2014, and more than 86% of hospital-level medical institutions do not comply with the nursing workforce standards [23]. Despite the fact that more than 20,000 nurses graduate every year, the reason why there is a lack of nurses in the field may be due to the high turnover rate. In 2015, the turnover rate of nurses was 12.4% on average, which is considerably higher than 2.16%, the turnover rate of other health workers. As turnover intention is directly linked to turnover [9], it is necessary to pay attention to turnover intention and relevant factors in order to reduce the turnover rate of nurses.

In this study, as a factor affecting turnover intention, nurses in their 20s showed a significant difference of .006, which is considered to receive a lot of real shock between theory and clinical practice. In order to tackle this problem, it is believed that it is needed to deepen the student practice time into a direct experience rather than a simple observer.

Unmarried nurses showed a significant difference of .003, which means a personal environment free on the job turnover as a single person has not yet formed a family, and a trend of increased opportunities for building 2~3 years of career and turning over to hospitals that they want, as graduates and experienced workers. This shows the same result as marital status accelerates a higher turnover intention [24].

Nurses of the 4-6 years of hospital career showed a significant difference of .009 in the turnover intention, which is thought to reflect another self-improvement and the trend of changing to a stable position after the 30s when building more than 4 years of career in university hospital level.

There was a significant level of .005 that pay is the cause of turnover, which is analyzed as the intention to turn over to the hospital that provides more pay according to their position, career, and ability on the process that all the information is exchanged and recognized in real-time online. This showed the same result as the result of the study that factors such as pay are related to turnover intention, as the result that Chan and Morsion [25] investigated the factors related to turnover intention in the survey of nurses of hospitals with 1,028 sickbeds.

There was a significant difference of .04 that shift work is the cause of turnover, which is regarded as an attempt to break away from shift work by showing that 3 shifts work breaks biorhythm as women and working at night and sleeping during the day act as a barrier to daily social life outside hospital work. This is also consistent with the study of Lee and Kang's [24], indicating that work patterns are a factor in the turnover.

Conclusion

Therefore, the factors affecting the turnover intention of hospital nurses need to be made at the level of the hospital organization as well as the efforts of the nursing department, and it is necessary to recognize the turnover intention is shown in the 4~6th years of working with independent judgment and experience after working as a new nurse, and to have them receive proper pay by improving the institutional and economic aspects which enable them to keep working, and it is needed to supplement the system to escape from the work of 3 shifts by introducing the system such as the placement of a dedicated nurse on night duty.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Three-dimensional Evaluation of Maxillary Sinus Volume in Different Sex Groups Using Cone-beam Computed Tomography

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Abstract

Background/Objectives: Determining the sex of corpses is the first step of identification in a forensic analysis. Accurate anatomical knowledge for the maxillary-sinus serves as an important mediator of forensic sex determination.

Method/Statistical Analysis: This study included 57 patients (27 males and 30 females) of Dan-kook university dental hospital. Cone-beam computed tomography data images were imported and reconstructed into Three-dimensional models by an interactive medical image control system, Mimics 17.0 software. This study was analyze at 95% significance level using SPSS Version 20.0. The independent t-test was performed to compare the measured values among the two experimental groups.

Findings: The volume of the maxillary sinus measured with traditional radiography may differ from its actual size. The maxillary sinus can be more accurately measured using a 3D model restructured using the CBCT data as the 2D base compared to simple linear measurement in 2D model. In the present study, sex-specific volumes of the maxillary sinus were measured using a 3D model, and there were no significant differences in the volumes between the left and right for both men and women. However, between sexes, the mean left sinus volume was significantly greater among men (23.25) than women (17.59) ($p < 0.05$). The mean right sinus volume was also significantly greater among men (22.46) than women (17.35) ($p < 0.05$).

Improvements/Applications: This study obtained more accurate sex-specific anatomical data for the maxillary sinus using a 3D model. The volume of the maxillary sinus is valuable in researching sex determination.

Keywords: Maxillary Sinus, Volume, Sex determine, 3D Measurement, Mimics.

Introduction

Determining the sex of damaged corpses is the first step of identification in a forensic analysis^[1]. Sex is determined based on various body parts, such as the

skull, pelvis, and maxillary sinus. The maxillary sinus not only plays an important role in the formation of facial contour but also is an area with little damage in a corpse. Particularly, severely mutilated corpses or deaths from a disaster show severe damages to most bones in the skull, but the maxilla is known to incur little injury^[2].

Sexual dimorphism refers to the differences of morphology and size between different sexes of the same species. The maxillary sinus is known to feature sexual dimorphism in various species^[3]. Chatterjee et al. reported that the volume of maxillary sinus differs according to sex and that this is a useful feature in

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determining sex^[4]. Take et al. measured the volume of the maxillary sinus for 94 adults and observed that men have larger volumes than women do^[2]. Thus, accurate anatomical knowledge for the maxillary sinus and its sexual dimorphism serves as an important mediator of forensic sex determination

Many studies measured the sex-specific volume of the maxillary sinus^[5]. However, two-dimensional (2D) computed tomography(CT) images cannot accurately reproduce the complex three-dimensional (3D) structure of the maxillary sinus, so the validity of its results is doubtful. The size of the maxillary sinus measured with traditional radiography may differ from its actual size. Furthermore, the exact margin of the maxillary sinus is blurred, as it is overlapped with surrounding soft tissues and structures. Because CT images are high resolution images, the boundaries of the maxillary sinus and surrounding soft tissues are clearly distinguished^[6]. Cone-beam computed tomography (CBCT) can provide resolutions of a unit smaller than millimeter in a shorter scanning time and higher quality. The maxillary sinus can be more accurately measured using a 3D model reconstructed using the CBCT data as the 2D base compared to simple linear measurement in 2D model^[7-8].

Based on this background, Based on this background, the present study used a 3D model to measure the sinus volume and assess the sex differences to provide basic data on sex determination using the maxillary sinus of Koreans.

Method

The CBCT data of 57(27 males and 30 females) patients who met the study criteria were obtained from the Department of Oral and Maxillofacial Radiology at Dan-Kook University Dental College Hospital. This study was approved by the Dentistry Hospital Clinical Examination Committee of Dan-Kook University (DUDH IRB 2015-12-022). Only patients with 28 teeth and with no missing teeth or systemic disease were selected. The mean age of all of the patients was 22.8 years.

The CBCT data of the subjects who satisfied the study criteria were obtained in Digital Imaging and

Communications in Medicine(DICOM) format from a CBCT scanner (Alphard 3030, Asahi, Kyoto, Japan). CT scanning was performed with the following image scaling parameters: slice increment, 0.39 mm; slice thickness, 0.39 mm; and matrix, 512 x 512 pixels. After the corresponding DICOM file was imported from MIMICS software (version 17, Materialise, Leuven, Belgium), a 3D model of the skull was created based on the uploaded CBCT image, and this model was used to visually confirm the presence of maxillary sinus [Figure 1].In this study, 2 investigators each used MIMICS to create 3D models and evaluate the volume of the maxillary sinus in 57 patients.

This study performed statistical analyses using SPSS (version 20.0, Statistical Package for the Social Sciences, IBM, USA), with differences considered significant at the 95% level. The general characteristics of the subjects were analyzed using frequency analysis. The independent-samples t-test was performed to detected sex-related differences in the measured values.

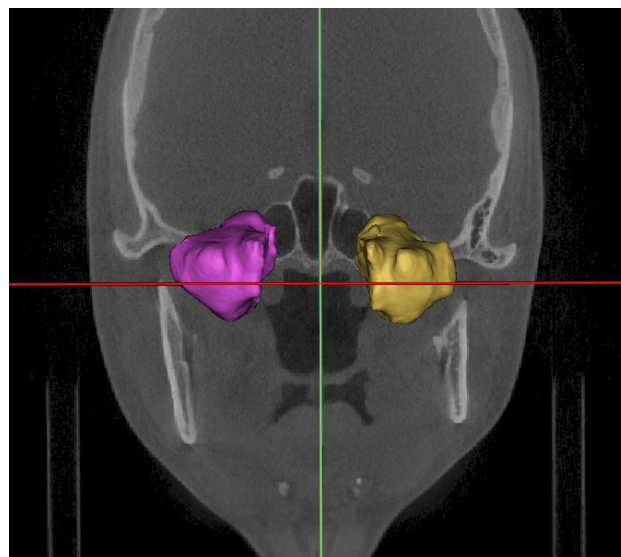


Figure 1. 3D reconstruction of the left and right maxillary sinus

Result and Discussion

In the present study, sex-specific volumes of the maxillary sinus were measured using a 3D model. There were no significant differences in the volumes between men and women [Table 1].

Table 1. Comparison of the maxillary sinus volume of sides

Parameters	Patients (n)	Sides	Average (cm ³)	STD. Deviation	p-value
Male	27	Left	23.25	6.94	0.678
		Right	22.47	6.95	
Female	30	Left	17.59	4.83	0.849
		Right	17.35	4.84	

However, between sexes, the mean left sinus volume was significantly greater among men (23.25) than women (17.59) ($p = 0.001$). The mean right sinus volume was also significantly greater among men (22.46) than women (17.35) ($p = 0.002$) [Table 2].

Table 2. Comparison of the maxillary sinus volume of sex

Parameters	Sex	Patients (n)	Average (cm ³)	STD. Deviation	p-value
Left	Male	27	23.25	6.94	0.001
	Female	30	17.59	4.83	
Right	Male	27	22.47	6.95	0.002
	Female	30	17.35	4.84	

Discussion

Forensic research is highly crucial for identifying the sex of a mutilated cadaver that had gone through death by physical injury due to a fire or strong chemicals. The maxillary sinus is denser and thus damaged less than other bones used in sex identification such as the pelvic bone, longitudinal bone or skull. Therefore, it can be used for the challenging task of determining sex using the human skeleton^[9-10]. Until now, sexual dimorphism has been studied using bones like the foramen magnum, occipital bone, frontal bone and maxillary sinus. Analysis of sexual dimorphism in the foramen magnum demonstrated the presence of dimorphism. Moreover, it was concluded as the major bone that can be used to understand sexual dimorphism^[10-11]. Since the maxillary sinus has the advantage of high density and resistance to damage, it is suitable for sex determination and thus more research on sexual dimorphism should be conducted in the maxillary sinus.

Saccucci revealed that the average sinus volume of male and female is similar and thus sex determination using such structure is impossible^[12]. In contrast, the present study found that sinus volume was greater in male than in female. The left sinus volume in male was 23.25mm³ and right 22.47mm³ which were both significantly larger than in female, 17.59mm³ and 17.35mm³ ($p = 0.001$, $p = 0.002$). Gomes et al. worked on the sex determination equation using sinus volume measurements and obtained results similar to our study,

male (19.54) and female (15.28). Fernandes also showed that the average sinus volume was greater in male than in female^[13]. For Egyptians, the size of the maxillary sinus is a useful feature for sex determination^[3]. Kanthem also found that the average sinus volume is significantly greater in male (39.93mm³) than in female (21.53mm³) although the values were significantly different from our male data^[14]. In Kanthem's data, the male sinus volume had a wide range with the minimum of 26.06mm³ and maximum 53.51mm³. These average values of the data make it difficult to trust the results of the research.

The present study measured the sinus volume using a 3D model and assessed the sex differences in order to provide a basic database of sex determination using the maxillary sinus of Koreans based on CBCT data. We used a software that can calculate the volume of the maxillary sinus. CBCT is an effective method for diagnosing maxillofacial structure^[15]. CBCT data has been shown to be a useful tool for maxillary sinus analysis and the accuracy of the results has been verified^[16-18]. The anatomy depicted by CBCT is helpful for volume measurements. In this study, the 3D data of the maxillary sinus obtained from CBCT enabled accurate assessment for sexual dimorphism research using the maxillary sinus.

Conclusion

Sex determination is important in forensic identification. This study obtained more accurate sex-

specific anatomical data for the maxillary sinus using a 3D model. CBCT is a significant development in radiology, enabling more accurate measurement. The three-dimensional information obtained from CBCT provides the opportunity to see beyond the plane and the spatial overlap of structures and to visualize the fine differences using a true 1:1 imaging. Such research is highly crucial for sex identification of an individual in estimation anthropology and criminal investigations and the volume of the maxillary sinus is valuable in researching sex determination.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Development of Personal Safety Education Program for Nursing Students Using Hybrid Application

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Abstract

Background/Objectives: This study describes a method of developing a personal safety education program for nursing college students using a hybrid application. The purpose of this study is to ensure that nursing college students receive appropriate education, protect themselves from the elements, and make the best use of their nursing ability before conducting clinical training.

Method/Statistical Analysis: This study uses Orem's theory of self-nursing as the basis of the theory, and the program was developed according to the ADDIE model. In the literature review, we selected themes with high demands through interviews with experts and research subjects, and developed a personal safety education hybrid application.

Findings: The contents of the developed educational program were conducted in four chassis. When practicing at a hospital, when visiting a practicum in a local community, management of musculoskeletal diseases and stress management during clinical practice. The satisfaction level of education through the developed application was very high with $4.84 \pm .33$ points out of 5 points.

Improvements/Applications: Using the application developed through this research, pre-clinical education for health centers in hospitals and communities at nursing colleges could reduce safety accidents in the field. In the future, it will be necessary to verify the effectiveness of various nursing universities and grades.

Keywords: Mobile application, Hybrid application, Nursing student, Personal safety, Occupational hazards.

Introduction

The working environment of medical personnel is not safe. Many health care workers are at risk of being easily exposed to nosocomial infections, and the shift and long hours of work disrupt the circadian rhythm and reduce the quality of sleep. The degree of fatigue continues to increase^[1]. Long hours of work have also been found to increase the incidence of musculoskeletal injury and needle sticks^[2-3]. In the past, emphasis was placed on infectious diseases that occurred in patients, and recently, it has been expanded to include subjects who should be protected by health care practitioners

who carry out medical practices, and safety management in the overall medical environment. It is accessed as a department^[4]. For these reasons, nurses, especially nurses, are often in direct or indirect close contact with patients and are often exposed to various infectious diseases. Much of the time spent in clinical practice is spent on patient care, which increases the risk of infection exposure. A study of nursing students found that up to 61.5% of clinical trials had been exposed to infectious diseases, and had been exposed to needle stick injuries or blood of patients^[5-8].

Nursing students are more vulnerable to safety accidents than licensed nurses due to lack of experience, lack of expertise and skills, lack of knowledge, lack of tutorial, anxiety and lack of self-care^[9,10]. In addition, 85% of nursing college students did not report to the organization at the time of the occurrence of a safety accident related to infection and could not know the

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results of the patient’s serological test^[11]. Considering these points, before starting these exercises, standard precautions must be given to recognize and prevent risks and ensure that the agency in the event of a safety accident occurs. As shown in the current study of nurses working in hospitals, nurses who work in the infection control room or who do not specialize in infection control in graduate school lack knowledge of infection management and lack of self-confidence^[12].

^[13]Presents hazards that threaten the health of health professionals who provide family nursing care. It is being described, but the guideline is not provided in Korea yet. Home health care providers experience a variety of hazards in the United States, which can have a negative impact on job performance, job satisfaction and health. In addition, broader training is needed to identify hazards in the client homes they visit and to provide care in a safe environment ^[14]. Currently, when a job is found at a university hospital in Korea, new nurses are educated at the point of incidence, but this is also not structured for each hospital. In the case of

education, lecture-centered education is provided using manuals, pamphlets, and materials collected by the hospital nursing department^[15-17]. In Korea, there were a needlestick prevention program for nurses ^[15] and an education program for new infection control nurses^[16], but the development of educational programs for nursing college students has not been carried out. Although it is not well understood, only the investigation of blood and body fluid exposure during clinical training^[18] and the influence factors^[4,12] that affect the implementation of standard attention instructions for infection prevention have been advanced, and the structure before clinical training has been structured. It is time to find a plan that can be educated efficiently. In this study, Orem’s theory of self-care^[19] was applied as a theoretical framework. The purpose of this study is to define nursing students as beings with self-care needs that can protect themselves from risks and to comply with safety, and to contribute to the maximum performance of nursing students by developing and applying personal safety education programs. The theoretical framework of this study is shown in Figure 1.

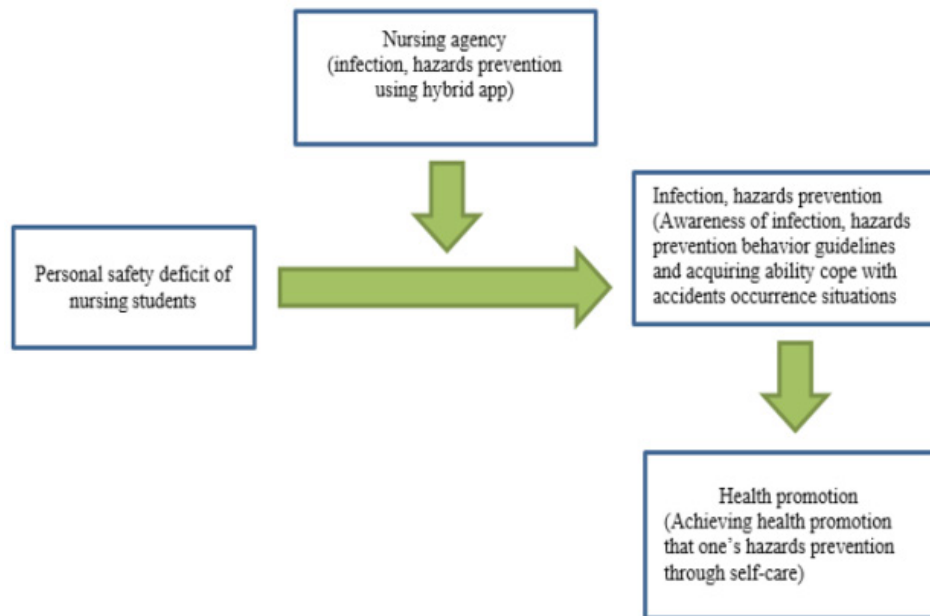


Figure 1. Framework of this study

Method

This study is a methodological study to improve the safety and health of nursing college students by developing a safety prevention program including the

infection of nursing college students using a hybrid app. The ADDIE model ^[20] was used to develop the program of this study. The ADDIE model has also been used as an evaluation rubric when developing new teaching strategies or media in instructional design^[21,22].

Result

1. Analysis: We referred to the guidelines proposed by [13]. In addition, we conducted a semi-structured interview survey on the necessity, content, method, and implementation period of safety education for nursing college students who completed clinical training for three or more semesters. As shown in Table 1 are composed of application contents.

Table 1. Contents of personal safety education program with hybrid app

Phase	Content
1	When practicing in the hospital <ul style="list-style-type: none"> • Concept of hospital infection, high risk of hospital infection, prevention of infection accidents, bloodborne pathogens including needlestick and sharp injuries, reporting method after infection exposure, necessary tests and vaccinations
2	When practicing home visit nursing at a health center or community care (in home health care) <ul style="list-style-type: none"> • The overall environment of the house (such as entering the house after confirming that the animal is bound, temperature in the house, house hygiene, places and things that only hurt)
3	Prevention of musculoskeletal diseases in all clinical practice (when changing patient position, assisting mobility)
4	Occupational Stress (verbal violence, sexual violence, sexual harassment, bullying, incivility)

2. Design: The program of this study was divided into the case of practicing in the hospital according to the practice place and the case of visiting nursing practice in the public health center and the community. Touch each table in the table view with the application then, it was designed to move to that area. When a nursing college student had a hospital infection accident during practical training, he was able to comprehend the situation in which the specific situation was embodied in video and accurately handled and reported.

3. Development: Development was based on the smartphone's general-purpose operating system Android. The screen was made using the photoshop CS4 program and using clear colors and text sizes. Each content has been developed so that it can be easily checked by turning it over, allowing nursing college students to play with videos that can happen in actual practical situations, and for confirmation learning, choose O, X quiz. Figure 2 shows part of the main screen. Two of the computer engineering

majors with extensive experience in developing educational smartphone applications and a professor who is currently teaching pedagogy at the university, participated in this development process.

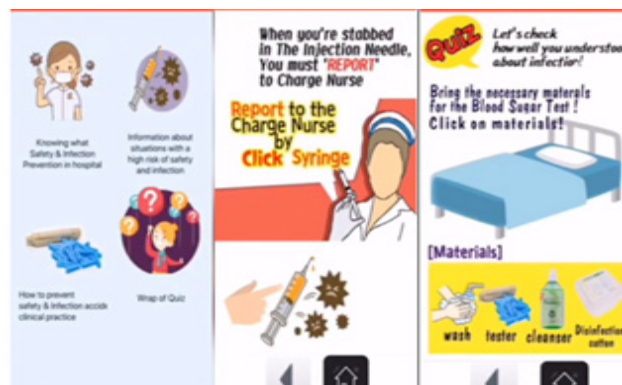


Figure 2. Screenshot of the smartphone-based app

4. Implementation: After developing this educational program, the content validity was verified by using a group of experts and revised based on the results. QUIS^[24] was used to evaluate the validity of the hybrid app training program. It reflects overall satisfaction (method, impact, interest), screen drive(characters, sequence order), system information and capabilities (terminology, technology, speed, position on the screen), learner(requests), usefulness of confirmation learning, and can be evaluated on a 10-point scale. The supplemented assessment tool was validated with a CVI score of over 90% in all items in a content validation study of a specialist group including two professors in the nursing department and eight nurses working in hospitals and health centers verified.

5. Evaluation: As shown in Table 2, in the evaluation of the expert group after the development of the program. Table 3 was designed to evaluate the satisfaction after directly implementing the program for 12 nursing college students in 3rd grade.

Table 2. Expert's satisfaction of the application (N = 10)

Categories of Satisfaction	M±SD
Overall reaction the application <ul style="list-style-type: none"> • Level of enjoyment, power, stimulation, ease of use, satisfaction 	9.85±0.45
Screen <ul style="list-style-type: none"> • Character, sequence of order, organization of information, highlighting simplifies task 	9.33±0.36

Terminology and system information • Use of term, positioning message, operation speed, reflecting the needs of the users	9.56±0.71
Learning • User's needs, remembering, use of commands	9.78±0.26
Total	9.63±0.24

Table 3. Nursing students satisfaction of the personal safety program (N = 12)

Questions of Satisfaction	M±SD
Was it easy to understand personal safety?	4.89±.31
Was the content and composition appropriate?	4.89±.31
Do you think the teaching method is effective?	4.78±.26
Do you have any ideas to recommend to other students?	4.92±.45
Has the intention to protect personal safety increased?	4.81±.38
Total	4.84±.33

Discussion

This study is based on the contents that students should know before clinical training, especially in high-risk incidents that are likely to occur in nursing college students who practice a lot of time at hospitals and patients' homes. Was carried out to develop the application. Considering the lack of pre-training education, the program was developed. In addition, it can be said that the arbitration study on safety for nursing college students is meaningful in that it was implemented for the first time.

In this study, the ADDIE model was applied to develop a program, which was also used in a study developed by a sex education program for college students^[25] and elementary school students ^[26]. The ADDIE model allows the evaluation of the program process, and the teaching materials developed during the analysis, design and development process can be checked and changed. In this study, satisfaction levels were measured objectively for nursing college students and experts, and as a result, both groups were very satisfied. In addition, the quality of the program was improved by reflecting the modification requirements, and the safety of the research was ensured by actively reflecting the requirements of nursing college students who are users of the application.

In our study, we can find great significance in including the behavioral guidelines before and after home visit training for nursing college students for the first time

in Korea. It can be said that education is necessary at this point when the number of elderly people living alone and patients with disabilities are increasing and the demand for home-visit nursing services is also increasing. In our research, it was confirmed that university students majoring in nursing were able to increase their nursing ability by trying new method. Future social and national efforts for nursing college students are likely to be necessary, and sufficient time and preventive education should be provided before clinical practice.

Conclusion

In this study, it is considered that a wide range of viewpoints were presented to promote physical and mental health of nursing college students from the aspect of nursing research. Through this study, we will be able to grasp the overall hazards of nursing college students in clinical practice, and this will help them develop nursing skills and promote health. Also, in this study, by developing a personal safety prevention program using an application in nursing practice, a university nursing professor provided information on prevention of infection and information on safety accidents for nursing university students and resources available for education. The significance can be found in that it was provided.

Considering the increasing phenomenon of nursing college students in Korea and the current rate of occurrence of these safety accidents, the program developed by this researcher is an appropriate customization program that is very necessary in the future. We expect these jobs to contribute greatly to satisfaction and health promotion. This program was developed by reflecting the specificity of college students with high smartphone use rate, and the respondents' response was very high. Although the personal safety program of nursing students suggested a new point of view, this study was applied only to nursing students of one university. Therefore, we recommend effectiveness verification through continuous arbitration studies for a large number of nursing college students in various regions.

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Source of Funding: Self

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Development and Evaluation of Educational Program to Prevent Cervical Cancer among Vietnamese Immigrant Women

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Abstract

Background/Objectives: This study was to develop and evaluate a cervical cancer prevention program for Vietnamese married immigrant women who show the high incidence of cervical cancer. In this regard, this study presents the grounds for the cervical cancer prevention program to be spread and adopted widely to promote Vietnamese married immigrant women's reproductive health.

Method/Statistical Analysis: Program was developed by the ADDIE model. The developed program was applied to Vietnamese immigrant women. Study design is random control group pre-test, post-test design. The effects of the program were assessed by health belief of Pap testing, knowledge of cervical cancer, and intention of preventive behavior. In the experimental group, four 120-minutes sessions of cervical cancer prevention education program intervention were provided once a week.

Findings: The results indicate that the educational program to prevent cervical cancer helps Vietnamese married immigrant women to lower the perceived barriers in cervical cancer prevention, to enhance the awareness about cervical cancer, and to raise the intention for cervical cancer prevention behavior, which proves the prevention program is very effective and useful.

Improvements/Applications: We expect that the devised program in this study be widely used in multicultural family support center to promote Vietnamese married immigrant women's reproductive health and quality of life.

Keywords: Vietnamese women, Cervix cancer, Prevention, Education program, Preventive behavior, Intention.

Introduction

Since the mid 1990s, the marriage between international women and Korean men has rapidly increased, and thus, multicultural families have also been rapidly increasing. In the Republic of Korea (ROK), a 'foreign' woman who married a Korean man is called a 'married immigrant woman'. The majority of their

nationalities are China, followed by Vietnam, Japan and Philippine^[1]. Most of them are women who have migrated from countries with a lower health-care level than ROK. It is difficult to comprehend their health status and preventive education regarding diseases^[2]. In recent years, Vietnamese immigrant women, who have a steady increase in the domestic (ROK) population, are known to have a higher risk of developing cervical cancer than women in other countries^[3,4].

In fact, Vietnamese married immigrant women living in the United States were twice as likely to develop cervical cancer as Caucasian women^[5]. The cervical cancer screening rate, one of the preventive health behaviors of cervical cancer, is significantly lower

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than that of other Southeast Asian women migrating to the United States^[6-8]. It implies that the possibility of missing early detection/intervention of cervical cancer is increased. As a result, it is a cause of the health and life threat of Vietnamese migrant women. Since early detection can increase the cure rate, the practice of preventive health behavior is particularly emphasized. Papanicolaou test, condom use and vaccination against cervical cancer are recommended for prevention of cervical cancer^[9]. In the case of preventive behavior for cervical cancer practiced by domestic, married immigrant women, the cervical cancer screening rate of Vietnamese, married immigrant women, in some areas of ^[2]was 10.9%. Condom use among the spouse of the immigrant women was examined and 63.5% did not use condoms^[10]. The vaccination rate for cervical cancer vaccination was 7.2% ^[11]. Previous studies indicate that the overall practice of prevention of cervical cancer is very low. Therefore, in order to improve the reproductive health of Vietnamese women who are married immigrants, it is urgently necessary to develop and apply customized education programs to promote the practice of prevention of cervical cancer. Prophylactic health behaviors such as the practice of cervical cancer prevention are known to be linked with individuals' health beliefs^[12]. The higher the perceived sensitivity, the perceived severity, the perceived benefit, and the less perceived barriers of the disease, the better the practice of preventive health behavior for the disease^[13]. However, Vietnamese women are reported to have very low perceived sensitivity and severity to cervical cancer^[14,15]. This study is based on the ADDIE model^[16], a systematic approach to effective teaching design for Vietnamese women who are vulnerable to cervical cancer and developed a cervical cancer prevention education program using illustrations, based on the health belief model. This study attempted to provide an empirical basis for the use of this study as an intervention program for prevention of cervical cancer in Vietnamese married immigrant women.

The hypotheses of this study are as follows.

Hypothesis 1: There will be differences in cervical cancer screening health beliefs in the experimental group and the control group.

Hypothesis 2: The experimental group will have higher cervical cancer knowledge scores than the control group.

Hypothesis 3: The experimental group will have a higher prevalence of preventive behaviors (condom use, Pap testing, vaccination) than the control group.

Method

This study used a randomized control group pretest-posttest design to develop an educational program to improve the prevalence of cervical cancer prevention in Vietnamese married immigrant women.

Subjects: Based on the research report of^[17] that proved its effectiveness after mediating the reproductive health promotion program for married immigrant women, and the research report of^[18] that provided the cervical cancer prevention education program and verified its effect, the significance level, power, and effect size were set as $\alpha = 0.05$, $1 - \beta = 0.8$ and $d = 0.80$, respectively. The minimum number of samples per group required for the independent t-test was 26^[19], which was calculated using G-power 3.1 program^[20]. In this study, a total of 60 subjects were recruited for the experimental group and the control group. Two subjects dropped out in the course of this study and 58 participants participated in the study.

Program development process and contents: The practitioners asked to translate all the lecture materials into Vietnamese and provide them with a Vietnamese interpreter at the lecture. They also requested to look for the most understandable way to communicate with the Vietnamese women. Table 1 shows the educational programs based on the above analysis results. In order to increase the perceived sensitivity of cervical cancer, as a material to be used in the very first class, stories about the incidence of cervical cancer of Vietnamese women who moved to other countries were provided with illustrations to make it easier to sympathize with the subject of learning [Figure 1].



Figure 1. Illustrated material examples

Table 1. Contents of program

Phase	Contents
1	perceived sensibility (structure and function of female reproductive organs, incidence of cervix cancer among female Vietnamese living in the U.S.A)
2	perceived seriousness(definition and cause of cervix cancer, relationship between cervix cancer and HPV, symptom of cervix cancer in each phrase, diagnosis method, treatment and prognosis)
3	perceived barriers(necessaries for examination without any symptoms, pap smear and process and benefits, cultural barriers, recommendation for examination)
4	perceived benefits(prevention method of cervix cancer, benefits of cervix cancer vaccine, use of condom and its expected result)

Measures: RSBB-V (Revised Susceptibility, Benefits, and Barriers Scale–Vietnamese version) developed by [26] was used for Pap testing health beliefs. The cultural barrier for cervical cancer screening was assessed with the CBSI–V (Cultural Barriers Screening Inventory-Vietnamese version) developed by [26]. The knowledge of cervical cancer is a tool developed by [27]. For the intention of cervical cancer prevention, an instrument developed by [28] was used in this study. The reliability of all the instruments was above .70. All the research devices used in this study were approved by the authors through email correspondence.

Result

1. General characteristics of the subjects: There was no significant difference between the two groups in terms of the general characteristics of the subjects, and the two groups were determined to be homogeneous.

2. Hypothesis Test:

The effects of program were as follows:

1. The experimental group has decreased in perceived barriers score significantly than that of the control group ($t = -2.65, p = .011$).
2. The experimental group has a statistically significant higher score in the knowledge of cervical cancer, compared to the control group ($t = 8.22, p < .001$).
3. The experimental group showed statistically significant higher intention score of prevention behavior compared to control group ($t = 5.56, p < .001$). Also the experimental group significantly increased the preventive behavior intention like condom use ($t = 2.63, p < .001$), Pap testing ($t = 3.24, p = .002$), HPV vaccination ($t = 2.46, p = .017$).

Discussion

The purpose of this study is to develop and apply a cervical cancer prevention education program to Vietnamese married migrant women who are known to have high cervical cancer incidence and to verify its effectiveness. The cervical cancer prevention education program developed by this study is unique from the existing education program developed in previous studies on women’s health for married immigrant women.

First, the educational program developed by this study is the first customized cervical cancer prevention education program developed in ROK to reflect the situational specificity of Vietnamese immigrant women. Considering that the proportion of Vietnamese nationality among married immigrant women in ROK is on the constant rise, the cervical cancer prevention education program developed by this study is timely and necessary for the improvement of preventive health behavior of Vietnamese married immigrant Vietnamese women. In the future, it will serve as an intervention program that contributes to the improvement of their health and quality of life. Second, the cervical cancer prevention education program developed by this study is a customized education program based on the cultural specificity and needs of Vietnamese immigrant women using the ADDIE model. [18] developed a cervical cancer prevention education program for immigrant women. In the study by [18], the origins of the married immigrant women were diverse. Thus, the cultural characteristics of the origins of married migrant women were not fully reflected. In this study, the research subjects were restricted to Vietnamese married immigrant women. In order to accurately grasp their current status, educational needs, vulnerabilities, and situational specificity, the contents and method of the education program were developed through the results of focus group interviews and the review of previous studies, thereby improving the participants understanding of the education program. Third, this study created and used illustrations in electronic lecture materials to help participants understand the goal of the education and to increase their intention to participate in preventive actions, which is the ultimate goal of the program. This feature is different from the cervical cancer prevention education program attempted in previous studies.

In this study, the first lecture was provided with a short story, “Booty Tam, American Married Immigrant Woman.” In each lecture, the participants were

encouraged to express their thoughts and obstacles to Pap testing through the main character in the illustration.

As a result, particular, the awareness of cervical cancer and the intention to prevent cervical cancer in the experimental group increased significantly compared to the control group. It indirectly suggests that the illustrations have been effective in inducing understanding and cooperation among Vietnamese married immigrant women who are not used to expressing their thoughts and feelings.

As a result of examining Pap testing within 6 months after providing educational program, the screening rate in this study was significantly higher than that in previous studies, suggesting that the educational program using illustrations was effective. Regarding the practice rate of cervical cancer screening within 6 months after the educational program, the research conducted by [23], which provided Chinese immigrant women in the U. S. with educational programs using videos, pamphlets and screening kits has the practice rate of 39.0%. A study on immigrant women residing in the United States by [22,29] has the practice rate of 61.7%, 65.8%. Compared to these previous studies, this study has the practice rate of 75.8%, indirectly indicating that the educational program was effective. Fourth, the educational materials developed by this study were produced in Korean and Vietnamese to share these materials with their spouses. This study is meaningful in that the Vietnamese married immigrant women actively participated in the program that includes their spouses in the curriculum.

Conclusion

In this study, randomized control study design was used to validate this study's effect, to provide a basis for practical application and widespread use of the cervical cancer prevention education program developed by this study. As a result of hypothesis test, the experimental group who received the cervical cancer screening program compared to the control group, has statistically meaningful 1) increase of the perceived sensitivity and 2) decrease of the perceived barriers among cervical cancer screening health beliefs. Through this, it can be concluded that the cervical cancer prevention education program developed by this study is a highly effective customized education program for promoting cervical cancer prevention behavior of Vietnamese married immigrant women. In the future, we hope that this educational program will be actively deployed to

multicultural family support centers, health centers, and various community organizations to prevent cervical cancer and to promote preventive health behaviors for cervical cancer.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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A Study on the Effect of Eclipta Prostrata Extract and MTS on the Improvement of Scalp Health and Prevention of Hair Loss for Workers in Their 20s and 30s

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Abstract

Background/Objectives: External and mental stress from hair loss degrades the quality of life and affects the interpersonal relationship and daily social life of individuals. Lately, due to an increase in hair loss population, various chemically synthesized products for hair loss prevention or treatment have been commercialized in the market. However, these products have well-known adverse effects. In order to prevent such adverse effects, this study aimed to develop a natural substance and utilize a tool that aids its transdermal delivery. This study intended to elucidate the scalp health and hair loss prevention effects of Eclipta prostrata and microneedle therapy system (MTS) use on the scalp of office workers in their 20s and 30s who have suffered from hair loss, in addition, to present a potential product for improving scalp conditions and preventing hair loss.

Method/Statistical Analysis: In order to identify the effects of the MTS and the Eclipta prostrata extract on improvement of scalp condition and prevention of hair loss, this study conducted scalp treatments on 24 office workers in their 20s and 30s who have suffered from hair loss by dividing them into three groups: MTS group, Eclipta prostrata group, and MTS-Eclipta prostrata group. The scalp treatment was performed for 10 weeks with one 30-min turn per week, resulting in 10 turns in total. The same home care products including shampoo and conditioner were distributed to all participants for use during the entire period of experiment. Hair density, hair thickness, effect on scalp improvement, and hairline distance were measured using a scalp diagnostic device (Kong Scope, Korea) and a measuring tape before, 5 weeks after, and 10 weeks after the experiment. Participants were then surveyed for satisfaction level after the experiment.

Findings: In the results, all three groups showed increase in hair density and thickness and a decrease in frontal hairline distance at both hairlines, 10 weeks after the experiment. Only the MTS-Eclipta prostrata group showed a statistically significant increase in hair density from 18 ea at 0 week to 19.43 at 10 weeks, hair line thickness, and frontal hairline distance changes. The Eclipta prostrata group also showed a significant increase in hair thickness. Furthermore, majority of the participants showed clean scalps with new hair growths 10 weeks after the experiment.

Improvements/Applications: It was revealed that co-treatment with MTS and Eclipta prostrata extract had more effect on hair density, hair thickness and hairline distance change. Furthermore, the satisfaction survey

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result after the experiment showed a positive response for hair richness and reduction in itching and sebum amount, thereby building self-confidence. Accordingly, it was proved that the use of MTS and the *Eclipta prostrata* extract is effective in scalp health and hair loss improvement.

Keywords: *Eclipta prostrata* extract, MTS (Microneedle Therapy System), Hair care, Hair loss, Scalp health.

Introduction

The external and mental stress from hair loss negatively affect the quality of life, interpersonal relationship, and daily social life of individuals. An increase in the number of hair loss population leads to an increase in the population that have suffered from hair loss-related symptoms as well. Therefore, creating demands for hair and scalp health products and treatments such as hair transplantation.

For accurate investigation of hair loss population, the data of number of patients who had been hospitalized or had been outpatients due to hair loss from 2013 to 2017 were acquired from the Healthcare Bigdata Open System^[1] provided by the Health Insurance Review & Assessment Service (HIRA).

According to HIRA, the number of hair loss patients treated in 2013 was 205,659. Also, there was a slight decrease in number from 208,688 in 2014 to 208,534 in 2015 and a significant increase from 212,916 in 2016 to 215,025 in 2017^[1].

Recently, there have been several studies and clinical trials that evaluate the efficacy of natural extracts on hair growth, for instance, cultured wild ginseng roots which was proven to facilitate hair loss prevention, hair growth, dandruff control, and have antibacterial properties^[2].

MTS is a device that can approximately create 200,000 micro-holes with its 192 microneedles to facilitate effective transdermal transport of compounds and induce collagen synthesis^[3]. According to a study, use of MTS on human dermis showed improvement in pores, pigment reduction, hair density, and hair thickness. Moreover, the use of traditional medicinal herb extracts, green tea, biota seed and MTS resulted in increased hair density^[4].

Eclipta prostrata L. refers to an annual or biennial plant that belongs to the Asteraceae family and typically grows in moist areas and in central or southern regions of

Korea. A damage to its stem causes a leak of Chinese ink-like black liquid which can be used to dye beard or hair black and to grow hair, a method used by the ancients as stated in *Uibangyuchwi*, the biggest oriental medicine encyclopedia. It has various names such as *Yejangcho*, *Mukallyeon*, *Mukttucho*, *Mukcho*, *Mugyeoncho*, *Hallyeonpul*, and *Haryeoncho*. In *Sinsuboncho*, it is named as *Eopungjang* and in *Dogyengboncho* as *Hallyeonja*, which is its generic name. In oriental medicine, *Eclipta prostrata* is characterized to have a spicy and salty taste and a warm property^[5, 6]. The entire body of *Eclipta prostrata* plant contains active ingredients such as saponin, nicotine, tannin, vitamin A, ecliptine, and thiophene compounds while its leaves contain wedelolactone and desmethylwedelolactone-7-glucoside^[7]. Of these, nicotine and wedelolactone have been known to cause the dark coloring of the liquid.

One study stated that *Eclipta prostrata* can be used for management of inflammation^[8]. Recently, both desmethyl-wedelolactone and wedelolactone were isolated from the leaf extract^[9] and 2-[butadiin-(1,3)-yl]-5-[buten-(3)-in-(1)-yl]-thiophen, a thiophene derivative, was separated from the entire body of the *Eclipta prostrata* plant^[10]. Other studies have reported on the biological activities of the compounds found in *Eclipta prostrata* such as their effects on liver function in hepatic carbon tetrachloride poisoning^[11], as well as mechanism of their hypoglycemic effect^[12, 13], anticancer effect^[14], hair growth effect in albino rats^[15], healing effects of ethanol extracts^[16], and immune-boosting effects^[17, 18].

The traditional oriental medicine literature show that *Eclipta prostrata* can change gray hairs to black, can provide anti-aging function^[19], and can be used for prevention and treatment of inflammatory diseases^[20, 21]. This study aims to elucidate the effects of *Eclipta prostrata* and MTS on scalp and hair loss in normal office workers in their 20s and 30s who have suffered from hair loss, in addition, to present a potential product for improving scalp conditions and preventing hair loss.

Method

- Study Subjects:** The participants of this study were 24 normal office workers in their 20s and 30s from K call center in Yun deung po-gu, Seoul. Their patterns of hair loss, types of scalp, and general characteristics were examined.
- Study Materials:** Carefully screened Eclipta prostrata was cleanly washed and dried, then matured with ultrasound waves within the solvent (1,3- Butylene Glycol 30% and Glycerin 5%) for 96 hours at 60°C. Afterwards, filtration was performed for extraction. The extraction ratio of Eclipta prostrata was 1:15~20, containing 5~6% of the original juice from Eclipta prostrata.

Table 1. Ingredient analysis

Compounding Ingredient	Weight (%)
Purified Water	62
Butylene Glycol	30
Glycerin	5
Eclipta Prostrata Extract	3
Total	100

3. Study Procedure

The comparison of variables of before and after the care such as hair density, hair thickness, effect on scalp improvement, and frontal hairline distance change, of male and female adult office workers in their 20s and 30s who have suffered from scalp troubles and hair loss is shown in Figure 2.

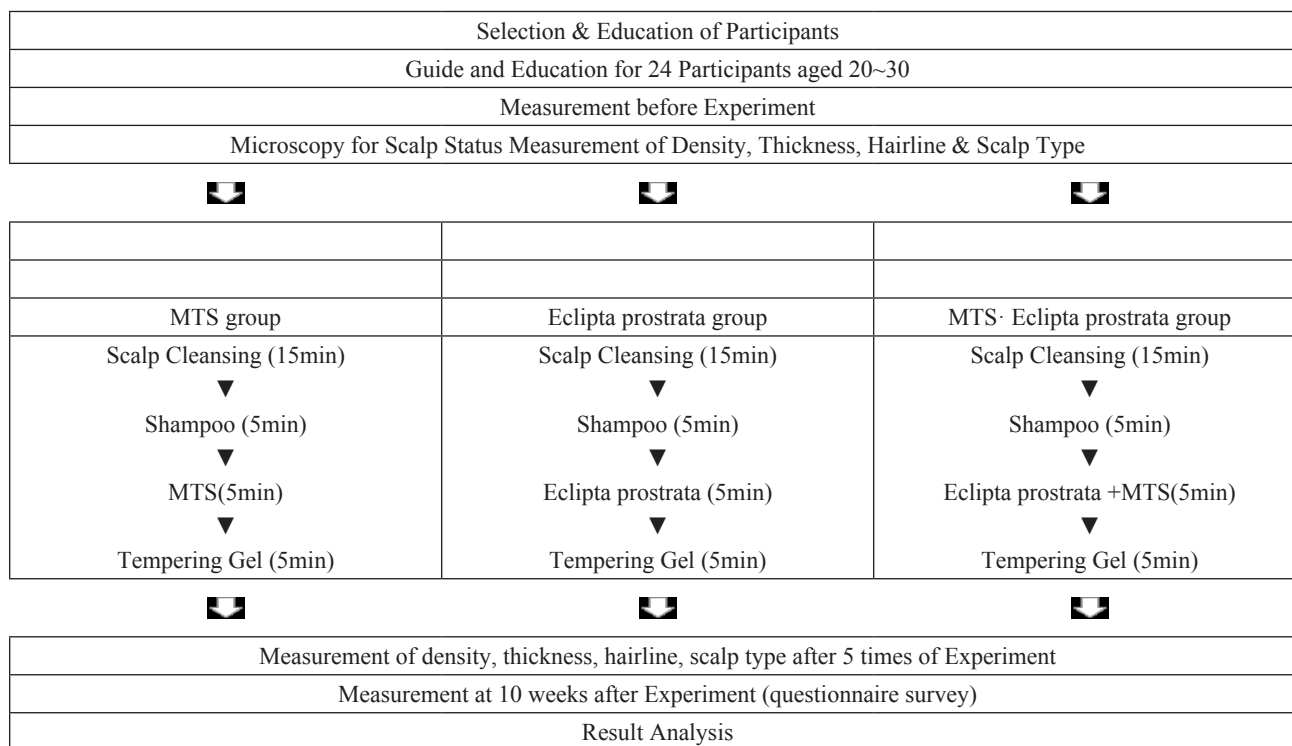


Figure 2. Whole Experiment Flow Diagram

- Analysis Methodology:** The acquired results were statistically processed using SAS (Statistical Analysis System version 9.1.3) and Statistics Program R (version 2.13.0).

Result

- General Characteristics of Participants:** The general characteristics, hair loss patterns, scalp

types, time of initial hair loss, and stress of participants were examined. The average age of the 22 to 30-year-old participants was 28. In terms of hair loss, no family history accounted for 45.8%, 33.3% from father’s side and 20.8% from mother’s side. Furthermore, normal stress accounted for 66.7% and scalp type fell into two, oily or dry, both 33.3%.

2. Hair Density Change before and after Experiment for each Group: The measurements revealed non-significant increased tendency in hair density in both the MTS and the Eclipta prostrata groups

while the MTS-Eclipta prostrata group exhibited a statistically significant difference with 18.00 ea at week 0 to 19.43 at 10 weeks after the experiment as shown in table 2.

Table 2. Hair Density Change before and after Experiment for each Group (Unit : ea/#)

Group	0 Week	5 Week	10Week	χ^2	Probabilit ^b (p value)
	M±SD				
MTS	19.23±3.34	19.32±3.27	19.98±3.37	1.237	0.0643
EPE	17.40±2.69	17.63±2.81	18.13±2.78	1.344	0.0703
MTS+EPE	18.00±2.92	18.63±2.95	19.43±3.08	15.073	0.0015**

** P < 0.01, # Unit Area 0.38cm×0.28cm

3. Hair Thickness Change before and after Experiment for each Group: The comparison of hair thickness at week 0 and at week 10 revealed an increase in all three groups. A statistically

significant difference was observed in the Eclipta prostrata and the MTS-Eclipta prostrata groups as shown in Table 3.

Table 3. Hair Thickness Change before and after Experiment for each Group (Unit : mm)

Group	0 week	5 week	10 week	χ^2	Probability ^b (p value)
	M±SD				
MTS G	0.0382±0.0065	0.0381±0.0059	0.0410±0.0062	1.258	0.0664
EPE G	0.0378±0.0081	0.0381±0.0084	0.0411±0.0078	11,563	0.0204
MTS+EPE	0.0374±0.0071	0.0382±0.0073	0.0409±0.0065	12.453	0.0153*

*P < 0.05

4. Frontal Hairline Distance Change: The results of frontal hairline distance, measured to a terminal hair, revealed a decreased tendency at 10 weeks after

the experiment in all three groups. Only the MTS-Eclipta prostrata group was statistically significant.

Table 4. Frontal Hairline Change before and after Experiment for each Group (Unit : cm)

Group	0 week	5 week	10 week	χ^2	Probabilit ^b (p value)
	M±SD				
MTS	13.19±1.63	12.52±1.54	0.67±0.09	0.42	0.1929
EPE	13.28±1.26	12.55±1.28	0.73±0.19	0.554	0.1465
MTS+EPE	13.33±1.51	12.45±1.51	0.88±0.23	13.572	0.0065**

** P < .01

5. Scalp Improvement: The scalp status of most participants showed blurry and generally reddened scalps with excessive sebum and dead skin cell-clogged holes, predominantly thin and weak hairs and empty follicles. Ten weeks post-treatment

revealed a nearly normal scalp appearance of pellucid and clean scalp with decreased amount of excreted sebum, clean holes, and new hair growth as shown in Figure 3.

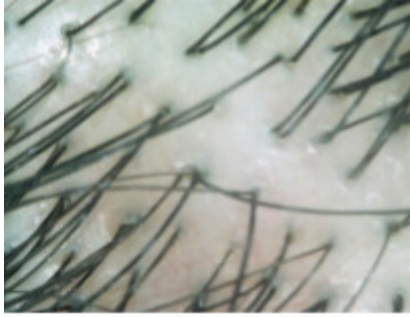



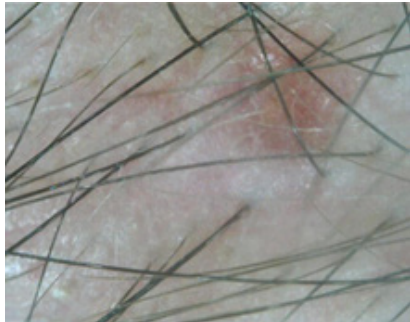
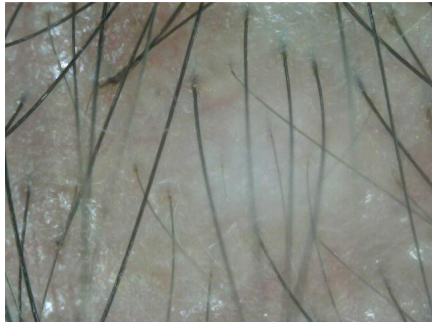


	Before	After
A		
B		
C		
D		

Figure 3. Scalp Status Change in MTS group before and after the Care

Discussion

This study was conducted by dividing the participants into a control group, which used a scalp improvement agent with the natural extracts and an experimental group, which added scalp scrubs. People with long-standing hair loss treatment failure had benefited from improvement thus, the Eclipta prostrata was observed to

have positive effects on the hairs and on the problematic scalps. The study demonstrated a notable effect on hair loss treatment in the control group which used scalp improvement agent with natural Eclipta prostrata extract and a significant improvement in hair growth and thickness in the experimental group that used scalp improvement agent, natural Eclipta prostrata extract, and

MTS. Furthermore, aside from improved problematic scalp, the latter had better improvement in the number and thickness of hairs compared to the control group that only used MTS.

Based on these results, it is deemed that the compounds of the *Eclipta prostrata* extract, such as saponin, tannin, amara, ecliptine (*Eclipta prostrata* with small leaves), vitamin A-like substances, and wedelolactone and demethylwedelolactone-7-glucosid that are compounds of nicotine and coumarin, have brought in antioxidative and antibacterial effects to human body, thereby improving blood circulation and preventing hair loss and dandruff formation. The study elucidated the effects of *Eclipta prostrata* and MTS only in participants who are office workers aged 20-30 years old, therefore, further studies by age groups and by scalp types are necessary.

Conclusion

This study compared the variables, which include hair density, hair thickness, scalp improvement effect and the frontal hairline distance change, of before and after the care in the male and female office workers in their 20s and 30s who have suffered from scalp troubles and hair loss. The results are as follows. Firstly, hair density of all three groups increased at 10 weeks after the experiment. Secondly, in terms of hair thickness, all three groups exhibited an increased tendency when comparing Week 0 and Week 10. Also, the *Eclipta prostrata* group showed a statistically significant difference. Thirdly, regarding frontal forehead hairline distance, the measurement results of the distance to a terminal hair revealed that a decreased tendency was observed at both hairlines at 10 weeks after the experiment in all three groups. The MTS-*Eclipta prostrata* groups had statistically significant difference in all variables. Lastly, most of the pre-treatment scalp status of the participants were overall red and blurry, had holes clogged with excessive sebum and dead skin cells, with predominantly thin and weak hairs, and had some empty follicles. Ten weeks later, however, it was observed that the status of most of the scalps were pellucid and clean, close to normal scalp appearance, and with presence of new hair growths, decreased amount of secreted sebum, and clean hole surroundings.

In summary, when co-treated with MTS and *Eclipta prostrata* for scalp care, a positive effect was observed in terms of hair density, hair thickness, and frontal

hairline distance compared to those of MTS or *Eclipta prostrata* alone, moreover, participants from all three groups showed satisfaction after scalp care.

Based on the findings of this study, *Eclipta prostrata* is expected to play the role of a safe anti-hair loss agent and scalp condition enhancer, and is thought to have a high potential as a cosmetic with an anti-hair loss function.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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A Study on the Selective Strengthening Exercise of the Quadriceps Muscle According to Various Squat Types

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Abstract

Background/Objectives: The purpose of this study was to identify the highest activation in Vastus Medialis (VMO), Vastus Lateralis (VL) and Rectus Femoris (RF) while performing various squat exercises to create an effective exercising method.

Method/Statistical Analysis: 40 healthy subjects (males 23, females 17) from S University were recruited. Subjects performed four different types of squats; General Squats (GS), Instability Squats on an unstable surface (IS), Knee Adduction Squats (KAS), and Wall squats (WS). The difference in the activation of VMO, VLO and RF were recorded during the various exercises were analyzed and recorded with the EMG.

Findings: Measurements of all the experiments were analyzed using one-way ANOVA. Within these results, RF showed the most activation during (WS) and the least activation during (KAS). However, there were no significant differences found between (GS) and (IS). VLO showed the most activation during (GS). On the other hand, there were no significant differences found within (IS) and (WS). In addition to our results, VMO showed the least activation during (KAS). All three muscles displayed different activation patterns during each squat exercise.

Improvements/Applications: Considering these findings, this study may help to design a more effective exercise for specific muscles when strengthening the leg muscles.

Keywords: Weight bearing exercise, Various squat, Base of support, Muscle activity, Selective Quadriceps.

Introduction

Modern science has made life convenient, but it has caused a decrease of activities resulting in an increase of health problems^[1]. Squat is the most commonly used^[2] and the best exercise for the quadriceps because it requires more movement of the joint than weightless exercises. It also stimulates the senses, functional

pattern of muscle recruitment^[3] and it equally applies force to the buttocks, thighs, and calf muscles and the trunk muscles^[4]. Closed chain movement, such as squat, is less prone to shear force due to increased compression of the femoral joint and co-contraction of the quadriceps and hamstring^[5]. It is said that it is important to keep the tibia perpendicular to the floor in order to avoid sprains^[6] and certain amount of anterior displacement in the knee can prevent excessive stress and back pain^[7].

The quadriceps play the most important role in lifting body weight^[8] and exercises that activate the quadriceps help prevent injuries. When weakened, it reduces walking speed, balance and increases the risk of knee osteoarthritis^[9-11]. It is suggested that atherapeutic approach should be developed to optimize the function of the quadriceps before muscle reintegration^[12].

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There are various method in performing the squatting exercise. Squatting on an unstable surface enhances postural orientation^[13], improve balance, and motor control while activating core muscles^[14-15]. It is also suitable for those who need to have low level training^[16-17].

Based on the anatomy that the VMO muscle reaches the distal part of Adductor Magnus^[18], it has been shown that VMO activation can be selectively obtained and strengthened through hip adduction^[19-20].

Muscle strengthening of the quadriceps through squat is considered functional because it promotes muscle mobilization, and stimulates the proprioceptive sensation^[21]. Squat has been extensively used in clinical practice but the effectiveness of the patient’s posture has not been clearly differentiated.^[22] In this study, we investigated which muscles were most active in various squats so we can design a more effective exercising method.

Method

1. Participants: [Table 1] 40 healthy adult men and women in Asan, South Chungcheong Province who did not have any musculoskeletal or any neurological diseases during the last 6 months were selected as the subjects for this study. Before participating in this study, subjects were sufficiently informed about the content and purpose of the study and filled out consent forms. This study was conducted with the approval of the Institutional Bioethics Committee of Sun Moon University (SM-201805-036-2). shows the general characteristics of the subjects. All values are mean±standard deviation

Table 1. General Characteristics (N = 40)

Types	Mean
Sex (M/F)	23/17
Age (Years)	20.8±1.43
Height (cm)	168.3±9.2

2. Procedures: [Table 2] The purpose of this study was to compare the muscle activity of RF, VLO, VMO of 40 healthy subjects according to the four types of squat exercises; General squat(GS), squats on an unstable surface(IS), squats with a ball between the knees(KAS), and wall squats with a swiss ball against their back(WS). The squat types differed between stable or unstable surfaces, knee adduction, knee abduction, and walls. Before exercise, the body

weight and height of the subjects were measured by a body composition analyzer then the subjects did warm up for 5 minutes. The squat experiment was performed after attaching the measuring pad to the location of the RF muscle, VLO muscle, and VMO muscle. During the squat, the legs were spread shoulder width with the subject facing forward. Each exercises were held in the respective order and was held for 10 seconds; GS, IS KAS, WS. The subjects took a 5-minute break upon completing each exercise. All of the squat types except the GS were guided multiple times and there was constant feedback in order to maintain the correct posture. All squat exercises were performed by bending the knee at 90° and the flexion angle was measured using a digital goniometer. [Figure 1, 2].

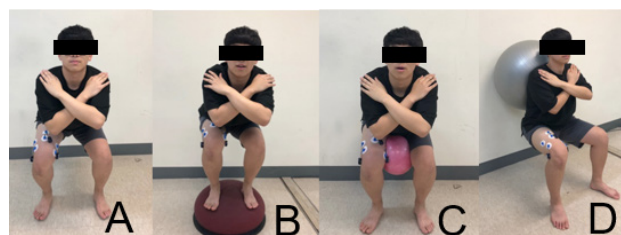


Figure 1. Types of Squats (A:General Squat, B: Instability Squat, C:Knee Adduction Squat, D: Wall Squat)

3. Measurement: In this study, EMG QUS100 (Zero wire EMG, Italy, 2009) was used to measure the muscle activity of the RF muscle, the VLO muscle, and the VMO muscle while the subjects were performing the experiment. Surface EMG, which evaluates the function of the bony muscle, can be used to electrophysiologically analyze the kinetic activity of each muscle.^[22] The pad of the VLO was attached laterally 55° and 10cm above the knee, and the VMO was attached medially 55° and 4 cm above the knee^[19]. In order to reduce the skin resistance of the electromyographic pads, the attachment site was depilated.

4. Statistical Analysis Result: [Figure 2] For data analysis, the SPSS/PC ver 22.0 for windows program was used. One-way ANOVA was used to compare the muscle activity of each exercise group. All study results were subjected to a post-test least significant difference (LSD) test, and all statistical significance levels were set at p <.05. The root mean square (RMS) value of the EMG was measured and the filtering bandwidth was 20 ~ 450Hz. And a 60Hz notch filter was used to reduce the static.

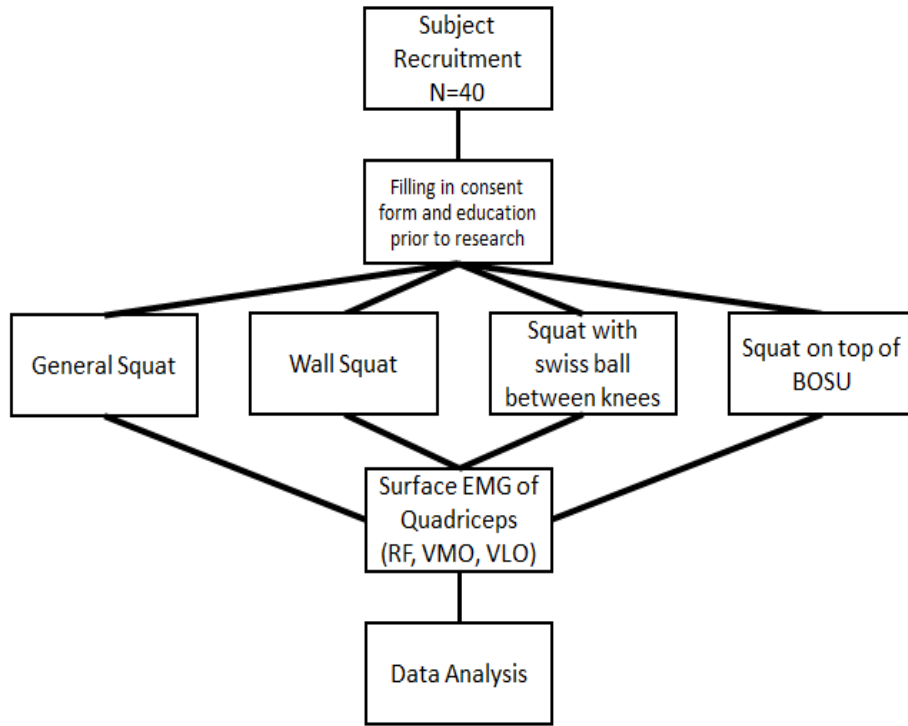


Figure 2. Flow diagram of experimental protocol

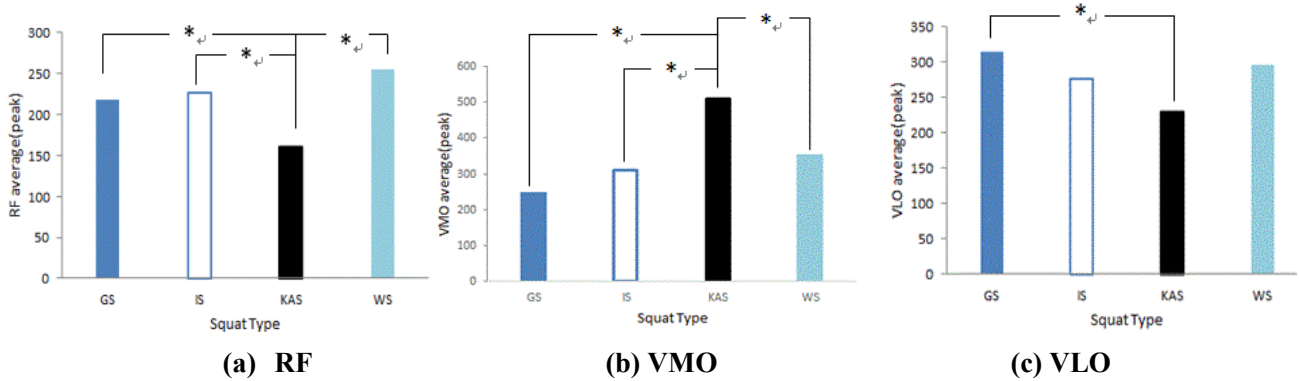


Figure 3. Muscle activation average according to type of squats for RF, VMO, VLO

Table 2. Types of Squat

Type	Squatting on a stable surface
GS	Squatting on an unstable surface
IS	Squatting on an unstable surface
KAS	Squatting while inducing knee adduction
WS	Wall squatting while leaning against a ball

GS: General Squats, IS: Instability Squats on an unstable surface, KAS: Knee Adduction Squats, WS: Wall squats.

Result

Changes in muscle activity according to the squat type were significantly different in some muscles.

- 1. RF activation average according to types of squat:** [Table 3] In the RF, when comparing the results of GS (133.92±21.18) and IS (93.54±14.79), GS and WS (183.24±28.97), IS and KAS (41.45±6.55), IS and WS, and finally, KAS and WS, there was no significant difference (p>.05). However, when comparing KAS to every squat there was a significant difference (p<.05). Considering these findings, GS, IS and WS produced the most activation within RF [Figure3 (a)].
- 2. VMO activation average according to types of squat:** [Table 3] In the VMO, when comparing the

results of GS (104.14±16.47) and IS (168.22±26.60), GS and WS (153.61±24.29), IS and WS, WS and GS, there was no significant difference (p>.05). However, when comparing KAS (70.68±11.18) and GS, and other squats, significant differences were found (p<.05). Due to these results, we have concluded that the KAS (70.68±11.18) showed the most activation in the VMO [Figure 3 (b)].

3. VLO activation average according to types of squat: [Table 3] In the VLO, when comparing the results of GS(88.67±14.02) and IS(160.01±25.30), GS and WS(195.90±30.97), IS and KAS(96.58±15.27), IS and WS, KAS and WS, there was no significant difference (p>.05). However, when comparing GS and KAS, there was a significant difference (p<.05).

Therefore, it was concluded that GS produced the most activation in the VLO [Figure 3 (c)].

Table 3. Quadriceps muscle activation according to types of squats (RMS)

Muscle	Squat Type I J		I-J	F	p
RF	GS	IS	4.34	-6.99	1.00
		KAS		67.07*	.02
		WS		-27.55	.97
	IS	GS		6.99	1.00
		KAS		74.05*	.00
		WS		-20.57	.99
	KAS	GS		-67.07*	.02
		IS		-74.05*	.00
		WS		-94.62*	.02
	WS	GS		27.55	.97
		IS		20.57	.99
		KAS		94.62*	.02
VMO	GS	IS	34.34	-75.73	.10
		KAS		-274.39*	.00
		WS		-48.87	.46
	IS	GS		75.73	.10
		KAS		-198.66*	.00
		WS		26.86	.97
	KAS	GS		274.39*	.00
		IS		198.66	.00
		WS		225.52*	.00
	WS	GS		48.87	.46
		IS		-26.86	.97
		KAS		-225.52*	.00

Muscle	Squat Type I J		I-J	F	p
VLO	GS	IS	2.38	31.72	.85
		KAS		79.56*	.00
		WS		13.59	.10
	IS	GS		-31.72	.85
		KAS		47.85	.50
		WS		-18.12	.10
	KAS	GS		-79.56*	.00
		IS		-47.85	.50
		WS		-65.97	.31
	WS	GS		-13.59	.10
		IS		18.12	.10
		KAS		65.97	.31

*p<.05 Mean±standard deviation, RF (Rectus Femoris), VMO (Vastus Medialis Oblique), VLO (Vastus Lateralis Oblique), GS (General Squat), IS (Instability Squat), KAS (Knee Adduction Squat), WS (Wall Squat).

Discussion

The purpose of this study was to investigate the differences in muscle activity of the RF, the VMO muscle, and the VLO muscle while performing GS, IS, KAS, and WS. Blanpied suggested that the quadriceps were required to assist the hip joint during squatting^[23]. The VMO is physiologically the weakest muscular muscle^[24] and is active during knee stabilization, knee extension and lateral movement^[25]. VMO is the first to exhibit atrophy; once weakened, it can cause an imbalance in the muscles and increase the lateral movement of the knee^[26-28] which results in various diseases^[29]. Therefore, for the purpose of this study, it was necessary to know the ratio of the muscle activity of the VMO, the VLO, and RF muscle.

There were significant differences in some muscles according to each squat type. For the RF. there was a significant difference in KAS with GS, IS, and WS. It can be seen that excluding KAS, the GS, IS, and WS approach are good exercise method for activating the RF muscle. When Shawn R (2010) performed GS body weight shifted to the tip of the toe, indicating that muscle activity was high in the RF^[30]. Nairn (2016) also supported these results by stating that squatting on an unstable support surface resulted in high muscle activity in the RF^[31]. In addition, Felipe (2011) reported that the wall squatting against a swiss ball was effective in producing muscle activity of RF.

In the VMO muscle, there was a significant difference between KAS and GS, KAS and IS, KAS and WS ($p > .05$). respectively. In HyoukHyong (2015) reported that a squat with isometric adduction using a ball was effective in selective activation of VMO^[32], which aligned with our results.

Shawn (2010) reported that there was a significant difference in muscle activity of the VLO muscles during a traditional squat^[30]. Likewise, there was significant difference in GS, IS, WS movement in the RF, and in the muscle of the VMO, the most significant difference was found in the KAS exercise.

This study has some limitations. First, it cannot be generalized to patients and all ages because it is conducted on adults in their 20's. Second, these results were done on a short-term therefore, the results of a long term test is unknown. Third, it was assumed that the signal from EMG was muscle activity. Finally, the subject's fatigue may affect the outcome by repeating the inter-experiment squat.

Conclusion

In order to investigate the muscle activity according to posture, each muscle was compared and analyzed. In the case of the RF muscle, a significant difference was found in all four squat method; GS, KAS, IS, and WS. The most significant difference in the VLO was found in the KAS. Finally, in VMO, there was a significant difference in the GS. Therefore, it was found that the squat type that is most effective for the selective strengthening of the RF is GS and IS WS, and for the VMO, the most effective exercise the KAS. In addition, we found that the maximum activation of the VLO was shown greatest during the GS.

Through the use of these results, we hope to suggest an effective exercise method for the selective muscle strengthening of the RF, VLO and VMO respectively.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Change of Serratus Anterior Muscle Thickness According to Knee Flexion Angle During Knee-Push Up Plus Exercise on Sling

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Abstract

Background/Objectives: The purpose of this study is to compare the change of thickness of serratus anterior muscle to different angles of knee flexion when knee push up plus (KPP) exercise is conducting on an unstable surface (sling).

Method/Statistical Analysis: There were 30 healthy young male and female students randomly selected and divided into 3 different groups along different knee flexion angles on an unstable surface (sling). The three groups of ten did KPP exercises on the sling. The muscle was measured before and after the exercise.

Findings: All three groups showed some changes in the thickness of the muscle. The group with the biggest change was the 60° knee flexion, followed by 75° and 90° groups.

Improvements/Applications: Based on the results, all experimental groups showed some differences with KPP exercise conducted on an unstable surface (sling) and especially the group with the lowest angle had the most effect. Therefore, it is concerned that a lower knee flexion angle can be more effective on the KPP exercise.

Keywords: *Serratus anterior muscle, push up plus exercise, unstable support surface, knee flexion angle, thickness change, ultrasonography.*

Introduction

Neck pain is also very common following backache symptoms, and patients with neck pain can improve forehead posture. The posture gives some effects on the position of the shoulder joint and its kinematics^[1]. To treat the pain and the abnormal stance, it can be helpful to do stabilizing exercises for shoulder and retraining serratus anterior(SA) muscle to control muscle^[2].

SA is quite important to make shoulder muscle stable. Also, the proper function of SA muscle helps

to keep normal scapulohumeral rhythm while raising arms up. When the humerus is flexion and external rotation, SA muscle has the shoulder blade remain in a stable position. Moreover, SA muscle can stop winging scapular and help the shoulder blade stay in posterior tilt while practicing upward rotation. SA muscle has an important role for stabilizing the scapula and its settlement influence on shoulder stabilization. Thus, many treatments and exercise therapy protocols have been studied to activate SA muscle for prevention and rehabilitation of shoulder joint dysfunction^[3].

Recently PUP (Push-Up Plus) exercise has been widely used as a type of exercise to rotator cuff. PUP is the exercise to increase the function of SA muscle and decrease extremity muscle activity. Also it is highly recommended because it shows the highest average of muscular activation compared to other activation exercises for SA muscle^[4]. There are several ways of

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PUP exercise such as Standard Push-up Plus (SPP), Knee Push-up (KPP) with kneeling SPP, Wall Push-up (WPP) with standing and putting hands against the wall, and other exercises with applying SPP. These alternative ways applied SPP are to help patients to put less or limitation on weight load when they cannot repeat SPP at the early stage of rehabilitating program^[5].

PUP exercise is an exercise through repetition of the scapula’s protraction and retraction with hands supporting either unstable or stable support sling. It is used as a therapy for the patients who have injured or damaged shoulders to improve the rehabilitation and various kinesitherapies have been developed with different flexural angles of the shoulder, many types of support surfaces and the positions of supporting hands.

According to previous studies, PUP exercise on an unstable support surface (sling) has more effective than that on a stable support surface (sling)^[6,7]. Additionally, there was another result showing that shoulder 110 flexion has more efficacious than other shoulder angles^[8]. However, there was no study to show us which knee flexion angle can be the most efficient to do PUP exercise. Therefore, the aim of this study was to find out the most effective way for stabilizing shoulder muscle comparing the thickness of SA when trying different knee flexion angles for KPP exercise on an sling.

Materials and Method

1. Subjects of Study: The subjects were healthy young adults who volunteered to participate in the study. The experiment was conducted with a short orientation about its purpose and its process. Thirty healthy young male and female adults in their 20’s, who do not have any pain on shoulder or knee joints for the past 6 months, musculoskeletal system disorder on shoulder or knee joints in the past or now, any experience of surgical procedure, physical damages or disorders on other parts of the body, were randomly selected. This study proceeded with

the bioethical approval of IRB. (Approval number: SM-2018-05-034-2)

2. Instrument and Method:

- (a) **Instrument:** eZono 3000 was used to measure the thickness of SA muscle in the study. Ultrasonography imaged the structural feature of muscle in the body^[9].
- (b) **Method:** The measurements were conducted by the tester who fully knew about the study and the tester measured the subjects 3 times to reduce errors and then measured the thickness of SA muscle on the clearest image [Figure 1.(a)].

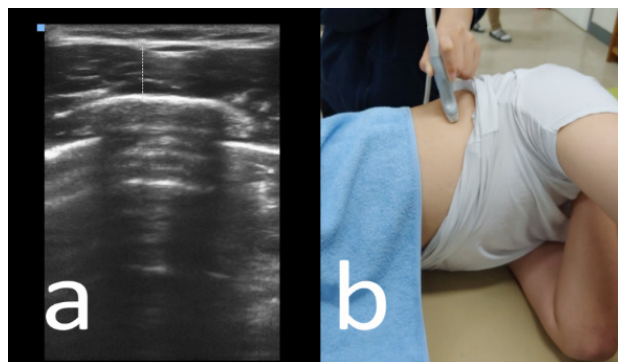


Figure 1: (a) Ultrasonography by imaging of SA muscle (b) Measurement posture using ultrasonography

For the measuring process, the subjects lay down on their side and put one of their arms up. Then we put the ultrasonography horizontally around the fifth rib and measured the thickness of serratus anterior muscle which is located right above its rib shadow^[10] [Figure 1.(b)].

3. Analysis: In this study, 30 adult males and females who had no abnormality in their shoulders were randomly selected and divided into 3 groups. The first group, Group 1 for knee flexion 90°, the second group, Group 2 for 75°, and the third, Group 3 for 60° [Table 1], [Figure 3].

Table 1: General Characteristics of the subject (N = 30)

Characteristic	group 1 (n=10)	group 2 (n=10)	group 3 (n=10)
Age (y)	21.05±1.72	20.80±1.03	22.00±3.12
Height (cm)	168.78±10.69	170.12±9.06	165.42±9.38
Weight (kg)	71.56±11.37	69.35±12.09	73.13±10.98

group 1: knee flexion 90°, group 2: knee flexion 75°, group 3: knee flexion 60°

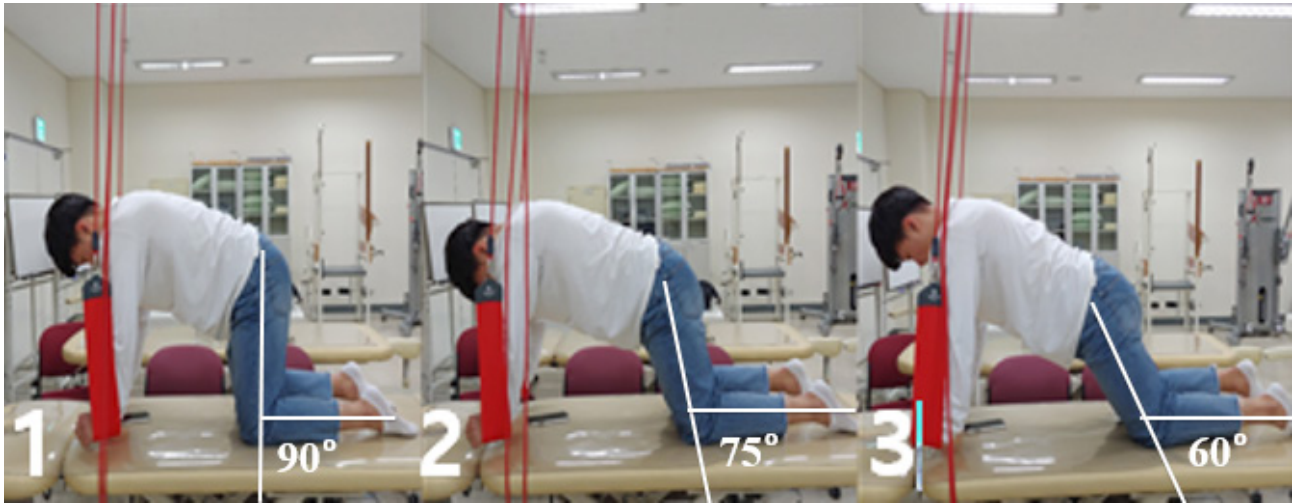


Figure 3. Posture by group. group 1: knee flexion 90°, group 2: knee flexion 75°, group 3: knee flexion 60°

The groups were divided by different angles of knee flexion and degrees of the lines between the distance of fibula lateral line and femur lateral epicondyle and the distance from femur lateral epicondyle to femur lateral line in crawling position. Each group had 10 people; 3 were female and the rest were male.

Before the experiment started, there was an orientation to explain about the study and teach the participants about the exercising postures. For PUP exercise, they put the knees down and bent shoulder in right angle with their hands on an unstable surface (sling). To make 90° of shoulder flexion, hands were put as wide as shoulders and posed in an external rotation which performs optimal muscle activation^[8,11,12]. In this position, the protraction and retraction of the shoulder blades were repeated in 10 times for 10 seconds per set. During 3 sets, there was a 30-second break between sets. The three groups had done the exercise with different settings of the knee flexion angles twice a week.

The results of the differences of the thickness of SA muscle before and after the PUP exercise were compared to study the change of the muscle along the different angles of knee flexion for PUP exercise on an unstable supporting surface (sling). The instrument, ultrasonography measured the thickness for three times then the clearest image was chosen to look [Figure 4] below shows the process of the experiment.

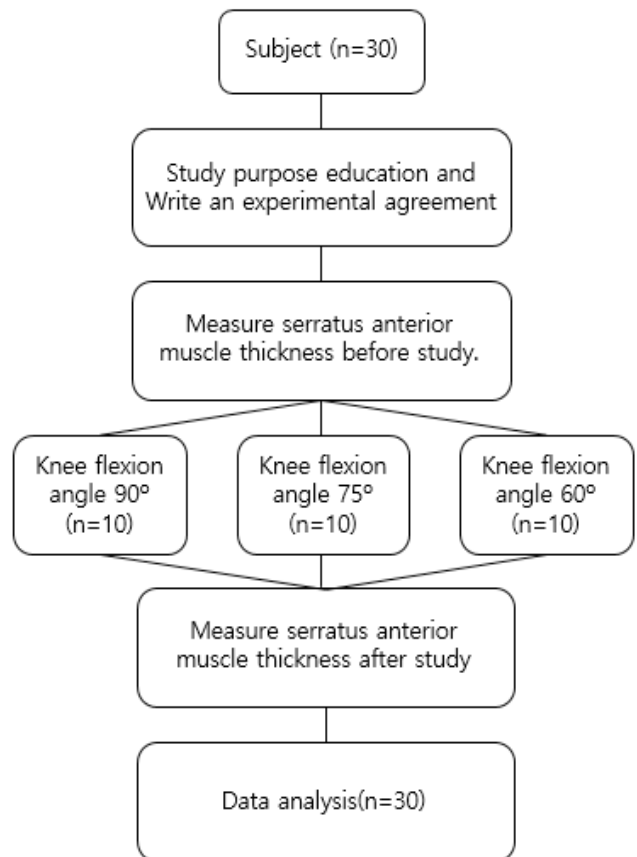


Figure 4. Experiment protocol flow chart

4. **Statistical Analysis:** All the values of the experiment were calculated with SPSS/PC ver. 20.0 for window program. Matching sample T-test was used to compare the groups before and after. For the comparison of the average of the groups, one-

way-layout analysis of variance was used and post verification method was used to show the difference between factors. Significant levels were set $p < .05$ to verify statistics.

Result

[Table 2] shows the different thickness of SA muscle of each group when the KPP exercise had done on an unstable supporting surface (sling) twice a week.

Table 2: Before and after each exercise group serratus anterior muscle thickness Average (N = 30)

	Before exercise	After exercise	Response difference	t	p
Group 1	5.27±1.96	5.64±1.99	.37	-12.33	.00***
Group 2	5.97±1.63	6.61±1.87	.64	-6.12	.00***
Group 3	5.66±1.57	6.55±1.62	.89	-11.40	.00***

group 1: knee flexion 90°, group 2: knee flexion 75°, group 3: knee flexion 60°, * $p < .05$, ** $p < .01$, *** $p < .001$

Before the exercise, Group 1 with right angle got the average of 5.27±1.96, Group 2 with 75° got 5.97±1.63 and Group 3 of 60° had 5.66±1.57 for the average value. After the exercise, the first group with 90° got 5.64±1.99 on the average of the muscle change, the second got 6.61±1.87 and the third had 6.55±1.62 average. Therefore, there was some difference in comparing the change of the thickness of SA muscle ($p < .05$).

Moreover, like [Figure 5] shows the increase on average before and after conducting the exercise, the changes between Group 1 and 2 and between Group 2 and 3 did not show enough compared to no difference between Group 1 and 3 on the thickness change of SA muscle.

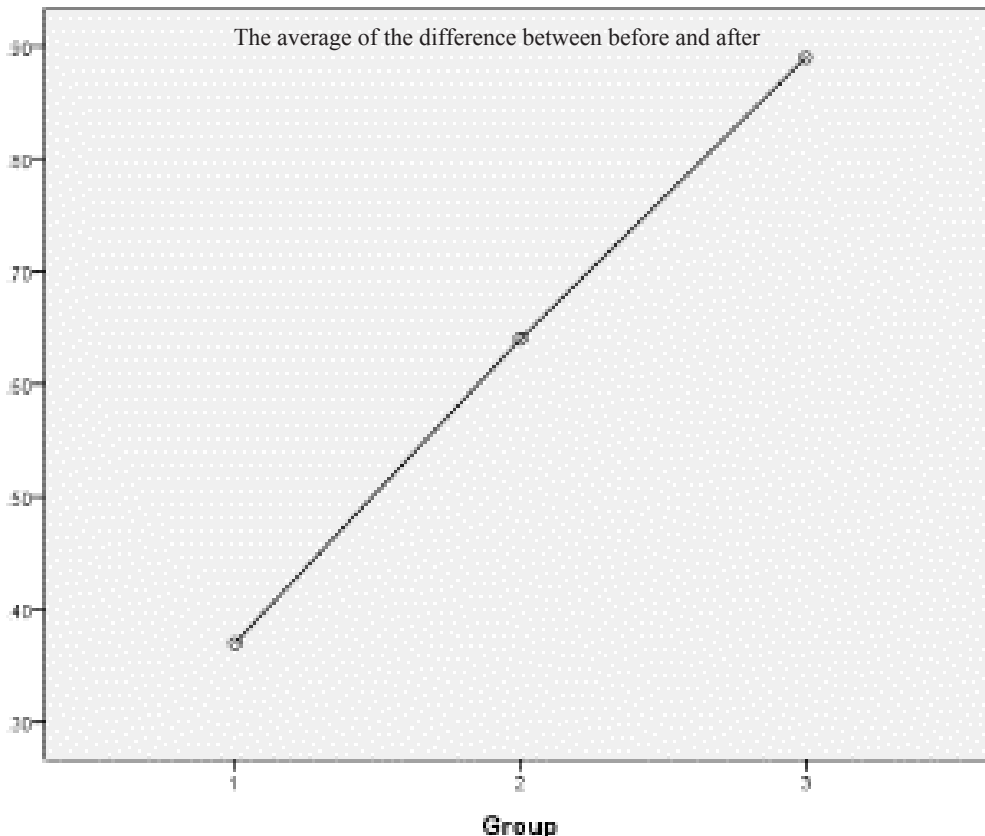


Figure 5. The mean of the before and after difference of each group

Discussion

This experiment was done to show the difference of the SA muscle thickness before and after the exercise. The three groups all got some positive results after conducting KPP exercise on an unstable supporting surface (sling). The biggest difference was shown from the knee flexion 60°.

The SA muscle observed in the study can stabilize the shoulder muscle and its exercise can help to release the neckache and control and relax forward head posture pain^[1]. According to one study found that applied PUP exercise can be generally used to treat patients for shoulder rehabilitation and when doing the exercise in kneeling position, the shoulder blades protraction can more activate serratus anterior muscle^[4]. Additionally, based on another experiment by Ludewig, P. M. et al. SSP exercise has shown the highest level of SA muscle activity among Standard Push-Up Plus Exercise (SPP), Wall Push-Up Plus Exercise (WPP), Elbow Push-Up Plus Exercise (EPP), and Knee Push-Up Plus Exercise (KPP) had done on stable surface (sling), followed by KPP, EPP, and WPP. In addition, these exercises can be good alternatives for SPP exercise^[5]. Jeong, S. Y. et al. found that PUP exercise with a sling (as unstable supporting surface) increased SA muscle activation more than that on stable supporting surface. Also, this showed a sling can bring more positive activation on the shoulder muscles^[7].

Based on the studies above, the study we conducted focused on serratus anterior muscle which stabilizes muscles on the shoulders, doing PUP exercise to help muscle movement. Although Ludewig, P. M. et al. said that SPP exercise showed the most muscle activation in her study, upon consideration of female participants in this experiment, the study we conducted chose KPP exercise which is a little bit easier to do and has the second highest muscle activation results in her study. KPP exercise was conducted on unstable supporting condition (sling) because muscle activity of SA muscle is higher when PUP exercise is conducted on unstable surface.

Cho, S. B. et al. and his researchers found shoulder external rotation made the highest level of SA muscle activity compared to other shoulder angles, internal rotation and neutral position^[3]. In the current study, when the PUP exercise was performed at 10, 20, and 30% wider than shoulder width and 10%, 20%, and 30% narrower than the shoulder width and shoulder width,

The SA muscle activity was the highest at the shoulder width^[11]. There was another experiment by Lee, S. Y. et al. to find which shoulder flexion angle can have higher level of SA muscle activity. 110° of the flexion showed the most activation rate on the muscle followed by 90° and 70°^[8]. The experiment we did accepted the factors from the previous studies which could make the highest activation of SA muscle, shoulder external rotation and hand position as the shoulders apart. Also 90° of shoulder flexion could be one of the factors for this experiment. Even though they showed the result that 110° had the most activation when PUP exercise was done, we chose 90° which showed the second better activation on SA muscle considering the truth that all participants in the study by Lee, S. Y. et al. were healthy male adults. To check the factor about different weight load, we had an experiment on knee flexion angles. There was a significant difference on knee flexion 60°.

The result showed that unstable surface stimulates ones' proprioception to encourage SA muscle activation. The sense of proprioception and the stability of joints can be improved through weight load^[13]. This can bring 20% more of maximum voluntary contraction of SA muscle through gradual load and PUP exercise stimulating the proprioception^[14].

The limitation of this study is that it is not possible to generalize research to people of all ages because they have been experimented with healthy men and women in their 20s. Also, during the exercise, there are some difficulties to keep balance on unstable supporting surface (sling) and to have hard exercise intensity along narrower knee flexions. Lastly the experiment has been done with a fewer study subjects.

Later studies will increase the number of subjects to obtain more reliable research results. We propose additional studies that can maintain a constant posture such as fixing the position of the head by placing the bar on the head during KPP. Moreover, due to the exercise in unstable supporting surfaces (slings) when establishing treatment plans, continuous study will be required by a variety of subjects to consider musculoskeletal patients with knee or shoulder problems or a nervous system patient with a problem with balance.

Conclusion

For the study, healthy female and male adults in 20s participated in the exercise with each knee flexion option like 60°, 75°, and 90° on the unstable surface. Then it

showed that the group with 60° had the biggest change, .89mm, on the thickness of SA muscle comparing before and after the exercise. The second group performed on 75° flexion was following with the average .64mm change. Lastly, Group 3 had got the smallest change .37mm on the thickness of the muscle. Between the groups of 60° and 90° of knee flexion, there was a significant difference in the averages they got. Thus, the experiment showed that PUP (Push-up Plus) exercise was the most effective with the 60° of knee flexion which put the most weight load on.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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A Study on the Recognition of Child Abuse and Countermeasures

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Abstract

Background/Objectives: With the recent emergence of child abuse as a social issue, national responsibility, not a family problem, is being emphasized. Child abuse is taking place in a private space of family. Abuse by biological parents is occurring continuously.

Method/Statistical Analysis: This study conducted a survey of 300 children's mother with elementary school students living in area C. Recognition of child abuse by type and awareness of how to deal with child abuse were investigated.

Findings: As a result, awareness of the seriousness of the occurrence of child abuse was high. However, parents' experience of finding abused children appeared relatively low. This is a result of parents' inability to clearly distinguish child abuse and a lack of information about it.

Improvements/Applications: Therefore, it is necessary to establish clear criteria for child abuse and provide correct knowledge through regular parental education and promotion. In addition, practical measures such as legal sanctions are needed to deal with child abuse cases.

Keywords: *Attitude, Child abuse, Countermeasure, Mother of a school-age child, Recognition.*

Introduction

Child abuse is a criminal act that negatively affects the physical, emotional, and social development of children and causes many problems. Therefore, not only is prevention of child abuse important, but it also needs to be made efforts to find the abuse before it gets worse. The nation has long taken it for granted that parents have the right to discipline and discipline children in a patriarchal large family culture. Childhood should not be ignored or abused just because it is a child, nor should abuse be justified just because it is a parent^[1]. However, compared to advanced countries, social awareness of the problem of child abuse in households was relatively low. It wasn't until recently that child abuse emerged

as a serious problem that related laws and systems were reorganized^[2]. The definition of child abuse varies. Child abuse is a comprehensive term that includes all forms of child abuse and neglect, generally meaning deliberate acts of delegation and neglect^[3]. This extends to not only physical abuse but also emotional, sexual and neglect. In our country, 7 of Article 3 of the Child Welfare Act, "Child abuse refers to adults, including caregivers, committing physical, mental and sexual violence or abuse that could harm the child's health or well-being, or hinder normal development, and child caregivers abandoning or neglect the child," which includes passive neglect as well as active abuse.

Physical abuse refers to the deliberate or accidental physical injury to a child. Objectively obvious traumatic bodily injury means that a child is subjected to severe or severe beating, unprovoked beating, and repeated beatings^[4]. Emotional abuse does not directly inflict physical damage on children, but it refers to the damage to a child's sense of self-respect by parents ignoring or hating them and discriminating against or verbally abusing other siblings. Sexual abuse refers to forcing

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an immature child to damage a sexual body part or requiring a child to come into contact with a sexual body part, which he or she has been forced to do^[5].

Obligation refers to any act that can hinder the normal development of a child by the caregiver's deliberate and repeated neglect of child care and protection to the type of neglect is distinguished by physical neglect, educational neglect, medical neglect, emotional neglect, and sexual neglect. Physical neglect includes not providing basic shelter, not protecting children from injury and danger, and leaving the child in a dirty environment or in dangerous condition. Educational neglect includes the act of allowing child absenteeism, not caring for school supplies, and neglecting special educational needs. Medical neglect includes not taking the necessary medical treatment for children and not vaccinating children who need vaccinations. Emotional neglect refers to the inability of parents or dependent children to be encouraged to develop growth because they are not interested in or very interested in children. It can be said that children do not talk, or show affection by stroking or touching. Emotional neglect arises from parents' lack of affection or neglect. Sexual neglect means the same state of letting a child be exposed to sexual assault or sexual exploitation^[2].

In recent years, various types and ranges of abuse have occurred in Korea, ranging from simple physical abuse to serious overlapping abuse, and the number of cases of abuse has also been on the rise. The number of cases of child abuse reported in Korea increased by more than 16 times from 2,105 in 2001 to 34,169 in 2017. According to the 2017 National Child Abuse Status Report, overlapping cases accounted for 10,875 cases (48.6%), followed by 4,728 cases of emotional abuse, 2,728 cases (21.1%), physical abuse, 3,285 cases (14.7%), neglect (22.5%) and sexual abuse 692 cases (3.1%). In particular, 76.8% of the perpetrators of child abuse cases that occurred in 2017 were biological parents, while 80.4% of the abuse locations were homes^[6].

The serious reason for this problem is that the victim is physically and mentally immature and abused by a trusted and dependent guardian of a young child who lacks self-defense capabilities^[7]. Child abuse not only causes physical damage, such as simple bruises and fractures, but also leads to death in severe cases, psychologically damaging the development of self-function, which seriously affects the development and adaptation of children. Nevertheless, many parents and

adults in society are not aware that they are abusing their children. There needs to be a change in the idea that corporal punishment is necessary to discipline children. Also, the idea that parenting is a parental right and cannot be interfered should be changed^[8]. To prevent the occurrence of child abuse, we need to educate the negative aspects of corporal punishment in child rearing, and to educate the effective method of parenting. Parents who raise and protect children do not regard child abuse as abuse, but as discipline or not abuse, so it is necessary to improve awareness of it. An expanded awareness of child abuse is needed to first recognize the importance of parents' role in protecting abused children.

Therefore, it is necessary to ensure that education and promotion of child abuse can be done first to parents who are most closely related to the child as well as to the reporting officer. This was done because studies on parents' awareness and attitudes toward child abuse were necessary. The results of the study will help raise awareness of child abuse and help prevent and treat child abuse quickly.

Method

This study is a study on the perception and attitudes of child abuse among primary school children to find out their parents' perception of child abuse as a social problem. This study was conducted on 300 mothers of students attending two elementary schools located in area C. This study required that questionnaires be distributed and responded online from 2 March to 10 March 2019. First, they agreed to participate in the study on their own and stated that their responses should be kept secret in addition to the study.

In order to explore recognition by type of child abuse (physical abuse, emotional abuse, sexual abuse, neglect) based on the Child Welfare Act, this study used a measure of child abuse assessment developed by Hong and Lee^[9]. The tool consists of 29 questions, classified into 8 questions of physical abuse, 5 questions of emotional abuse, 7 questions of sexual abuse, and 9 questions of neglect. To identify the perception by type of child abuse, the survey was answered with a five-point equilibrium scale of "Not at all" (1 point) "I don't think it's abuse" (2 point) "I don't know if it's abuse" (3 point) "I think it's abuse," (4 point) and (5 point).

'Awareness of Finding and Countermeasures for Abuse Children' used a tool developed by Baek^[10]. The contents were composed of seven total questions,

including how to cope with abuse, how to report child abuse, whether to recognize child abuse, whether to recognize child abuse, whether to operate a reporting phone, whether to recognize a reporting obligation, and whether to recognize a reporting officer in Article 26 of the Child Abuse Act.

Result and Discussion

1. General Characteristics: The general characteristics consisted of items of respondents’ age, educational level, religion, income level and occupational status <Table 1>. The comparable figures were 62.2% in their 40’s, 31.8% in their 30’s and 6% in their 20’s. Fifty-eight. 3% of college graduates, 35.2% below high school graduates, and 6.5% above graduate school graduates. Religion was 45.8% without religion, 33.2% with Christianity, 13% with Catholicism and 8% with Buddhism. The income level was 61.5% below 3 million won to 5 million won, 30.2% over 5 million won and 8.3% below 3 million won. The employment status was 74.5% without a job and 25.5% with a job.

Table 1: General characteristics

Categorization		N	%
Age	20’s	18	6.0
	30’s	95	31.8
	40’s and above	187	62.2
Academic background	Below high school graduation	106	35.2
	A college graduate	175	58.3
	Graduate degree or higher	19	6.5
Religion	Christianity	100	33.2
	Catholic	39	13.0
	Buddhism	24	8.0
	No religion	137	45.8
Monthly income	Less than 3 million won	25	8.3
	3 million won - 5 million won	184	61.5
	5 million won or more	91	30.2
Occupation status	Yes	77	25.5
	No	223	74.5

2. Recognition of abuse by type of child abuse: Awareness of child abuse is shown in Table 2. Child abuse was the highest with 4.48 points, physical abuse with 4.46 points, emotional abuse with 4.33 points, sexual abuse with 4.88 points and neglect with 4.29 points, while parental awareness of child abuse was generally high.

Table 2: Recognition of abuse by type of child abuse

Categorization		M	SD
Child abuse		4.48	0.333
Type	Physical abuse	4.46	0.389
	Emotional abuse	4.33	0.456
	Sexual abuse	4.88	0.321
	Neglect of duty	4.29	0.435

- 3. Differences in the perception of child abuse according to general characteristics:** A look at the differences in type perception of child abuse showed that there were no differences in age, religion, income level and job status, and there were differences in education level. Those who answered that they were college graduates and those who graduated from graduate schools were higher than those who had less than a high school diploma.
- 4. Differences in the perception of physical abuse according to general characteristics:** A look at the differences in perception of physical abuse by type showed that there were no differences between age, education level, religion, and income level and job status.
- 5. Differences in the perception of emotional abuse according to general characteristics:** A look at the differences in the type of perception of emotional abuse showed that there were no differences between age, education level, religion, and income level and job status.
- 6. Differences in the perception of sexual abuse according to general characteristics:** A study of the differences in perceptions of different types of sexual abuse showed that there were no differences in age, education, religion or job status, and that there were differences in income levels. Those who answered more than 5 million won were higher than those who said less than 3 million won.
- 7. Differences in the perception of neglect of duty according to general characteristics:** A study of the differences in perceptions of types of neglect showed that there were no differences in age, religion, income level and job status, and there were differences in education level. Those who answered “more than graduate school” and those who answered “college graduate” were better aware of neglect than those who said they should graduate from high school.

Looking at the differences in perceptions of different types of child abuse depending on whether or not child abuse is discovered, respondents with experience in finding children are more aware of physical abuse, emotional abuse, sexual abuse, and neglect and child abuse as a whole than those with no experience of discovery.

A study of the degree of awareness by type of child abuse based on the recognition of child abuse obligations showed that respondents who were aware of the reporting obligation were all more aware of physical and emotional abuse, sexual abuse, neglect and child abuse than those who were not aware of it, but no statistical difference was made

Discussion

To summarize the results, the parents' awareness of child abuse was high, and the perception by type was shown in the order of sexual abuse, physical abuse, emotional abuse and neglect. A look at the differences according to general characteristics showed that there were no differences among age groups. Depending on the level of educational background, the higher the level of educational background, the more accurate it is to recognize child abuse and neglect. Religion has shown no difference. The higher the income level of households, the more accurately they perceive sexual abuse. Lastly, there is no difference depending on whether or not they are employed.

Second, awareness of how to deal with child abuse accounted for a high percentage of respondents who had no experience finding abused children. Respondents who had found that they did not take action because they were not serious enough to intervene or because the evidence was not clear. According to the method of reporting, most of the respondents who did not know about the obligation to report the report by phone showed a high percentage of the respondents who knew about the obligation to report the report.

The perception by type of child abuse by third-parent child abuse detection experience showed that respondents with experience in finding children are more likely to recognize physical abuse, emotional abuse, sexual abuse, and neglect and child abuse as a whole than those with no experience of discovery. There were also no significant differences in the recognition of different types of child abuse depending on whether the reporting obligation was recognized.

From the above findings, the perception of the seriousness of child abuse cases was high, but parents' experience of finding abusive children was relatively low. I think this is a result of a lack of clear distinction between child abuse and proper information about child abuse. Therefore, more publicity and regular education will be needed by developing practical programs on preventive parenting so that child abuse can be established with clear measures and criteria to be connected to actual behavior. In addition, it will be required to realize the importance of awareness of child abuse, make it legally mandatory for lectures and programs on parental education, and implement information education related to child protection services to cope with child abuse.

Conclusion

In this study, the awareness of the seriousness of the occurrence of child abuse was high, but parents' experience of finding abusive children was relatively low. This is a lack of proper information about child abuse that makes it hard to distinguish between child abuses. Therefore, it is necessary to establish clear measures and criteria for child abuse to be applicable in real life. Practical programs on preventive parenting should be developed for this purpose. It will also require more publicity and regular education. It should also realize the importance of awareness of child abuse and make it legally mandatory for parent education lectures and programs related to it. Information education related to child protection services shall be mandatory to cope with the occurrence of child abuse. In particular, public relations should be carried out on a national level so that there is no difficulty in coping with the role and function of the Center for Prevention of Child Abuse and simple report reception calls.

Also, the idea that corporal punishment is necessary to discipline should be changed. And the idea that parenting is a parental right should be changed. Therefore, in order to prevent the occurrence of child abuse, research is needed on the effects of programs that explain the negative aspects of corporal punishment in child care and educate more effective child care method.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Influencing Factors on Mid-Life Well-Being

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Abstract

Background/Objectives: The purpose of this study was to identify the factors which may influence a mid-life well-being.

Method/Statistical Analysis: This study is a descriptive survey design using a convenience sampling. The data were analyzed using descriptive statistics, t-test, ANOVA, Pearson's correlation coefficient and stepwise multiple regression using the SPSS 22.0 program.

Findings: As a result of conducting the stepwise regression analysis, the explanatory power of above 4 variables was appeared to be 52.3% including positive thinking ($\beta = .416, p < .001$), depression ($\beta = -.266, p < .001$), meaning of life ($\beta = .196, p < .001$) and perceived health status ($\beta = .110, p = .027$).

Improvements/Applications: This study will be used as basic data for developing nursing intervention programs that can improve well-being of middle age by establishing factors that affect well-being of middle age using variables of multilateral aspects.

Keywords: *Mid-life, Meaning of life, Depression, Positive thinking, Self-efficacy, Social support.*

Introduction

Mid-life is a kind of transition period from adulthood to old age and is an important and meaningful stage in the life cycle. In recent years, people have shown lots of interests in life satisfaction, happiness and well-being which promote happiness and growth of individuals emphasizing the positive aspects of human beings.

Well-being is used in combination with many similar concepts such as quality of life, happiness, life satisfaction, positive emotions and morale^[1]. General well-being is divided into subjective well-being (life satisfaction, happiness) focusing on the 'pleasant' result and psychological well-being (purpose and meaning of life) that emphasizes 'self-fulfilling' results^[2]. Among

them, the subjective well-being is closely related to depression^[3] which can be considered as a variable that negatively affects well-being as a factor to reduce the life quality throughout the middle age. Meaning of life is an indicator of psychological health related to happiness, and the effort to find meaning of life is the power to lead the life well by discovering meaning of life in the adversity or suffering experienced in the life^[4].

Positive thinking is a factor that allows people to accept and cope positively with their life despite the negative side in the life. Having positive thinking is not only a means of gaining happiness, but also is reported to have a significant effect on the mental health as a factor that can promote health, life quality and well-being^[5]. Social support is an important factor influencing well-being^[2]. The greater the social support, the less likely they are to experience stress and the potential to develop mental symptoms therefrom^[6]. The concept of self-efficacy has been diversely applied in the nursing or health-related fields and acts as a determinant to create behavioral change and motivation for solving problems occurring in the middle age, such that it can be assumed as a factor affecting well-being^[7].

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There have been few studies on well-being in the aspect of nursing. In particular, no integrated approach to the factors affecting well-being of middle age has been carried out. Therefore, this study aims to find a nursing intervention plan that can improve well-being of middle age by establishing variables that affect well-being of middle age.^[1]

Method

1. **Subjects:** In this study, middle-aged men and women from 40 to 59 years old living in three areas Seoul, Gyeonggi-do, and Chungcheongnam-do, were selected as subjects. To verify the fitness of the sample size, the G*Power 3.0 program was used and a significance level of .05, effect size of .15, verification power of .95 and 12 predictive factors were applied to the regression analysis to acquire the final number of 184 subjects. A total of 219 copies were used in the final analysis.
2. **Instruments:**
 1. **Well-being:** The scale developed by Dupuy^[8] and revised by this researcher. This tool consists of 5 points scale from 1 to 5 points with 18 items. The higher score, the higher score of well-being. Cronbach 's $\alpha = .83$ in this study.
 2. **Meaning of Life:** The scale used in Won et al.^[4] was used to measure the meaning of life. The higher the score on the 7-point scale of 10 questions, the more subjective meaning of life they have. Cronbach 's $\alpha = .93$ in this study.
 3. **Depression:** Korean version of Center for Epidemiologic Studies Depression Scale-Revised, K-CESD-R which Lee et al.^[9] validated the feasibility and reliability was used in this study. The tool consists of five scales ranging from 0 to 4 points in 20 questions. The higher score, the higher score of depression. Cronbach 's $\alpha = .96$ in this study.
 4. **Positive thinking:** The positive accident scale developed by Kim et al.^[5] was used to measure positive thinking. This tool consists of 18 questions, ranging from 1 point of 'not at all' to 5 points of 'very much'. The higher score, the more score of positive thinking. Cronbach 's $\alpha = .94$ in this study.
 5. **Self-efficacy:** In this study, Korean Version of General Self-Efficacy scale (GSE) developed by Schwarzer & Jerusalem^[10] was used to measure the Self-Efficacy. This tool consists of 10 questions from 1 point of 'not at all' to 4 points of 'very much'. The higherscore, the higher score of self-efficacy. Cronbach 's $\alpha = .90$ in this study.
 6. **Social support:** In this study, Korean version of the MSPSS scale (Multiple Dimensional Scale of Perceived Social Support) developed by Zimet et al.^[11] was used to measure the social support. This tool consists of 5-points scale with total 12 questions. The higher score, the higher score of social support. Cronbach 's $\alpha = .95$ in this study.
3. **Data collection:** Data collection period was from 1st May 2019 to 30th June 2019. Data were collected by sampling the middle-aged men and women who visited religious and service organizations and sports centers. In addition, after explaining the purpose of the study, the researcher asked subjects who voluntarily participated in the study to fill out the written consent form and then answer the questionnaire.
4. **Ethical Consideration:** The researcher explained to subjects the purpose of the study, promised anonymity and confidentiality, and explained in advance that the subject would not have to respond if they were reluctant to reveal personal information. The researcher also explained that subjects can stop or withdraw the answering at any time if they do not want to participate in the study.
5. **Data Analysis:** Using the SPSS/WIN 22.0 program, the subjects' general characteristics and variables were analyzed for frequency, percentage, mean, and standard deviation. The difference in well-being according to general characteristics was analyzed using ANOVA and Scheffé test. In addition, multiple regression analysis was conducted to establish the factors affecting well-being of subjects.

Result and Discussion

1. **General characteristics of subjects:** The average age of subjects was 46.51 years old. Among them, 40 to 49 years old was the most common with 154 persons (70.3%), and number of female subjects, 113 persons (51.6%) was greater than that of male subjects. For the degree of education, 182 persons (83.1%) graduated college or higher, 181 persons

(82.6%) had spouse, 110 persons (50.2%) who had a religion, and 178 persons (81.3%) had a job. 157 persons (71.7%) considered their economic status as ‘middle’, 91 persons (41.6%) considered

their perceived health status as moderate while 101 persons (46.2%) thought their sleep status as good [Table 1].

Table 1. General Characteristics and Difference of Well-being according to Characteristics (N = 219)

Characteristics	Categories	n (%)	Well-being		
			M±SD	t/F (P)	Scheffé
Age (Years)	40-49	154(70.3)	3.03±0.45	-0.37(.707)	
	50-59	65(29.7)	3.06±0.47		
Sex	Male	106(48.4)	3.08±0.46	1.28(.878)	
	Female	113(51.6)	3.00±0.45		
Education	Below high school	37(16.9)	3.11±0.51	1.03(.286)	
	Above college	182(83.1)	3.03±0.44		
Spouse	Yes	181(82.6)	3.04±0.47	-0.35(.730)	
	No	38(17.4)	3.06±0.39		
Religion	Yes	110(50.2)	3.01±0.47	-1.01(.313)	
	No	109(49.8)	3.07±0.44		
Occupation	Yes	178(81.3)	3.04±0.43	0.26(.795)	
	No	41(18.7)	3.02±0.55		
Economic status	Low	55(25.1)	3.06±0.56	0.52(.597)	
	Middle	157(71.7)	3.04±0.45		
	High	7(3.2)	3.20±0.54		
Perceived health status	Bad ^a	57(26.0)	2.71±0.37	47.96(<.001)	a<b<c
	Moderate ^b	91(41.6)	2.99±0.34		
	Good ^c	71(32.4)	3.37±0.44		
Sleep status	Bad ^a	66(30.1)	2.77±0.39	22.64(<.001)	a<b<c
	Moderate ^b	52(23.7)	3.04±0.34		
	Good ^c	101(46.2)	3.22±0.46		

2. Descriptive Statistics of the Variables: The mean of subjects’ meaning of life was 4.57 (±0.97), 0.65 (±0.78) for depression, 3.24 (±0.62) for positive

thinking, 2.64 (±0.44) for self-efficacy, 3.44 (±0.76) for social support and 4.57 (±0.97) for well-being [Table 2].

Table 2. Descriptive Statistics of the Variables

Variables	M±SD	Min	Max
Meaning of life	4.57±0.97	1.80	7.00
Depression	0.65±0.78	0.00	3.85
Positive thinking	3.24±0.62	1.17	4.94
Self-efficacy	2.64±0.44	1.30	4.00
Social support	3.44±0.76	1.42	5.00
Well-being	3.04±0.46	1.78	4.33

3. Difference of well-being according to general characteristics: The difference of well-being according to general characteristics showed significant difference according to perceived health status ($F = 47.96, p < .001$) and sleep status ($F = 22.64, p < .001$). In other words, the better the perceived health and sleep status, the higher well-being [Table 1].

4. Correlations Coefficient among the Variables: Well-being of subjects had negative correlation with depression ($r = -.53, p < .001$), but had positive correlation with meaning of life ($r = .50, p < .001$), positive thinking ($r = .64, p < .001$), self-efficacy ($r = .48, p < .001$) and social support ($r = .48, p < .001$). In other words, the lower the depression score, the higher the meaning of life, positive thinking, self-efficacy, social support and well-being score [Table 3].

Table 3. Correlations Coefficient among the Variables

Variables	Meaningof life r(p)	Depression r(p)	Positive thinking r(p)	Self-efficacy r(p)	Social support r(p)
Well-being	.50(<.001)	-.53(<.001)	.64(<.001)	.48(<.001)	.48(<.001)

5. Factors affecting well-being of subjects: As a result of stepwise regression analysis, positive thinking ($\beta = .416, p < .001$), depression ($\beta = -.266, p < .001$), meaning of life ($\beta = .196, p < .001$), perceived

health status ($\beta = .110, p = .027$) were shown, and the explanatory power of these four variables was 52.3%. Among them, the most influential variable was positive thinking [Table 4].

Table 4. Factors Affecting Well-being of Subjects

Variables	B	SE	β	t	p
Intercept	2.122	.140		15.214	<.001
Positive thinking	.306	.042	.416	7.318	<.001
Depression	-.155	.030	-.266	-5.130	<.001
Meaning of life	.190	.053	.196	3.592	<.001
Perceived health status	.107	.048	.110	2.134	.027
F = 60.65, p<.001, Adj R ² = .523					

Discussion

In this study, well-being of subjects ranged from 1 to 5 with a mean score of 3.04. The subjective well-being is the overall happiness experienced by the individual and includes emotional states such as perceived assessment for overall life satisfaction, positive and negative emotions while it is reported that men experience more positive emotion and women experience more negative emotion^[12].

Well-being according to general characteristics showed significant difference according to the perceived health status and sleep status. Especially for middle age women, the quality of menopausal life differed according to their sleep status. This can be inferred from the fact

that the life quality is a health indicator^[13] affected by not only general well-being but also disease degree, such that the degree of well-being is different by these variables. In addition, early studies on well-being also reported that demographic variables had a low effect on the subjective well-being. However, the contradictory result that the younger people have higher well-being scores than the middle aged and showed differences according to culture, age and gender^[14] requires a further study in the future therefrom.

As a result of examining the correlation between well-being of middle age and variables, the lower the depression score, the higher the meaning of life, positive thinking, self-efficacy, social support and well-being

score. These findings support the result of previous studies that the higher the meaning of life, the higher the positive emotion^[4], the lower the depression^[3] and meaning of life is closely related to the life quality and well-being^[4]. Positive thinking is highly correlated with positive variables such as life satisfaction and well-being^[5]. It is reported that the higher the self-efficacy, the higher well-being^[15], so it is similar to the result of this study. In addition, it is consistent with the research result^[2] that the higher the degree to perceive the social support system or resources by the individual in the social relation, the higher well-being.

In order to identify the factors affecting well-being of middle age, as a result of hierarchical regression using the perceived health status and sleep status cognized to be different in well-being of middle age according to general characteristics as control variables, positive thinking, depression, meaning of life and perceived health status were shown to be significant variables. The explanatory power of these four variables was 52.3%. The most influential variable was positive thinking and is reported to be a variable^[5] that has a significant effect to the life satisfaction and well-being of individuals and supports the results of this study. The second factor affecting well-being of middle age was depression. Depression is an important variable that negatively affects the whole life after middle age. Depression was reported to make people not feel the life satisfaction and give negative effect^[6] to well-being by looking the life with a critical attitude.

Next, meaning of life is the decisive constituent of well-being, which supports the results of this study as a variable that directly affect the health and well-being^[1]. Therefore, the perception of meaning of life as a developmental task in the middle age is related to well-being of the middle age.

Lastly, the perceived health status means the physiological adaptation, and it is reported that as the perceived health status gets worse, the life quality decreases^[13], such that it is predictable that the health status perceived through the relation between the perceived health status, life quality and psychological well-being is an influence variable for well-being.

In addition, self-efficacy and social support were not identified as variables affecting well-being of middle age. However, as a result of identifying the relative influence of factors that explain the meaning of life, the biggest

influential variable was social support for middle aged men and self-efficacy for middle aged women^[8]. This is contradictory to the results of this study, considering that meaning of life is an important constituent of well-being^[1]. These results are difficult to compare directly with other studies due to different measuring tools used and variables that were entered as predicting variables in well-being of middle age, so repetitive studies are required in the future.

Therefore, it is necessary to prepare a way to strengthen the ability to adapt well to negative emotions such as depression by giving new meaning to life through cognitive change through positive thinking.

Conclusion

Through the above results, an active process to experience well-being and reorganize and understand the integral life of old age, for example, positive thinking through cognitive change, enhancing the ability to manage the individualized depression, giving a meaning of life at a new viewpoint, and promoting the physical and mental health status of individuals to prepare for old age. This study is meaningful in that it is an integrated approach that considers variables in various domains to provide nursing interventions to promote well-being of middle age. However, this study is limited to generalize the results by conveniently selecting middle age men and women living in some regions only.

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Conflict of Interest: Nil

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Effectiveness of Virtual Reality Based Cognitive Rehabilitation on Cognitive Function, Motivation and Depression in Stroke Patients

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Abstract

Background/Objectives: The aim of this study was to investigate the effects of virtual reality cognitive training on cognitive function, rehabilitation motivation, and depression in patients with sub-acute stroke.

Method/Statistical Analysis: Total 22 patients with sub-acute stroke were included in our study. All stroke patients were classified either into experimental group (n = 11) or control group (n = 11). The experimental group performed virtual reality cognitive training on each session during 30 min/day, and control group conducted conventional cognitive therapy on each session during 30 min/day. The outcome measures were the LOTCA (Lowenstein Occupational Therapy Cognitive Assessment), VQ (Volitional questionnaire), BDI (Beck Depression Inventory) before and after intervention.

Findings: The both groups showed significant improvements in cognitive function before and after intervention ($p < .05$). The experimental group showed significant reduction in depression before and after the intervention ($p < .05$), but there was no significant change in the control group ($p > .05$). In comparisons for change score between the two groups, the experimental group showed a significant greater improvements in cognitive function and rehabilitation motivation than control group ($p < .05$).

Improvements/Applications: These findings suggest that virtual reality cognitive training may have a effects of the improvements of cognitive function and rehabilitation motivation than conventional cognitive therapy in sub-acute stroke.

Keywords: *Virtual Reality, Stroke, Cognitive function, Rehabilitation Motivation, Depression.*

Introduction

Stroke reduces the efficiency of synaptic connections in the brain's nervous system due to damage in the brain's blood vessels^[1]. Cognitive impairment was reported to be between 12-56%^[2], and the slower the recovery in cognitive function, the slower the patient's depression,

the lower the motivation, and the lower the quality of life not only for the patient but for the family^[3].

Cognition as meaning encompassing attention, memory, problem-solving skills, judgment, and high-dimensional thinking has been found to be a major factor in predicting an independent daily life ability, related to depression levels or recidivism in stroke^[4]. Thus, various rehabilitation approaches for physical and functional recovery of people with post-stroke cognitive decline are essential^[5-6].

The therapeutic approach of cognitive rehabilitation can be divided into traditional cognitive rehabilitation and computerized cognitive rehabilitation^[7]. Computerized

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cognitive rehabilitation is applied by strengthening memory, attention, etc. by performing games or tasks in the software using digital programs^[8-9].

The advantages of computerized cognitive rehabilitation over traditional cognitive rehabilitation are objectively measuring the amount of cognitive training or the degree of improvement of cognitive function, providing immediate feedback to patients, interesting and easy to adjust difficulty to patient level^[10].

Virtual reality is defined as a human-computer interface in which users interact with the environment in real time within a computer-generated virtual environment. The term was first mentioned by Jarson Lanier in 1989 and has since been developed globally^[11]. While most studies of the effects of virtual reality cognitive training have been reported on stroke patients with unilateral spatial neglect, it is not well known how it affects cognitive functions, rehabilitation motivation and depression^[12-18].

Therefore, this study wanted to know the effects of virtual reality cognitive training on cognitive function, rehabilitation motivation, and depression in patients with subacute stroke.

Method

This study was conducted on 22 patients with sub-acute stroke who were admitted to a rehabilitation hospital. The inclusion criteria were: (1) those diagnosed with stroke by a doctor, (2) those who had one month or more of a stroke, those who were less than six months old, and (3) Korean Mini-Mental Status Examination (K-MMSE) scores of 18 or 23 points, those who were able to perform according to their instructions, and (4) those whose medical conditions were stable. The criteria for exclusion were: (1) persons with severe unilateral spatial neglect, (2) persons unable to maintain independent seating, (3) persons with speech and hearing impairments, and (4) persons with illiteracy. All subjects voluntarily agreed to participate in the study after hearing a full explanation of the research involved. And after written consent, research was conducted.

Lowenstein Occupational Therapy Cognitive Assessment (LOTCA) was used to measure cognitive function. The inter-inspection reliability of this assessment was reported as 0.82 to 0.97^[20]. The Voluntary Questionnaire (VQ) was used to quantify the rehabilitation motivation of stroke patients.

The confidence between the examiners in the will questionnaires is between .75 and .90, the intrinsic value of the 14 items^[21]. Beck Depression Inventory (BDI) was used to quantify the level of depression^[22]. The classification of the level of depression based on the score is 0 to 9 without depression, 10 to 15 without depression, 16 to 23 with serious depression, and 24 to 63 with severe depression. Cronbach's alpha the examiners in BDI is .942^[23].

All subjects were assigned to experimental group (n = 11) or control group (n = 11). The two militaries received usual occupational therapy for 30 minutes a day, five times a week and four weeks. The experimental group received 30 minutes more per session of virtual reality cognitive training, while the control group received 30 minutes of conventional cognitive therapy. The control group received traditional cognitive therapy. Traditional cognitive therapy was determined based on previous studies, where activities through pencils and paper were conducted in the occupational therapy room^[24-26].

The experimental group mediated the virtual reality programs using software from the cognitive rehabilitation training system (Moto Cog, Cybermedic, Korea). The system is a program developed to improve the cognitive function of patients who need rehabilitation. The cognitive rehabilitation training system consists of basic training, a game course, a mission course, and a cognitive training program. To carry out a cognitive training program, the game course and a cognitive training program were introduced for intervention. The subjects of the experiment were trained, defining the composition of the intervention time for each half-hour session as 10 minutes for the game course and 20 minutes for the cognitive training program.

All the data collected were analyzed as SPSS 21. The statistical significance level of the study was set to .05. The general characteristics of the subject were identified by frequency analysis. The comparison of general characteristics, cognitive function, reproducibility, and depression in the two groups was analyzed with either the Mann Whitney U test or the Chi-Square test, and the change before and after intervention was confirmed by the Wilcoxon-signed rank Test.

Result and Discussion

1. General Characteristics: There was no significant difference in the general characteristics of the

subject between the two groups ($p > .05$) [Table 1]. There was no significant difference in the cognitive function, rehabilitation motivation, and in depression between the two group before intervention ($p > .05$) [Table 2].

- 2. Changes of cognitive function, rehabilitation motivation, and depression within groups before and after intervention:** The total score of LOTCA before and after intervention in the experimental group, except for motor praxis, showed significant improvement in the orientation, visual perception, spatial perception, visuo-motor organization, and thinking operation among the sub-items ($p < .05$), indicating significant positive changes in rehabilitation motivation and depression ($p < .05$). The total score of LOTCA before and after intervention in the control group, except for motor praxis, showed significant improvement in orientation, visual perception, spatial perception,

visuo-motor organization, and thinking operation among the sub-items ($p < .05$), indicating a significant improvement in the rehabilitation motivation ($p < .05$) [Table 3].

- 3. Comparison of cognitive function, rehabilitation motivation, and depression between two groups after intervention:** Comparing the changes before and after the intervention of the two groups, the experimental group had significantly greater improvements in the LOTCA than in the control group, the visual perception, spatial perception, visuo-motor organization and rehabilitation motivation ($p < .05$) [Table 4].
- 4. Relationship between rehabilitation motivation and depression in subjects:** Before intervention, the correlation between the rehabilitation motivation of 22 subjects and the depression was significant ($r = -.521$, $p < .05$) [Table 5].

Table 1. General characteristics

	Experimental Group (n = 11)	Control Group (n = 11)	p
Age (Year), Mean±Sd	58.18±8.22	59.09±11.65	.835
Gender			.665
Male	6	7	
Female	5	4	
Injury type			1.000
Ischemic	7	7	
Hemorrhagic	4	4	
Affected side			.665
Right	7	6	
Left	4	5	
Lesion location			.842
Cortical	5	5	
Subcortical	2	3	
Mixed	4	3	
Education level			.809
Middle school	2	1	
High school	5	6	
College	4	4	
Onset duration (days), mean±SD	78.36±20.93	75.00±38.34	.554
K-MMSE, mean±SD	21.18±1.66	21.45±1.75	.613

Footnotes. K-MMSE = Korean Mini-Mental State Examination.

Table 2. Comparison of cognitive function, rehabilitation motivation, and depression between two groups before intervention

		Experimental Group (n=11)	Control Group (n=11)	p
		Mean±SD	Mean±SD	
LOTCA	Total	76.73±4.29	76.36±5.20	.553
	OR	11.09±1.04	11.18±1.83	.919
	VP	9.91±1.87	10.18±1.47	.763
	SP	8.73±1.27	8.45±1.57	.893
	MP	11.55±0.69	11.82±0.60	.418
	VO	16.36±2.98	16.09±2.34	.763
	TO	19.09±1.58	18.64±2.46	.690
VQ		33.64±7.47	33.00±7.14	.717
K-BDI		11.27±3.80	11.09±3.53	.869

Footnotes. LOTCA = Lowenstein Occupational Therapy Cognitive Assessment; OR = Orientation; VP = Visual Perception; SP = Spatial Perception; MP = Motor Praxis; VO = Visuomotor Organization; TO = Thinking Operation; VQ = Volitional questionnaire; K-BDI = Korean Beck Depression Inventory.

Table 3. Changes of cognitive function, rehabilitation motivation, and depression within groups before and after intervention

		Experimental Group (n = 11)		p	Control Group (n = 11)		p
		Before	After		Before	After	
		Mean±SD	Mean±SD		Mean±SD	Mean±SD	
LOTCA	Total score	76.73±4.29	86.82±2.82	.003**	76.36±5.20	82.55±4.59	.003**
	OR	11.09±1.04	12.00±0.77	.015*	11.18±1.83	12.73±1.42	.007**
	VP	9.91±1.87	12.45±1.13	.003**	10.18±1.47	11.27±1.10	.010*
	SP	8.73±1.27	10.82±1.47	.003**	8.45±1.57	9.45±1.63	.005**
	MP	11.55±0.69	12.00±0.00	.059	11.73±0.47	12.00±0.00	.083
	VO	16.36±2.98	19.36±2.34	.003**	16.09±2.34	17.45±1.75	.007**
	TO	19.09±1.58	20.18±1.94	.008**	18.64±2.46	19.55±2.46	.021**
VQ		33.64±7.47	37.36±6.56	.003**	33.00±7.14	34.91±7.54	.004**
K-BDI		11.27±3.80	9.64±3.04	.011*	11.09±3.53	9.91±2.51	0.121

Footnotes. *p<0.05, **p<0.01, LOTCA = Lowenstein Occupational Therapy Cognitive Assessment; OR = Orientation; VP = Visual Perception; SP = Spatial Perception; MP = Motor Praxis; VO = Visuomotor Organization; TO = Thinking Operation; VQ = Volitional questionnaire; K-BDI = Korean Beck Depression Inventory.

Table 4. Comparison of cognitive function, rehabilitation motivation, and depression between two groups after intervention

		Experimental group (n = 11)	Control group (n = 11)	p
		Change values	Change values	
		Mean±SD	Mean±SD	
LOTCA	Total	10.09±3.27	6.18±2.93	.012*
	OR	0.91±0.83	1.55±1.04	.140
	VP	2.55±1.21	1.09±0.83	.006**
	SP	2.09±0.70	1.00±0.63	.002**
	MP	0.45±0.69	0.27±0.47	.573
	VO	3.00±1.26	1.36±1.03	.006**
	TO	1.09±1.04	0.91±1.04	.857
VQ		3.73±2.45	1.91±1.45	.045*
K-BDI		-1.64±1.57	-1.18±2.23	.284

Footnotes. *p<0.05, **p<0.01, LOTCA = Lowenstein Occupational Therapy Cognitive Assessment; OR = Orientation; VP = Visual Perception; SP = Spatial Perception; MP = Motor Praxis; VO = Visuomotor Organization; TO = Thinking Operation; VQ = Volitional questionnaire; K-BDI = Korean Beck Depression Inventory.

Table 5. Relationship between rehabilitation motivation and depression in subjects

	Volitional Questionnaire	
Korean Beck Depression Inventory	r	-.521
	p	.013*

Footnotes. *p<0.05

Discussion

Results of table 2 were similar to those of Kim et al.^[19], who reported improvements in cognitive function in both groups, which conducted virtual reality training and occupational therapy (cognitive training) in acute stroke patients. Kim^[18] had significant improvement in cognitive function through intervention three times a week and twice a day for chronic stroke patients, but the control group that received conventional rehabilitation did not show significant improvement.

While the experimental group showed a significant decrease in depression before and after intervention, the control group showed a decrease in the BDI score. First of all, in comparing the variation between the two groups, rehabilitation motivation is concerned with the significantly greater improvement in the experimental group than in the control group. The pre-intervention values indicate a relationship between the motivation and the depression, so authors think virtual reality training has had a positive effect on reducing depression. In studies such as Kim et al.^[28], the reproducibility of stroke patients also shows a significant association between depression and quality of life, supporting the results of this study.

The experimental group showed significantly greater improvement in cognitive function than the control group. Subtitles showing greater change were visual perception, spatial perception, and visuo-motor organization. The improvement in this area of cognitive function is a virtual reality-based repetitive cognitive training that combines the effects of eye-hand coordination, attention, categorization ability, memory, recognition, calculation ability, visual perception, and language applied for 20 minutes at each session, and the effects of eye-hand coordination required to perform a specific task that has been performed for 10 minutes per session.

Brain damage causes the efficient fall into the neural circuitry between cerebral cortex, brain stem, and cranial nerve, resulting in a decrease in automatic

eye-hand coordination function, which is thought to indicate meaningful improvement in visual and spatial perception through virtual reality cognitive training^[27].

The limitations of this study are as follows. First, sample size was small. Second, the intervention period was relatively short at one month, and did not measure how long the effect of virtual reality cognitive training would last.

Conclusion

These results suggest that virtual reality cognitive training is more positive for the cognitive function and rehabilitation motivation of sub-acute stroke patients than conventional cognitive therapy. In future studies, limitations such as small sample size and missing follow-up are thought to be supplemented to require randomized controlled study.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Development of a Phantom for Low Dose Mammography

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Abstract

Background/Objectives: Interest in regular mammography has grown as a way for early detection of breast cancer. In this study, we produced a phantom that allows for an evaluation of the image quality of images acquired at different phases using X-rays.

Method/Statistical Analysis: To measure the radiation generated during breast cancer diagnosis using X-rays, the X-ray tube system by Varian was used to measure and analyze at a distance of 40 cm under the conditions of 22kVp, 20 mA, and 710mAs. To reduce errors in measurement, imaging of the breasts was done repeatedly for 10 times.

Findings: In the absorption image, there were 5.0 ± 0.2 fibers, 4.5 specks and 4.5 masses, making the total 14 which is higher than the 10 required to be officially authorized. In the dispersion and phase differential images, there were 5.5 ± 0.0 fibers, 4.5 specks, and 4.5 masses, making the total 14.5 which is higher than the 10 required to be officially authorized. In addition the image quality was better than that of the absorption image. When a dosimeter was used, the radiation exposure was an average of 2425.85 ± 0.33 mR. When the absorbed radiation was measured using a glass dosimeter, it was $1,334\pm 1.82$ μ Gy. This was different from the value converted using the valid radiation.

Improvements/Applications: In particular, phase differential imaging is expected to be applied to breast cancer tests where most of the tissue is soft, verification tests for foreign objects and forecasting of the progress in the disease.

Keywords: *Low dose, Mammocancer, Rontgen ray, Image Quality, Phantom.*

Introduction

With the increase in fat intake, contemporary people have seen an increase in obesity, a fall in birth rates and nursing rates, a fall in the age of women's first period and an increase in the age at which menopause arrives, leading to more potential to be exposed to the risk factors of breast cancer. As such, there is a clear increase in demand for breast cancer tests^[1-2].

In the forecast of cancer incidence and cancer-

related deaths in 2018 by the WHO IARC, the cancer burden has been increasing. Breast cancer is forecast to be the most frequently occurring cancer for women, while for Asian men lung cancer is forecast to be ranked first. In other areas, prostate cancer is expected to be ranked first for men. Regardless of a nation's income level, breast cancer has a significantly higher incidence than any other cancer in women^[3-7].

In 2003, ICRP presented a Diagnostic Reference Level for radiation by measuring the radiation amount during mammography in the U.S. and U.K and has been recommending that governments have it applied. In Korea, too, efforts to reduce radiation exposure have increased, by evaluating the radiation that patients are exposed to during mammography and having a study jointly conducted by the KFDA and Korea Medical Image Quality Management Center^[7-12].

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Interest in regular mammography has grown as a way for early detection of breast cancer. Mammography is offered at many medical institutions across the country. The Ministry of Health and Welfare, too, recommends that women over age 40 undergo a mammography.

Many report that an imaging device for the breasts that has a high contrast and resolution offers the benefits of early detection of breast cancer and increasing the survival rate by over 30% even when cancer is found^[13-14]. But ill-managed devices or certain types of imaging devices for the breasts may actually increase the risk of breast cancer.

Despite the growth in demand for check-ups for breast cancer around the world, there is no cost-effective test method for the dense breast tissue, raising the need for a new test method. In recent years, devices that have significantly increased the accuracy in diagnosis of dense breast tissue have appeared. Digital Breast Tomosynthesis, Automated Breast Ultrasound, X-ray phase contrast imaging technology and imaging devices that bring all these together have earned a lot of interest in the market.

Hologic has led the market for diagnosis devices for breast imaging launched in 2011 Selenia Dimension, which is the world's first three dimensional imaging device for the breasts approved by the FDA and KFDA. In recent years, low dose technology has seen progress to produce several tens of slices with radiation exposure on par with existing mammography. In particular, the two dimensional mammography required by FDA is not taken in addition, but the synthesis technology using Tomosynthesis is applied to reduce radiation exposure while realizing a high contrast level for the lesion. The technology is called C-View.

X-ray phase differential imaging technology uses information on dispersion and difference in phases to dramatically show the borders between similar types of substances with similar density^[7-12]. In addition, it has the benefit of using less radiation to produce better quality images compared to existing imaging technologies that leverage the difference in absorption rate of X-rays. Because of this trait, the technology is being researched for its application to low dose diagnostic devices for breast cancer^[13-15].

In this study, we produced a phantom that allows for an evaluation of the image quality of images acquired

at different phases using X-rays. The image quality and practical value of the technology were analyzed to optimize the valid radiation amount in a breast cancer test that has a high sensibility to radiation. The radiation amount and absorption amount for X-ray phase differential imaging was measured to verify the accuracy of the theoretical valid radiation and provide basic data for further research on X-ray phase differential phantoms.

Study Subjects and Methodology

1. **Evaluation of the practical value of the phantom manufactured in the lab:** For the radiation generating device, Hologic LORAD selonia System was used. To acquire images during breast cancer tests and evaluation of such images, the posture used for breast cancer tests at clinical hospitals conducting health check-ups was used. In the postures, R – CC, L – CC. R – MLO, L- MLO, the phantom produced by the researcher was exposed to a radiation of 28kVp 100mAs.
2. **Measuring and analyzing the radiation generated and absorbed during an X-ray test for breast cancer:** To measure the radiation generated during breast cancer diagnosis using X-rays, the X-ray tube system by Varian was used to measure and analyze at a distance of 40cm under the conditions of 22kVp, 20mA, and 710mAs.

The radiation generated was measured using Radcal 2026C device with a 360cc detector equipped. To reduce errors in measurement, imaging of the breasts was done repeatedly for 10 times.

For the measurement of radiation absorbed, the glass dosimeter ACE 100GD model of the Japanese company Chiyoda was used. For the calibration of the glass dosimeter, ¹³⁷Cs standard radiation from the Japanese Radiation Standard Center was applied, using a glass device receiving 6mGy.

Given the characteristics of the glass device, the annealing process before the radiation consisted of one hour of heating at 400°C, then cooling and measuring of the background value to measure 10-20μGy. After a panorama scan, pre-heating was done at 70°C for one hour. After a cooling period, the radiation value that the glass device was exposed to was read 10 times using the reader to calculate the mean and standard deviation. Using the calculated value, the background value was deducted to conclude the exposure of radiation ^[9, 13].

Conclusion and Discussion

1. Evaluation of the image quality when using an in-house produced phantom for breast cancer diagnosis tests: Diagnostic tests for breast cancer consist of self-diagnosis, clinical diagnosis, imaging tests, ultrasound tests and biopsy. Early detection of breast cancer not only improves the full recovery rate and survival rate, but also helps preserves the breasts and improves the quality of life. Imaging tests of the breasts are essential to the diagnosis of breast cancer and plays an important role in detecting early lesions that cannot be picked up on by diagnosis by touch or by ultrasound tests, such as subtle calcification.

In this study, a phantom was manufactured in the lab to evaluate the image quality and the technology of the X-ray phase differential imaging, as well as verify the data provided by the image.

The phantom was manufactured using a material that is similar to the breast tissue, artificially creating an environment similar to a disease in the breasts. Under the clinical imaging conditions, the X-ray absorbed was as seen in Figure 1, 2. As seen in the figures, in both the phantom made of liquid substances and the phantom made of solid substances, resolution had relatively decreased.

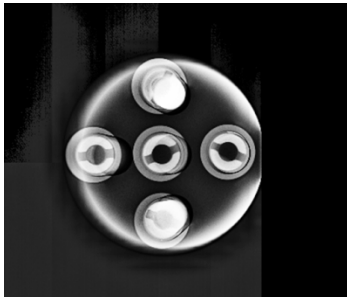


Figure 1. Image acquired from the phantom made of liquid substances

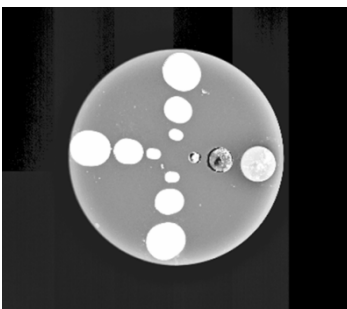


Figure 2. Image acquired from the phantom made of solid substances

To evaluate the resolution of images, the phantom made of solid substances was used to review the absorption image, dispersion image and phase differential image, as seen in Figure 3.

A team consisting of a radiology doctor and five radiologists with more than 10 years of experience conducted qualitative evaluation of the images. In the absorption image, there were 5.0 ± 0.2 fibers, 4.5 specks and 4.5 masses in resolution. The total was 14, which is more than the cutoff rate of 10 for the image to meet the authorized standard. In the dispersed image and phase differential image, there were 5.5 ± 0.0 fibers, 4.5 specks, and 4.5 masses. The total was 14.5 which is more than the cutoff rate of 10 for the image to meet the authorized standard. It was also confirmed that the quality of the image was better than that of the absorption image [Table 1].

Based on these results, the absorption image, dispersion image and phase differential image were analyzed using a phantom made of solid powder. The results were as seen in Figure 4. As seen in the figure, the lead substance has a low valid atomic number, leading to the data decreasing in the absorption image compared to those of the dispersion image and phase differential image. In particular, it was confirmed that the data were superior in the phase differential image.

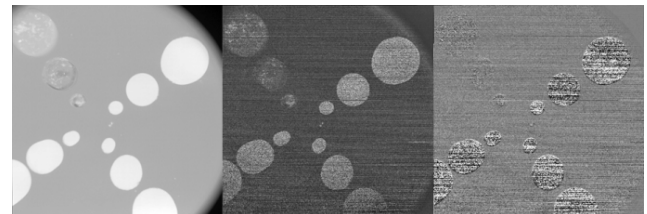


Figure 3. Absorption, dispersion and phase differential in phantoms made of solid substances

Table 1. Evaluation of absorption, dispersion and phase differential in breast cancer imaging tests

	Absorption Image	Dispersion Image	Phase Differential
Fiber	5.0 ± 0.2	5.5 ± 0.0	5.5 ± 0.0
Specks	4.5 ± 0.0	4.5 ± 0.0	4.5 ± 0.0
Mass	4.5 ± 0.2	4.5 ± 0.2	4.5 ± 0.2
Total	14.0 ± 0.2	14.5 ± 0.1	14.5 ± 0.1

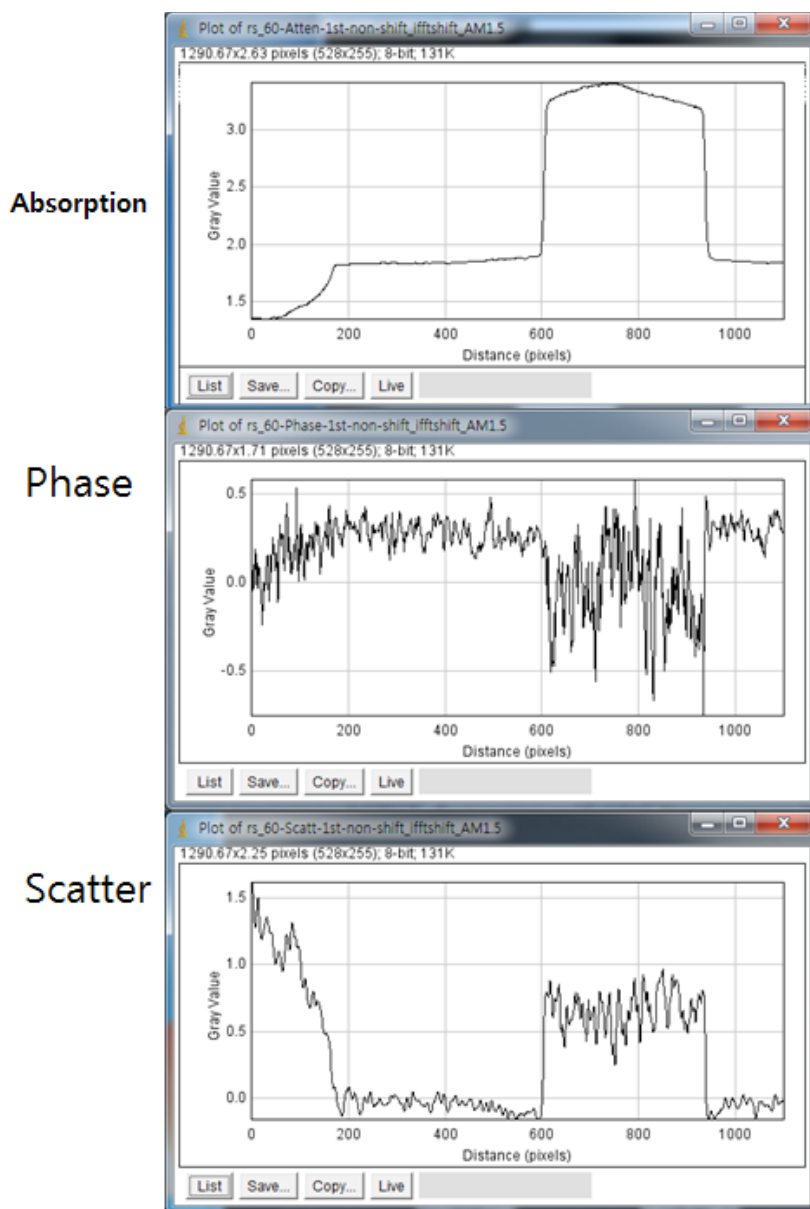


Figure 4. Analysis of the data from the absorption, dispersion and phase differential images using the in-house phantom made of solid substances

2. Measurement and analysis of the radiation exposed and absorbed during an X-ray diagnostic test for breast cancer: The mammary tissue in the breasts is relatively sensitive to radiation. As such, it is reported that X-ray diagnostic tests can rather increase the chances of causing cancer rather than giving the benefit of early detecting of breast cancer. For this reason, the measurement of radiation in breast cancer tests and defenses against radiation are very important.

In this study, to measure the radiation during an X-ray diagnostic test for breast cancer, the X-ray tube

system by Varian was used to measure at a distance of 40cm under the condition of 22kVp, 20mA, 710mAs. The measurement of radiation amount generated was done using Radical 2026C. To reduce the margin of error in measurement, it was repeated 10 times.

The measurement of the radiation amount absorbed was done using the glass dosimeter ACE 100GD model of the Japanese company Chiyoda. se company Chiyoda was used. For the calibration of the glass dosimeter, ¹³⁷Cs standard radiation from the Japanese Radiation Standard Center was applied, using a glass device receiving 6mGy. The radiation applied to the glass device was

measured 10 times through the reader to calculate the mean and standard deviation.

Table 2. Evaluation of the radiation exposed and absorbed during a diagnostic test for breast cancer

Scan No.	Radiation Exposure [mR±SD]	Radiation Absorbed [μGy±SD]
1	2425.85±0.35	1,324±1.82
2	2425.35±0.33	1,330±1.82
3	2432.85±0.32	1,334±1.82
4	2426.15±0.35	1,335±1.62
5	2418.85±0.31	1,333±1.82
6	2420.35±0.33	1,344±0.82
7	2423.65±0.35	1,338±1.82
8	2425.85±0.43	1,324±1.01
9	2431.35±0.29	1,332±1.23
10	2428.05±0.35	1,336±2.30
Average	2425.85±0.33	1,334±1.82

[Table 2] shows the evaluation of radiation exposure during the phase differential imaging for breast cancer tests. When a radiation measuring device that is highly dependent on direction was used, the mean was 2425.85±0.33mR. From a conservative viewpoint assuming that the energy of the X and r-rays applied to the human body has an energy absorption coefficient ratio of approximately 1.11 when the energy of the X and r-rays are 0.1MeV or higher, the absorbed amount can be calculated as $0.974 \times X[R] =$ approximately $1.0 \times X[R]$ [rad]. When this is converted to an equivalent dose, 1 R becomes 10mSv. Therefore, it is converted into 24.25mSv. This result shows that when the breast tissue's weighted coefficient 0.2 is multiplied, the value becomes 4.85mSv, which is much higher than the average valid radiation of 0.3mSv in a breast cancer X-ray test.

When the radiation absorbed was measured using a glass dosimeter, it was 1,334±1.82 μGy. When this is converted to valid radiation, the radiation's weighted coefficient 1 and the breast tissue's weighted coefficient of 0.2 are multiplied to generate 0.2668 mSv. This is a lower value than the average valid radiation of 0.3 mSv during one breast cancer X-ray test.

The radiation exposure converted to valid radiation amount and the absorbed amount converted to valid radiation amount were different. This difference indicates that in low energy of below 0.1MeV with low radiation, it is difficult to convert the radiation exposure into valid radiation. As such, to evaluate the radiation

exposure in low energy, the absorption amount must be used as a base. Follow-up studies would be needed in this field.

From these findings, it was verified that during a diagnostic test for breast cancer, the X-ray dispersion image and phase differential image reduce radiation exposure and improve the image quality. In particular, phase differential imaging is expected to be applied to breast cancer tests where most of the tissue is soft, verification tests for foreign objects and forecasting of the progress in the disease.

Conclusion

In breast cancer tests where there is high sensibility to radiation, optimization of the valid radiation is needed to acquire optimal images. This study used an in-house manufactured phantom to analyze the quality of image resolutions and the practical value of the technology, as well as to compare the radiation exposure and radiation absorption during X-ray phase differential imaging to analyze theoretical valid radiation

In the absorption image, there were 5.0±0.2 fibers, 4.5 specks and 4.5 masses, making the total 14 which is higher than the 10 required to be officially authorized.

In the dispersion and phase differential images, there were 5.5±0.0 fibers, 4.5 specks, and 4.5 masses, making the total 14.5 which is higher than the 10 required to be officially authorized. In addition the image quality was better than that of the absorption image.

When a dosimeter was used, the radiation exposure was an average of 2425.85±0.33mR. When the absorbed radiation was measured using a glass dosimeter, it was 1,334±1.82 μGy. This was different from the value converted using the valid radiation.

To evaluate the low energy radiation exposure, the absorbed radiation must be used as a base. Follow-up studies would be needed on this topic.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Medication Supportive Behavior of Mothers with Children with ADHD: A Structural Equation Model

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Abstract

Background/Objectives: This study aimed to establish and validate a supportive behavior model for the medication of mothers with children with ADHD based on Theory of Planned Behavior (TPB) and empirical evidence.

Method/Statistical Analysis: Participants were 205 mothers with children in elementary school in grades 1 to 3 who had been diagnosed with ADHD and experienced medication treatment. A constructed Structural Equation Model (SEM) was analyzed using AMOS program.

Findings: The goodness-of-fit index of the final model was found to be appropriate. The model's explanatory power for mother's medication supportive behavior was 90.4%. The intention for medication supportive behavior ($\beta = .486, p < .001$), subjective norms ($\beta = .250, p < .001$), the perceived control for the medication supportive behavior ($\beta = .287, p < .001$) and psychological health of mothers ($\beta = -.074, p = .008$) had a direct effect on medication supportive behavior. Mothers' ADHD knowledge ($\beta = .060, p = .016$) was found to have an indirect effect on medication supportive behavior.

Improvements/Applications: The results of this study are expected to guide the development of interventions to improve the medication compliance rate of ADHD children in lower academic years in elementary school.

Keywords: ADHD, Medication, Mother, Supportive behavior, Children.

Introduction

Attention-deficit hyperactivity disorder (ADHD) is a condition that occurs mainly in early childhood before 7 years old^[1]. In most cases, ADHD in children is typically found after entrance into elementary school as children experience having problems with academic performance or classroom life, such as disruptive behavior during class or noncompliance of rules. In this case, if the symptoms are not treated, more behavior

problems may occur in their later academic years; in this regard, early treatment is critically important^[1].

The primary treatment for ADHD is medication for treating brain function problems^[1,2]. In Korea, however, the proportion of children with ADHD who showed consistent medication compliance was about 5% only^[3], which is very low. The lack of adequate treatment of ADHD at the time it is needed negatively impacts children's academic achievements and peer relationships, leading to misconduct and crime in adolescence and adulthood. Thus, starting medication for ADHD from early elementary years is important^[1].

Meanwhile, the role of mothers is crucial to ensure smoothness of ADHD medication treatment of elementary schoolchildren. Treatment decisions for children with ADHD are largely made by parents, especially children in lower grades who tend to take

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medication given by their mother rather than take care of medication themselves^[4,5]. Therefore, to improve the medication compliance rate of children with ADHD, understanding mothers' medication supportive behavior is the first priority.

In previous studies, several factors related to mothers' medication supportive behavior for ADHD children have been reported in parts. In fact, there is no study on a mothers' medication supportive behavior model for the comprehensive understanding of these relationships. Therefore, in this study, we developed a hypothetical model comprising TPB-based variables (attitudes, subjective norms, perceived control, intention)^[2,3,5-9], which are known to be effective in the explanation of health-related behavior, and variables that have been reported as factors affecting mothers' medication supportive behavior for children with ADHD (social stigma perception, knowledge of ADHD, degree of symptoms, and the psychological health of mothers)^[2,3,5-11]. This study investigated the validity of the model.

Method

The present study employed cross-sectional design. Participants were the mothers of lower-grade children with ADHD in a Korean elementary school. They were recruited by convenience sampling according to the following inclusion criteria: a mother a) who has a child of age between 6–9 years diagnosed with ADHD and experienced ADHD medication treatment; b) who had been understood the purpose of the study, and agreed to participate in the study. A total of 205 questionnaires, which was a sufficient number of the sample size,^[12] were collected and analyzed. For the contents and method of this study, approval from K University's IRB was received.

The theoretical framework (Figure 1) was based on TPB and established by adding relationships between influential factors and concepts identified in the literature review.

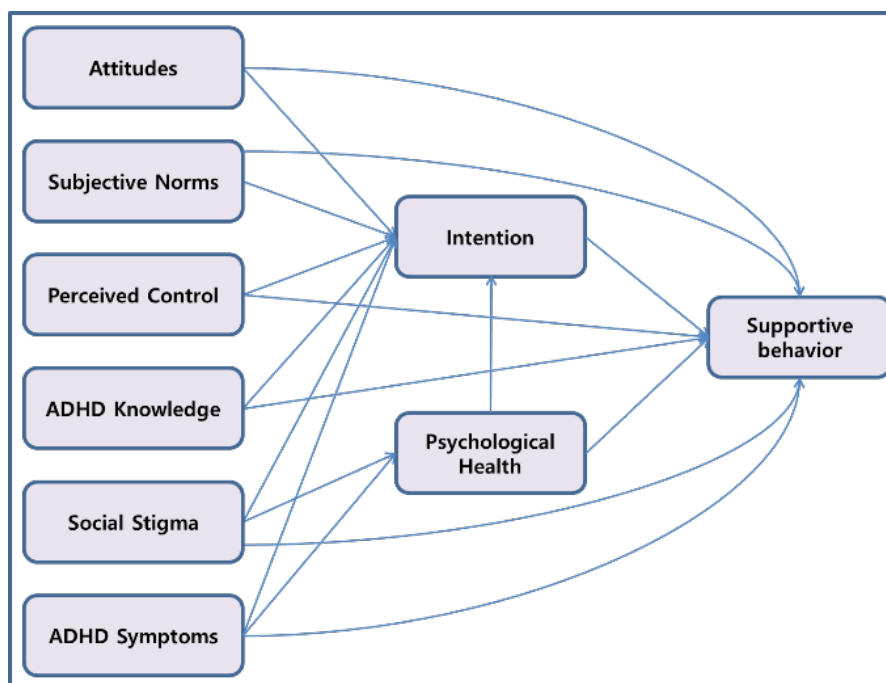


Figure 1. Theoretical framework

Ten observed variables for the hypothetical model were measured as follows. Attitudes referred to a mother's overall like or dislike of ADHD medication supportive behavior for their children^[13]. Measurement was carried out using Attitude Direct Questions from

the ADHD Medication Belief Report (AMBR)^[2], which consisted of five question measured on 7-point Likert scale. Higher scores mean positive attitudes. Cronbach's α was 0.93 in this study.

Subjective norms were measured by Subjective Norm Questions in the AMBR^[2]. Subjective norms referred to the extent to which significant others recognize a mother’s supportive behavior and to which a mother is willing to conform to expectations of significant others^[13]. This tool consisted of 11 questions measured on a 7-point Likert scale. The higher the score, the more positive the perception of subjective norms. Cronbach’s α was 0.95 in this study.

Perceived control referred to the perception that mothers perceive supportive behavior as easy or difficult^[13] and was measured by self-efficacy for the supportive behavior^[14]. The tool consisted of eight questions measured on a 5-point Likert scale. The higher the score, the higher a mother’s perceived control of a child’s ADHD medication supportive behavior. Cronbach’s α was 0.95 in this study.

Mothers’ knowledge of ADHD was measured by the questions associated with ADHD^[15], which consisted of 19 questions. Knowledge score was the sum of the number of questions answered correctly. Cronbach’s α was 0.62 in this study.

Social stigma is the degree to which mothers perceive social stigma for ADHD. It was measured on the social stigma scale^[16], which consisted of five items measured on a 4-point Likert scale. The higher the score, the more social stigma is perceived. Cronbach’s α 0.98 in this study.

ADHD symptoms referred to the degree of mothers’ perception of their child’s symptoms, measured using the ADHD Rating Scale(ARS)^[17], which consisted of 18 questions measured on a 4-point Likert scale; it had two subscales: attention deficit and hyperactivity symptoms^[17]. Higher scores indicate that symptoms are more severe. In this study, Cronbach’s α was 0.87 and 0.88 for each subscale.

Intention referred to the subjective possibility of mothers to perform supportive behavior^[13], which was measured by Intention Questions in the AMBR^[2]. The tool consisted of five questions measured on a 7-point Likert scale. Higher scores indicate strong intentions. Cronbach’s α was 0.99 in this study.

Psychological health referred to the depression of mothers, measured using the Beck Depression Inventory (BDI)^[18], which had 21 items measured on a 4-point Likert scale. Higher scores indicate severe depression. Cronbach’s α was 0.83 in this study.

Supportive behavior referred to a mother’s supportive behavior of the medication of a child. We measured the degree of supportive behavior of mothers for outpatient visits, drug doses, and time-to-dose compliance for their children^[3]. This tool was a three-item 10-point scale. The higher the score, the more likely a mother is well supporting her child. Cronbach’s α was 0.99 in this study.

From the collected data, participants’ general characteristics were analyzed by descriptive statistics using SPSS 22.0. For verification of the model, AMOS 22.0 were used. The normality of the observed variables was evaluated. Then, a confirmatory factor analysis (CFA) was conducted. Finally, the fitness of the hypothesis model was evaluated by goodness-of-fit indices, and the statistical significance of the direct, indirect, and total effects of the model was tested using Bootstrapping.

Result

1. Demographic Characteristics: Demographic characteristics of the subjects are shown in Table 1.

Table 1. General characteristics

Characteristics	Categories	N(%) or M±SD
Mothers		
Age		40.51±4.48
Marital status	Married	167(81.5)
	Divorced	38(18.5)
Economic status	Upper-middle	26(12.7)
	Middle	96(46.8)
	Lower-middle	61(29.8)
	Low	22(10.7)
Children		
Age		7.79±0.87
Gender	Boys	175(85.4)
	Girls	30(14.6)
Academic achievement	High	3(1.5)
	Upper-middle	14(6.8)
	Middle	51(24.9)
	Lower-middle	44(21.5)
	Low	93(45.4)
Age at ADHD diagnosis		6.17±0.75
Duration of ADHD treatment (month)		18.9±11.26
Current medication	Yes	180(87.8)
	No	25(12.2)
Experience of drug side effects	Yes	106(51.7)
	No	99(48.3)

M: Mean, SD: Standard deviation

2. Descriptive statistics and normality test of observed variables: All observed variables satisfied the condition of normal distribution^[12] (Table 2). VIF of each variable was distributed in the range of 1.77-5.91 and condition index was 49.785. The correlation coefficients between exogenous variables were in the range of 0.04–0.77, indicating no problems with multicollinearity^[12].

The results of the CFA showed that all goodness-of-fit indices were within the recommended range: $\chi^2(p) =$

.279, $\chi^2/df = 1.235$, RMSEA = .034, RMR = .013, GFI = .992, AGFI = .935, NFI = .995, RFI = .970, CFI = .999, and TLI = .994. Convergence validity was found with factor loading of observed variables between 0.50 and 0.99; average variance extracted (AVE) value was in the range of 0.71–0.98; and construct reliability was in the range of 0.91–0.99. The largest value of the correlation coefficients was 0.77 and the square of 0.77 was 0.59 (ϕ^2); as AVE value was larger than 0.59, the discriminant validity was also verified^[12].

Table 2. Descriptive statistics of observed variables

Variables	M±SD	Range	Skewness	Kurtosis	VIF	AVE	
Attitude	5.18±1.01	1~7	0.10	-0.84	3.34	0.71	
Subjective norms	4.83±1.33	1~7	-0.34	-0.43	5.53	0.87	
Perceived control	3.90±0.87	1~5	-0.54	-0.52	4.55	0.96	
Knowledge toward ADHD	0.66±0.15	0~1	-0.07	-1.06	2.17	-	
Social stigma	2.48±0.65	1~4	-0.08	0.30	2.81	0.97	
ADHD symp-toms	Attention deficit	1.44±0.52	0~3	0.32	0.02	2.34	0.94
	Hyperactivity	1.22±0.52	0~3	0.34	0.28	2.73	-
Intention	5.40±1.72	1~7	-1.05	0.35	5.91	0.98	
Psychological health	0.38±0.33	0~3	0.51	-0.51	1.77	0.94	
Behavior	7.10±2.87	1~10	-0.96	-0.12	1.77~5.91	0.98	

M: Mean, SD: Standard deviation, VIF: Variance inflation factor, AVE: Average variance extracted

3. Structural equation modeling: The goodness-of-fit indices of the hypothesis model are as follows: $\chi^2 = 34.716$, $df = 11$, $\chi^2(p) < .001$, $\chi^2/df = 3.156$, RMSEA = .103, RMR = .017, GFI = .968, AGFI = .839, NFI = .981, RFI = .924, CFI = .987, and TLI = .947. Of these, $\chi^2(p)$, χ^2/df , RMSEA and AGFI did not meet the criteria, so the model was modified^[12]. We added two paths to the hypothesis model. The goodness-of-fit indices of the modified model were all within the recommended range except for $\chi^2(p)$, so this model was confirmed as the final model^[12]: $\chi^2 = 18.358$, $df = 9$, $\chi^2(p) = .031$, $\chi^2/df = 2.040$, RMSEA = .071, RMR = .023, GFI = .982, AGFI = .892, NFI = .990, RFI = .951, CFI = .995, and TLI = .974.

4. Analysis of the effects of the final model: There are 10 significant paths of the final model (Figure 2). Variables with direct effects on supportive behavior were subjective norms ($\beta = .250$, $p < .001$), perceived control ($\beta = .287$, $p < .001$), intention ($\beta =$

.486, $p < .001$), and psychological health ($\beta = -.074$, $p = .008$). Direct ($\beta = .250$, $p = .002$), indirect ($\beta = .201$, $p = .018$), and total ($\beta = .451$, $p = .006$) effects were all significant in the path from subjective norms to supportive behavior. Direct ($\beta = .287$, $p = .006$), indirect ($\beta = .233$, $p = .023$), and total ($\beta = .520$, $p = .021$) effects were all significant in the path from perceived control to supportive behavior. Only indirect effects ($\beta = .060$, $p = .016$) were significant in the path from knowledge of ADHD to supportive behavior. Direct ($\beta = -.074$, $p = .008$) and total ($\beta = -.071$, $p = .011$) effects were significant in the path from psychological health to supportive behavior. Subjective norms, perceived control, knowledge of ADHD, intention, and psychological health explained 90.4% of supportive behavior.

The variables with significant direct effects on intention were subjective norms ($\beta = .413$, $p < .001$), perceived control ($\beta = .479$, $p < .001$), and knowledge of ADHD ($\beta = .100$, $p = .016$). These variables explained

83.0% of intention. The variables that directly affect psychological health were attitudes ($\beta = -.161, p = .049$), knowledge of ADHD ($\beta = -.163, p = .031$), and social

stigma ($\beta = .396, p < .001$), which explained 40.3% of psychological health.

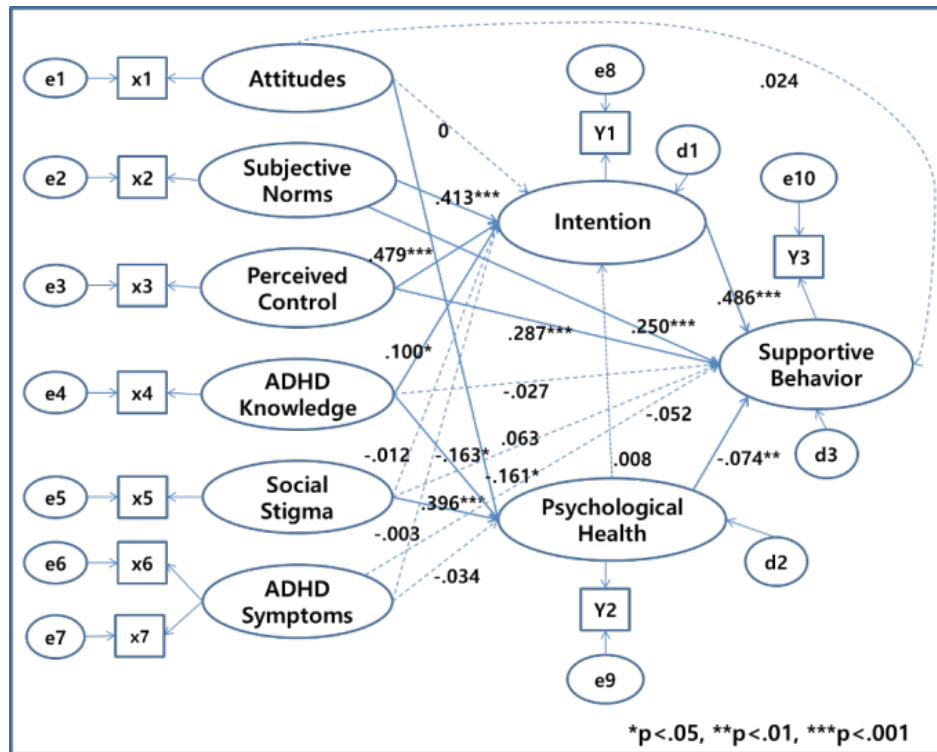


Figure 2. Path diagram for the final model

Discussion

In this study, the most influential variable on a mother’s supportive behavior was the intention for supportive behavior, and such intention was directly affected by subjective norms, perceived control, and knowledge of ADHD. These results are consistent with previous studies, which reported that the higher a mother’s supportive behavior intention for the medication of their child with ADHD, the better her child’s medication compliance and that the subjective norms perception affected the intention^[7]. It is also consistent with a previous study^[20] stating that subjective norms and perceived control had a significant effect on the intention of seeking help in women with incontinence. The results of knowledge of ADHD as a predictor of intention can also be found in a previous study^[10].

These findings indicate that interventions that increase the intention are effective in improving mothers’ supportive behavior in the medication of their children with ADHD. To enhance the intention, it is necessary to

provide mothers with nursing interventions that increase their subjective norms perception and perceived control of ADHD medication supportive behavior for children. In addition, supportive behavior increases along with mothers’ knowledge of their children’s condition and medication. Therefore, a program that helps mothers’ accurate understanding of their child’s condition and medication, such as active counseling by medical staff, are necessary.

Meanwhile, a mother’s psychological health negatively affected the direct path for supportive behavior and was influenced by attitudes and social stigma. These results imply that a child’s medication supportive behavior is less active when a mother’s depression is more severe. This finding is consistent with previous studies that reported negative correlations between a mother’s psychological health and supportive behavior [3,5,6,9]. It also supports a study that reported a positive correlation between a mother’s social stigma perception and her depression being related to her child with

ADHD^[9]. Therefore, these findings suggest that social biases and stigma of children with ADHD negatively affect a mother's psychological health and interfere with her supportive behavior to help her child's medication. Increasing medication compliance in children with ADHD requires a change in social perception of them. Therefore, more attention should be paid to the extent of depression of a mother taking care of children with ADHD.

The limitation of this study is that the generalization of study results is limited because participants were recruited by convenience sampling in limited areas. It is necessary to conduct a study with more representative samples later. Nevertheless, this study is the first to build and validate a model of medication supportive behavior of Korean mothers with children with ADHD. Its significance lies in its establishment of a theoretical framework for future intervention development.

Conclusion

In this study, intention for the medication supportive behavior, perceived control, subjective norms perception, psychological health, and knowledge of ADHD affected mothers' supportive behavior. Attitudes and social stigma perception directly affected psychological health of mothers. These results indicate that enhancing intention of a mother's supportive behavior, perceived control, and subjective norms perception; improving psychological health; and increasing knowledge of ADHD may improve mothers' medication supportive behavior.

Ethical Clearance: Not required

Source of Funding: Nil

Conflict of Interest: Nil

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Comparison of the Effects of Standardized Patient-based Simulation Education and Clinical Practice Education for Preoperative Nursing Care for High-risk Pregnant Women

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Abstract

Background/Objectives: This study aimed to compare the effects of conventional clinical practice education and standardized patient-based simulation education on preoperative nursing care for high-risk pregnant women scheduled for a cesarean section, and, ultimately, to identify effective education method for nursing students.

Method/Statistical Analysis: This study used a non-equivalent control group, non-synchronized post-test design. The experimental group (34 subjects) received standardized patient-based simulation education, whereas the comparison group (32 subjects) participated in traditional clinical practice education. Descriptive statistics and ANCOVA was done to find the differences in the effects of the intervention between the two groups.

Findings: The results showed that clinical judgment ($F = 33.63, p < .001$), nursing performance competency ($F = 46.78, p < .001$), communication ability ($F = 13.90, p < .001$), and learning satisfaction ($F = 31.83, p < .001$), except for problem-solving ability, were significantly higher in the experimental group.

Improvements/Applications: Standardized patient-based simulation education can be effectively replaced with conventional clinical practice education when educating nursing students about preoperative nursing care for high-risk pregnant women.

Keywords: *Standardized patient program, Clinical practicum, Simulation education, Nursing students, Preoperative nursing care*

Introduction

As the primary goal of nursing education is to train, through theoretical and practical education, professional nurses who can provide qualitative nursing^[1]. However, with the recently increasing awareness of human rights among patients, there is a growing tendency for patients

to express that they do not want to be attended to by inexperienced and unskilled student nurses. Therefore, the conventional clinical practice education that provides nursing students with opportunities to perform direct nursing care in clinical settings is being reduced^[2]. In other words, there are limitations for nursing students to have sufficient nursing competence through clinical practice education, and it is thus necessary to seek alternatives to effective practice education for nursing students.

Recently, simulation education using standardized patients (SPs) has emerged as an effective practice education method. SPs are individuals trained to imitate realistic patients with respect to health condition,

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personality, and emotional reactions^[3]. Using scenarios that mimic clinical settings, SP-based simulation education aims to ensure that learning takes place in the process of allowing students to solve problems in situations similar to real-world situations^[4]. Therefore, SP-based simulation education has the advantage of allowing students to learn more realistic and empirical knowledge compared with other education method^[5].

In South Korea, there is growing awareness of the rights to privacy protection, especially among pregnant women who experience childbirth. In addition, owing to an extremely low birth rate, nursing students are having fewer learning opportunities to perform directly nursing care for pregnant women^[6]. Therefore, it is necessary to seek alternatives to practice education for nursing care for pregnant women.

No previous study has investigated the effects of SP-based education on preoperative nursing care for high-

risk pregnant women. In addition, studies comparing the effects of conventional clinical practice and SP-based education, even for other subjects of education, are scarce^[7]. Thus, the present study aimed to compare between the effects of SP-based simulation education and conventional clinical practice education, and to investigate whether clinical practice education can be replaced by SP-based simulation education.

Method

This was a study using a non-equivalent control group, non-synchronized post-test design [Figure 1]. The individuals of the study were the third-year students at a nursing college in C City, South Korea. The selection criteria were as follows: a) students who had already taken a women’s nursing theory course, and b) those who understood the purpose of this study and consented to join in this study.

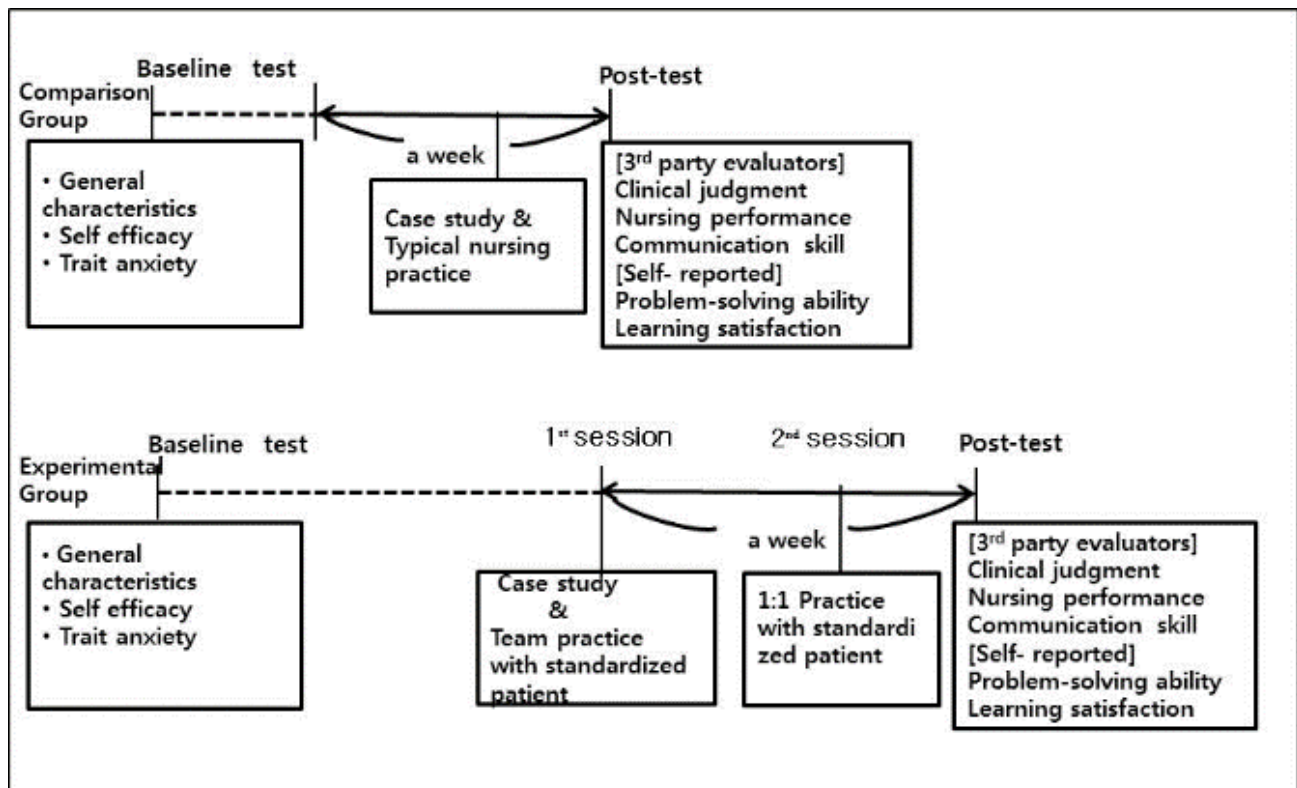


Figure 1. Research Design

The number of sample was computed using G*Power (3.1.9.2). The number of sample required 30 individuals in each group with effect size of .65^[8], α of .05, and a power of .80. This study recruited 35 participants for

each group; 1 in the experimental group and 3 in the comparison group dropped out. Accordingly, a total of 66 individuals were used in the analysis. Approval from the IRB at K University was obtained.

Study procedure was as follows. Prior to the intervention, the SPs were trained and scenarios were developed. The SPs were trained to portray patients for six hours. The scenarios to be used for the intervention were reconstructed based on two medical records by the chief nurse at the ob-gyn ward and the researchers: one educational scenario for the intervention and one for evaluation. The scenarios were constructed of a topic related to preoperative nursing for high-risk pregnant women who were scheduled for a cesarean section owing to preterm premature rupture of membranes.

Subsequently, the baseline test was conducted to verify the homogeneity between the two groups [Figure 1]. Then, the comparison group received the intervention first. The comparison group was divided into five teams. On the first day, they received case study education about nursing care for pregnant women who were scheduled for a cesarean section, followed by conventional clinical practice for one week, through which the participants were allowed to experience preoperative nursing care for high-risk pregnant women who will undergo a caesarean section.

After a post-test was conducted with the comparison group, the experimental group received the intervention. They received two training sessions for one week. At the first session, the group was divided into six teams to receive the same case study education as done for the comparison group. Then, several students in each team practiced team nursing for one SP using an educational scenario. After completing the team-level practice, debriefing was carried out to analyze the nursing care performed by the students themselves. At the second education session, each student directly performed face-to-face nursing care for the SP for 10 minutes, and then debriefing was followed.

After completing the intervention, the post-test was conducted in both groups. During the post-test, the effects of the intervention were measured in the two groups using a scenario on preoperative nursing care for high-risk pregnant women, and SPs. The scenario used here was different from the one used for the students during the intervention.

In the post-test, clinical judgment and nursing performance competency were assessed by a third party who did not join in the education of students during the intervention to ensure that each student could not be identified as from either study group. Communication

ability was also assessed by SPs who did not participate during the intervention. These steps were intended to increase the validity of the measurement. Problem solving ability and learning satisfaction were self-evaluated by the students.

In the baseline test, general characteristics, trait anxiety, and self-efficacy were investigated. The general characteristics of the participants included gender, age, experience of simulation education, and academic grade. Trait anxiety was measured using a tool developed by Spielberger^[9]. The tool consists of 20 items rated on a 4-point Likert scale. A higher score means higher trait anxiety. Cronbach's α was .87 in this study. Self-efficacy was measured using a tool that was modified for the self-efficacy in preoperative nursing care for high-risk pregnant women from the Neuroscience Nursing Self-efficacy scale^[10]. This tool consists of 14 items rated on a 5-point Likert scale. A higher score means higher self-efficacy in preoperative nursing care for high-risk pregnant women. Cronbach's α was .87 in this study.

A post-test was conducted to compare the effects of the intervention in the experimental and comparison groups. The post-test measures included clinical judgment, nursing performance competency, communication ability, learning satisfaction and problem solving ability. Clinical judgment was investigated using the Lasater Clinical Judgment Rubric^[11], which consists of 11 items rated on a 4-point Likert scale. A higher score means higher clinical judgment. Cronbach's α was .88 in this study.

Nursing performance competency was measured using a tool that was modified by the researchers based on a checklist for evaluating preoperative patient nursing care presented by the Korean Accreditation Board of Nursing Education. This tool consists of 29 items rated on a 3-point Likert scale. A higher score means higher nursing competence. This tool was verified for content validity by two nursing professors, a chief delivery room nurse, and an ob-gyn physician. Cronbach's α was .87 in this study. Communication skills were measured with an instrument developed by Yoo^[12]. This tool consists of five items rated on a 5-point Likert scale. A higher score means higher communication competency. Cronbach's α was .85 in this study. Problem-solving ability was investigated with an instrument developed by Woo^[13] that consists of 25 items rated on a 5-point Likert scale. A higher score means higher problem-solving ability. Cronbach's α was .93 in this study. Learning satisfaction

was measured using a tool developed by Seong^[14]. This tool consisted of 20 items rated on a 5-point Likert scale. A higher score means higher learning satisfaction. Cronbach’s α was .94 in this study. Data analysis was done using SPSS (21.0). The homogeneity between the groups was examined using t-test and X²-test. As the results of the homogeneity test for the general characteristics of the two groups revealed that self-efficacy was not homogeneous, analysis of covariance (ANCOVA) was done to find a difference between the groups.

Result and Discussion

1. **Demographic Characteristics:** The characteristics of the individuals are presented in [Table 1]. The gender, age, experience of simulation education, academic grade, and trait anxiety were not significantly different between the groups. However, self-efficacy in preoperative nursing care for high-risk pregnant women was significantly higher in the comparison group ($p = .001$).

Table 1. General Characteristics of Individuals

Characteristics	Experimental (n = 34)	Comparison (n = 32)	χ^2 or t	p
	M(SD) or n(%)	M(SD) or n(%)		
Gender				
Female	33(97.1)	28(87.5)	2.15	.142
Male	1(2.9)	4(12.5)		
Age□	21.15(0.65)	21.94(2.12)	0.39	.068
Experience of simulation education				
Yes	7(20.6)	5(15.6)	0.52	.608
No	27(79.4)	27(84.4)		
GPA				
<3.0	3 (8.8)	1(3.1)	0.38	.709
≥3.0, < 3.5	9 (26.1)	10(31.3)		
≥3.5, < 4.0	14 (41.2)	13(40.6)		
≥ 4.0	8 (23.5)	8(25.0)		
Trait anxiety□	2.26 (0.31)	2.27 (0.27)	0.16	.894
Self-efficacy□	2.51 (0.46)	2.92 (0.47)	3.53	.001

□: mean (standard deviation)

2. **Comparison of post-test data between the two groups:** The scores for the effects of intervention in each group are shown in [Table 2]. Clinical judgment, nursing performance competency, community ability, and learning satisfaction were significantly higher in the experimental group than the comparison group (p for all <.001). However, problem solving ability was not significantly different between the groups ($p = .057$).

Table 2. Comparison of Post-Data between the Groups When Adjusted for Self-Efficacy

Variables	Group	M(SD)	F	p
Clinical judgment	EG	3.01(0.47)	33.63	<.001
	CG	2.21(0.47)		
Nursing performance	EG	2.47(0.20)	46.78	<.001
	CG	1.95(0.33)		
Communication skill	EG	3.90(0.85)	13.90	<.001
	CG	2.93(0.94)		
Problem-solving ability	EG	2.82(0.70)	3.79	.057
	CG	2.64(0.53)		
Learning satisfaction	EG	3.90(0.57)	31.83	<.001
	CG	3.17(0.54)		

EG: Experimental group, CG: Comparison group

Discussion

The results showed that SP-based simulation education was more effective for training clinical judgment, nursing performance competency, and communication ability, and learning satisfaction compared with conventional clinical practice, except for problem-solving ability. A comparison of these results and the results of previous studies is as follows. First, owing to the scarcity of previous studies comparing the effects of SP-based simulation education and conventional practice education on clinical judgment, it is difficult to compare results directly. The results of a study of Chinese nursing students comparing the effects of conventional education (demonstrated by instructors) and SP-based simulation education showed that clinical judgment was significantly higher in students who received SP-based education^[15], which is similar to the results of our study. In addition, although self-efficacy of preoperative nursing care for high-risk pregnant women was found to be lower in the experimental group at baseline, clinical judgment was found to be improved more in the experimental group after the SP-based education, which implies that the effects of SP-based simulation education were greater.

Second, nursing performance competency, communication ability, and learning satisfaction were found to be significantly higher in the experimental group. This result is consistent with those of studies revealing that SP-based simulation education improved nursing students' nursing performance competency in ob-gyn pelvic examination education^[16], and end-of-life care education^[17], and of another study indicating that communication ability significantly improved after SP-based education on the topic of interactions with patients with depression^[18]. In addition, results of the present study are also consistent with those of a previous study indicating that learning satisfaction with SP-based simulation education on the topic of mental health was significantly higher^[19]. However, these previous studies were conducted without a control group, or were comparisons with a control group receiving no intervention. Therefore, as the present study compared between the effects of conventional clinical practice education and SP-based simulation education, our study is different from previous ones.

Third, no significant difference was seen in the problem-solving ability between the experimental and comparison groups. This result does not necessarily

mean that SP-based simulation education was not effective in increasing problem-solving ability but that both SP-based education and conventional clinical practice likely contributed similarly to problem solving ability. In addition, as self-efficacy was higher in the comparison group, the possibility that students with high self-confidence reported having high-problem solving ability could not be ruled out as well.

The limitations of the study are as follows. First, as the participants of this study were selected from a single nursing college, it is difficult to generalize the results of this study to other samples. Second, it was difficult to identify how much the students in the comparison group experienced in nursing care for high-risk pregnant women during their conventional clinical practice. Third, this study used a quasi-experimental design in which the individuals were not randomly assigned.

Nevertheless, the results of this study are significant as follows. First, although most previous studies used no control group, or used a control group without intervention, this study compared the effects of SP-based simulation education and conventional clinical practice using a comparison group receiving conventional clinical practice education. Second, previous studies often assessed the effects of education based on self-report measures. In the present study, clinical judgment, nursing performance competency, and communication ability were objectively assessed by third parties who were not aware of the participants' grouping. As such, this study has a high validity.

Conclusion

This study aimed to compare the effects of SP-based simulation education and conventional clinical practice education for nursing students on preoperative nursing care for high-risk pregnant women, and to seek effective practice education method for preoperative nursing care for high-risk pregnant women. The results showed that SP-based simulation education had higher effects on clinical judgment, nursing performance competency, communication ability, and learning satisfaction compared with the conventional clinical practice education. In addition, both education method showed similar effects on problem-solving ability. Therefore, conventional practice education can be effectively replaced by SP-based simulation education for preoperative nursing care in high-risk pregnant women.

Ethical Clearance: Not required

Source of Funding: Nil

Conflict of Interest: Nil

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Antimicrobial Activity of *Coptischinensis* Extract against Dental Caries

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Abstract

Background/Objectives: Many microorganisms reside in the oral cavity, and they are referred to as oral-resident bacteria. Oral microorganisms are an important cause of oral diseases, and as such, many studies have been conducted to control them. This study aimed to investigate the antimicrobial activity against *S. intermedius* and *S. gordonii* among the oral-resident bacteria using *Coptischinensis*, a natural extract.

Method/Statistical Analysis: To investigate the antimicrobial activity of *Coptischinensis*, the clear-zone confirmation method using filter paper and colony-forming unit (CFU) was used to check the bacterial proliferation. As the concentration of *Coptischinensis* increased, the size of the clear zone also increased. As a result of the CFU, bacterial proliferation was not observed in the experimental group as compared to the control group.

Findings: The results of this study proved the antimicrobial activity of *Coptischinensis* against the oral-resident bacteria *S. intermedius* and *S. gordonii*. The clear zone results showed that *S. intermedius* and *S. gordonii* were larger in size than the control group. CFU showed a large amount of colony in the control group but not exist colony in the experimental group. The result showed its potential as an antimicrobial agent applicable to oral-resident bacteria.

Improvements/Applications: *S. intermedius* and *S. gordonii* bacteria found in the oral cavity showed antimicrobial effect on the extracts. *Coptischinensis* was confirmed to be a preventative and therapeutic agent of tooth decay. In conclusion, the possibility that it can be applied to various intraoral antibacterial products in the future.

Keywords: Antibacterial activity, *Coptischinensis*, Dental caries, Dental pathogens, Microorganism.

Introduction

In the 21st century, with the Westernization of people's lifestyles, oral diseases have become

diverse and have emerged as a serious social problem. According to a recent WHO report on dental diseases, 60% of adults worldwide are suffering from dental caries and periodontal diseases^[1]. The most important factor causing oral diseases, as represented by dental caries and periodontal diseases, has been known to be dental plaque, composed of oral-resident bacteria that form a cluster on the tooth surface, or on and beneath the gingiva^[2]. It has been reported that more than 500 types of bacteria reside in the human oral cavity, and that 10⁸-10⁹ CFU/mg of bacteria are present in dental plaque^[3]. Dental caries is an oral and maxillofacial disease that

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has plagued humanity since the ancient times, and its harmful effects have become a serious problem both economically and socially in both developing and developed countries^[4]. Dental caries occurs when the bacteria attached to the tooth surface form dental plaque, and then the bacteria of the dental plaque generate acids by fermenting the carbohydrates obtained from food^[5]. Among the many bacteria present in dental plaque, oral streptococci is considered a causative bacteria of dental caries^[6]. In particular, the *Streptococcus gordonii* (*S. gordonii*) in the oral cavity is known to play an important role in the adhesion of bacteria in the oral cavity by specifically binding to a specific glycoprotein of saliva^[7]. *Streptococcus intermedius* (*S. intermedius*) is an oral-resident bacterium clinically characterized by forming abscesses in the oral cavity^[8]. Moreover, it has been reported to form dental calculus like streptococci, and to cause endocarditis in vitro^[9].

Medicinal plant remedies have been attracting attention of late in South Korea for the prevention of oral infectious diseases and for the ongoing inhibition of oral pathogens. In particular, medicinal plants are expected to be able to overcome the problems of safety or tolerance, which the conventional natural therapeutic agents used from the olden times also had^[10]. Among the various medicinal plants, *Coptidisrhizoma* is a perennial vegetation belonging to *Coptis japonica* Makino (Japan), *Coptischinensis Franch* (China), or other wisteria (Ranunculaceae), and is a rootstock with almost no roots. *Coptidisrhizoma* is slightly odorous, with a very bitter taste, and has a persistently yellow color. It has strong antimicrobial activity against various pathogens as well as excellent anti-inflammation, antioxidant, hemostatic, blood pressure lowering, and anticancer effects^[11]. The studies on the antimicrobial activity of the natural extract of *Coptischinensis* against oral streptococci have been limited. Thus, this study was conducted to investigate the antimicrobial activity against dental caries of *Coptischinensis* extract, and to identify its potential for the prevention and treatment of oral diseases.

Method

Coptischinensis was purchased from Foodsynergy Co., Ltd. (Seoul, South Korea). After adding 80% ethanol to 100 g crushed *Coptischinensis*, extraction was done at 65°C for 12 hours. The extract was filtered using filter paper, and the *Coptischinensis* extract was concentrated using a rotary vacuum evaporator (N-1300E.V.S

EYELA Co., Japan). The concentrated *Coptischinensis* extract was again lyophilized using a freeze dryer (FD5508, Ilshin Lab, Yangju-kun, Kyunggi-do, South Korea). It was diluted in distilled water to form the 5, 10, 20, and 40 mg/mL concentrations, and as a control group, PBS (phosphate-buffered saline, Gibco™) was applied as a medium. *S. intermedius* (ATCC 9895) and *S. gordonii* (ATCC, 10558) were purchased from Korean Culture Center of Microorganisms (KCCM). Each microorganism was activated by brain heart infusion (BHI; Sigma-Aldrich, St. Louis, MO, USA) and was diluted at a 2x10⁶ ratio

100 µL (2x10⁶) of *S. intermedius* and *S. gordonii*, respectively, were applied on a solid medium; 100 µL of each experimental group was dropped onto a paper disc, and it was carefully placed on the solid medium inoculated with the bacteria. After keeping it at 37°C for 24 hours in each environment, the diameter of the clear zone was measured on a paper disc. The average value and standard deviation were obtained after three repeated experiments, to measure the diameter of the clear zone, where the growth was inhibited. Only the average value was recorded, however, because the degree of deviation was insignificant.

The media for each bacterium and bacteria (1X10⁵) were mixed at a ratio of 9 (medium):1 (bacteria). Mixed extracts were prepared at the 5, 10, 20, and 40 mg/mL concentrations, and 100 µL was inoculated into the solid medium. After keeping the extracts in a 37°C bacterial incubator for 24 hours, the number of CFUs present in the solid medium was checked.

Result

1. Clear zone results: As a result of the application of the *Coptischinensis* experimental group to *S. intermedius*, a slight bacterial concentration decrease of 1-2 mm around the filter paper was observed at the 5 mg concentration, but there was no definite zone. At the 10 mg concentration, a 10mm clear zone was observed, and at the 20 mg concentration, a 20 mm clear zone [Figure 1].

For the results of the application of the *Coptischinensis* experimental group to *S. gordonii*, a slight death of about 1 mm appeared around the 5 mg filter paper, and a 10mm clear zone was shown in the 10 mg group while a 15 mm clear zone was shown in the 20 mg group [Figure 2].

2. CFU Results: To examine the ability of the

Coptischinensis extract to inhibit bacterial proliferation, the group with only bacteria and the groups with 5, 10, and 20 mg of the extract with bacteria were incubated for 24 hours. As a result, it was confirmed that many bacteria survived in the control group with only bacteria, not mixed with the extract, and *S.intermedius* and *S.gordonii* were both killed in all the experimental groups (5, 10, and 20mg groups) overall [Figure 3].

As a result of the application of *Coptischinensis* extract to the opportunistic, infectious oral-resident bacteria, a definite clear zone appeared on the paper disc of *S. intermedius* when 10mg extract was applied, and became larger when 20mg extract was applied. Even in *S. gordoii*, a 10mm clear zone appeared in the 10mg extract, showing an antimicrobial activity almost similar to the one against *S. intermedius*, but a smaller clear zone was shown in the 20mg extract compared to the one in *S. intermedius*. In the comparison of CFUs, it was confirmed that bacteria were killed in all the 5, 10, and 20mg extracts [Figure 4].

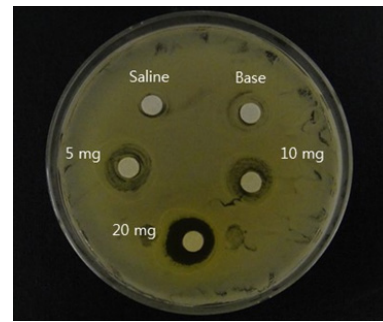


Figure 1. Results of the clear zone of Coptischinensis extract against *S. intermedius*. (Saline: 0mm, base: 0 mm, 5mg: 1mm, 10mg: 10mm, 20mg: 20mm)

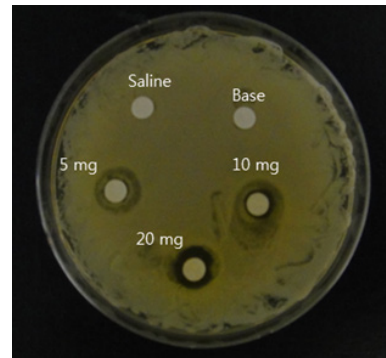


Figure 2. Results of the clear zone of Coptischinensis extract against *S.gordonii*. (Saline: 0mm, base: 0mm, 5mg: 1mm, 10mg: 10mm, 20mg: 15mm)

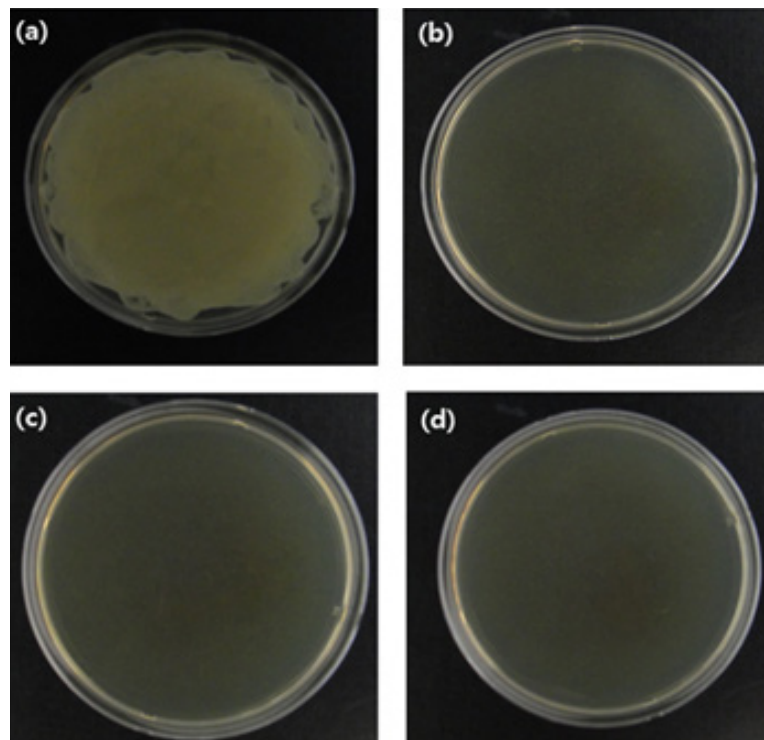


Figure 3. CFU results of Coptischinensis extract against *S.intermedius*: (a) control; (b) 5 mg/mL; (c) 10 mg/mL; (d) 40 mg/mL

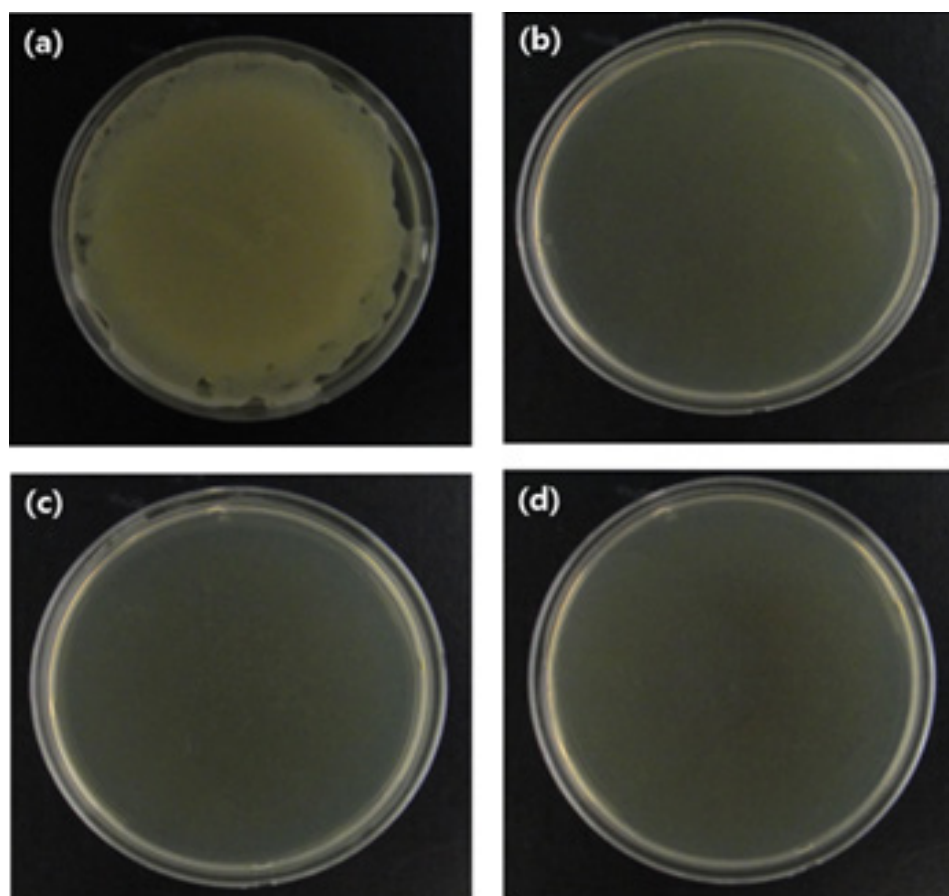


Figure 4. CFU results of *Coptischinensis* extract against *S.gordonii*: (a) control; (b) 5 mg/mL; (c) 10 mg/mL; (d) 20 mg/mL; and (e) 40 mg/mL

Discussion

Studies with the aim of finding new antimicrobial substances in natural resources like plants have been actively conducted of late. As such, this study was conducted to evaluate the antimicrobial activity against two kinds of oral-resident bacteria, using a substance isolated from *Coptischinensis* ethanol extract.

The environment in the oral cavity consists of various microorganisms linked together to form an ecosystem, in which biofilm is formed in various orders. The biofilm is usually present in the oral cavity, and if a trigger factor that causes opportunistic infection is involved, an oral disease may occur^[12-13]. In this study, *S. intermedius* and *S. gordonii*, which are normally residing in the oral cavity, were included in the experiment. *S. intermedius* in the root canal of the natural tooth is known to be present in the oral cavity, pharynx, and gastric juice, and is known to be capable of causing brain tumor and liver abscess through opportunistic infection^[14]. On the other hand, *S. gordonii* is not only associated with pulpitis but can also

cause systemic diseases like infective endocarditis and infectious arthritis^[15-17].

Looking at the previous studies on the antimicrobial activity of *Coptischinensis* extract against oral bacteria, Yoo et al. reported a 10-22 mg killing range on average as a result of the application of *Coptischinensis* to oral disease bacteria, including *S. sobrinus*, *A. viscosus*, and *S. mutans*^[18].

Cha et al. reported that *Coptischinensis* showed a strong antimicrobial activity against *Staphylococcus aureus* and *Candida albicans* in the study on the antimicrobial activity using various native cosmetic plants^[19]. In addition, various studies have shown the results of the excellent antimicrobial activity of *Coptischinensis*, which were similar to the results of this study^[18]. The excellent antimicrobial activity of *Coptischinensis* is attributed to a component called “berberin,” which is known to inhibit the metabolism of carbohydrates and the synthesis of the glycoproteins in the bacteria^[19]. Additionally, this component was found

to form a complex with the DNA of the bacterium, thereby affecting the DNA replication, inhibiting the growth and propagation of the bacterium, and exhibiting the antimicrobial activity^[20].

When evaluating the antimicrobial activity of *Coptischinensis* extract, the influence of the solvent used to make *Coptischinensis* extract should also be considered. In the case of *Coptischinensis*, it is known that its antimicrobial activity can be confirmed in all the extracts obtained from solvents like water, ethanol, and methanol, and its effect has been proven^[21]. Even native plants with excellent antimicrobial activity may have stronger antimicrobial activity in a wide range of bacteria, when mixed with other substances rather than when used alone. Thus, it is necessary to verify the antimicrobial activity in the future using this type of stable complex.

Conclusion

This study analyzed the antimicrobial activity of *Coptischinensis* ethanol extract as a natural plant by applying it to oral-resident bacteria. As a result of the analysis of the clear zone of *Coptischinensis* extract against two kinds of oral-resident bacteria, *S. intermedius* and *S. gordoi*, which may cause opportunistic infections, excellent antimicrobial activity was shown, and 20 and 15mm clear zones were observed at a high concentration of 20 mg, proving an excellent antibacterial activity. These results suggest that *Coptischinensis* extract can be used to efficiently control and manage oral-resident bacteria. Further studies using a combination of various extracts with similar antimicrobial activities and analyses of the component causing antimicrobial activity other than berberine of *Coptischinensis* need to be conducted.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Analysis of Depression and Stress Trends of Families Receiving Basic Life Support for Dementia Patients: Based on the Community Health Survey in 2015, 2016 and 2017

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Abstract

Background/Objectives: The purpose of this study is to identify the relations between the depression and the stress of the family with low income who are living with the patient with dementia and to utilize it as basic data to develop the health promotion program for the efficient management of the depression and stress in the family with low income.

Method/Statistical Analysis: The subjects of the study were the first analysis of 685,391 people over 45 years-old by requesting raw data from the Community Health Survey from 2015, 2016 and 2017. Trend analysis was conducted.

The statistical software R program was used for data analysis, and frequency analysis and chi-square analysis were conducted for the general characteristics, health behaviors, chronic diseases, depression, and stress according to the dementia patients and their living families. Performed linear to linear coupling were used for the yearly trend analysis. Logistic regression analysis was performed to analysis the factors related to depression as a dependent variable of family members living with dementia.

Findings: The yearly trend analysis showed an increase in hypertension with men over 75 years old, and housewives and smoking decreased ($p < 0.05$). Logistic regression analysis showed depression as a dependent variable, and the higher the educational background, the higher the level of education in agriculture, forestry, and fisheries compared to housewife or unemployed ($p < 0.05$).

Improvements/Applications: In conclusion, a systematic free counselling program for the management of chronic diseases, depression and stress for the elderly aged of 75 or older who are taking care of low-income and dementia patients is urgently needed.

Keywords: *Depress, Stress, Health behaviors, Dementia, Cohabitation family with dementia patients, Trend analysis.*

Introduction

In 2015, the dementia prevalence of the people having 65 years or older in our country is 9.8% and

the population of aged with dementia is estimated to be 648,000 and it is estimated to be increased to 2.71 million corresponded to 15% of entire population of aged in 2050^[1].

According to the announcement of Alzheimer's Disease International (2015), the worldwide dementia population is estimated as 46.8 million, it is expected to be increased to 135 million in 2050.^[2] The dementia prevalence of the people having 65 years or older in Korea is 9.8% and the dementia population is estimated

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to be 648,000 and it is expected to be increased to 2.71 million corresponded to 15% of entire population of aged in 2050^[3].

Dementia is a serious geriatric disease that is developed chronically and deteriorated, the social activities, work life, interpersonal relationship, etc. are limited by the cognitive disorder, memory impairment, behavior disorder, change of character, etc, and the wandering behavior or psychotic symptoms, problem behavior are shown^[4].

Dementia causes the serious mental, physical and economic burden to the patient with dementia and the family, for which it is reported that 68% of the family caregivers of the patient with dementia feel the high level of care burden^[5] and such care burden is related to the physical symptoms, depression, health perception subjective well-being of the primary caregiver^[6]. In addition, in the results of performing the stepwise regression analysis to verify the factors having influence on the cumulative stress of family with demented elderly, for the variable having influence on the cumulative stress, the anxiety showed the statistically significant difference out of the mental health condition, and the inclination that the higher the anxiety, the more the cumulative stress is increased was shown^[7]. Moreover, the dementia care brings the change in the depression and the stress of the caregiver^[8].

For that, it is reported that 68% of the family caregivers feel high level of care burden^[5]. and such care burden is related to the physical symptoms, depression, health perception and subjective well-being of the primary caregiver^[9].

In addition, the results of performing the stepwise regression analysis to verify the factors having influence on the cumulative stress of family with demented elderly, for the variable having influence on the cumulative stress, the anxiety showed the statistically significant difference out of the mental health condition, and the inclination that the higher the anxiety, the more the cumulative stress is increased was shown^[10]. Paid caregiver family with demented elderly vacation system is being implemented from July, 2014 to support the rest (vacation) of family that cares the demented elderly at home. This system allows the family to leave the demented elderly under the short-term protection service of the long-term care institution, etc. for 6 days a year bearing 15% of the cost regardless of the monthly limit but the stress reduction

program for the family with demented elderly is not sufficient.

Therefore, this study intended to provide the basic data to develop the program for the health promotion and the health education of the family members who are caring the patient with dementia by identifying the influence on the stress of family member.

Method

The subjects of the study were the first analysis of 685,391 people over 45 years old by requesting raw data from the Community Health Survey from 2015, 2016 and 2017. The yearly trend analysis was conducted.

The statistical software R program was used for data analysis, and frequency analysis and chi-square analysis were conducted for the general characteristics, health lifestyle, chronic diseases, depression, and stress according to cohabitation family with dementia patients or not. Performed linear by linear coupling were used for the yearly trend analysis. Logistic regression analysis was performed to analysis the factors related to depression as a dependent variable of cohabitation family with dementia patients.

Result and Discussion

1. General characteristics and trend of cohabitation family with dementia patients by year (2015, 2016 and 2017): As a result of analyzing general characteristics according to whether they live with dementia patients, the rate of family living together was 1.1%, which was very low. In the age group, 34.9% were significantly higher in the family members over 75 years of age ($p < 0.001$).

The level of education was the highest in elementary school (25.8%) ($p < 0.001$). Marital status was significantly higher in the case of spouses (70.7%) ($p < 0.001$). In household income, 3 million won was significant from 1 million won to 3 million won ($p < 0.001$).

In house occupations, housewives and unemployed workers had the most time (47.1%), followed by agriculture, forestry and fisheries (14.4%), simple labor workers, sales service workers, professional administrative workers, office workers, and others ($p < 0.001$).

As a result of analyzing the yearly trends in 2015, 2016 and 2017, the yearly trends in the age group 75

years and older showed a significant increase of 32.2%, 35.3% and 37.0%. On the other hand, 45-64 and 65-74 years of age showed a significant decrease, indicating that no-no-care of the elderly is increasing ($p < 0.05$).

In occupational classification, housewives and unemployment decreased significantly to 48.4%, 47.7%,

and 45.2%, and the second largest occupational group in agriculture, forestry, and fishery was 15.9%, 14.0%, and 13.3%. There was a decreasing trend ($p < 0.001$).

On the other hand, the number of job category showing a yearly increase was professional administrative managers, which increased by 6.1%, 6.4% and 11.7% ($p < 0.001$) [Table 1].

Table 1. General characteristics and trend of cohabitation family with dementia patients by year (2015, 2016 and 2017) Unit: N (%)

Categories	Cohabitation family with dementia patients				Trend by year					
	Yes		No		2015		2016		2017	
Gender	p = 0.475				p = 0.920					
Male	3,404	(45.4)	304,942	(45.0)	1,111	(45.8)	1,154	(44.5)	1,139	(49.5)
Female	4,094	(54.6)	372,922	(55.0)	1,315	(54.2)	1,438	(55.5)	1,341	(54.1)
Age	p = 0.000				p = 0.002					
45-64	2,829	(45.0)	259,963	(57.5)	940	(47.1)	965	(44.7)	924	(43.4)
65-74	1,265	(20.1)	106,783	(23.6)	413	(20.7)	433	(20.0)	419	(19.7)
75 or Older	2,193	(34.9)	85,738	(18.9)	642	(32.2)	763	(35.3)	788	(37.0)
Education	p = 0.000				p = 0.748					
Non- education	911	(12.2)	46,397	(6.9)	304	(12.5)	306	(11.8)	301	(12.2)
Elementary School	1,929	(25.8)	120,005	(17.8)	614	(25.3)	654	(25.3)	661	(26.9)
Middle School	962	(12.9)	75,345	(11.1)	311	(12.8)	338	(13.1)	313	(12.7)
High school	1,883	(25.2)	190,642	(28.2)	631	(26.0)	661	(25.5)	591	(24.0)
University and above	1,786	(23.9)	243,492	(36.0)	563	(23.2)	631	(24.4)	592	(24.1)
Marital status	p = 0.000				p = 0.658					
Single	1,006	(13.5)	103,675	(15.4)	322	(13.3)	360	(13.9)	324	(13.5)
Spouse	5,265	(70.7)	457,283	(67.7)	1,723	(71.2)	1,825	(70.4)	1,717	(70.7)
Divorce, bereavement, Separation	1,176	(15.8)	114,357	(16.9)	375	(15.5)	407	(15.7)	394	(15.8)
Household income	p = 0.000				p = 0.330					
Less than 1 million won	2,420	(32.6)	139,361	(20.8)	799	(33.2)	798	(31.2)	823	(33.5)
1 million to less than 3 million won	2,610	(35.1)	231,048	(34.4)	899	(37.3)	837	(32.7)	874	(35.5)
3 million to less than 5 million won	1,500	(20.2)	184,239	(27.4)	435	(18.1)	622	(24.3)	443	(18.0)
More than 5 million won	896	(12.1)	116,627	(17.4)	274	(11.4)	303	(11.8)	319	(13.0)
Job	p = 0.000				p = 0.000					
Professional Administration Manager	604	(8.1)	79,401	(11.7)	148	(6.1)	166	(6.4)	290	(11.7)
White collar	323	(4.3)	59,774	(8.8)	89	(3.7)	119	(4.6)	115	(4.6)
Sales service	775	(10.4)	87,245	(12.9)	239	(9.9)	285	(11.0)	251	(10.1)
Agriculture, Forestry and Fisheries	1,075	(14.4)	82,115	(12.1)	384	(15.9)	362	(14.0)	329	(13.3)
Functional labor	1,040	(13.9)	123,176	(18.2)	340	(14.1)	365	(14.1)	335	(13.5)
Housewife unemployed	3,525	(47.1)	222,734	(32.9)	1,170	(48.4)	1,235	(47.7)	1,120	(45.2)
Other(Student,Soldier)	144	(1.9)	22,578	(3.3)	49	(2.0)	56	(2.2)	39	(1.6)
Total	7,498	(1.1)	677,864	(98.9)	2,426	(32.4)	2,592	(34.6)	2,480	(33.1)

p-value calculated by χ^2 -test and linear to linear coupling., The silent answer was missing.

2. Health behaviors and trend of cohabitation family with dementia patients by year (2015, 2016 and 2017): The person who smoked in the past but currently does not smoke was 55.8% showing significantly higher than the persons who smoke very much or smoke sometimes ($p < 0.001$). For the annual drinking trend of the household cohabiting with the dementia patient, the person who is drinking was 72.8% showing significantly high and the proportion of not drinking was high compared to the group not cohabiting with the dementia patient ($p < 0.001$).

For the severe physical activities, the person who does severe physical activities were 67.7% having significantly high ($p < 0.001$). According to the analysis of health behaviors based on cohabitation status with the dementia patients, the annual drinking and severe physical activities did not show the significant trend change. In the currently smoking, which showed the significant trend change, the person who smoked in the past but current does not smoke was 54.3%, 56.5% and 59.7% showing that the subject who stops smoking is being increased significantly ($p < 0.001$) and the subject who stops smoking shows the increasing trend by year ($p < 0.001$) [Table 2].

Table 2. Health behaviors and trend of cohabitation family with dementia patients by year (2015, 2016 and 2017) Unit: N(%)

Categories	Cohabitation family with dementia patients				Trend by year					
	Yes		No		2015		2016		2017	
Current smoking	p = 0.000				p = 0.037					
Very smoke	1,109	(39.7)	111,634	(45.2)	394	(42.8)	372	(39.0)	343	(37.3)
Occasional smoke	98	(3.5)	10,957	(4.4)	27	(2.9)	43	(4.5)	28	(3.0)
I smoked the past but not the present	1,589	(56.8)	124,599	(50.4)	500	(54.3)	540	(56.5)	549	(59.7)
Annual drinking	p = 0.000				p = 0.897					
Yes	4,038	(72.8)	461,133	(82.5)	1,350	(73.1)	1,381	(72.7)	1,307	(72.5)
No	1,511	(27.2)	97,874	(17.5)	496	(26.9)	518	(27.3)	497	(27.5)
Moderate physical activity	p = 0.000				p = 0.819					
Yes	2,419	(32.3)	238,323	(35.2)	794	(32.7)	827	(31.9)	798	(32.2)
No	5,079	(67.7)	439,541	(64.8)	1,632	(67.3)	1,765	(68.1)	1,682	(67.8)
Total	7,498	(1.1)	677,864	(98.9)	2,426	(32.4)	2,592	(34.6)	2,480	(33.1)

p-value calculated by χ^2 -test and linear to linear coupling., The silent answer was missing.

3. Chronic disease, depression, stress and trend of cohabitation family with dementia patients by year(2015, 2016 and 2017): Results of chronic disease, depression and stress according to dementia patients living together

The percentage of hypertension 33.3%, diabetes 14.0%, arthritis 12.8%, depression, 2.6%, and stress 3.7% were significantly higher than those who did not live together ($p < 0.001$) [Table 3].

Table 3. Chronic disease, depression, stress and trend of cohabitation-family with dementia patients by year (2015, 2016 and 2017) Unit: N(%)

Categories	Cohabitation family with dementia patients				Trend by year					
	Yes		N0		2015		2016		2017	
Hypertension	p = 0.000				p = 0.002					
Yes	2,493	(33.3)	163,103	(24.1)	755	(31.1)	867	(33.5)	871	(35.4)
No	4,987	(66.7)	513,794	(75.9)	1,671	(68.9)	1,724	(66.5)	1,592	(64.6)
Diabetes	p = 0.000				p = 0.306					
Yes	1,047	(14.0)	64,659	(9.5)	337	(13.9)	341	(13.2)	369	(14.9)
No	6,447	(86.0)	613,050	(90.5)	2,089	(86.1)	2,250	(86.8)	2,108	(85.1)
Arthritis	p = 0.000				p = 0.539					
Yes	953	(12.8)	57,234	(8.5)	313	(12.9)	310	(12.0)	330	(13.5)
No	6,507	(87.2)	618,787	(91.5)	2,111	(87.1)	2,281	(88.0)	2,115	(86.5)
Depressed	p = 0.000				p = 0.116					
Yes	197	(2.6)	7,580	(1.1)	61	(2.5)	56	(2.2)	80	(3.2)
No	7,288	(97.4)	669,873	(98.9)	2,360	(97.5)	2,534	(97.8)	2,394	(96.8)
Stress	p = 0.000				p = 0.739					
Yes	278	(3.7)	12,997	(1.9)	94	(3.9)	93	(3.6)	91	(3.7)
No	7,186	(96.3)	663,694	(98.1)	2,326	(96.1)	2,493	(96.4)	2,367	(96.3)
Total	7,498	(1.1)	677,864	(98.9)	2,426	(32.4)	2,592	(34.6)	2,480	(33.1)

p-value calculated by χ^2 -test and linear to linear coupling., The silent answer was missing.

4. Results of logistic regression analysis taking depression as dependent variable: In the results of logistic regression analysis taking the depression as dependent variable, in case of the 75 years or older, the depression was significantly increased by 6.210 times compared to the age from 45 years to 64 years ($p < 0.05$). For the education level, the depression was increased significantly by 4.765 times in the

elementary school graduates, by 6.293 times in the high school graduates and by 7.848 times in the college graduates or higher compared to the uneducated ($p < 0.05$). The depression was increased significantly by 6.434 times in the agriculture, forestry and fisheries compared to the homemaker or unemployed ($p < 0.05$) [Table 4].

Table 4. Results of logistic regression analysis taking depression as dependent variable

Variables	B	S.E,	Exp(B)	95% C.I for Exp(B)	
Gender (ref: Female)					
Male	.325	.551	1.385	.471	4.074
Age (ref: 45-64)					
65-74	.227	.561	1.255	.418	3.768
75 or Older	1.826	.650	6.210	1.738	22.188
Education (ref: non-education)					
Elementary school	1.561	.677	4.765	1.265	17.949
Middle school	1.259	.717	3.521	.864	14.343
High school	1.839	.755	6.293	1.432	27.659
University and above	2.060	.845	7.848	1.499	41.087
Marital status (ref: single)					
Spouse	.325	.822	1.383	.276	6.932
Divorce, bereavement, separation	.615	.878	1.849	.331	10.324

Variables	B	S.E,	Exp(B)	95% C.I for Exp(B)	
Household income(ref: More than 5 million won)					
Less than 1 million won	.561	.697	1.752	.447	6.874
1 million to less than 3 million won	1.299	.698	3.666	.933	14.412
3 million to less than 5 million won	1.178	.869	3.248	.592	17.829
Job(ref: Housewife, unemployed)					
Professional Administration Manager	.732	.797	2.078	.436	9.909
White collar	16.894	4638.845	2.173	.000	.
Sales service	-.484	.699	.616	.156	2.427
Agriculture, Forestry and Fisheries	1.862	.847	6.434	1.222	33.868
Functional labor	1.307	.866	3.695	.676	20.191
Current smoking(ref:I smoked the past but not the present)					
Very smoke	.153	.460	1.166	.473	2.871
Occasional smoke	-.769	.830	.464	.091	2.356
Annual drinking (ref: No) Yes	.337	.416	1.401	.620	3.166
Moderate physical activity(ref: Yes) No	.457	.494	1.579	.599	4.160
Hypertension(ref: No) Yes	.225	.415	1.252	.555	2.825
Diabetes(ref: No) Yes	.839	.457	2.313	.945	5.664
Arthritis(ref: No) Yes	.503	.592	1.653	.518	5.278
Stress (ref: No) Yes	4.396	.450	81.103	33.606	195.731

Conclusion

Currently, the diverse programs for the caregiver of demented elderly are implemented by the national responsibility system for dementia but the customized regional program to relieve the depression of the family cohabiting with the patient with dementia during the busy time of the farm village, mountain village and the fishing village besides the subjects of low income of 75 years old is not sufficient.

Therefore, the systematic free counselling program for the management of depression and stress in the male elderly of 75 years or older who have low income and cares the patients with dementia is needed desperately.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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A Study on the Adjustment to the College Life: Focusing on Mediated Effect of Self-Differentiation

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Abstract

Background/Objectives: To find relationships among stress, self-differentiation, and adjustment to college life in the college students and verify the mediated effect of self-differentiation between stress and adjustment to the college life.

Method/Statistical Analysis: Data were collected from 1,192 attending college students and analysed using SPSS Statistics 22. T-test and ANOVA were used to confirm the level of stress by the adjustment level to the college life, differences of self-differentiation, adjustment level to the college life by the levels of stress and self-differentiation.

Findings: Even with the same level of stress, there were differences in the adjustment to the college life by degree of self-differentiation. The stress and self-differentiation of the college students were significant predictors for the adjustment to the college life by 15.8%, which showed higher level of the adjustment to the college life as the stress was lower and self-differentiation was higher, demonstrating partial mediated effect of self-differentiation between the stress and adjustment to the college life.

Improvements/Applications: Based on these study results, controlling stress by enhancing self-differentiation is considered to be helpful for the adjustment to the college life.

Keywords: *Adjustment, College life, Stress, Self-differentiation, College students, Mediation effect.*

Introduction

Most of the Korean college students experience the life historical process of entrance examination until they enter the colleges. This is the transitional period from the late adolescent to the adult, facing the developmental tasks to have to adapt the new environment of college such as relieving from dependency in the adolescent period and playing a role of adult. Most of the Korean students live

together with their families rather than separating and they are in the situations not to be free from the contexts of families on the multiple issues of adjustments that can occur in the college life such as career development, interpersonal relationship, personality, values, and so on^[1]. Therefore, well adjustment to the college environment primarily will be the major prerequisite to achieve a variety of developmental tasks which should be acquired by the college life. Multiple experiences in the family environment would work as the variables to adjust to the new environment. For the adjustment to the college life of the students, it is necessary to study the interactions and relationships with various variables in the family environment.

In Korea, Je^[2] developed the index of self-differentiation in Bowen's theory, demonstrating less interpersonal conflicts as the level of self-differentiation

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was higher, and more interpersonal conflicts and less development of adjustment mechanism as the level of self-differentiation was lower in a study to investigate the relationship between self-differentiation and dysfunctional behaviors. Studies were published on the relationships among the level of self-differentiation, mental health and symptoms of maladjustment, and problematic behaviors in the subjects mainly with adolescents, college students and married men and women. You^[3] reported that dysfunctional behaviors were generated when family projection was significant, they experienced the emotional disconnection a lot, and family return was severe in a study on the adjustment to the college life and career preparation behaviors by the level of self-differentiation. Park and Jo^[4] showed in their study on the adjustment to the college life by the level of self-differentiation that well adjustment to the college life as the level of self-differentiation was higher, especially when their ego was integrated, family return was less, they belonged to the nuclear families with well differentiation. Park^[5] reported relatively higher explanatory power with 30% in the children's self-differentiation for their adjustment to the school lives, demonstrating the influential predictors with differentiation between cognitive and emotional functions, emotional disconnection, and family return.

In summary of the prior studies, the level of self-differentiation could be closely related to the adjustment to the college life. Family functions have been described variously with multiple concepts to explain and evaluate the family dynamics in view of family system.

Kerr and Bowen^[6] considered the concept to show the degree of individualization in the family system as self-differentiation. Self-differentiation means not only the individual thinking capability upon separating thinking from emotion but also the emotional maturation and degree of individualization from the family in which he or she was born^[7]. That means, self-differentiation is the course to establish the identity upon individualization from the mass of undifferentiated ego and to acquire freedom in the self-impulsive and emotional thinking and behaviors^[8]. Kang et al^[9] reported that the most essential concept in Bowen's family therapy theory was self-differentiation which was related to the control of emotion. Bowen^[7] suggested that self-differentiated people lived goal-oriented lives since they could respond the stress efficiently upon thinking independently to relieve from the emotional integration.

Considering adjustment as a series of processes that individuals control themselves and change the environment so as to lower the imbalance or discomfort factors between them and environment and to live their lives with balanced ones upon accepting a variety of desires in the society, the individuals can solve the conflicts by themselves being independence from their parents emotionally in any difficult situations if their egos are differentiated as healthy and matured personalities. Being independence itself means to transit into the actionable state as the independent individual. Balanced adjustment to the environment is possible only in case that emotional support from the families and individualization are performed together since the most active independence enables when it is performed based on the emotional stability.

Self-differentiation which will be discussed in this study implicates the directly opposed concept as well as those to facilitate complementarily, therefore, it is necessary to review the issues of development how they are related with the psychosocial adjustment in view of family system including the family relationship. In this respect, this study is to investigate whether the level of self-differentiation perceived by the college students mediates the stress and adjustment to the college life. The objective of this study is to provide with the fundamental data to prepare the alternatives for effective adjustment to the college life considering the level of self-differentiation in the college education and counseling.

Method

The survey was conducted with structured questionnaires in the subjects with 1,192 college students who understood its purposes and consented the participation in the study. A total of 1,104 survey sheets was used as the final analysis excluding the data with insincere responses and abnormal standardized residual values over ± 3 .

In the analyses of the Research, an index of college life adjustment modified by Kim^[10] with existing indexes^[11-13] was used including three sub-domains (adjustment to the study; adjustment to the society; and college environment and general adjustment) and its Cronbach α was .85. An index of college life stress developed by Chon and Kim^[14] was used including eight sub-domains (economic problems, relationships with the opposite sex, relationships with professors,

relationships with friends, career problems, values, and study). It contained 50 questionnaires of 3-point-scale meaning higher experience of college life stress as the score was higher, and the reliability on the sub-domains of stress was .82-.89 in this study. Self-differentiation index developed by Je^[2] based on Bowen’s family system theory was used to measure the level of self-differentiation, including 5 sub-domains (cognitive versus emotional function, ego-integration, family projection process, emotional disconnection, and family return). It contained 36 questionnaires of 4-point-scale meaning higher level of self-differentiation as the score was higher. Its Cronbach α on sub-domains of self-differentiation index was .56-.82 in this study (overall .87).

Data were analyzed using SPSS Statistics 22. T-test and ANOVA were used to confirm the level of stress by the adjustment level to the college life, differences of self-differentiation, and adjustment level to the college life by the levels of stress and self-differentiation. With respect to the mediated effect of self-differentiation in the relationships with the stress and adjustment, Sobel test was performed to find out the statistical significance on the mediated effect after performing regression analysis according to the analysis process of mediated effect suggested by Baron & Kenny^[15] (1st step, effects of independent variables to mediated variables; 2nd step,

effects of independent variables to dependent variables; and 3rd step, effects of independent variables with mediated variables to dependent variables).

Result

- 1. Adjustment to the college life by levels of stress and self-differentiation:** The group with lower level of the stress and higher level of self-differentiation showed higher level of adjustment to the college life and the group with higher level of the stress and lower level of self-differentiation did lower level of adjustment, demonstrating statistically significant differences [Table 1].

Table 1. Adjustment by level of stress and self-differentiation

Stress	Self-differentiation	n	Adjustment	F
Low	Low	179	3.14±0.40	62.47*
	High	372	3.40±0.45	
High	Low	377	2.99±0.38	
	High	176	3.15±0.40	

*: p<0.01

- 2. Mediated effect of self-differentiation:** [Table 2] shows the results whether self-differentiation was mediated to the relationship between the stress of college students and their adjustment level to the college life.

Table 2. Mediation effect of self-differentiation

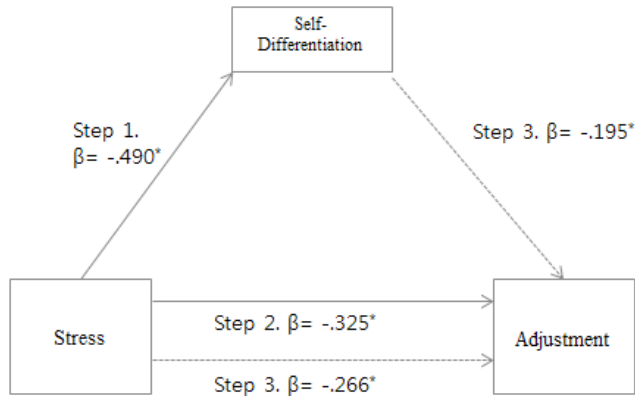
Step	Predictors	Variable	B	SE	β	t	Adj.R ²	F
1	Stress	S-differentiation	-0.46	0.02	-0.49	-18.64*	0.24	347.51*
2	Stress	Adjustment	-0.30	0.03	-0.33	-11.41*	0.11	130.27*
3	Stress	Adjustment	-0.18	0.03	-6.15	-6.15*	0.16	104.55*
	S-differentiation		0.26	0.03	0.27	8.40*		

*: p<0.01

In the 1st step, the stress was shown as the statistically significant predictor for self-differentiation ($\beta = -.490$, $t = -18.642$, $p < .001$) and its explanatory power of regression model was 23.9%. In the 2nd step, the stress was shown to predict the adjustment significantly ($\beta = -.325$, $t = -11.413$, $p < .001$) and its explanatory power of regression model was 10.5%. In the 3rd step, the stress ($\beta = -.266$, $t = -6.1473$, $p < .001$) and self-differentiation ($\beta = .266$, $t = 8.403$, $p < .001$) were shown to predict the adjustment significantly in the regression model predicting both

simultaneously, and its explanatory power of regression model was 15.8%. That means, self-differentiation predicted the adjustment even in the controlled state on the adjustment with the influences of the stress, demonstrating the stress with negative prediction of adjustment apart from the mediated effect. Therefore, self-differentiation can be considered as the partial mediated variable between the stress and adjustment to the college life. Lastly, upon Sobel test results, the statistically significant mediated effects were found

with 7.648 [Figure 1]. In conclusion, self-differentiation can be considered with partial mediated effect in the relationship between the stress and adjustment.



* p < .001, Sobel test z=7.648, p=.000

Figure 1. Mediated effect of Self-differentiation in the relationship between Stress and Adjustment

Discussion

First, upon the results of the stress by the adjustment level of college life and the differences of self-differentiation, the group with lower level of adjustment to the college life showed higher levels in overall stress level and its sub-domains and lower levels in overall self-differentiation and its sub-domains. This is consistent with the previous reports that the level of adjustment to the college life was lower as the level of stress was higher^[4], and the level of self-differentiation was lower^[16]. Geun^[17] reported in his study on the relationship among self-differentiation, symptoms of maladjustment, and problematic behaviors in the adolescents that symptoms of maladjustment were occurred such as psychosomatic symptom, obsession, interpersonal sensitivity, depression, anxiety, hostility, paranoia, phobic anxiety, psychosis, and so on when the level of self-differentiation was low, and the level of self-differentiation could predict the maladjustment symptoms and problematic behaviors, which supports the results of this study.

Second, upon the results of the adjustment level of college life by the level of self-differentiation when the students experienced the same level of the stress, the level of the adjustment of college life was different by the level of self-differentiation even with the same level of the stress. It would be all right for the adjustment to the college life if the levels of stress and self-differentiation were low, however, in case of the high level of stress,

the level of the adjustment to the college life was enhanced by lowering the level of stress if the level of self-differentiation was high while the adjustment level was lowered without controlling the stress if the level of self-differentiation was low.

Third, the stress and self-differentiation of the college students were significant predictors with 15.8% of explanatory power on the adjustment to the college life. As the level of the stress was lower and the level of self-differentiation was higher, the level of the adjustment to the college life was higher, and self-differentiation showed the partial mediated effect in the relationship between the stress and the adjustment to the college life. As the level of self-differentiation was higher, the experiences of living stress were lower without considering the stress seriously^[18]. Self-differentiation may play a role to enhance the level of the adjustment to the college life by controlling stress in a way to maintain harmonious interpersonal relationship upon proper responses to the stressful situations by active reactions such as problem-centric ones or pursuing social support^[19], and upon expressing their feelings in the proper time and places with well socialized adjustment way.

Being the college students from the high school ones, they develop a variety of relationships and experience multiple problems such as competitions for job seeking, financial problems like tuition fee, pocket money and so on, and the stress from the anxiety on the future. From the results of this study, it is considered that enhancing self-differentiation is important since those with high level of self-differentiation perceive the stress low and cope with it properly to enhance the level of the adjustment to the college life. In the previous studies, the level of self-differentiation was determined by the results of family interactions^[20], the positive correlation was found in the communication between parents and children^[18] and the level of self-differentiation was higher as the communication was more open^[21].

Conclusion

From the results of this study, it is considered that enhancing self-differentiation is important since those with high level of self-differentiation perceive the stress low and cope with the stress properly to enhance the level of the adjustment to the college life. Hence, it is necessary to prepare multiple programs that can enhance the interaction between children and parents and acquire

the open communication skill. In addition, there were many studies on the effects of self-differentiation as the independent variable to the dependent variables, however, few studies on the effects of self-differentiation as the dependent variable, which requires further studies. This study had the meaning to find out the mediated effect of self-differentiation in the relationship between the stress and the adjustment to the college life although it has the limitation to generalize the results since the random sampling was performed among the college students in a region in Korea. Further studies are anticipated to be able to review the effective supports on the adjustment to the college life by understanding in multidimensional aspects upon development of structural equation model to verify the causality among major variables that can explain the adjustment to the college life.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Study on the Oral Health Attitude and Behaviour and the Changes in Dental Plaque According to the Use of Qraycam

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Abstract

Background/Objectives: The study aimed to identify changes in dental plaque after intraoral application of a disclosing agent in two Qraycam groups and to investigate changes in oral health attitudes and behaviours.

Method/Statistical Analysis: The study population consisted of 80 people who participated in the study between May and August 2019. The equipment used was Qraycam and a plaque control records (O'Leary index); oral health attitudes and behaviours were investigated. Differences in participant characteristics according to Qraycam use were analysed by χ^2 test, while changes in the PCR(O'Leary index) by area for Qraycam use and non-use groups were analysed by pre-post paired-samples t-test. The influence on the oral health attitudes of the Qraycam use group was analysed by multiple linear regression analysis. All analyses were performed using IBM SPSS ver. 25.0 (IBM Co., Armonk, NY, USA) and the significance level for statistical testing was set to 0.05.

Findings: In the Qraycam use group, a decrease in the PCR in the left and right sides showed statistically significant differences ($p < 0.05$), while a change in the total PCR also showed a statistically significant difference ($p < 0.05$), with the right side showing a greater change in dental plaque. In the Qraycam non-use group, there were no statistically significant differences in the decrease in the left, right, and total PCR. In the Qraycam-use group, the biggest influencing factor on oral health attitudes was oral health behaviour ($p < 0.05$).

Improvements/Applications: PCR(O'Leary index) decreased significantly in the Qraycam use group, influencing oral health education, attitudes, and behaviours. The active use of Qraycam for community-based oral health activities and clinical dentistry would assist oral health promotion.

Keywords: O'Leary index, Oral health attitude, Oral health behaviour, Plaque control record(PCR), Qraycam.

Introduction

The most basic care method for maintaining healthy oral conditions and enjoying better quality of life is dental plaque management through proper tooth brushing^[1]. If dental plaque is not removed physically

or chemically, the types and amount of microorganisms can increase. Dental plaque is a non-calcified bacterial mass, which can typically be removed sufficiently by the physical force used when brushing teeth with a toothbrush^[2]. Since dental plaque has a yellow or milky white colour, similar to teeth, people sometimes have difficulty in distinguishing dental plaque from natural teeth with the naked eye. As dental plaque becomes worse, periodontal disease may occur. With periodontal disease, subjective symptoms caused by incipient lesions do not appear until the disease has progressed to a considerable extent and is left untreated in most cases since there is no discomfort. Therefore, such periodontal diseases can be viewed as a chronic disease since they

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are often treated in the advanced stage^[3]. Periodontal disease is preventable by dental plaque control, and up to now, the method of using a disclosing agent to test the effect of dental plaque control has helped increase the effectiveness of oral health education. It has been reported that oral health education method for motivating patients and the maximization of the visual effect by using a disclosing agent are effective in improving oral hygiene^[4]. To achieve behavioural changes in patients, it is necessary to induce motivation. In particular, for oral health education, continuous and long-term behavioural changes are very important. Proper oral health education and the use of oral care products can build reasonable oral care habits. Oral health education through a disclosing agent for dental plaque examination is very effective, but using a disclosing agent is time consuming in that the surface of each tooth must be coloured and the examination must be performed after rinsing the mouth. Moreover, it requires effort from both the patient and examiner and there is discomfort when cleaning the coloured tooth surface upon completion of the examination^[1].

To resolve such discomfort, new technology has been developed which would allow dental plaque to be detected without colouring. Recently, the latest diagnostic equipment using fluorescence have been introduced in dentistry, a prime example of which is quantitative light-induced fluorescence (QLF) used for detecting incipient caries lesions^[5-6]. QLF is an equipment that detects the red fluorescence emitted by a metabolite called porphyrin, which is secreted by intraoral bacteria^[7]. It has been reported that dental examinations using Qraycam can produce results similar to directly observing the teeth of study participants and it has the excellent ability of visual inspection in distinguishing between dental caries and restorations^[8]. The advantages of this equipment include the fact that it does not use a disclosing agent for dental plaque assessment and that older dental plaques show redder fluorescence^[7], which could be very helpful visually when educating patients. A study by Lee^[9] investigated and reported on the oral hygiene status of adolescents who smoke by addressing the disadvantage of observing dental plaque by using a disclosing agent to overcome the problem of different results being found according to the subjective perspective and skill level of the examiner.

The present study aimed to apply a disclosing agent inside the oral cavity to check whether any change in dental plaque is actually observed in both Qraycam use

and non-use groups. The study also aimed to investigate changes in oral health attitudes and oral health care behaviour. Oral care education and motivation through the use of a disclosing agent is an appropriate and excellent method, but Qraycam is very beneficial for motivating patients and can help the effectiveness of education in addition to being more convenient to patients. For dental hygienists, it helps examine the overall health status of patients and the quantification of the results, while also being helpful in providing such information to patients to promote behavioural changes.

Accordingly, the objective of the present study was to investigate the effectiveness of oral health education and changes in attitude and behaviour based on changes in PCR(O'Leary index) in groups that used or did not use Qraycam.

Method

The study population consisted of 80 people who visited the 00 university for clinical dental hygiene practical training between May and August 2019. The appropriate sample size needed for the χ^2 test, paired t-test, and multiple linear regression analysis was calculated via priori power analysis using the G*power 3.1 program. The present study was conducted with approval from the Institutional Review Board (IRB) of Silla University (1041449-201904-HR-002).

Qraycam is a dental diagnostic equipment developed by AIOBIO (Seoul, South Korea). The students who participated in the present study have experience from repeated training in treating patients, and thus were familiar with the items that appeared in the questionnaire. During practical training, a dental hygiene assessment was performed according to normal lessons and the items were surveyed using a preliminary questionnaire and records. Upon completion of all preliminary surveys, the investigation was conducted by dividing participants into those who received oral health education by Qraycam images and those who did not.

A plaque control record (O'Leary index) is used to assess the ability of patients to perform dental plaque control. It indicates the location or amount of dental plaque and measurement is possible with just the dental mirror and a probe. Generally, since it can accurately investigate the areas with dental plaque build-up, the areas where a toothbrush and dental floss should be used can easily be identified, while the surfaces of the teeth are coloured with a disclosing agent and each

tooth is divided into four surfaces for the assessment of any remaining dental plaque in the tooth margins^[10]. In the present study, the PCR(O’Leary index) of all participants were investigated to determine the changes in dental plaque.

The study used thirteen oral health attitude items that Lee^[11] applied to workers aged 18 to 65. Each item was graded on a five-Likert scale with 1 point for “not at all” and 5 points for “very much so”. The maximum possible score was 65 points, with higher scores indicating higher oral health attitudes.

This is the contents extracted from the chart records in clinical dental hygiene practice^[12]. Oral health care behaviour consisted of eight items regarding the frequency of tooth brushing, duration of tooth brushing, tooth brushing intensity, tooth brushing time, tooth brushing method, the use of fluoride toothpaste, interdental cleaning, and tongue cleaning. The maximum possible score was sixteen points, with higher scores indicating better oral health care behaviour.

To analyse the differences in the general characteristics of the participants according to the use of Qraycam, a χ^2 test was performed. Changes in PCR by area in the Qraycam use group were investigated by a pre-post paired-samples t-test. Changes in PCR by area in the Qraycam non-use group were also investigated by a pre-post paired-samples t-test. The influence on the oral health attitudes of the Qraycam use group was analysed by multiple linear regression analysis. All analyses were performed using IBM SPSS ver. 25.0

(IBM Co., Armonk, NY, USA) and the significance level for statistical testing was set to 0.05.

Result and Discussion

Typical oral diseases, such as dental caries and periodontal disease, are caused by bacterial dental plaque; thus, dental plaque control is the simplest and most efficient method for preventing oral disease. Therefore, sound dental plaque control practices can be very helpful in preventing oral disease. There is a variety of oral health education method for achieving dental plaque removal. The present study investigated whether using Qraycam can be helpful for dental plaque removal by dividing the participants into Qraycam use and non-use groups.

[Table 1] shows general characteristics of participants, the Qraycam usage rate in males and females was 59.4 percent and 47.9 percent, respectively; the Qraycam usage rate was relatively higher due to the participants being involved in practical training in school. When the participants brushed their teeth, they usually used their right hands. The Qraycam usage rate in the groups with and without negative experiences during previous treatments was 50.0 percent and 52.9 percent, with and without regular visits to the dental clinic was 50.0 percent and 53.4 percent, with and without scaling experience was 54.5 percent and 48.0 percent, and with and without oral health care education experience was 51.6 percent and 53.1 percent, respectively. The Qraycam use and non-groups according to general characteristics of participants showed no statistically significant differences.

Table 1. General characteristics of participants

		A	B	Total	χ^2	p
1	Men	19(59.4)	13(40.6)	32(100.0)	1.011	0.219
	Women	23(47.9)	25(52.1)	48(100.0)		
2	Right	41(53.2)	36(46.8)	77(100.0)	0.459	0.602
	Left	1(33.3)	2(66.7)	3(100.0)		
3	NO	36(52.9)	32(47.1)	68(100.0)	0.035	0.548
	Yes	6(50.0)	6(50.0)	12(100.0)		
4	NO	31(53.4)	27(46.6)	58(100.0)	0.076	0.489
	Yes	11(50.0)	11(50.0)	22(100.0)		
5	NO	12(48.0)	13(52.0)	25(100.0)	0.295	0.381
	Yes	30(54.5)	25(45.5)	55(100.0)		
6	NO	26(53.1)	23(46.9)	49(100.0)	0.016	0.541
	Yes	16(51.6)	15(48.4)	31(100.0)		

1:Gender, 2:Use of hands, 3:Negative experience during previous treatment, 4: Regular visits to the dental clinic, 5: Scaling experience, 6:Oral health care education experience, A: Use group of Qraycam, N(%), B: Non-use group of Qraycam, N(%), *p<0.05 by χ^2 test

[Table 2] shows the changes in plaque control record by area in the Qraycam use group. A decrease in the right PCR showed a statistically significant difference ($p = 0.002$) and a decrease in the left PCR also showed a statistically significant difference ($p = 0.002$). Changes in the total PCR also showed a statistically significant difference ($p = 0.001$), with the right side showing greater change in dental plaque (diff. 9.01). As shown in Table 2, dental plaque was removed better on the left side than on the right side. Most of the participants were right-handed and right-handed people typically have difficulty cleaning the right side of their mouths, as compared to the left side. This is because there may be difficulties with the appropriateness of the direction or approach of the toothbrush, as compared to the left side. Generally, when oral health education is conducted, instructions are given on how to clean the right teeth, left teeth, and anterior teeth. Since oral health education was conducted in many cases after showing images in the Qraycam use group, the decrease in dental plaque may have shown significant change.

Table 2: Changes in plaque control record by area in the Qraycam use group (N = 42)

PCR	Before	After	Mean diff	p
Right side	45.91	36.90	9.01	.002
Left side	42.65	34.81	7.84	.002
Total	46.28	37.73	8.55	.001

* $p < 0.05$ by paired t-test

[Table 3] shows the changes in plaque control record by area in the Qraycam non-use group. A decrease in right, left, and total PCR did not show statistically significant differences. However, as shown in Table 3, dental plaque was removed better on the left side than on the right side. The PCR of the right teeth appeared relatively higher in the Qraycam non-use group, while the PCR of the left teeth was very similar to that of the Qraycam use group. However, the difference between the before and after was not high.

Table 3: Changes in plaque control record by area in the Qraycam non-use group (N = 38)

PCR	Before	After	Mean diff	p
Right side	49.68	47.65	2.03	0.471
Left side	42.65	43.38	4.30	0.102
Total	46.90	42.17	4.72	0.138

* $p < 0.05$ by paired t-test

As shown in [Table 4], oral health attitudes in the Qraycam use group appeared significantly higher in the order of oral health behaviour ($\beta = 1.715$) and total plaque control record (before) ($\beta = 0.134$), while the explanatory power was approximately 33.2 percent with adjusted R square = 0.332.

Table 4: Influence on oral health attitude in the Qraycam use group (N = 42)

	β	Std. Error	t	p
(Constant)	22.092	9.668	2.285	0.028*
1	3.344	1.936	1.727	0.093
2	-0.063	0.102	-0.618	0.541
3	0.134	0.065	2.050	0.048*
4	-0.036	0.083	-0.433	0.668
5	2.816	6.620	0.425	0.673
6	1.715	0.521	3.292	0.002*

1: Gender, 2: Age, 3: Total Plaque Control Record Before, 4: Total Plaque Control Record After, 5: Use of hands, 6: Oral Health Behaviour, Dependent Variable: Oral Health Attitude, R Square = 0.430, Adjusted R Square = 0.332, * $p < 0.05$ by Multiple linear regression analysis

The limitations of the present study include the following: First, the participants were selected by convenience sampling and the study used questionnaires and practical lesson records of clinical hygiene students. Therefore, there are difficulties in generalising the findings. Second, although the results were derived by a single-group pretest-posttest design using before and after comparisons during visits and re-visits by the participants, there were difficulties in testing the effect of Qraycam due to the absence of a control group, despite efforts to control the exogenous variables. If future studies can identify the interventional effect of Qraycam through a study design using experimental and control groups, then such differences could be presented more clearly. Studies to date have often focused on the validity and reliability of dental plaque and dental examinations using Qraycam. However, the present study is valuable in that it demonstrated the interventional effect of oral health education through Qraycam.

Conclusion

The objective of the present study was to identify the influence on the oral health education effect, attitudes, and behaviours through changes in PCR of the Qraycam use and non-use group. The study was conducted on 80 people who visited the 00 university for clinical dental hygiene practical training between May and August

2019. The participants understood the objectives and method of the study, had no systemic problems and were otherwise healthy, and consented to participate in the study. The findings were as follows:

1. In the Qraycam use group, a decrease in the left and right PCR showed statistically significant differences ($p < 0.05$). The total PCR also showed statistically significant differences ($p < 0.05$), with the right side showing greater changes in dental plaque.
2. In the Qraycam non-use group, a decrease in the left, right, and total PCR showed no statistically significant differences.
3. In the Qraycam use group, the biggest influencing factor on oral health attitude was oral health behaviour ($p < 0.05$).

Through the present study, PCR decreased significantly in the Qraycam use group and appeared to influence the effect of oral health education, attitude, and behaviour. Accordingly, it is believed that the active use of Qraycam of community-based oral health activities and clinical dental hygiene would be helpful for oral health promotion.

Ethical Clearance: IRB(1041449-201904-HR-002)

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Conflict of Interest: Nil

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Differences of Passive Ankle Stiffness in Post-Stroke Hemiplegia by Varying Angular Velocity between the Paretic and Non-Paretic Side

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Abstract

Background/Objectives: The purpose of this study was to investigate the effect of passive stiffness on joint function by analyzing the in the passive stiffness of the PS and NPS ankle joint at various angular velocity.

Method/Statistical Analysis: The differences of the stiffness of ankle according to different angular velocity in both sides were compared and analyzed in 11 hemiplegic patients. Analyses on the difference of stiffness of ankle joint at each angular velocity between the P and NP side were performed using a paired t-test. The ANOVA with repeated measure was performed to analyze the differences of the stiffness. Statistical significance was defined as $P < .05$.

Findings: In the comparison on the passive stiffness of ankle joint, the paretic side was turned out to be higher in the passive stiffness than the non-paretic side at all angular velocity (20, 40, 60 deg/sec, $P < .05$). In addition, the analysis on the differences of the stiffness according to the changes in angular velocity showed that the stiffness was found to be the largest at 60 deg/sec and the smallest at 20 deg/sec in both paretic and non-paretic side indicating that the stiffness increases in the higher velocity ($P < .05$). These results indicate that the range of movement of paralyzed muscles caused by stroke is limited due to the increased passive ankle stiffness and that the velocity of movement is related to the joint function.

Improvements/Applications: This study can be exploited as a basis to evaluate the passive ankle stiffness of paretic muscles of stroke patients affecting joint function and as a data for rehabilitation program.

Keywords: Stroke, Hemiplegia, Muscle, Passive Stiffness, Angular Velocity, Rehabilitation.

Introduction

Spasticity shows velocity-dependent characteristics in addition to abnormal increase of muscle tension. Since spasticity causes some serious problems, such as footdrop in plantarflexion of the ankle joint, which hinders basic functional behavior such as walking, it is an important part of rehabilitation [1]. The spasticity and hypertonia of muscles due to stroke are known to be

induced by a wide variety of causes, the major causative factors, nevertheless, are yet to be clearly understood. Changes in muscle tension are caused by changes in the reflex and non-reflex factors, leading to an increase in the passive stiffness of joint and muscles [2]. Changes in muscle fascicle length, thickness, and pennation angle, in addition to the neurological factors, are known to cause the changes in passive ankle stiffness [3]. The passive stiffness is also induced by an increase in plantarflexion moment with changes in muscle viscoelasticity properties. As such, movement disorder such as paralysis after brain injury occur with changes in muscle architecture and in the passive characteristics of muscles as well, hence leading to serious influence on daily life in a negative manner. Previous studies have

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shown that the passive spasticity of the paretic muscle is 43% higher than that of the non-paretic muscle^[4]. Hence, understanding the stiffness that increases in the ankle joint after stroke and analyzing the changes in stiffness in respect to the velocity of motion can be an important part of the evaluation of function. In particular, since the ankle joint is an important joint that is directly related to natural ability of human, walking, it is a clinically crucial joint for returning to daily living activity after stroke and it is a body segment that is deeply affected by paralysis and spasticity compared to other joints^[5]. In addition, the typical walking pattern of stroke patients is caused by plantarflexion of the ankle joint, and the recovery is slower than other joints^[6]. It has been studied by many researchers since it is important to understand the factors listed above for functional recovery of the ankle joint^[7].

Joints move the skeleton by generating torque, a muscle-generated force of rotating characteristics. Force is used as a moment in biomechanical analysis, the moment, which changes as the angle changes while the joint is moving, can be described as a function of stiffness, i.e., the stiffness is the moment divided by the angle (Nm/deg)^[8]. The spasticity of ankle joint and an increase of muscle tension is a major causative factor and have been intensively studied thus far. It has been suggested that the degree of non-reflective factors may influence more than reflective factors and some studies have suggested that the degree of spasticity can lead to a change in the passive characteristics of the ankle joint, limiting the amount of torque generated internally^[9]. The spasticity of paralyzed muscle is closely related to the velocity of joint motion since the spasticity

shows a velocity-dependent feature due to excessive exaggeration of stretch reflexes. Hence, it is essential to understand the velocity of joint angle and the change pattern of spasticity since the velocity of joint motion in functional movement such as walking affects the rigid muscles^[10,11].

In this study, the passive stiffness of the ankle joint after stroke was analyzed by measuring the difference of the joint angle and the angular velocity of the paretic and non-paretic side using the torque-angle relationship curve and slopes which indicate the relation between the torque generated from the ankle joint and the angle at a specific point in time. In addition, we aimed to analyze the velocity of motion and the trend of passive stiffness increase by means of measuring the motion of different velocities in different conditions to analyze the characteristics of the velocity-dependent rigid muscles.

Method

- 1. Participants:** The participants voluntarily agreed to participate and signed on the consent form for the experiment after hearing the explanation of the contents and purpose of the study, the experimental procedure, human rights protection of the subject, and the safety of the study. The participants were selected for patients who were able to walk independently at a chronic stage 6 months after onset and had ankle stiffness graded as less than 2 on Modified Ashworth Scale (MAS). The physical characteristics and medical history of the subjects are shown in Table 1.

Table 1. Medical history and physical characteristics of each subject.

No.	Gender	Age (Years)	Diagnosis	Paretic side	MAS	Onset (months)	Height (cm)	Weight (kg)
1	F	52	Rt. Subarachnoid Hemorrhage	Lt	1+	33	157	53
2	M	57	Lt. Basal Ganglia Infarction	Rt	1	29	171	71
3	F	52	Lt. Cerebral Infarction	Rt	1+	10	152	52
4	M	59	Rt. Subarachnoid Hemorrhage	Lt	1	34	173	67
5	M	54	Lt. Thalamus Infarction	Rt	2	17	178	83
6	F	57	Rt. Cerebral Infarction	Lt	2	44	161	61
7	M	51	Rt. MCA Infarction	Lt	1+	45	169	64
8	M	53	Lt. Subarachnoid Hemorrhage	Rt	1	9	155	63
9	M	55	Lt. Pontine Infarction	Rt	2	23	165	67
10	F	53	Rt. Basal Ganglia Infarction	Lt	1+	8	165	65
11	F	58	Rt. Cerebral Hemorrhage	Lt	1+	28	153	60
Mean±SD		54.6±2.7				25.5±13.3	163.5±8.7	64.2±8.5

□ M: Male, F: Female, Rt: Right, Lt: Left, MCA: Middle Cerebral Artery, MAS: Modified Ashworth Scale, NP: Non-paretic, P: Paretic.

2. **Experimental Procedures:** Torque was measured by dynamometer (cybex, lumex, USA) to calculate the passive stiffness of the ankle joint according to the velocity of movement. For the measurement, participants sat comfortably in the dynamometer chair, straightened the knees, set the ankle joint to anatomical 0 degree, and secured it with a strap to the footrest. The range of ankle joint motion was measured within the range from 10 degrees of dorsiflexion to 30 degrees of plantarflexion. The motion was repeatedly performed for 10 times for each velocity and the data were collected for 6 intermediate excluding the beginning and ending two times. A 5 minute break was set between the measurements to rule out the interference effect between the velocities and the velocity condition was scheduled in a random basis.
3. **Data Analysis:** The raw data were collected on a personal computer using Lab View 8.0 (National Instrument, USA). The dynamometer received the synchronization signal of torque and angle and converted each analog signal into digital one and stored them in a personal computer. The voltage value gained from the dynamometer was recalibrated, converted to actual Nm value and subjected for analysis. The remaining signals were derived from real data using Chart 5 for Window (AD Instrument, USA) program. Passive stiffness was analyzed by determining slopes ranging from 10 degrees of plantarflexion to 10 degrees of dorsiflexion of the torque-angle curve during the operation at each velocity [8].

Result and Discussion

As shown in Table 2, the passive stiffness of the ankle joint, which was determined by measuring the slope between 10 degrees of plantarflexion and 10 degrees of dorsiflexion, was measured at an angular velocity of 20 deg/sec as 2.61±1.25 of non-paretic side and 4.46±2.11 paretic side, indicating that the stiffness of paretic side was larger than that of non-paretic side with statistical significance. The passive stiffness at angular velocity of 40 deg/sec was measured as 3.40±1.57 in non-paretic side and 6.93±2.63 in paretic side indicating consistent patterns as in the 20 deg/sec as paretic side showed higher value with statistical significance. In case of 60 deg/sec, it was measured as 3.94±1.88 in non-paretic side and 8.69±3.85 in paretic side also resulting in the consistent pattern as the paretic side showed higher value with statistical significance. The

passive stiffness of paretic side turned out to be higher in all angular velocity tested and all the differences were statistically significant ($P < .05$). The degree of stiffness increase according to the velocity tended to increase as the angular velocity increases.

Table 2. Passive ankle stiffness of post stroke hemiplegia in different angular velocity

Side \ Velocity	Nom-Paretic side	Paretic side
20 deg/sec	2.61±1.25	4.46±2.11*
40 deg/sec	3.40±1.57	6.93±2.63*
60 deg/sec	3.91±1.88	8.69±3.85*

The result above was consistent with the results of previous studies that the stiffness increased during passive movement of the joints [10-12]. This means that neurological changes after cerebral infraction and changes in the material and biomechanical properties of the muscles and tendons cause negative consequences on joint movement, and velocity-dependent properties greatly influence on adaptation to external environmental changes and on controlling the proper velocity of joint movement. Biomechanical changes in the ankle joint correlate with decreased joint range and increased ankle resistance and stiffness together with spasticity after stroke [15].

Figure 1 shows the difference in ankle joint stiffness between the paretic side and non-paretic side at ankle joint angular velocity of 60 deg/sec. As shown in the figure, the torque increases as the ankle joint flexes to the dorsal side and as the slope increases. The slope is higher in paretic side than in non-paretic side, so the hardness is higher indicating the stiffness is higher in paretic side.

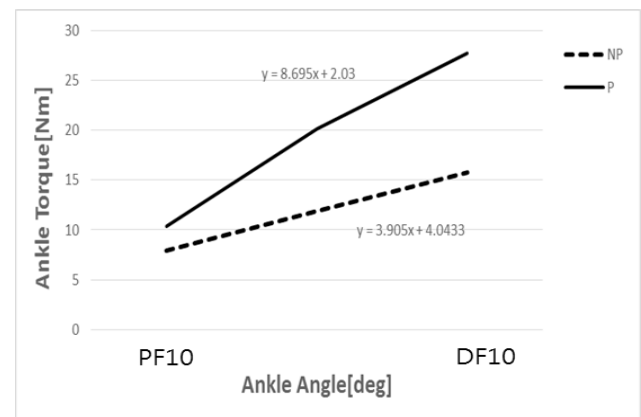


Figure 1. Torque-angle relationship slope of paretic and non-paretic side in 60 deg/sec ankle movement. NP: non-paretic, P: paretic

The torque-angle curve in the whole range of joint motion given in Figure 2 shows the overall pattern. The paretic side increases slowly in the plantarflexion compared to the non-paretic side, and the torque increases rapidly toward the dorsiflexion. This means the intrinsic muscle ability to stretch is deteriorated as resistance due to spasticity and contracture largely increased when the plantarflexion muscle becomes longer. These results mean that the resisting torque of the ankle joint generated during dorsiflexion is relatively greater than the resisting torque during plantarflexion, thus, the heel strike of the stance phase and the toe off, which is the beginning of the swing phase, are prevented during walk [16]. The stiffness increase with the elevating velocity of the joint movements indicates that the resistance of rigid muscle increases according to the joint movement [17]. Although the increase in exaggeration of stretch reflex, which is intrinsic characteristics of spasticity, cannot be directly observed with the velocity suggested in this study, the increasing passive stiffness will also affect active movement and muscle traits and will interfere with various movements given that voluntary movements are not smooth due to the nature of stroke [18].

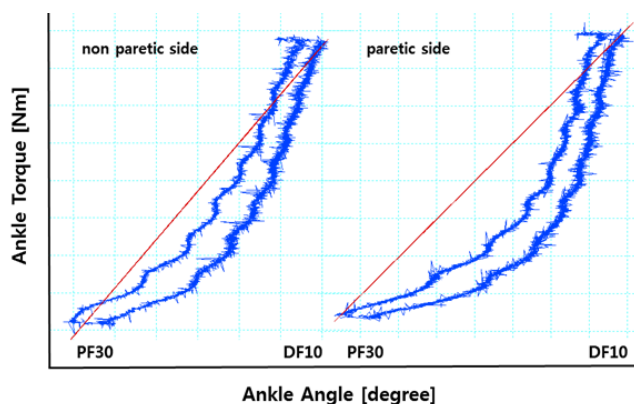


Figure 2. The torque-angle curve in the full range of ankle joint

Changes in the material properties of muscles are secondary to nerve damage. The stiffness of the paralyzed muscles is associated with changes in the reflex mechanisms and passive mechanical properties of the muscles at rest, resulting in contractures and reduced joint range. Many current clinical tests cannot clearly distinguish the contributions between the two, but the abnormal increase in torque occurs equally. Furthermore, as stiffness increases, the range of motion decreases and the motor function of the limbs decreases [6].

Passive stiffness may be related with increased amount of collagen in muscle, however the evident

for long term accumulation in connective tissue has not been elucidated [19]. After stroke, the paralyzed muscles are immobilized for a long while, thus reducing the longitudinal load on the muscles. This reduction is reportedly known to cause muscle atrophy, shorten sarcomere and accumulate fat in connective tissue. A long-term study with immobilization of rats has revealed an increase in collagen fibers in the endo/epimysium of connective tissue, and a change in the ratio of muscle fibers and collagen related to gene expression has been observed [20]. When the muscle loses its intrinsic stretch ability in the process of the force generated by the muscles acting on the skeleton via the muscle, the magnitude of the force is proportional to the size of the cross sectional area that is the thickness of the muscle, and is determined by various factors such as the pennation angle and muscle fiber length. Debilitation of muscles results in a decrease in thickness and the pennation angle and this phenomenon frequently occurs in paralyzed muscles after stroke. Eventually, all changes in biomechanical properties from muscle fibers to joint levels can cause functional impairment; it is hence thought to be important to analyze the complex correlations among the variables and the contribution of each factor to the malfunction in the studies of paralyzed muscles due to stroke.

Conclusion

As a result, the paretic side showed resistance in joint toward movement than the non-paretic side. The difference in stiffness appeared to be generally larger in higher velocity of movement than in lower velocity. Spasticity, a representative symptom of paralyzed muscles, directly affects joint movement, and the resistance is increased by shortened muscles due to changes in its material properties, thus increasing joint stiffness. In addition, the changes of the degree of change in stiffness dependent according to the velocity of movement means that it is difficult to adapt to various changes between the inside the body and external environment. Hence, it will be important to resolve these problems through various interventional method.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Factors Affecting Subjective Health Status in Adult Male Workers with Metabolic Syndrome Using Seventh Korean National Health and Nutrition Examination Survey (KNHANES, 2016-2018)

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Abstract

Background/Objectives: Metabolic syndrome has been increasing for the last 10 years in South Korea, and the rate of increase in the prevalence rate of male workers is especially fast. Metabolic syndrome is a disease for which continuous care is important. Motivation for health behavior that induces health promoting behavior is affected by subjective health status. Accordingly, subjective health status of adult male workers with metabolic syndrome in South Korea and factors influencing subjective health status will be examined in this study.

Method/Statistical Analysis: This study performed secondary data analysis using the Seventh Korean National Health and Nutrition Examination Survey. The number of participants of the Seventh Korean National Health and Nutrition Examination Survey was 29,321. There were 469 adult male workers with metabolic syndrome. Subjective health status was measured using a 5-point scale for subjective judgment of one's health status. In this study, subjective health status of the subjects according to general characteristics, health-related characteristics and health-related behavioral characteristics were verified by t-test and ANOVA. Multiple regression was used to analyse the factors causing significant differences in subjective health status.

Findings: The results showed body discomfort, perceived stress, comorbidity, muscle strengthening and walking exercise, restriction of activity were significantly associated with subjective health status.

Improvements/Applications: The results of this study show that the developed interventions are needed to improve health of adult male workers with metabolic syndrome in Korea.

Keywords: *Metabolic syndrome, adulthood, subjective health status, national survey, secondary analysis*

Introduction

Metabolic syndrome is defined as a comprehensive disease that is clinically classified as to have three or more symptoms among abdominal obesity, blood

pressure, diabetes, HDL cholesterol and neutral fat^[1]. In South Korea, the prevalence rate of metabolic syndrome is very high that 32.1% of adults in their 30s and older have metabolic syndrome. In adults aged up to 50s, metabolic syndrome is 2~3 times more often in men than women^[2]. The risk and incidence rate of metabolic syndrome in Korean male workers are high because stress from work intensity, overtime work and get-togethers and lack of exercise lead to an increase of neutral fat and fasting blood sugar, decrease of HDL cholesterol, and increase of blood pressure and waist size. This is shown in the results of a previous study, which reports that sex,

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age and occupational class are associated with metabolic syndrome^[3].

These previous study proposed to intervene the factors influencing metabolic syndrome^[4]. In other words, since the prevalence rate of metabolic syndrome is high in adult men in South Korea, it is regarded as important to verify the factors related to metabolic syndrome and providing interventions to lower the risk of metabolic syndrome. Various previous studies made the effects to verify and intervene the factors related to metabolic syndrome^[5-6].

In terms of nursing, it is important not only to examine the risk factors of metabolic syndrome but also to examine perceived subjective health status related to metabolic syndrome. By paying attention to subjective health status that affects health behavior of metabolic syndrome patients and verifying the factors influencing subjective health status, method of improving subjective health status can be prepared. Subjective health status is self-perceived health status, and accurate perception of health status is known to have significant impact on health promoting activities^[7-8]. Improved perception of subjective health status can lead to an increase of health promoting activities, which would then create a virtuous circle of managing metabolic syndrome as patients can positively perceive their own health status.

Previous studies on metabolic syndrome patients of diverse ages propose various method of improving health promoting activities to take care of metabolic syndrome. Body weight, drinking, smoking, sleep, rest, stress, health examination and exercise were presented as the factors influencing metabolic syndrome, and efforts were made to intervene these factors^[9]. Such efforts can directly affect health-related behavior of metabolic syndrome, but they cannot examine changes in subjective health status perceived by the patient group. Since subjective health status determines subjective status of one's health, positive perception can be turned into a more comfortable and long-term habit of metabolic syndrome management. However, domestic studies on subjective health status of metabolic syndrome patients only compared subjective health status between normal group and metabolic syndrome group. None of them investigated the factors influencing health promoting activities.

This study was carried out only on adult male workers aged 20 years or above who are exposed to a

high risk of metabolic syndrome to analyze subjective health status and propose a health-related intervention that can improve subjective health status.

Method

- 1. Study Design:** This study involves secondary data analysis. Data used in this study were constructed based on the Seventh Korean National Health and Nutrition Examination Survey, and weighted values were considered to increase representativeness and accuracy of data. Accordingly, this study was designed to calculate the analytical results by considering complex sampling factors according to the data structure and analysis method presented in the Korean National Health and Nutrition Examination Survey Analysis Guideline.
- 2. Sample:** The Seventh Korean National Health and Nutrition Examination Survey was not a complete enumeration survey but a sample survey conducted on 29,321 respondents. Based on the criteria for Adults Treatment Panel □ of the National Cholesterol Education Program, along with the criteria for men suggested by Korean Society for the Study of Obesity in the case of waist size, 469 final subjects of this study were selected by classifying adult workers who satisfy three or more of the following criteria^[10] [Table 1].

Table 1. Clinical identification of the metabolic syndrome in men – Any 3 of the following

Risk Factor	Defining Level
Abdominal obesity	Waist circumference >90cm
Triglycerides	≥150mg/dL
HDL cholesterol	<40mg/dL
Blood pressure	sbp≥130mmHg/dbp≥85mmHg
Fasting glucose	≥110mg/dL

- 3. Ethical Considerations:** This study obtained prior approval of the Institutional Review Board at T University (201905-HR-004). Data used in this study were provided by Korea Centers for Disease Control and Prevention after removing personal identification information in accordance with the Personal Information Protection Act.
- 4. Measures:**
 - 1. General characteristics and health-related characteristics:** Items of the Korean National Health and Nutrition Examination Survey such

as education, occupation status, living state, home ownership, income, unmet healthcare needs, weight change, perceived body shape, body discomfort, restriction of activity, comorbidity, perceived stress and depressive mood were analyzed as general characteristics and health-related characteristics. Health-related characteristics included unmet healthcare needs, weight change, perceived body shape, body discomfort, restriction of activity, comorbidity, perceived stress and depressive mood as items that can influence metabolic syndrome.

2. Health-related behavioral characteristics: Current smoking status, current alcohol drinking status, frequency of binge drinking, participatory rate of aerobic exercise, muscle strengthening exercise, walking exercise were analyzed as health-related behavioral characteristics. Drinking, smoking and exercise are known as primary risk factors of metabolic syndrome, and they were included as health-related behavioral characteristics.

5. Data Analysis: The study results were derived using SPSS 23.0 and STATA 13.0 programs. Subjective health status of adult male workers with metabolic syndrome according to general characteristics, health-related characteristics and health-related behavioral characteristics were analyzed using t-test, ANOVA and multiple regression.

Result

In the Korean National Health and Nutrition Examination Survey, subjective health status was measured on a 5-point Likert scale ranging from ‘1 point: Extremely poor’ to ‘5 points: Extremely good.’ Responses with a score closer to 5 points were continuous variables meaning ‘poor’ subjective health status.

The differences in subjective health status of adult male workers with metabolic syndrome in South Korea according to general characteristics and health-related characteristics are as presented in [Table 2]. There were statistically significant differences in subjective health status according to income, unmet healthcare needs, weight change, body discomfort, restriction of activity, comorbidity, perceived stress and depressive mood.

Table 2. Subjective health status according to general and health-related characteristics

Characteristics	Categories	M±SE	t or F	P post-hoc
Age		48.06±10.57		
Education (complete school)	≤Elementary Middle High ≥College	3.22±0.85 2.95±0.74 2.85±0.68 2.88±0.65	2.525	.057
Occupation	Office worker Service worker Manufacturing worker	2.86±0.65 2.96±0.72 2.91±0.72	0.699	.498
Living state	Not alone Alone	2.87±0.67 3.15±0.88	1.401	.176
Home ownership	No One More than two	2.93±0.68 2.87±0.67 2.91±0.74	0.322	.725
Income	Lower Lower-middle Lower-upper upper	3.07±0.67 2.83±0.71 2.80±0.68 2.88±0.66	3.650	.013
Unmet healthcare needs	Yes No No needs	3.30±0.66 2.86±0.68 2.91±0.60	7.275	.001 a>b

Characteristics	Categories	M±SE	t or F	P post-hoc
Weight change	Weight loss	3.08±0.76	3.748	.024
	No change	2.83±0.66		
	Weight gain	2.98±0.70		
Perceived body shape	Underweight	3.20±0.56	1.982	.139
	Normal weight	2.83±0.75		
	Overweight	2.90±0.66		
Body discomfort (during the past 2 weeks)	Yes	3.19±0.83	2.841	.006
	No	2.85±0.66		
Restriction of activity	Yes	3.54±0.78	3.489	.001
	No	2.87±0.67		
Comorbidity (hypertension, diabetes mellitus, dyslipidemia)	Yes	2.99±0.75	-2.566	.011
	No	2.83±0.63		
Perceived stress	Very High	3.00±0.80	3.866	.009 b>d
	High	3.01±0.61		
	Moderate	2.88±0.67		
	Low	2.63±0.82		
Depressive mood (more than 2 weeks)	Yes	3.18±0.77	2.542	.011
	No	2.87±0.68		

Note. n(%), M±SE were except missing values.

Likewise, the differences in subjective health status of adult male workers with metabolic syndrome in South Korea according to health-related behavioral characteristics are as presented in [Table 3]. There were

statistically significant differences in subjective health status according to current smoking status, walking exercise and muscle strengthening exercise.

Table 3. Subjective health status according to health-related behavioural characteristics

Characteristics	Categories	M±SE	t or F	P post-hoc
Current smoking status	Every day	3.01±0.66	3.077	.027
	Sometimes	2.82±0.80		
	Not now	2.83±0.71		
	Never	2.79±0.64		
Current alcohol drinking status	Yes	2.88±0.68	0.626	.531
	No	2.95±0.76		
Frequency of binge drinking	None	2.89±0.75	0.210	.890
	1/month	2.89±0.71		
	1/week	2.87±0.56		
	Almost daily	2.95±0.77		
Participatory rate of aerobic exercise	Yes	2.82±0.69	1.947	.052
	No	2.94±0.66		
Muscle Strengthening Exercise (within 1 week)	No	2.97±0.65	9.477	<.001
	1-3/week	2.67±0.76		
	≥4/week	2.66±0.68		
Walking Exercise (within 1 week)	No	2.96±0.69	4.464	.004 b>d
	1-3/week	3.02±0.64		
	≥4/week	2.81±0.76		
	7/week	2.75±0.64		

Note. n(%), M±SE were except missing values.

The factors influencing subjective health status of adult male workers with metabolic syndrome in South Korea are as shown in [Table 4]. The regression model for subjective health status of the subjects was significant ($F = 6.960, p < .001$), and explanatory power

of the overall model was 12.3% (adjusted $R^2 = .123$). The factors influencing subjective health status were found to be recent body discomfort, perceived stress, comorbidity, restriction of activity, walking exercise and muscle strengthening exercise.

Table 4. Factors affecting perceived subjective health status in metabolic syndrome group

Characteristics	Unstandard coefficient B SE		Standard coefficient β	t	p
(Constant)	5.743	.479		11.990	<.001
Income	-0.051	.027	-0.082	-1.880	.061
Unmet healthcare needs	-0.142	.085	-0.074	-1.679	.094
Weight change	0.042	.054	0.035	0.781	.435
Body discomfort (during the past 2 weeks)	-0.253	.097	-0.117	-2.596	.010
Restriction of activity	-0.477	.188	-0.115	-2.532	.012
Comorbidity (hypertension, diabetes mellitus, dyslipidemia)	0.155	.062	0.111	2.489	.013
Perceived stress	-0.115	.045	-0.115	-2.577	.010
Depressive mood (more than 2 weeks)	-0.209	.118	-0.078	-1.769	.078
Current smoking	-0.017	.012	-0.065	-1.482	.139
Muscle Strengthening Exercise (within 1 week)	-0.167	.048	-0.156	-3.501	.001
Walking Exercise (within 1 week)	-0.069	.028	-0.109	-2.439	.015
R2 = .144 Adj R2 = .123 F = 6.960 p<.001					

Note. n(%), M±SE were except missing values.

Discussion

This study is secondary data analysis using data from the Seventh Korean National Health and Nutrition Examination Survey, carried out to examine the factors influencing subjective health status of adult male workers aged 20 years or above among metabolic syndrome patients through multiple regression analysis.

In this study, perceived subjective health status was examined as an indicator that reflects actual health status by checking subjective health status of adult male workers with metabolic syndrome in South Korea. Since subjective health status is a universal tool to self-evaluate one's health status, it is included in the Korean National Health and Nutrition Examination Survey. Therefore, examining the factors influencing subjective health status measured using this tool can be presented as the grounds for policy suggestions to improve health status of the subjects.

Mean age of the adult male workers with metabolic syndrome was 48.06 years. As they need to work for more than 10 years based on the retirement age of 60

years in South Korea, male workers with metabolic syndrome can be regarded as the primary targets of health care. The results related to medical services that were not suggested in previous studies on metabolic syndrome were found in this study. It was found that the subjects who cannot receive medical services when they want have poor subjective health status. In addition, low income of workers was associated with poor subjective health status, which agrees with previous study^[11]. Also, reduction of body weight was found to have an adverse effect on subjective health status in this study. Weight loss had an adverse effect in this study because the subjects of this study are men. As for health-related characteristics, body discomfort during the past 2 weeks and restriction of activity were related to poor subjective health status. Perception of subjective health status was found to have direct impact on the judgment of one's actual health status^[8].

The subjects of this study who have one or more comorbidities such as hypertension, diabetes mellitus and dyslipidemia showed poor subjective health status. This is probably because patients who have to manage

more than one disease have low subjective perception of health status. The subjects with high perceived stress showed poor subjective health status compared to low perceived stress. Poor subjective health status was also shown with depressive mood that continued for more than 2 weeks. Since subjective health status is health status perceived by oneself, both physical and mental health status seem to affect the results. In terms of health care, it would be necessary to pay attention to the intervention of negative mental health status of adult male workers with metabolic syndrome^[12].

For health-related behavioral characteristics, subjective health status of adult male workers with metabolic syndrome was not affected by drinking. The subjects who smoke on a daily basis showed poor subjective health status compared to other subjects. Continuous smoking can be habitual or caused by mental stress. Therefore, patients with metabolic syndrome are recommended to manage health by planning interventions based on the reason for smoking. For exercise, subjective health status was improved with increasing consistency of muscle exercise and walking exercise. This was similar to the results of a previous study reporting that physical activities can become interventions to reduce the risk of metabolic syndrome^[4]. It is suggested to create exercise interventions for Korean male workers with metabolic syndrome.

Looking at previous overseas studies on subjective health status, comparison was difficult due to the lack of research papers about metabolic syndrome patients. The results of this study derived from the analysis of national data were helpful in examining subjective health status of Korean adult male workers with metabolic syndrome, verifying their general characteristics, health-related characteristics and health-related behavioral characteristics, and proposing directions for health care.

Conclusion

In this study, physical factors such as exercise performed to improve health, body discomfort and restriction of activity were found to be the factors influencing subjective health status. Accordingly, various interventions need to be developed and applied to enhance health and improve subjective health status of adult male workers with metabolic syndrome in South Korea. Although health care interventions should be provided on the national level for adult male workers with metabolic syndrome, there are realistic

limitations. A possible method is to make each company manage metabolic syndrome of workers through policy suggestion, but it needs to be preceded by an additional study that verifies the grounds for intervention of metabolic syndrome.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Factors Influencing Self-rated Health Status in Middle-aged Women with Osteoporosis: Based on the 7th Korea National Health and Nutrition Examination Survey

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Abstract

Background/Objectives: The purpose of this study was to examine factors influencing self-rated health status in middle-aged women with osteoporosis in Korea.

Method/Statistical Analysis: This study carried out secondary analysis using the available data of the 7th Korea National Health and Nutrition Examination Survey (2016-2018). Total subjects are 462 middle-aged women with osteoporosis. The data were analyzed by using descriptive statistics, multiple regression.

Findings: Health-related quality of life ($p = .045$), comorbidity (hypertension, diabetes mellitus, dyslipidemia) ($p = .001$), body discomfort ($p = .038$), current alcohol drinking status ($p < .001$), perceived stress ($p < .001$), occupation ($p < .001$) were significantly associated with self-rated health status in middle-aged women with osteoporosis. The regression model for self-rated health status of the subjects was significant ($F = 15.622$, $p < .001$), and explanatory power of the overall model was 34.7%. (Adjusted $R^2 = .347$). Based on the results of this study, factors influencing self-rated health status of middle-aged women with osteoporosis in Korea included occupation ($p = .011$), current alcohol drinking status ($p = .024$), body discomfort during the past 2 weeks ($p = .001$), comorbidity (hypertension, diabetes mellitus, dyslipidemia) ($p = .030$), perceived stress ($p = .004$), and health-related quality of life ($p < .001$).

Improvements/Applications: The results of this study will be helpful in developing interventions to improve health management and can ultimately improve self-rated health status.

Keywords: *Osteoporosis, middle-aged women, self-rated health status, national survey, secondary analysis.*

Introduction

Osteoporosis is a disease characterized by high risk of bone fracture caused by the weakening of bones from reduced mass^[1-2]. In general, osteoporosis is known to be more prevalent in women than men and with increasing age^[1-2]. A study reports that over one-third of the entire middle-aged female population of Korea experiences bone fracture caused by poor bone health^[3]. As such,

health risk of osteoporosis occurs more frequently in women. There are various causes of high prevalence rate of osteoporosis in women including the reduction of hormones after the menopause and poor exercise habit and nutrition intake compared to men^[4]. The reason why osteoporosis draws attention is because it not only arouses serious secondary risks such as fracture but also has negative influence on health status by limiting activities of daily living with pain and disability^[5]. Therefore, osteoporosis of women is an important disease that needs to be managed carefully.

Self-rated health status refers to subjective awareness of one's own health status^[6]. Self-rated health status is a comprehensive and inclusive measure of evaluating one's own health, and the method is

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very easy^[7]. Accordingly, Korea National Health and Nutrition Examination Survey include self-rated health status, which identifies health status affected by various domains of everyday life such as diseases and medical service status, as a survey item. The dominant view is that subjective health status is a valid tool to determine actual health status^[8]. Accurate subjective awareness of health status can lead to health care behavior. Therefore, it is important to pay attention to self-rated health status in order to enhance health^[9]. Examining the factors that affect subjective health status can be an important process to prepare for an effective health care strategy.

A study that examined self-rated health status of osteoporosis patients showed that patients who are aware of having osteoporosis have worse self-rated health status, but this study did not analyze the factors influencing subjective health status^[10]. In a previous study on the factors influencing health promoting behavior related to osteoporosis, subjective health status was found to affect health promoting behavior to prevent osteoporosis. Patients with better self-rated health status showed better health promoting behavior^[11].

Studies on self-rated health status were carried out on a variety of disease groups, and the results showed that self-rated health status is associated with quality of life, physical and mental health, and practice of health behavior^[12-14]. Verifying the factors influencing self-rated health status would be meaningful in verifying the factors that need educational interventions to promote health of patients. As it is difficult to find studies on the factors influencing self-rated health status of middle-aged women with osteoporosis, this study aims to provide the basic data for understanding the factors influencing self-rated health status of female osteoporosis patients aged 40 years or above and seeking the method of improving their health. This study intends to examine the characteristic factors that influence self-rated health status in all middle-aged women with osteoporosis of Korea using the Korea National Health and Nutrition Examination Survey.

Method

- 1. Study Design:** A secondary analysis was conducted using the available data of the 7th Korea National Health and Nutrition Examination Survey (2016-2018). The Korea National Health and Nutrition Examination Survey applies the multistage stratified clustered sampling method, which is a complex sampling design that represents the entire population.
- 2. Sample:** From 8,127 respondents of the 7th Korea National Health and Nutrition Examination Survey, 508 persons who clearly responded to the question asking about osteoporosis as 'Yes' or 'No' were extracted. Among them, 462 women aged 40 years or above were selected as the final subjects of this study, and their responses were used for the analysis.
- 3. Measures:** In this study, age, education, occupation, duration of osteoporosis, satisfaction of dietary patterns, weight change, body discomfort during the past 2 weeks, restriction of activity, comorbidity (hypertension, diabetes mellitus, dyslipidemia), perceived stress, depressive mood more than 2 weeks, and health-related quality of life were analyzed as general characteristics and health related characteristics. And current smoking status, current alcohol drinking status, participatory rate of aerobic exercise within 1 week, muscle strengthening exercise within 1 week, walking exercise within 1 week were analyzed as health related behavioral characteristics.
- 4. Data Analysis:** The data for this study were analyzed using the SPSS 23.0 and STATA 13.0 programs as follows. Based on secondary data analysis, general characteristics, health-related characteristics and health-related behavioral characteristics were analyzed using frequency, percentage, mean and standard error. Self-rated health status of osteoporosis patients according to general characteristics, health-related characteristics and health-related behavioral characteristics was analyzed using t-test, ANOVA and multiple regression. The significance level (α) was defined as 0.05 or below for all analyses. In this study, the score is based on a 5-point scale ranging from 1 to 5 points. A score closer to 5 points indicates poor self-rated health status.

Result

As for self-rated health status according to sub-items of general characteristics and health-related characteristics, there were statistically significant differences in self-rated health status with occupation ($p < .001$), duration of osteoporosis ($p < .001$), satisfaction of dietary patterns ($p = .004$), body discomfort during the past 2 weeks ($p < .001$), restriction of activity ($p < .001$), comorbidity such as hypertension, diabetes mellitus and dyslipidemia ($p < .001$), perceived stress ($p < .001$), and depressive mood perceived for more than 2 weeks ($p < .001$) [Table 1].

Table 1. Self-rated health status according to general characteristics and health-related characteristics (N = 462)

Characteristics	Categories	n(%) or M±SE	M±SE	t or F	p (post-hoc)
Age	40~59	77(16.7)	3.20±0.89	0.381	.683
	60~79	327(70.8)	3.43±0.85		
	≥80	58(12.6)	3.65±0.87		
Education (complete school)	≤Elementary	280(60.6)	3.55±0.87	1.358	.255
	Middle	70(15.2)	3.23±0.85		
	High	72(15.6)	3.27±0.83		
	≥University	39(8.4)	3.09±0.78		
Occupation	Yes	150(32.5)	3.18±0.82	-3.925	<.001
	No	311(67.5)	3.53±0.87		
Duration of osteoporosis	<10 years	6.87±6.95	3.31±0.84	-4.146	<.001
	≥10 years		3.72±0.86		
Satisfaction of dietary patterns	Good	49(10.6)	3.26±0.85	5.719	.004 (a<c)
	Moderate	227(49.1)	3.50±0.82		
	Bad	186(40.3)	3.85±0.86		
Weight change	Weight loss	60(13.0)	3.52±0.90	2.272	.080
	No change	330(71.4)	3.38±0.87		
	Weight gain	72(15.6)	3.46±0.80		
Body discomfort (during the past 2 weeks)	Yes	215(46.5)	3.76±0.85	7.742	<.001
	No	247(53.5)	3.12±0.77		
Restriction of activity	Yes	111(24.0)	3.83±0.86	5.633	<.001
	No	351(76.0)	3.28±0.83		
Comorbidity (hypertension, diabetes mellitus, dyslipidemia)	Yes	615(65.4)	3.54±0.83	3.721	<.001
	No	160(34.6)	3.21±0.89		
Perceived stress	Very High	28(6.1)	4.08±0.91	9.276	<.001 (a>c,d, b>c,d)
	High	96(20.8)	3.64±0.93		
	Moderate	238(78.4)	3.33±0.81		
	Low	100(21.6)	3.19±0.78		
Depressive mood (more than 2 weeks)	Yes	95(20.6)	3.76±0.93	4.238	<.001
	No	366(79.2)	3.32±0.82		
Health-related quality of life		0.91±0.15 (possible range -0.17~1.00)			

Note. n(%), M±SE were except missing values.

As for self-rated health status according to subitems of health-related behavioral characteristics, there were statistically significant differences in self-rated health status with current alcohol drinking status ($p = .002$), participatory rate of aerobic exercise within 1 week ($p = .002$), and walking exercise within 1 week ($p = .012$) [Table 2].

Table 2. Self-rated health status according to health-related behavioral characteristics (N = 462)

Characteristics	Categories	n(%) or M±SE	M±SE	t or F	p (post-hoc)
Current smoking status	Every day	6(1.3)	4.25±0.50	2.865	.037
	Sometimes	3(0.6)	3.33±0.58		
	Not now	15(3.2)	3.93±0.92		
	Never	438(94.8)	3.39±0.86		
Current alcohol drinking status	Yes	189(40.9)	3.25±0.82	3.146	.002
	No	273(59.1)	3.52±0.88		
Participatory rate of aerobic exercise (within 1 week)	Yes	130(28.4)	3.20±0.83	-3.173	.002
	No	327(71.6)	3.50±0.87		

Characteristics	Categories	n(%) or M±SE	M±SE	t or F	p (post-hoc)
Muscle Strengthening Exercise (within 1 week)	No	412(89.6)	3.45±0.86	1.307	.272
	1-3/week	26(5.7)	3.09±0.97		
	≥4/week	22(4.8)	3.15±0.88		
Walking Exercise (within 1 week)	No	132(28.7)	3.67±0.88	4.455	.012 (a>b,c)
	1-3/week	129(28.0)	3.37±0.80		
	≥4/week	199(43.3)	3.26±0.86		

Note. n(%), M±SE were except missing values.

The regression model for self-rated health status of the subjects was significant ($F = 15.622, p < .001$), and explanatory power of the overall model was 34.7% (adjusted $R^2 = .347$). The factors influencing self-rated health status of middle-aged women with osteoporosis aged 40 years or above in Korea verified in this study

were occupation ($\beta = 0.113, p = .011$), current alcohol drinking status ($\beta = 2.259, p = .024$), body discomfort during the past 2 weeks ($\beta = -3.364, p = .001$), comorbidity ($\beta = -2.174, p = .030$), perceived stress ($\beta = -2.895, p = .004$), and health-related quality of life ($\beta = 6.012, p < .001$) [Table 3].

Table 3. Factors influencing perceived self-rated health status (N = 462)

Characteristics	Unstandardized coefficient		Standardized coefficient	t	p
	B	SE	β		
(Constant)	5.645	.447		12.638	<.001
Duration of osteoporosis	0.131	.087	0.068	1.503	.134
Occupation	0.202	.079	0.113	2.552	.011
Satisfaction of dietary patterns	0.109	.059	0.083	1.842	.066
Current smoking status	-0.012	.031	-0.018	-0.399	.690
Current alcohol drinking status	0.175	.077	0.101	2.259	.024
Body discomfort	-0.268	.080	-0.158	-3.364	.001
Restriction of activity	-0.139	.092	-0.071	-1.515	.131
Comorbidity	-0.169	.087	-0.096	-2.174	.030
Participatory rate of aerobic exercise	-0.129	.090	-0.069	-1.432	.153
Walking Exercise	-0.028	.050	-0.027	-0.546	.586
Perceived stress	-0.154	.053	-0.147	-2.895	.004
Depressive mood	-0.013	.104	-0.006	-0.120	.905
Health-related quality of life	2.664	.250	.221	6.012	<.001
$R^2 = .371$ Adj $R^2 = .347$ $F = 15.622$ $p < .001$					

Note. n(%), M±SE were except missing values.

Discussion

This study used raw data from the 7th Korea National Health and Nutrition Examination Survey to verify that factors influencing self-rated health status of women with osteoporosis aged 40 years or above in Korea. Out of 8,127 respondents, 462 women aged 40 years or above who have osteoporosis were selected

as the subjects to examine the differences in self-rated health status according to general characteristics, health-related characteristics and health-related behavioral characteristics.

This study verified significant differences in self-rated health status according to general characteristics, health-related characteristics and health-related

behavioral characteristics of middle-aged women with osteoporosis. And also the factors influencing subjective health status were identified. The factors influencing self-rated health status were found to be body discomfort during the past 2 weeks, comorbidity (hypertension, diabetes mellitus, dyslipidemia), perceived stress, and health-related quality of life level. In other words, osteoporosis patients showed poor subjective health status when they have body discomfort and comorbidity. They also showed poor subjective health stress if they perceive stress. Health-related quality of life was found to affect self-rated health status. Poor health-related quality of life resulted in poor subjective health status. To clarify the correlation between subjective health status and influencing factors, additional analysis must be performed in a future study.

High subjective health status was shown in patients who have occupation, high satisfaction of dietary patterns, no body discomfort experienced during the past 2 weeks, no restriction of activity, low degree of perceived stress, no depressive mood perceived for more than 2 weeks, and no comorbidity such as hypertension, diabetes mellitus and dyslipidemia. This was similar to a study conducted on obese adults^[15] and studies that examined subjective health status of elders^[15-16]. In addition, high subjective health status was shown with short duration of osteoporosis, indicating that time passage after diagnosis of osteoporosis has an negative influence on self-rated health status. Therefore, it would be necessary to check difficulties in management of osteoporosis at different times and come up with appropriate educational approaches for intervention.

In the case of health behavior, patients who currently drink alcohol showed higher subjective health status than patients who do not drink. This is probably because drinking relieves stress and has a positive impact on self-rated health status, but additional analysis is required to identify the cause of this result. In addition, it is necessary to verify that patients do not neglect management of osteoporosis because of drinking. Participatory rate of aerobic exercise within 1 week and walking exercise within 1 week caused positively significant differences in self-rated health status. Therefore, this study proposes a method of positively changing self-rated health status by adding physical activities, namely light aerobic exercise and walking exercise, to manage osteoporosis.

Since previous studies suggest that self-rated health status is related to quality of life, physical and

mental health, and practice of health behavior^[12-14], it is important to verify the factors influencing self-rated health status to find an effective strategy to improve subjective health status. In this study, the factors influencing subjective health status were analyzed. The results showed that educational interventions can be applied to body discomfort during the past 2 weeks, comorbidity (hypertension, diabetes mellitus, dyslipidemia), perceived stress, and health-related quality of life level. Body discomfort is thought to be recognized from restriction of activities to reduce chronic pain, back pain and risk of bone fracture in osteoporosis patients. Interventions to resolve various situations that lead to pain and activity restriction would be necessary to reduce body discomfort experienced by osteoporosis patients. Comorbidities were found to have an adverse effect on subjective health status. Accordingly, an additional study is required to identify the factors related to the effects of comorbidity on subjective health status. Furthermore an intervention program to verify and reduce the cause of body discomfort and an integrated education program to manage osteoporosis and comorbidity would be necessary. Also, various interventions must be developed to remove the causes of stress and change awareness of stress situations to improve subjective health status according to perceived stress.

Conclusion

The meaning of this study is in verifying self-rated health status of middle-aged women with osteoporosis and deriving the factors influencing self-rated health status using data from the Korea National Health and Nutrition Examination Survey, a survey conducted to examine health status of Korean citizens.

Ethical Clearance: This study was approved by the Institutional Review Board of the author's affiliated university (201905-HR-003).

Source of Funding: Self

Conflict of Interest: Nil

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A Study on Factors Affecting Communication Ability of Korean Nursing Students

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Abstract

Background/Objectives: This study was attempted to identify factors affecting the communication ability of nursing students. The study subjects were 210 nursing students.

Method/Statistical Analysis: This study was statistically processed using SPSS. 19 program and correlation analysis and hierarchical regression analysis were used to confirm the relationship between the main variables.

Findings: As a result, the communication ability of nursing students showed a positive correlation with self-awareness, empathy, self-esteem. Regression analysis was found to have a significant effect on self-awareness, empathy, and self-esteem. Among them, empathy was the most influential and the explanatory power of the main variables was 53.4%. That is, the higher the empathy ability, the higher self-awareness, and the higher self-esteem of nursing college students, the higher the communication ability ($F = 80.871$, $p < .000$). That is, the higher the empathy ability, the higher self-awareness, and the higher self-esteem of nursing college students, the higher the communication ability.

Improvements/Applications: Therefore, universities should provide continuous education to improve empathy, self-esteem, and self-awareness in order to improve communication skills of student nurses, and develop specific education method and operational strategies through follow-up studies.

Keywords: *Self-awareness, empathy, self-esteem, communication ability, nursing students.*

Introduction

Nurses need to fulfill the roles of communicating and cooperating continuously with professional manpower in other areas with the aim of solving practical or potential problems of patients in the hospital environment^[1]. The effective communication ability necessary to perform such a professional and dynamic nursing job efficiently is required as an important qualification to be a nurse^[2]. Nurses' therapeutic communication ability in clinical

practice contributes to patients' relief in symptoms, improvement in physiological functions, and emotional stability^[3]. Nurses need to form a therapeutic relationship with patients and explore and solve their health problems positively through a diversity of verbal and nonverbal communication skills. For this reason, therapeutic communication skills are emphasized as one of the core competences essential to nurses and have been used effectively within the therapeutic relationships in clinical practice^[2]. In South Korea, nursing education institutions are aware of the importance of communication training and presents it as important learning outcome of education^[3]. Colleges develop education programs to help students improve their communicative competence in curriculums, build structural and systematic education systems, taking stages, association, and integration into account, and provide various types of education^[4].

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While the educational contents include conceptual learning related to knowledge about communication and clinical training performance evaluation, they may reportedly have limitations in allowing students to develop communication skills fully^[3-4].

It is reported, also, that even nurses getting relevant education can have their therapeutic communicative competence easily affected by diverse variables, including unpredictable emergencies and their own stress at busy clinical sites, and have difficulty in sustaining consistent communication^[1]. For nursing education, therefore, it is necessary to cultivate nursing equipped with consistent and sustainable communication ability against a diversity of situational variables in clinical practice and to help develop communication skills by covering the internal factors involved in communication, instead of delivering knowledge simply.

The literature review regarding nurses in South Korea found that nurses who were more confident in their job, were more responsible, had better self-esteem, and were more autonomous were more self-assertive and better at coping with the conflicts in interpersonal relationships^[5]. As can be seen in the finding that self-assertive communication was effective in coping actively with stressors in a clinical situation^[6], education related to individuals' internal factors involved in communication is more effective in developing communication ability than education simply based on knowledge acquisition.

The literature review regarding the factors for communication ability of nursing students in South Korea found that self-awareness and self-esteem were

repetitively covered as important variables^[3,7]. Greater emphasis is placed on the variable of self-awareness, which is to understand and pay attention to one's own inner world, improve the understanding of others and empathy, and, ultimately, contribute to effective communication ability^[1,3]. In other words, knowledge education and practical training simply based on concepts have limitations in improving practical communication ability and it is possible to develop sustainable communication ability only by changing inner contributors of human beings that take the fundamental lead in communication.

From this perspective, attention should be paid to the associations among the variables of self-awareness, self-esteem, and empathy in the literature review regarding

communication ability. Self-awareness is to pay attention to one's own inner thinking or emotions and nurses' self-awareness capabilities are concerned with the efforts to understand and empathize with patients as they are and serve as crucial resources in forming relationships with them^[8]. Self-esteem means a type of attitude by which individuals respect and regard themselves as desirable and valuable; it was reported that people with higher self-esteem were better at interpersonal relationships^[9] and had better communicative competence^[7].

While a few studies on the effects on communication ability of nursing students were identified by variables, no integrative research has been conducted on which of self-awareness, empathy, and self-esteem is more influential and it was difficult to determine the relative impact of these variables. However, it is important to determine which of these variables makes greater contributions to the improvement in communication ability if the ground for effective nursing education is secured, taking the efficiency of the educational contents into account.

On the basis of the literature review regarding communication ability of nursing students in South Korea, this study aimed to analyze the associations among self-awareness, self-esteem, empathy, and communication ability and determine the contribution of the influential variables.

Method

Data collection was performed among 210 graduates-to-be as nursing students in South Korea. It was performed using structured questionnaires from November to December 2017. It was performed among those students who were given explanation by the researcher and gave their consent; the notice was given that all the data related to the research were anonymous and that the refusal to participate in the research might cause no disadvantage.

For the purpose of exploring the factors affecting communication ability in nursing students, an SPSS.19 program was used to determine the effects of self-awareness, empathy, and self-esteem on communication ability. To determine the findings suitable to the goal of the research, such statistical techniques as frequency analysis, correlation analysis, and hierarchical regression analysis were used.

1. Survey Tools: Self-awareness of nursing students

was measured using the self-awareness inventory which had been developed by Fenigstein, Scheier, and Buss^[10] and adapted by Eun^[11]. This tool is in the five-point scale with a total of 20 items in such sub-areas as private self-awareness, public self-awareness, and social anxiety. The scores ranged from 1 *totally disagree* to 5 *totally agree*, with a higher score meaning better self-awareness. For its reliability, Cronbach $\alpha = .74$ in Eun^[11] and Cronbach $\alpha = .65$ in this study.

Empathy of the nursing students was measured using the tool which had been developed by Davis^[12] and Bryant^[13] and applied by Kim et al.^[14]. This tool is in the five-point scale with a total of 30 items whose scores ranged from 1 *totally disagree* to 5 *totally agree*, with a higher score meaning a higher level of empathy. For its reliability, Cronbach $\alpha = .85$ in Kim et al. ^[14] and Cronbach $\alpha = .86$ in this study.

Self-esteem was measured using the tool which had been developed by Rosenberg^[15] and translated by Jeon^[16]. It has total of 10 items; the higher score, the higher level of self-esteem. For its reliability, Cronbach $\alpha = .82$ in this study.

Communication ability was measured using the communication ability inventory developed by Lee et al.^[17]. This tool is in the five-point likert scale with a total of 49 items whose scores ranged from 1 *very rarely* to 5 *very often*, with a higher score meaning a higher level of communication ability. It is composed of five elements of competence—interpretation, role performance, self-presentation, goal-setting, and message transition—and 13 negative items for preventing any bias in responses were recoded. For its reliability, Cronbach $\alpha = .70$ at the time of its development by Lee et al.^[17] and Cronbach $\alpha = .90$ in this study.

Result

1. General characteristics of subject: The general characteristics of the participants are as presented in [Table 1]. Among the 210 participants, there were more female students (190; 90.5%) than male ones (20; 9.5%). As for academic achievement, 1 student (0.5%) was *very satisfied*, 53 (25.2%) were *satisfied*, and 113 (53.8%) were at the *average* level. More than 50% of the students were satisfied with their major: 9 students (4.3%) were *very satisfied*, 98 (46.7%)

were *satisfied*, and 87 (41.4%) were at the *average* level. As for peer relationships, 19 students (9.0%) were *very satisfied*, 137 (65.2%) were *satisfied*, and 48 (22.9%) were at the *average* level. As for communication ability, 4 students (1.9%) were *very satisfied*, 86 (41.0%) were *satisfied*, and 99 (47.1%) were at the *average* level; thus, more than 50% of the students were at the *average* or higher levels of satisfaction with the peer relationships, major, academic achievement, and communication ability.

Table 1. General Characteristics of Study Participants

Characteristics	Categories	n(%)	M±SD
Gender	male	20(9.5)	23.10±.29
	female	190(90.5)	
Academic achievement	very satisfied	1(0.5)	3.03±.75
	satisfied	53(25.2)	
	moderate	113(53.8)	
	unsatisfied	37(17.6)	
	very unsatisfied	6(2.9)	
Satisfaction in major	very satisfied	9(4.3)	3.47±.72
	satisfied	98(46.7)	
	moderate	87(41.4)	
	unsatisfied	14(6.7)	
	very unsatisfied	2(1.0)	
Satisfaction in friendship	very satisfied	19(9.0)	3.80±.66
	satisfied	137(65.2)	
	moderate	48(22.9)	
	unsatisfied	4(1.9)	
	very unsatisfied	2(1.0)	
Satisfaction in communication ability	very satisfied	4(1.9)	3.33±.72
	satisfied	86(41.0)	
	moderate	99(47.1)	
	unsatisfied	18(8.6)	
	very unsatisfied	3(1.4)	

2. Participants’ self-awareness, empathy, self-esteem, and communication ability: The principal variables, such as self-awareness, self-esteem, empathy, and communication ability, were analyzed as shown in [Table 2]. They scored an average of 3.32 out of 5 for self-awareness, 2.83 out of 10 for self-esteem, 3.51 out of 5 for empathy, and 3.47 out of 5 for communication ability self-esteem, empathy, and communication ability.

Table 2. The Degree of General Characteristic, Self-awareness, Self-esteem, Empathy, Communication ability

Variable	Item	Item	Total
		M±SD	M±SD
Self-awareness	20	3.32±.29	66.5±5.89
Self-esteem	10	2.83±.40	28.39±4.02
Empathy	30	3.51±.35	105.37±10.69
Communication ability	49	3.47±.32	170.07±15.92

3. Correlation analysis among self-awareness: The correlation analysis found that there were significant correlations among the principal variables, such as self-awareness, self-esteem, empathy, and communication ability, as presented in [Table 3].

Table 3. Correlations between Communication ability and major variables

Variables	Pearson Correlation (p)			
	a)	b)	c)	d)
a) Self-awareness	1			
b) Self-esteem	.346 (<.000)	1		
c) Empathy	.551 (<.000)	.182 (.004)	1	
d) Communication ability	.640 (<.000)	.345 (<.000)	.633 (<.000)	1

4. Effects of self-awareness, self-esteem, and empathy on communication ability: The regression analysis found that self-awareness ($\beta = .368$), self-esteem ($\beta = .144$), and empathy ($\beta = .404$) had a significant impact on communication ability ($F = 80.871, p < .000$) and that the impact was very likely to account for communication ability (53.4%). Among the principal variables, empathy had the strongest impact, followed by self-awareness and self-esteem. That is, the better empathy, the better self-awareness, and the higher self-esteem, the higher level of communication ability in nursing students [Table 4].

Table 4. Influencing factors on Communication ability

Independent Variables	Model				
	B	SE	β	t (p)	VIF
Constant	24.28	9.48		2.560(.011)	
Self-awareness	.995	.160	.368	6.206(<.000)	1.577
Empathy	.602	.084	.404	7.141(<.000)	1.436
Self-esteem	.570	.199	.144	2.864(.005)	1.136
Statistic results	$R^2 = .541, \text{Adjusted } R^2 = .534, F = 80.871, p < .000, \text{Durbin-Watson} = 1.892$				

Discussion

On the basis of the literature review regarding communication ability in nursing students, this study aimed to analyze the associations among such principal variables as self-awareness, self-esteem, empathy, and communication ability and determine the relative impact of the relevant variables on communication ability.

For self-awareness, they scored higher than 2.82 ± 0.74 in Kang^[18] and slightly lower than 3.40 ± 0.32 in Oh et al.^[2]. They scored similar to 3.31 for secondary school students in Eun^[11]; self-awareness was generally at the similar level to the findings from literature review.

For self-esteem, the nursing students scored 2.83, which was lower than 2.94 in Lee et al.^[7] applying the same tool; however, there was no significant gap but similarity between the two studies. For empathy, the nursing students scored an average of 3.51, which was lower than 3.54 in Jeong^[1], 3.58 in Kim et al.^[14], and 3.67 in Kang^[18]. This is because of the variation in grade and personal factors among the respondents by study design although each of them was conducted in nursing students. For communication ability, they scored 3.47, which was similar to 3.43 in Oh^[2] applying the same tool. The correlation analysis found that such principal variables as self-awareness, self-esteem, and empathy were all positively correlated with communication ability in nursing students. Self-awareness and empathy had a high level of positive correlation with communication ability; self-esteem had a medium level of positive correlation with communication ability, as shown in literature review^[1,7,18].

On the basis of the correlation analysis, all of such independent variables as self-awareness, self-esteem, and empathy significantly affected communication ability, with the total explanatory power estimated at 53.4%. As for the relative impact of the independent variables, empathy, followed by self-awareness and self-esteem, had the strongest impact on communication ability. The literature review found that empathy was strongly correlated with self-awareness^[14]; therefore, it was included in this study as a predictor and its relevance was confirmed in the results. In other words, it was statistically confirmed that empathy was a factor significantly affecting communication ability of nursing students. Empathy refers to an emotional bond by which individuals feel the other's feeling and thinking as their own. People convey their heart through empathy and the empathetic responses between a patient and a nurse

can promote therapeutic relationships, increase trust, induce changes in the patient's health, and improve the therapeutic effects. On the basis of this result, it has been confirmed that very empathetic nursing students are very sensitive to patients' emotions, use their own emotions to empathize, express the emotions both verbally and nonverbally, and improve their communication ability.

In conclusion, all of such factors as empathy, self-awareness, and self-esteem affected communication ability in nursing students and the impact of these variables had great explanatory power; therefore, it is necessary to provide education that can help nursing students improve their empathy, self-awareness, and self-esteem in pursuit of better communication ability. The education stimulating the internal factors of students is expected to overcome the limitations in the effectiveness of the conventional education for acquiring simple knowledge about communication and contribute to the development of communication ability that can be sustained consistently even in an unpredictable nursing situation. Such areas as empathy, self-esteem, and self-awareness are nursing students' internal factors that can be improved through steady educational stimuli and individual students' efforts rather than through fragmentary stimuli; therefore, further research should be conducted to develop specific method and teaching strategies to improve them

Conclusion

In conclusion, nursing education institutions in South Korea need to be aware of the need to combine sustainable educational stimuli for empathy, self-esteem, and self-awareness with the curriculums to improve communication ability; further research should be conducted to develop specific teaching method and management strategies with the aim of developing effective teaching strategies.

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The Effects of ICT-based Public Health Center Mobile Health Care Project on Adult Health Risk Factors

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Abstract

Background/Objectives: This study uses a single group pretest-posttest design to identify the effects of ICT-based public health center mobile health care project on adult health risk factors.

Method/Statistical Analysis: The subjects of this study were 100 adults, over 19 years of age residing in the jurisdiction of the public health center of G city, who are not yet diagnosed with metabolic syndromes but have at least one kind of risk factors. The general characteristics of the subjects were analyzed by using the frequency and percentages, and the comparison and analysis before and after the program were analyzed by using t-tests.

Findings: Blood pressure decreased significantly, as the systolic blood pressure decreased from 141mmHg to 136mmHg and the diastolic blood pressure decreased from 87mmHg ($p < .001$) to 83mmHg ($p < .001$). Fasting blood sugar decreased significantly from 111mg/dL to 104mg/dL ($p < .001$). The waist circumference decreased significantly from 93.4cm to 92.4cm ($p < .001$). Although triglyceride decreased from 222.4mg/dL ($t = 18.2, p < .001$) to 193.6mg/dL ($t = 23.7, p < .001$), the difference was not significant ($p = .051$). HDL-cholesterol increased from 42.1mg/dL to 44.4mg/dL which showed significant differences ($p = .003$). As there were also significant results on the HDL-cholesterol, it was proved that the ICT-based public health center mobile health care project is highly effective on the adult health risk factors (blood pressure, fasting blood sugar, waist circumference and HDL-cholesterol).

Improvements/Applications: There should be improvements in health management habits through management in physical activities and nutrition for metabolic syndromes of adults that can lead to chronic diseases, and expand health promotion projects that use ICT as a prevention health care service.

Keywords: Mobilehealth careproject, Metabolic syndromes, Healthrisk factor, ICT, Publichealthcenter.

Introduction

The present society is consistently on the search for a solution to the increase of the national health care costs and the socioeconomic burden due to the aging population and the increase of chronic diseases^[1].

Due to the fourth Industrial Revolution and a rapid advancement of technology, the number of mobile service subscribers rapidly increased, and mobile health which integrates the mobile services is being focused as the new alternative to health management^[2-3]. Recently, there has been an increase in the focus for mobile health due to wide distribution of wireless connection and wearable smart devices and development of biosensor technology, leading to an active integration of ICT and medical instruments^[4]. 'Mobile Healthcare' or 'Mobile Health (mHealth)' refers to medical and public health work supported by mobile devices^[5]. Mobile healthcare has been receiving even more attention as there are active integration of ICT and medical devices with the

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development of wireless connection and wearable smart devices, and the miniaturization and high density integration of biosensors^[6]. According to a report from the EC (European Commission), the major implementation factor of mobile healthcare is reducing medical costs for developed countries and increase accessibility to basic healthcare for developing countries^[7-8].

According to a recent study on the rate of metabolic syndromes of Korean adults, it was shown that 20.3% of the adults, or one out of five adults, had metabolic syndromes, which resulted in a need to prevent the metabolic syndromes^[9]. Metabolic syndromes are groups of physiological, biochemical, clinical and metabolic factors that are mutually related that increase the direct risks of all death factors such as Type 2 Diabetes and cardiovascular diseases^[10]. There should be intervention programs or studies to improve the risk factors of metabolic syndromes that can lead to chronic diseases for adults and for the adults to have healthy diets, physical activities, quit smoking and reduce drinking^[11-13]. Lee and Kim^[14] studied the effects of an intelligent VR exercise-appropriate protocol on the biological health factors of chronic stroke patients, and Park et al^[15] studied the possible benefits of a comprehensive support on obesity management of elementary school students using mobile phones as a qualitative study on the aspect of program providers. In addition, in the study by Lee and Park^[16] that identified the effects of an increase in physical activities with mobile healthcare on the body composition and risk factors of metabolic syndromes of the office worker men, it was shown that there is a positive effect of the increase of physical activities with mobile healthcare on the change of the body composition and risk factors of metabolic syndromes of the office worker men. However, after systematically studying literature on the health behavior intervention and the theoretical inter-correlation, there were little cases of developing mobile intervention programs based on the behaviour theory^[17]. In addition, there needs to be various kinds of studies that identify the effects of the ICT-based public health center mobile health care projects on adult health risk factors.

Therefore this study aimed to identify the effects of the ICT-based public health center mobile health care projects on adult health risk factors.

Method

This study uses a single group pretest-posttest

design to identify the effects of ICT-based public health center mobile health care project on adult health risk factors [Figure 1].

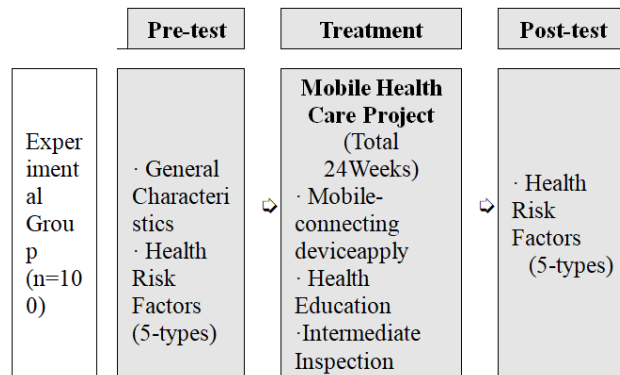


Figure 1. Design of Research

The subjects of this study were among the adults over 19 years of age residing in the jurisdiction of the public health center of G city, who are not yet diagnosed with metabolic syndromes but have at least one kind of risk factors out of the five health risk factors of the standards of metabolic syndromes according to the national health screening examinations^[18] who agreed to participate in this study. The adults who did not have prior experiences in participating in mobile health care projects were prioritized in selection; those who have developed into chronic diseases were excluded, and if there are too much new participants, those with higher numbers of health risk factors were selected in priority^[19-20]. The exclusion criteria were if data such as activity measurements were not transmitted during two weeks of the study, if the subjects lost the devices due to carelessness, if the risk factors have developed into chronic diseases during the course of the study and if the subjects were transferred to another jurisdiction, and a total of 100 subjects that match all criteria were selected for this study. The study started in February 2018 with selecting appropriate subjects to the selection criteria, and progressed on from May to October 2018 with the pre-test of the measured variables, the mobile health care project for 24 weeks (6 months) and the post-test after the project.

Starting from May 2018, the subjects were connected to a mobile application via Bluetooth and a mobile-connecting device such as activity measuring tools on their smart phones (at least Android 4.3, IOS 7.0), and for the 24 weeks (6 months) until October 2018, the subjects measured the number of walks, the walking time, walking distance, consumed calories, and real-time

heart rates which were sent to the mobile application and to the health center staff on the web. During the period, according to the results of health behaviors such as self-managing service, health information providing services, reciprocal health counseling services and continuous practice supporting services for the subjects based on a mobile application, it was possible to set health goals through counseling services such as quitting smoking and reducing drinking from nurses, nutrition counseling from nutritionists according to diet evaluation, physical activity counseling from physical activity instructors to induce sustainable customized health behaviors. Before and after (24 weeks) the mobile health care project, the study used surveys through the web to analyze the risk factors according to the subjects out of the five health risk factors (blood pressure, fasting blood sugar, waist circumference, triglyceride, HDL-cholesterol).

This study used SPSS Win 23.0 Program for the statistical analysis. The general characteristics of the subjects were analyzed by using the frequency and percentages, and the surveys through the web before and after the mobile health care projects (24 weeks) and the change and the analysis of the five health risk factors (blood pressure, fasting blood sugar, waist circumference, triglyceride, HDL-cholesterol) were analyzed by using t-tests.

Result and Discussion

1. General characteristics of the subjects: Out of the subjects of this study, 24% were aged between 30 and 39 (24 subjects), 33% were aged between 40 and 49 (33 subjects) and 36 were aged between

50 and 59. In terms of gender, 38 were males and 62 were females. In terms of the number of health risk factors, 24% of the subjects had one risk factor (24 subjects), 33% had 2 risk factors (33 subjects) and 43% (43 subjects) of the subjects had more than three, which was the highest proportion [Table 1].

Table 1. General characteristics of the subjects (N = 100)

Variables/Categories		n(%)
Years	20 years ~ 29 years	1(1.0)
	30 years ~ 39 years	24(24.0)
	40 years ~ 49 years	33(24.0)
	50 years ~ 59 years	36(36.0)
	60 years ~ 69 years	3(3.0)
	70 years <	3(3.0)
Gender	Male	38(38.0)
	Female	62(62.0)
Health risk factor	One	24(24.0)
	Two	33(33.0)
	Three≤	43(43.0)

2. Change and comparison in retention rate by Blood Pressure and Fasting Blood Sugar: [Table 2] After comparing the blood pressure before and after the mobile health care projects, both types of blood pressure decreased significantly, as the systolic blood pressure decreased from 141mmHg to 136mmHg and the diastolic blood pressure decreased from 87mmHg ($p<.001$) to 83mmHg ($p<.001$). Fasting blood sugar decreased significantly from 111mg/dL to 104mg/dL ($p<.001$).

Table 2. Change and comparison in retention rate by Blood Pressure (N = 100)

Variables	Group	Pre M±SD	Post M±SD	Difference M±SD	t	p
Blood Pressure (Systolic/ Diastolic) (mmHg)	Exp.(n = 100)	141/87±8.71	136/83±9.62	-5.03/-4.23 ±8.66/7.45	-4.56/-4.74	<.001
	t	135.58	118.40			
	p	<.001	<.001			
Fasting blood sugar(mg/dL)	Exp.(n = 100)	111±12.53	104±10.42	-6.63±7.04	-5.14	<.001
	t	48.45	54.78			
	p	<.001	<.001			

Exp.: Experimental group

3. Change and comparison in retention rate by Waist circumference, Triglyceride and HDL-cholesterol: [Table 3] The waist circumference decreased significantly from 93.4cm to 92.4cm ($p < .001$). Although triglyceride decreased from

222.4mg/dL ($t = 18.2, p < .001$) to 193.6mg/dL ($t = 23.7, p < .001$), the difference was not significant ($p = .051$). HDL-cholesterol increased from 42.1mg/dL to 44.4mg/dL which showed significant differences ($p = .003$).

Table 3. Change and comparison in retention rate by Blood Pressure (N = 100)

Variables	Group	Pre M±SD	Post M±SD	Difference M±SD	t	p
Waist circumference (cm)	Exp.(n = 100)	93.4±6.63	92.4±10.34	-2.10±2.96	-5.41	<.001
	t	107.36	68.62			
	p	<.001	<.001			
Triglyceride (mg/dL)	Exp.(n = 100)	222.4±93.02	193.6±59.97	-22.2±81.17	-1.99	.051
	t	18.21	23.72			
	p	<.001	<.001			
HDL-cholesterol (mg/dL)	Exp.(n = 100)	42.1±5.04	44.4±5.39	2.32±3.58	3.24	.003
	t	41.82	41.20			
	p	<.001	<.001			

Exp.: Experimental group

Discussion

This study was attempted to find out how the ICT-based mobile healthcare project affects health risk factors in adults with health risk factors according to the metabolic syndrome criteria in the national health examination results.

In this study, the subjects who participated in the mobile health care project were effective with blood pressure and fasting glucose. Similar to the results of this study, Kim et al.^[21] conducted a trial intervention to verify the short-term effects of the mobile application ‘NICE Health Ten’ on 68 adults in their 20s for 8 weeks, and fasting blood sugar, which had the highest screening rate, decreased from 16.2% to 4.4%.

In particular, as blood pressure and blood sugar are important health risk factors that can lead to chronic diseases, the subjects should focus on improving these factors with physical activities, managing nutrition and health and receiving counseling from experts. Although this study did not analyze the correlation of blood pressure and blood sugar with managing nutrition and health, there should be future studies to analyze the correlation. As well, the individuals with such risk factors should be continuously educated on self-managing the blood

pressure and blood sugar and should make sure that they do not lead to chronic diseases with additional education on quitting smoking and reducing drinking.

In addition, the subjects who participated in the mobile health project showed effective results in waist circumference and HDL-cholesterol. However, triglycerides did not show significant results. In a study by Kim^[21] to verify the short-term effects of the mobile application ‘NICE Health Ten’, triglyceride and HDL-cholesterol each decreased from 13.2% and 11.8% to 2.9%. Also, Chen et al.^[21] verified that the Internet-based health intervention program of eHealth for adults was effective for adults with one or more unnatural factors of the diagnosis standards of metabolic syndromes after providing individual feedback. Although this study did not show a significant result for triglyceride, as triglyceride is a major health risk factor that can lead to chronic diseases, those with problems in triglyceride should improve their levels with physical activities, managing nutrition and health and receiving counseling from experts.

Due to the rapid development of the mobile healthcare industry in Korea, there has been an increased interest in using mobile technology in the health promotion field

which is also rapidly developing. Although there are many studies that add mobile technology to the health management and intervention programs, there are still little studies that are based on theories or models. Therefore based on the results of this study, there should be future studies based on theories and models on the various mobile healthcare projects and intervention programs to prevent the metabolic syndromes of adults.

Conclusion

The purpose of this study was to identify the effects of ICT-based public health center mobile health care projects on the health risk factors of the adults. Through this study, it was proved that the ICT-based public health center mobile health care projects are highly effective on the adult health risk factors (blood pressure, fasting blood sugar, waist circumference and HD-cholesterol). Although there was no significant difference in the health risk factor of triglyceride, there should be future studies on the changes of health risk factors according to the changes in counseling to quit smoking and reduce drinking for nurses, practice rate of health behaviors and diet. In addition, there is a need of ICT-based health promotion projects as a preventive health care service through managing nutrition and physical activities for those with metabolic syndromes who are at risk for chronic diseases.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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A Study on the Subjectivity of Organ Donation for Adults

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Abstract

Background/Objectives: The purpose of this study is to understand subjective structures of subjectivity on organ donation by using of Q method, draw up plans to promote positive perceptions by each type and utilize a basic material to provide authentic ways for activating organ donation.

Method/Statistical Analysis: To collect non-structured statements, a population was extracted by use of materials such as literatures and news articles and interviews, then finalized 32 Q samples. These were distributed final 33 p samples via Q sorting procedures and analysed the results throughout Q factors analysis.

Findings: Subjectivity of organ donation was finally verified 4 types and explained 59.2% of total variables. The power of explanation by type was 40.3% for the 1st type, 10.6% for the 2nd type, 4.8% for the 3rd type and 3.5% for the 4th type. Among 33 participants, 18 for 1st type, 6 for the 2nd type, 6 for the 3rd type and 3 for the 4th type was distributed. Each type was shown as a type for social public interest-oriented donors, a reluctant type for donating their conviction, a passive type for donating organs and a type for donating organs after their death recognition.

Improvements/Applications: This study will be helpful and useful in drawing up plans for promoting positive perceptions depending upon individual subjectivity of organ donation and utilizing basic materials to provide realistic ways for activating organ donation.

Keywords: Organ, donation, subjectivity, adult, Q-methodology.

Introduction

With the development of medical technology, we are trying to prolong lifespan as well as keep our life healthy, however organ transplantation is only effective and only solution for the patients who are terminally ill^[1-2]. The success rate for organ transplantation is increasing and the number of patients who need to transplant organs is also rapidly increasing^[3]. The Brain-death organ donors were 515 in Korea in 2017, it was significantly lower than in other countries compared to number of

donors per million people^[4]. Organ donation not only enables the patients who wait for being transplanted to prolong their life but has a great effect on people nearby the patients. It is the matter for patients, their family and society^[5]. It might therefore be the matter which is ultimately meant to pursue the public interest of all members of our society and is also seems crucial to ensure more organ donors and applicants registered to settle problems occurred by order imbalance of organ donation. However, negative effects such as organ trade caused by an extreme imbalance that supply of organ donation falls short of demand pose social issues.

In addition, a lot of ethical and procedural arguments were raised. To settle this, Korean government has made lots of efforts to create systematic transplantation procedures like prohibition of organ trade and legalization of organ harvesting of brain death by foundation of KONOS responsible for organ transplantation making

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law on organ transplant and amending it several times. However, it is reported that the number of organ donors is getting decreased because of the influence of cultural Confucian tradition not to embarrass own body, reduced prevalence of brain death and manpower shortage needed for brain death management^[6]. It is also reported that prolonged life expectancy made supply of organs lower by low death rate, and that legal issues like consent with family members, issues of organ donation information, and issues on management are factors that impede activation of organ to donation^[3,7]. There is still a lack of awareness of organ donation, if any, it is very rare to pledge to donate organs, and even though organ donation pledges were made, there are few cases that lead to actual organ donation. It is therefore needed to make effort to revitalize organ donation^[7,8].

Therefore, it is important to establish social atmosphere where citizens and medical staffs naturally accept organ donation and advertisement and educational activities at national level should be preceded through cultural diffusion of organ donation to inspire recognition on organ donation^[5]. Approaches for increasing individual organ donation pledges, for eliciting family's consent and for establishing social atmosphere should be driven.

There were lots of precedent descriptive studies on the perception, knowledge and attitudes of organ donation based on certain groups such as medical personnel, medical university students, nursing university students, nurses, etc^[1-2,9-10]. However attitudes on organ donation are difficult to define as positive or negative recognition and an action to register as an organ donor is required for grasping subjective structures of individual value, belief, attitude, etc. Therefore, this study was to understand subjective structures on organ donation by applying Q methodology which provides individual insight on humans' subjectivity. Additionally, the study was performed to draw up plans for promoting positive perceptions depending upon individual subjectivity of organ donation and utilize basic materials to provide realistic ways for activating organ donation.

Method

Q methodology is based on the assumption of intraindividual difference in significance, and scores difference among samples represents meaning difference to the researcher who sorted it^[11].

1. Q Sample: To collect non-structured statements

which enable to express subjectivity of participants, materials such as literatures and news articles and interviews were utilized. Except duplicated statements through interviews, two researchers selected 50 statements and rearranged 35 statements were finally determined to 32 statements by two researchers a enabling to include various opinions.

- 2. P Sample:** Q methodology, a research method that conceptualize contents rather than people, should be taken into account the characteristics that different opinions can occur more than random method and the number of samples is not as large as random method^[12]. After explaining the purposes of the study and it will not be used in any other purpose, 33 subjects who understood the purposed of the study and agreed to participate in the study were finally selected and written consent from in writing
- 3. Q Sorting:** Each subject was given 32 Q cards written each statement on it and forced to arrange in important order according to personal perspective. Q cards were classified into most strongly agreed statement (+4) and most strongly disagreed statement (-4). Starting from the 1st week of March, 2019 for four weeks, researchers met respondents in person, explained and classified. The statements placed both extremes were forced to write the reason why they chose.
- 4. Data Processing:** Upon completion of P sample investigation, score was given as following; +1 point was given to the most strongly disagreed and +9 was given to the most strongly agreed. After each score had been coded, major factor analysis method was carried out by using PC QUANL Program. Various numbers of factors were input on the base of Eigen value more than 1.0 then 4 types which enabled to depict its unique property were classified among results.

Result

Subjectivity on organ donation was eventually identified in 4 types accounting for 59.2% of total variances. The power of explanation by type was [Table 1]. Among 33 respondents, 18 for the 1st type, 6 for the 2nd type, 6 for the 3rd type and 3 for the 4th type was divided and correlation which shows degree of similarity is as shown in [Table 2]. To grasp subjective characteristics and the differences by type on organ donation, the most strongly agreed statements and the most strongly disagreed statements in each type were

primarily interpreted among 32 statements. In each type, the respondents who have weight factor more than 1.00 represent its type as a typical person, showing 12 for the 1st type, 4 for the 3rd type, 1 for the 2nd and 4th respectively.

Table 1. Eigen value and variances, cumulative variance

	Type 1	Type 2	Type 3	Type 4
Eigen value	13.287	3.493	1.586	1.161
Variance	.403	.106	.048	.035
Cumulative variance	.403	.509	.557	.592

Table 2. Correlations between types

Type	1	2	3
2	.429		
3	.519	.657	
4	.598	.548	.655

To analyze subjectivity on organ donation, types were described for focusing on the most strongly agreed statement (+4) and most strongly disagreed statement ($Z \leq -1.0$) among 32 statements.

1st Type: Social public interest-oriented type:

The people who belonged to the 1st type thought the purpose of organ donation is to prolong life and to save several people, therefore they thought active promotion is very important. They also thought that more people would participate in organ donation if they knew more about it, and that more patient would be saved through organ donation. On the other hand, they opposed the fact that why they do not donate their organs because of religious belief, values, and thinking of rising from the dead and that it is hard to accept their bodies are transplanted into others. Unlike other three types, they would let the people around them know their intention for organ donation. The people who represented the 1st type intended to donate their organs in the future, and thought education is absolutely necessary, even though they have never been educated about organ donation. The people in the 1st type were named social public interest-oriented donors because they thought organ donation as a crucial act which enables to save several lives.

2nd Type: Reluctant type:

The people who belonged to the 2nd type had in common on organ donation in that organ donation is valuable in prolonging others' lives, however they did not have any intention for organ donation to help others. They regarded organ

donation as either donating least organs such as corneas or donating only to the extent that body is intact. A respondent in his 50s worried about postmortem mutilation and never admitted being destruction of a body. 5 out of 6 belonging to in this type did not have intention for organ donation, and most of them had no blood donation experience compared to other types. They thought it valuable to donate organs, they however did not perceive organ donation as an act to help others, but a separate matter from them. Given that they were very reluctant to join organ donation, they were called a reluctant type for donating one's conviction.

3rd Type: Passive type: The people who belonged to the 3rd type felt the necessity for organ donation, they, however did not want their death and thought organ donation was made consent with their parents or family members. They also thought if their parents had known their children's organ donation, they would strongly have opposed or expressed sad on it. This type had more educational experience on organ donation, but the effect on it was minimal. Since they thought decision making on organ donation had not been changed, they did not agree on the opinion of active promotion or education on organ donation. On the other hand, it will be valuable if organ donation enables to prolong someone else's life. They had no active intention for organ donation, however they thought donated organs were used to save lives through appropriate procedures. They were named passive type for donating organs mainly because they did not want to think anything related to death.

4th Type: Type for donating organs after their death:

The people who belonged to the 4th type thought to donate organs connects directly the death, as not knowing anything, they could donate organs after death. So this type is considered as type for donating organs after the death recognition. They thought on one side they admit upcoming death if they are told about organ donation by medical team and on the other side they worried about whether organ is sold or not. In addition, they did not think religious belief or values as obstacles for organ donation. Since they were reluctant to donate their organs, they could not accept their family's donation yet. To them organ donation is the recognition of their death. They however thought 'I can give a good impression to others around me by donating organs.' The people in this type were named organ donors after their death recognition because they are the type, who cannot donate their organs now, but can donate organs after their death.

Discussion

The study was conducted to study subjective structures on organ donation according to personal characteristics and subjectivity in Korea where there are a lot of patients who need organ donation but actual organ donors were very low. The analyzed 4 types had each characteristic however, they had 8 statements in common. While in [8] study on organ donation and organ transplantation, the more position an individual has, the higher intention for organ donation the person has, in this study the people in the 1st type had more positive perception on organ donation, therefore they had higher intention for organ donation. [9] reported that knowledge on organ donation had been significantly affected on attitude and subjective norm. With this, continuous education and governmental level promotion will be required to increase organ donation. The fact that the people belonged to the 1st type had a lot of blood donation experiences backed up the argument that they had higher responsibility for the society [13].

The 2nd type admitted the value for organ donation at the same time they were reluctant to donate their organs due to a sense of rejection on postmortem mutilation. According to [14], the need for respect for organ donors responded positively accounting for 77.3% of total respondents, and the ways for respect were presented 'support service for funeral (63.4%)', and 'Support program for the bereaved at social level (40.6%)' in order. This can be seen the same that the respondents in the 2nd type stated that they need after death support for those who had brain death after organ donation. For 2nd type respondents, provision of accurate information on organ transplantation and postmortem mutilation will be a top priority. They recognized the value of organ donation, but they were reluctant to donate organs.

The 3rd type had educational experience on organ donation and participated in the real organ transplant surgery, rather they did not have positive intention on organ donation. They tended to distrust effects of education, but they thought they need organ donation. To them, emotional support and education is needed, emphasizing them positive value that organ donation can enable others to live a new life.

The 4th type is the type that organ donation is connected to death and they thought their family dislike to donate their organs. In this respect, they need to be interested in organ donation and education to change their wrong awareness on organ donation is required.

The understanding for organ donation should be aimed through death education, information for making them look back on value of life should be given and chances for selection should be provided for them.

It is suggested that programs to encourage positive attitude on organ donation and put it into practice should be developed depending on each type through appropriate education.

Conclusion

This study was designed to understand subjective structures on organ donation by using Q method which provides unique insight of humans' subjectivity. The subjectivity on organ donation by adults was revealed 4 types. This study will be utilized as basic materials in preparing for ways to promote positive awareness and realistic ways to activate organ donation depending on individual subjective type on organ donation. Along with, information related to organ donation should be provided to make meaningful death through death preparation education and chances to select organ donation should also be generated. The development of educational or promoting program for activating organ donation registration is suggested by understanding characteristics of each type.

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Conflict of Interest: Nil

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Attitude about Advanced Directives among Middle-aged Using Q Methodology

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Abstract

Background/Objectives: The purpose of this study was to identify type of attitude about advanced directives among the middle-aged using Q methodology.

Method/Statistical Analysis: For the Q population, an in-depth interview and literature review were used to select 34 Q samples for Q-sort. P-sample was made with 37 middle-aged and Q-sort was performed on a 9-point scale according to their subjective agreement. The analysis by PC-QUNAL program resulted in three types.

Findings: The result of this study showed 48.1% of total variance, with 20 people (38.2%) of Type 1, 12(5.7%) of Type 2, and 5(4.2%) of Type 3. The 1st type named “yes, in principle” agreed to sign up advanced directives and disagreed life-long treatment. The people belonged to the 2nd type absolutely agreed to sign up advanced directives and thought its decision should be made on their own. This type can be called “Yes, absolutely type.” The 3rd type is “Probably I will, But” type. It means that they will be responsible for everything that might happen by family deciding to stop life-long treatment. They are unlikely to stop life-long treatment from a parent or a child position.

Improvements/Applications: As the result of this study suggests, based on classification of attitude about advanced directives among the middle-aged, intervention program for the middle-aged will need to be developed and different, individualized intervention strategies provided.

Keywords: *Attitude, Advanced directives, the Middle-aged, Q methodology, subjectivity.*

Introduction

The advancement of medicine has been enabled patients who were critically serious or unconscious to prolong their life span. Depending on life support systems, doubts were raised whether the patients themselves really wanted such life or not, prolonged their painful life meaninglessly and received life-saving treatment helplessly^[1]. In addition, even ethical dilemmas such as

disagreements were brought between medical staffs and patients' cares without expressing patients' opinions^[2]. In Korea, a special committee for life-long treatment was composed, issuing cases of Boramae and Grandma Kim. Since February, 2018, patients who were judged medically impossible have enabled to make decisions on life-long treatment themselves and executed life-time medical decision method, respecting patients' self-decision and ensuring the best interests^[3]. This means setting up standards and procedures not to be received life-long treatment enabling to end up patients' life with dignity.

What advanced directives means that a person over 19 years old must visit one of registry offices for advanced directives designated by the Ministry of Health and Welfare hear full explanation and compose intention

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forms in writing not to be treated or suspend life-long medical treatment^[4].

Advanced Directives regard human beings' dignity that all the people's life is noble to the last minute as a top priority. They can give an opportunity for patients to enhance their life in the final stage and prepare for a dignified death by discussing and deciding treatment plan along with their families and medical staffs^[1]. Middle age, proceeding for old age is a period of preparing and introspecting own death as well as experiencing indirect death of their parents and close acquaintances. Therefore, the study to understand attitudes on advanced directives is needed targeting middle age. So far, studies conducted about advanced directives were about knowledge, attitudes, educational needs, intention, etc. involved by nursing students, the elderly and health workers^[3, 5].

Since the attitudes on advanced directives were subjective and varied depending on personal experiences, sociocultural background and values, a study showing subjective recognition of middle age and considering sociocultural context was tried presenting intervention. Q method for analysing systematically and grasping its category was used in the study to know exactly what advanced directives meant. Through this study, we should know there is no meaningless life and want to use it as a fundamental material of educational program development which able to understand that life is valuable to the last minute.

Method

1. **Research Design:** Since Q method designed to measure the subjective self, latent acts of individual had each type's feature understood according to subjective structure of humans ^[6], Q method was employed to investigate attitudes type of middle age on advanced directives in this study.
2. **Concourse and Q sample:** In this study, literature review related to advanced directives was conducted and in-depth interview targeted middle aged male and female was performed to the point of saturation of the statement's material. Through this process, 90 Q populations were extracted in total. Using Q method, after altering and modifying the statements by experienced nursing professionals, 34 Q statements were finally decided.
3. **P sample:** Q method does not treat interindividual difference but intraindividual difference in significance, it is therefore enough that the number

of P sample generates factors and compare among factors. P sample for this study was aimed at 37 middle aged subjects.

4. **Q sorting:** P sample subjects were presented 34 cards written statements selected by Q samples then forced to distribute them on a nine-point scale from strongly disagree (-4), neutral (0), to strongly agree (+4) according to the degree to which they have made. The subjects should write the reasons why they chose the extremes (+4, -4) among statements. These will be utilized as useful information in interpreting each Q factor.
5. **Data analysis:** Collected data was analyzed as Q factors with PC QUANL program. For deciding ideal number of factors, the number of factors was entered variously based on the Eigen value over 1.0 then three types judged ideally were finally selected through calculated result.

Result

1. **Formation of the types:** The attitudes on advanced directives through Q factors analysis were shown as three types. After analysing weighing factors and variable quantities, three types explained approximately 48.1% of total variables; explanations per each type were 38.2% for the 1st type, 5.7% for the 2nd type and 4.2% for the 3rd type [Table 1].

Table 1. Eigen Value, Variance, and Cumulative Percentage

Variables	Type 1	Type 2	Type 3
Eigen value	14.115	2.109	1.564
Variance (%)	.382	.057	.042
Cumulative variance	.382	.439	.481

Among 37 subjects, 20 for the 1st type, 12 for the 2nd type and 5 for the 3rd type was divided, and correlation between types was as shown in [Table 2].

Table 2. Correlation Matrix between Types

Variables	Type 1	Type 2	Type 3
Type 1	1.000		
Type 2	.725	1.000	
Type 3	.672	.563	1.000

The higher factor weights a subject has within each type, the more typical characteristic the subject shows. This means that such a person represented the corresponding type.

2. Characteristics by types: To analyse characteristics by types on advanced directives, characteristics by types were described for focusing on the most positive statement ($Z \geq +1.0$) and the most negative statement ($Z \leq -1.0$) among 34 statements

Type 1: Yes, in Principle: In the 1st type, the most strongly agreed statements were ‘It is much more meaningful to spend the rest of life with one’s loved family than to receive the lifespan treatment to prolong own life. ($Z = 1.74$)’ and ‘It is right to follow the patient’s will in case of patient’s intention to stop the lifespan treatment ($Z = 1.39$).’ While the most disagreed statements in the 1st type were ‘I will not compose advanced directives because I want to receive all the available treatment until I take my last breath ($Z = -1.77$).’, ‘Tendency of neglecting life can be prevailed in societies if discontinuing life-long treatment allows ($Z = -1.44$)’. Also, the strongly agreed statements compared to other types were ‘It is most appropriate for patient’s family to decide to discontinue life-long treatment.’, ‘Educational programs at national level will be helpful and useful when making decisions on death or life-long treatment.’ in order and the most strongly disagreed statements were ‘I will encourage others like friends or colleagues to compose advanced directives.’, ‘From a parent or a child position, I feel like I have not done my duty to stop life-long treatment.’ in order.

20 subjects out of 37 in total belonged to the 1st type, and they agreed to compose advanced directives and objected to life-long treatment. They also think it is better to organize the rest of their life according to their will and meaningful to spend the rest of time with their family. Plus, they think educational programs at national level are needed. They, however, think it is most appropriate for patient’s family to decide to discontinue life-long treatment, at the same time they do not encourage others to compose advanced directives. So this type can be called “Yes, in principle”

Type 2: Yes, absolutely: In the 2nd type, the most agreed statements were ‘I will compose advanced directives because I do not think receiving life-long treatment is worth ($Z = 1.60$)’, ‘I will compose advanced directives because I think living with no consciousness is to live like a dead person in case of treating life-long treatment ($Z = 1.48$)’. The most disagreed statements in the 2nd type, on the other hand, were ‘Even though I lie without consciousness or neither control bowel nor move, I must carry on my life to the end because

human dignity is still existed ($Z = -1.90$)’, ‘Since it is not up to me to decide whether I live or die, life should be kept to the end of my life ($Z = -1.70$)’, ‘I will not compose advanced directives because I want to receive all the available treatment until I take my last breath ($Z = -1.64$)’. Also, the strongly agreed statements compared to other types were ‘I will compose advanced directives because I think living with no consciousness is to live like a dead person in case of treating life-long treatment’, ‘People should live with their own will. It is meaningless to live with the help of machines’ in order. The most strongly disagreed statements were ‘Since it is not up to me to decide whether I live or die, life should be kept to the end of my life’, ‘Educational programs at national level will be helpful and useful when making decisions on death or life-long treatment’ in order.

12 subjects out of 37 in total belonged to the 2nd type, and they objected to meaningless life-long treatment in that live unconsciously with the help of machines at the same time they strongly agreed to compose advanced directives. They think it will be painful for the family to see the process of life-long treatment and to discontinue life-long treatment keeps the dignity of human beings in situations where medical treatment is impossible. So, this type can be called “Yes, absolutely”

Type 3: Probably I will, but: In the 3rd type, the most agreed statements were ‘It is right to follow the patient’s will in case of patient’s intention to discontinue life-long treatment ($Z = 1.70$)’, ‘Advanced directives should be composed in advance as it is important to state that I have an intention to discontinue life-long treatment ($Z = 1.50$)’ in order. The most disagreed statements in the 3rd type, on the other hand, were ‘I will not compose advanced directives because I want to receive all the available treatment until I take my last breath ($Z = -2.05$)’, ‘I think medical staffs will not be likely to cure sincerely if I compose advanced directives ($Z = -1.66$)’ in order. The strongly agreed statements compared to other types were ‘Even though a member of family is in a state where recovery is impossible, I want to do all the available medical treatment I can as a family’, ‘Since it is not up to me to decide whether I live or die, life should be kept to the end of my life’ in order, and they were not revealed in other types. The most strongly disagreed statements were ‘I will compose advanced directives because I think living with no consciousness is to live like a dead person in case of treating life-long treatment’, ‘People should live with their own will. It is meaningless to live with the help of machines’ in order.

5 subjects out of 37 in total belonged to the 3rd type, and they will compose advanced directives by themselves, however they basically objected to discontinuing life-long treatment. They think life is meaningful even with the help of machine unconsciously and human life should be maintained until the end of life that God has given. In other words, they think life exists in heaven. They will compose advanced directives for themselves; it means that they will be responsible for everything that might happen by family deciding to stop life-long treatment. So, this type can be called “Probably I will, But”

The common perspectives between types were ‘I will compose advanced directives because I do not think receiving life-long treatment is worth ($Z = 1.18$)’, ‘I will compose advanced directives in advance because it will be painful for the family to see the process of life-long treatment ($Z = 1.07$)’, ‘I cannot compose advanced directives because I have little medical knowledge or experience ($Z = -1.26$)’, ‘I will not compose advanced directives because I want to receive all the available treatment until I take my last breath ($Z = -1.82$)’, etc.

Discussion

The study was carried out to divide types for attitude on advanced directives targeting middle aged by using of Q methodology. The 1st type named ‘yes, in principle’ agreed to sign up advanced directives and disagreed life-long treatment. As just shown in the study [7] for middle aged adults 82.3% of the respondents agreed to draw up advanced directives, middle aged showed interest in them. In the study [7] 80.5% of the subjects would not have life-long treatment, showing that a lot of middle aged had the same thought like the 1st type. The respondents belonged to the 1st type reported that they need education programs at national level for decision making on life-long treatment. This was proved by the study [8] that after getting an education on advanced directives for seniors at the local community, efficacy score on the understanding of advanced directives and decision making has significantly improved. It is therefore considered drawing up advanced directives through educational programs making us end life, prepare death, and reflect on life.

The people belonged to the 2nd type absolutely agreed to sign up advanced directives and thought its decision should be made on their own. It needs to be distinguished the recognition of a patient’s right to die

from death as a result of exercising the right to self-determination on medical practice [9]. They also said they would sign up advanced directives for their family, which is the same as the study found that advanced directives reduce stress, anxiety, depression of the family after the patient dies [10]. This implies that we need to be more active in signing up advanced directives.

Respondents in the 3rd reported that while they would sign up for advanced directives for themselves, they would do the entire available medical cure for their family members even though they are in a state where recovery is impossible. This is the same result shown as in the study [11] saying they stop meaningless life-long treatment for themselves, but they cannot give up their parents’ treatment. They said they would compose advanced directive for themselves, not to feeling regret or guilty if their family decides to stop treatment. After all, it is the same context as the argument that it is common for guardians to make all decisions [12]. Therefore, it is necessary to provide a chance to prepare his or her death naturally by discussing and deciding with family members about his or her life-long treatment when in healthy.

Conclusion

As a consequent of this study, since adults have intentions for composing advanced directives commonly educational strategies suitable for life cycle and program development are required for right understanding on advanced directives. To have an education with the contents of keeping human dignity at the last period of life, requiring proper treatment and cure, hospice palliative care, the reflection of life and death will instill a positive consciousness on advanced directives. It also requires a change in understanding of death and accepting it in a natural way in making decision in advance. Therefore, it is desirable to have an education on preparing for death.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Effects of Smartphone Addiction on Radiology Students' Interpersonal Satisfaction

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Abstract

Background/Objectives: Although smart phone is known for its convenient functions and portability, it is also causing smart phone addiction which is becoming a serious social issue. The objective of this study was to determine the degree of smartphone dependence in university students majoring in radiology and analyze the influence of smartphone addition on their interpersonal relationships.

Method/Statistical Analysis: : A questionnaire was used to survey 431 university students about the use of smartphone. The questionnaire had 26 questions. Each question was evaluated with a 5-point Likert scale. Its Cronbach's α value was 0.893. Students' satisfaction for interpersonal relationship was determined according to their situation. Three additional socio-demographic characteristics (economic level, addiction, and gender) were also determined. Questions and answers were provided face-to-face.

Findings: Overreliance on smartphones was the highest in living standards with income at the "middle" level with 240 (55.64%) and female students at 184 (42.6%) in gender, higher than 247 (57.3%) for male students. In terms of interpersonal satisfaction, 247 (57.3%) male students showed high levels of satisfaction with each other's relationships, while in terms of smartphone overreliance, the group of people who are not satisfied (3.545 ± 0.34) showed high levels. Correlation analysis showed a static correlation between sex and smartphone over-dependence ($r = .217, p < .001$), and there was a negative correlation between smartphone and interpersonal satisfaction ($r = -.236, p < .001$).

Improvements/Applications: Based on results of this study, a program should be developed to prevent smartphone dependence of students and raise interpersonal satisfaction. Results of this study could be used as basic data necessary for education on smartphone dependence prevention in university students.

Keywords: *Smartphone, Smartphone addiction, Smartphone dependence, Radiology university student, Interpersonal satisfaction.*

Introduction

Smartphones not only have communication and internet functions due to rapid development of IT

technology and communication systems, but also make it easy and convenient to transcend time and space. They are revolutionizing life.

Unlike mobile phones, smartphones combine the functions of digital devices as well as texts and phones, allowing users to use various convenient functions such as information search, music, media, games, and learning. In addition, it is possible to have convenient access to information and networks without being influenced by time and place, but the convenient function and portability of such smartphones can cause negative phenomena such as addictive use of smartphones. Excessive use

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of smartphones by university students can be expected to cause significant obstacles in daily life as well as psychosocial problems^[1]. Smartphone overreliance can be considered an act addiction and there are no official diagnostic criteria for smartphone overreliance, so there is a mix of definition and classification.

Considering the trend in the spread and usage of smartphones, it is urgent to recognize and prevent dependence of smartphones^[2]. Smartphone dependence rate in university students has been reported to be 18.1%, more than three times higher than the rate (5%) in age groups of 40s and 50s^[3]. Recently, studies have been mainly focused on teenagers. There is a need to perform research on smartphone dependency in university students^[4].

Currently, smartphones are commonly used by university students in the information society. Smartphone is used as a tool for obtaining communication media and information in daily life. Unconsciously relying on smartphones while acquiring mutual information and information through smartphones can be said to be a trend of over-dependence symptoms and individualism.

Over-dependent use of smartphones can lead to interpersonal problems. Interpersonal relationship refers to the ability to interact effectively with others, including the formation and initiation of relationships with others, the assertion of one’s rights or displeasure, the opening of personal information, emotional support of others, and conflict management^[5]. Failure to form a smooth interpersonal relationship results in emotional isolation and reported correlation between smartphone over dependence and interpersonal satisfaction in order to understand the relationship between loneliness, anxiety and depression, which are side effects of smartphone overreliance caused by interpersonal related factors^[6].

In recent years, smartphone dependence in university students has been increasing. Various studies have been conducted on smartphone dependence of university students. However, researches on the identification of related factors of relationship satisfaction are insufficient. In previous studies, university students are stressed by personal characteristics, interpersonal relationships, study, and careers. They feel anxiety and confusion at the same time as they worry about employment, causing psychological problems^[7]. Most psychological problems are reported to arise from interpersonal satisfaction^[8]. Therefore, the objective of

this study was to determine the degree of smartphone dependence in university students majoring in radiology and analyze the influence of smartphone addition on their interpersonal relationships.

Method

- 1. Subject:** A questionnaire survey was performed to determine factors affecting interpersonal satisfaction on internet relations among Korean radiologists from March to July 2018. A total of 500 questionnaires were distributed and 431 (86.2%) copies were collected. Thus, the total number of subjects was 431 including 247 (57.3%) males and 184 (42.6%) females.
- 2. Method:** The questionnaire used in this study had 15 questions (Cronbach’s α value 0.899). It was developed by the Korea Information Technology Agency^[9]. Interpersonal satisfaction level was measured using the scale developed by Eun hyuk Ki (1999). The test of interpersonal relationship satisfaction was reconstructed according to university students’ condition. It had 26 items of “interpersonal satisfaction” (Cronbach’s α value of 0.893) evaluated with a 5-point Likert scale^[10]. The questionnaire was composed of three additional socio-demographic characteristics (economic level, addiction, and gender). Questions and answers were given face-to-face. For data analysis, frequency analysis and correlation analysis were performed using IBM SPSS Statistics version 23. Statistical significance level was set at $p < 0.05$.

Result

- 1. Smartphone Dependence and Interpersonal Relationship Satisfaction Level:** [Table 1] As a result of technical statistics to find out the level of dependency on smartphones and the level of interpersonal satisfaction, the level of interdependence on smartphones was 2.64 out of 5 points, and the level of interpersonal satisfaction was 3.56 out of 5 point.

Table 1. Smartphone Dependence Level and Interpersonal Relationship Satisfaction Level (N = 431)

Division	Average±SD
Addiction level	2.64±0.61
Interpersonal Satisfaction	3.56±0.53

2. Interpersonal Satisfaction According to Personal Characteristics, Dependence on Smartphone: [Table 2] According to personal characteristics, average difference analysis was performed to identify difference between Smartphone over dependence and interpersonal satisfaction. The

difference in smartphone over dependence was found to be 2.54 for males and 2.78 for females ($p < .001$), according to living standards, “Upper” is 2.78, “middle” is 2.56, “Lower” is 2.71, and there are statistically significant differences ($p < .001$).

Table 2. Difference in smartphone addiction according to personal characteristics (N = 431)

Personal Characteristics		Smartphone Addiction		t/F value	p-value
		N	M±SD		
Gender	Male Student	247	2.54±0.62	-4.16**	0.000
	Female Student	184	2.78±0.58		
Level of Living	Lower	97	2.71±0.66	4.99**	0.007
	Middle	240	2.56±0.57		
	Upper	94	2.78±0.65		

* $p < .05$, ** $p < .001$

[Table 3] Regarding the level of interpersonal satisfaction, it was 3.61 for male students and 3.50 for female students, showing statistically significant difference between the two ($p < .05$).

Table 3. Regarding the level of interpersonal satisfaction (N = 431)

Personal characteristics		Smartphone addiction		t/F value	p-value
		N	M±SD		
Gender	Male student	247	3.61±0.57	2.03*	0.043
	Female student	184	3.50±0.47		
Level of living	Lower	97	3.59±0.54	2.17	0.115
	Middle	240	3.59±0.53		
	Upper	94	3.46±0.50		

* $p < .05$

3. Interpersonal Satisfaction Differences Depending on Smartphone Dependence: [Table 4] The t-test was performed to find out the difference in the interpersonal satisfaction level according to the dependency on the smartphone. Smartphone over dependence was 225, interpersonal satisfaction was 3.323, aesthetic dependence was 206, interpersonal satisfaction was 3.545, aesthetic dependence was high, and there was a statistically significant difference between the two groups ($p < .001$).

Table 4. Difference in self-control according to whether or not a smartphone is addictive (N = 431)

Division		Smartphone addiction		t/F value	p-value
		N	M±SD		
Addiction	Addiction	225	3.323±0.31	46.06***	0.001
	Non-addiction	206	3.545±0.34		

*** $p < .001$

4. Relationship between smartphone dependency and interpersonal satisfaction: [Table 5] A correlation analysis was conducted to examine the relationship between gender, economic level, smartphone dependence, and interpersonal satisfaction. There was a positive correlation between gender and smartphone dependence ($r = .217$, $p < .001$). Correlation was shown.

Table 5. Relationship between smartphone addiction and self-control (N = 431)

	Gender	Level of living	Smartphone addiction	Self-control
Gender	1			
Level of living	.007	1		
Smartphone addiction	.217***	-.027	1	
Self-control	-.083	-.018	-.236***	1

***p<.001

Discussion

Each country of the Organization for Economic Cooperation and Development stresses the role of the middle course that leads to a job after graduating from a university. In these days, smartphone over dependence and interpersonal relationships are the most important period as university students are developed into later adolescence as there is a growing interest and policy regarding smartphone overreliance on university students.

Existing literatures on smartphones have focused on university students, adolescents, and adults. Many studies have been conducted in Korea. This study examined smartphone dependency and interpersonal relationship satisfaction among university students majoring in radiology. Korean students are using SNS, UCC, Kakao Talk, and BAND applications without using face-to-face interactions. Griffiths (1995) has suggested that interpersonal satisfaction is a variable that has a significant effect on smartphone dependence. Therefore, the purpose of this study was to investigate the importance of interpersonal relations in university life and society by grasping the relationship between satisfaction of interpersonal relations and dependence of smartphones of university students majoring in radiology.

Kim Choon-kyung (1991) reported the result of her research that her relationship is weak because she spends a lot of time playing games using her smartphone and lacks time to hang out with her friends. Kang Yeon-dal (2010) has shown that the higher the level of smartphone game addiction, the higher the anxiety of interpersonal relations. Park Ji-hyun (2017) has shown that the relationship between university students' anxiety and smartphone dependence is the same as the result between smartphone dependency and interpersonal satisfaction.

In the study of Kim Nam-sun (2012), female university students showed higher scores for smartphone dependence than male university students^[11]. Syu (2010) has also compared men and women in smartphone use and found that females use smartphones and download applications more often than men. In the present study, female students also had higher smartphone dependence than male students, consistent with results of previous studies.

University students are stressed by their new life after completing high school, such as completing credits, learning majors, relationships, careers, and employment (Baek, Hye-young et al., 2016). It has been shown to act dependently^[12]. This interdependent behavior is related to interpersonal ability and smartphone dependence. It has been shown that interpersonal ability and smartphone dependence have a negative correlation^[13].

In the relationship between smartphone over dependence and interpersonal satisfaction, Kim Sa-ri (2002) has shown a significant correlation between interpersonal satisfaction and smartphone dependence^[14,15]. Results of the present study showed that interpersonal satisfaction was low in university students, consistent with results of previous studies. In addition, the higher the smartphone dependency, the lower the interpersonal satisfaction, resulting in inadequate correlation.

When university students become radiographers and come into contact with many people, they should always be wary that they can become addicted by adjusting their use of smartphones on their own to ensure proper interpersonal relationships.

Conclusion

This study analyzed the factors affecting the interpersonal satisfaction level according to the dependency of smartphones.

First, the level of dependency on smartphones was 2.64, and interpersonal satisfaction was 3.56. The female students showed high dependence on smartphones, and the level of living was high in the “medium”.

Second, interpersonal satisfaction was found to be high among male students, and high degree of dependency on smartphone aesthetics.

Third, the correlation analysis showed a positive correlation between gender and smartphone dependence, and there was a negative correlation between smartphone and interpersonal satisfaction.

This study grasped the degree of dependence on smartphones among university students in radiology, analyzed the effect of smartphone dependence on interpersonal satisfaction, and suggested ways to satisfy interpersonal relationship in smartphone use of all university students in the future. Results of this study could be used as basic data for education on smartphone dependence prevention in university students.

Ethical Clearance: Not required

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Effects of Cognitive Exercise Therapy on Tactile Sensations of the Hands and Activities of Daily Living in Stroke Patients

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Abstract

Background/Objectives: The aim of present study was to evaluate the effects of cognitive exercise therapy (CET) on tactile sensations of the hands and activities of daily living in stroke patients.

Method/Statistical Analysis: A total of 14 stroke patients with impaired hand sensations were participated and were randomly assigned to the CET group or the traditional occupational therapy (TOT) group. Patients in the CET group performed cognitive tasks using their spatial and tactile senses, whereas those in the TOT group received traditional occupational therapy. The intervention periods of the two groups were 30 min per day, five-times per week for four weeks. All participations were assessed before and after intervention with light touch sensation using the Mono-Filament, two-point discrimination sensation using the Disk-Criminator (static and dynamic tactile sensations), and the modified Barthel index (MBI) for activities of daily living ability.

Findings: The CET group appeared significant improvements in static and dynamic two-point discrimination, and the MBI before and after the intervention. Also, the TOT group showed a significant improvement in MBI after intervention. At post-test, the CET group showed significant improvements in two-point discrimination and light touch compared to the TOT group.

Improvements/Applications: These findings suggest that CET can induce improvement of the tactile sensations of the hands in stroke patients. Thus, we suggest that CET can be used for tactile-sensory rehabilitation of patients with stroke in clinic.

Keywords: *Cognitive exercise therapy, Hand, Activities of daily living, Stroke, Tactile sensation.*

Introduction

Stroke is the most common central nervous system disorder in the Republic of Korea as well as the world, and it causes neurological problems in the sensory, motor, mental, perceptual, and speech functions^[1]. More

than 85% of patients with stroke experience hemiplegia, and over 69% have upper extremity motor function impairment^[2]. Post-stroke dysfunctions of the upper extremities cause significant problems with functional movement in performing the independent activities of the daily life, such as feeding and self-care^[3]. The incidence of decreased sensory function after stroke is up to 65%^[4]. As patients with stroke with sensory deficits show limitations in movement and performance of functional tasks, treatments for motor and sensory functions of the upper extremities are important in rehabilitation^[5].

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In the past, using simple objects such as cups, cones,

and a pegboard, therapeutic exercise was performed to enhance motor and sensory functions. Recently, however, more diverse therapeutic intervention methods have been used to improve the upper limb function of stroke patients in clinics. According to previous researches, the treatment of constraint-induced movement therapy (CIMT)^[6], virtual reality^[7], and robot-assisted therapy have a positive effect in the upper extremity functions in stroke patients^[8]. However, constraint-induced movement therapy requires 5 hours of intense training per day^[6], while virtual reality and robot-assisted therapy are expensive and have space constraints^[7-8]. Therefore, these limitations make it difficult to conduct the interventions in the clinics, and an effective intervention that overcomes these limitations is required.

Cognitive exercise therapy (CET) was designed by Carlo Perfetti in Italy at 1979. It is closely associated with the reorganization of the central nervous system and is a remedial approach based on learning theory^[9]. In other words, the treatment is based on learning theory and restores body damage through cognitive processes (perception, attention, memory, judgment, and language). This cognitive process can induce a change in the brain neuronal plasticity^[10]. Thus, CET has been used for disorders with emotional and/or psychiatric problems in the clinic and the researches.

CET has been actively studied in the Republic of Korea but mostly in case studies and not through sufficient experimental research. Recently, Lee et al.^[11] examined the effect of CET and task-oriented training on the upper limb functions in stroke patients, and reported a larger improvement in the upper extremity functions with CET compared to that with task-oriented training. However, this study as well as other studies did not identify the effect of CET on sensory functions especially the hands, in stroke patients.

The aim of this study investigated the effects of CET on tactile sensations of the hands and activities of daily living (ADL) in patients with stroke.

Method

Present study was performed on 14 individuals with chronic stroke who were admitted in a rehabilitation unit located in Seoul, Korea. The inclusion criteria were: 1) clinically diagnosed stroke; 2) more than 6 months of stroke onset; 3) a manual muscle testing (MMT) sensitivity of 6.65 mm (monofilament) or less; and 5)

a Mini-Mental State Examination (MMSE) score of 24 or more. The exclusion criteria were: 1) visual spatial neglect or visual impairment; and 2) severe spasticity. The subjects participating in the study provided written informed consent. The study was approved by the Gachon University Institutional Review Board (approval number: 1044396-201708-HR-137-01). Also, present study is in accordance with the Declaration of Helsinki.

Sensory tests were performed to evaluate the tactile sensations in the hands of the subjects, and the modified Barthel index (MBI) was used to assess an activities of daily living. All outcome tests were performed under blinded condition by one occupational therapist with minimum 3 years of clinical experience. To conduct accurate measurements, the measurer was trained and checked on the measurement method used in this study one week before the test.

We used the Semmes-Weinstein monofilament (Baseline, USA) to measure the minimum threshold at which the subject felt light touch of the hand^[12]. This monofilament consists of different diameters and degree of stiffness. Stimulus was applied to the hands with the perpendicular to skin until the filament was slightly bent. The threshold was measured by repeating the stimulation of the index finger of the paretic hand thrice, until the filament bent at the site for 1.5 seconds^[13].

To measure the two-point discrimination sense, the Dellon 2-Pint Disk-Criminator (Baseline, USA) was used^[14]. Static and dynamic tests were performed. The dynamic test provided stimulation to the proximal part of the distal side of the index finger of the paretic hand, and the static test was performed by taking a point^[15].

MBI was used to assess the level of the activities of daily living for stroke patients or other patients with neurological problems. This method has 10 categories, and was measured as 0 at complete dependence and 100 at independence of activities of daily living. The intra-rater reliability of the MBI is $r = .89$ and the inter-rater reliability is $r = .95$ ^[16].

The 14 subjects were randomly assigned to the CET group or traditional occupational therapy (TOT) group after they met the inclusion criteria. Tests were performed in both groups for 30 min/day, 5 times a week, for 4 weeks.

Patients in the CET group performed cognitive tasks using their spatial sense and tactile sense based on the

protocol used in a previous study^[11]. In the cognitive tasks using spatial senses, an occupational therapist covered the subject’s eye and subsequently moved the subject’s arm passively along the circle drawn on the task board. The size of the circle was identified. The subjects verbally expressed their feelings toward recognizing the differences. Cognitive tasks using tactile senses were performed by the subjects using their hands. Subsequently, an occupational therapist pressed various sponges of varying hardness on the subject’s hands. Subjects were masked and made aware of the hardness of the sponge. Further, subjects identified the hardness of the sponge being pressed on their hands. Subjects were asked to express their feelings verbally while recognizing differences in the sense of pressure. Occupational therapist performed therapeutic intervention without knowing which group the subject belong to. Patients in the TOT group performed a passive or an active range of motion exercises of the upper extremity, using an incline board, stacking cone, ring, pegboard, and putty for improvement in their fine motor and upper extremity functions after stroke.

The Statistical Package of the Social Sciences (SPSS) version 23.0 was used for the statistical analyses. The Wilcoxon signed-rank test was performed to compare the dependent variables within each group before and after intervention. The Mann–Whitney U test used to compare differences in the dependent variables between the groups. A p-value < .05 was considered statistically significant.

Result and Discussion

1. General Characteristics: The general characteristics did not differ between the groups (p>.05) [Table 1]. Also, there were no significant differences between the groups in light touch, static or dynamic two-point discrimination, and MBI before intervention (p>.05) [Table 2].

Table 1. General characteristics

	CET group (n = 7)	TOTgroup (n = 7)	P
Age (Year), mean±SD	57.57±5.83	59.43±8.72	.665
Gender, n(%)			.593
Male	3 (42.9)	4 (57.1)	
Female	4 (57.1)	3 (42.9)	
Stroke type, n(%)			.577
Ischemic stroke	4 (57.1)	5 (71.4)	
Hemorrhagic stroke	3 (42.9)	2 (28.6)	

	CET group (n = 7)	TOTgroup (n = 7)	P
Paretic side, n(%)			.593
Right	4 (57.1)	3 (42.9)	
Left	3 (42.9)	4 (57.1)	
Onset duration (months), mean±SD	9.14±1.77	10.71±1.80	.120
K-MMSE, mean±SD	27.43±1.27	26.14±1.86	.150

Footnotes. CET: cognitive exercise therapy, TOT: traditional occupational therapy, K-MMSE = Korean Mini-Mental State Examination, SD: standard deviation.

Table 2. Comparison of tactile sensory and activities of daily living before intervention

	CET group (n = 7)	TOT group (n = 7)	P
	Mean±SD	Mean±SD	
LT (g)	3.50±0.57	3.66±0.62	.646
TPDs (g)	10.43±3.15	10.00±2.83	.747
TPDd (g)	11.29±3.04	11.00±2.31	.897
MBI (score)	85.71±5.50	86.57±5.86	.699

Footnotes. CET: cognitive exercise therapy, TOT:traditional occupational therapy, LT: light touch, TPDs: two point discrimination (static), TPDd: two point discrimination (dynamic), MBI: modified Barthel index, SD: standard deviation.

- 2. Comparison of tactile sensations and activities of daily living:** The CET group showed significant improvements in static and dynamic two-point discriminations and MBI before and after intervention (p<.05), but no significant improvement in light touch (p>.05). The TOT group showed significant improvement in MBI before and after intervention (p<.05), but no significant improvement in light touch or static or dynamic two-point discrimination (p>.05) [Table 3].
- 3. Change score for tactile sensory and activities of daily living between two groups:** After intervention, the CET group had a significantly greater improvement in light touch and dynamic two-point discrimination than the TOT group based on the change in scores (p<.05). Static two-point discrimination and MBI showed no significant differences between the groups (p<.05) [Table 4].

Discussion

Previous CET studies were conducted mainly in the Republic of Korea. To date, the research on CET or its effect on sensory functions was not insufficient. In

addition, since most previous studies were conducted as the case studies or not as the randomized controlled trial (RCT), there are limitations that make it difficult to clearly demonstrate the effects of CET.

Results of this study showed that the CET group had significantly improved static and dynamic two-point discrimination sensation and MBI before and after intervention, while the TOT group showed significant improvement only in MBI. After intervention, the CET group had significantly greater improvement in light touch and dynamic two-point discrimination than the TOT group.

The CET group showed significant improvement in light touch and dynamic two-point discrimination

of hands than the TOT group. In Van de Winckel et al.'s functional magnetic resonance imaging study, cognitive tasks using spatial and tactile senses applied in CET activated the premotor cortex areas closely associated with hand functions^[10]. This result supports the improvement in sensory functions of the hand in this study. The recovery of upper extremity and hand functions is the slowest recovery after stroke, and control of hand movement must include grasp and prehensile activity for the activities of daily living^[17]. Lee et al. found that CET had a greater effect on the improvement of upper extremity function compared to TOT^[11]. However, our study did not assess upper extremity or hand function.

Table 3. Comparison of tactile sensations and activities of daily living

	CET Group (n = 7)		P	TOT Group (n = 7)		P
	Pre	Post		Pre	Post	
	Mean±SD	Mean±SD		Mean±SD	Mean±SD	
LT (g)	3.50±0.57	3.23±0.45	.059	3.66±0.62	3.66±0.62	1.000
TPDs (g)	10.43±3.15	9.43±2.44	.038*	10.00±2.83	9.71±2.50	.157
TPDd (g)	11.29±3.04	10.57±2.76	.025*	11.00±2.31	10.86±2.04	.317
MBI (score)	85.71±5.50	87.71±5.25	.014*	86.57±5.86	88.86±5.96	.027*

Footnotes. *p<0.05, CET: cognitive exercise therapy, TOT:traditional occupational therapy, LT: light touch, TPDs: two point discrimination (static), TPDd: two point discrimination (dynamic), MBI: modified Barthel index, SD: standard deviation.

Table 4. Change score for tactile sensory and activities of daily living between two groups

	CET Group (n = 7)	TOT Group (n = 7)	P
	Change Score	Change Score	
	Mean±SD	Mean±SD	
LT (g)	-0.27±0.28	0.0±0.0	.024*
TPDs (g)	-1.00±0.82	-0.29±0.49	.080
TPDd (g)	-0.71±0.49	-0.14±0.38	.037*
MBI (score)	2.00±0.58	2.29±1.50	.632

Footnotes. *p<0.05 CET: cognitive exercise therapy, TOT:traditional occupational therapy, LT: light touch, TPDs: two point discrimination (static), TPDd: two point discrimination (dynamic), MBI: modified Barthel index, SD: standard deviation.

There was no significant difference between the two groups. The interpretation of these results can be explained in three ways. First, there is a possibility that the results are not clear because the sample size is

small. Second, there is a possibility that CET will not be effective in improvement of activities of daily living. Third, we measured the evaluation of activities of daily living using MBI. The subcategories of MBI have more evaluation items for the lower extremity functions, such as gait, than for the upper extremity functions. Therefore, there is a possibility that it was difficult to confirm the improvement of the upper extremity functions.

The limitations of this study are as follows. First, the sample size was small. Therefore, it may be difficult to generalize the findings to population with stroke. Second, we performed only a relatively short period of intervention with four weeks of treatment. Third, we did not confirm the sustained effect of treatment. Finally, we did not evaluate proprioception or motions of the hands. In order to verify the effect of CET, one should check whether there is an improvement in motion or proprioception.

Conclusion

In conclusion, these findings suggest that CET can induce improvements in the tactile sensations of the hands in patients with stroke better than TOT. However, further studies with more subjects. In addition, it is necessary to study whether it is effective in improving the upper limb functions as well as sensory functions. In further studies, more patients should be included for long-term effects, and randomized controlled trial is required.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Effects of Voice Quality Improvement Program for Professional Voice Users with Functional Voice Disorders

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Abstract

Background/Objectives: One of the most emphasized aspects in voice therapy is voice quality. We investigated the effect of our intervention program on improving voice quality and reducing vocal fatigue.

Method/Statistical Analysis: 10 musical actors/actresses with functional voice disorders were given eight training sessions once a week, and both subjective and objective evaluations of their voices were conducted before and after the training. K-SVHI and VFI were used to measure voice handicap index and voice fatigue index. Praat was used to measure the objective acoustic indices. To examine the statistical significance, a paired sample *t*-test was performed.

Findings: The result of subjective voice quality evaluation showed that both scores of voice handicap index and voice fatigue index were decreased. The objective voice evaluation results showed that the jitter (%) and shimmer(%) scores decreased while the harmonics to noise ratio (HNR) and the speaking fundamental frequency (SF0) scores increased. The lower the jitter and shimmer, the better the quality of voice, while the higher the HNR, the better the quality of voice. The difference between pretest and posttest scores was statistically significant except for the SF0. The reason for small changes in the SF0 seems to be that all participants of musical actor/actresses who skillfully use the voice were able to control their voice to maintain the frequency at a certain level.

Improvements/Applications: Our findings indicate that patients with functional voice disorders have problems ways to use their voice and showed that their voice quality and vocal fatigue can be improved by modifying and training four stages of voice production.

Keywords: *Functional Voice Disorders, Professional Voice Users, Voice Quality, Vocal Fatigue Index (VFI).*

Introduction

Professional voice users are a group of people who use a voice to maintain their jobs, including singers, actors, teachers, and salesmen etc.^[1]. They are interested in ways to preserve voice quality at high risk of being exposed to voice disorders. Musical actors/actresses among professional voice users are highly advanced

artists because they have to digest both theatrical and musical elements, produce short-term intensive voice and imitate the voices of various characters. In the process of playing their role, they are accompanied by muscle tension dysphonia due to incorrect posture, inefficient respiration, excessive muscle tension, and incomplete obstruction of the vocal folds and frequently exposed to functional voice disorders such as vocal nodule, Reinke's edema, and vocal polyp, as well as experiencing voice fatigue^[2]. Functional voice disorders are caused by the misuse and abuse of voice, not by organic or neurological reasons, and are a type of voice disorders that clinicians can easily recognize because they can visualize the larynx structure and function^[3].

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In order to properly assess voice disorders, objective measurements using voice analysis devices are necessary. However, according to the previous research, there may be less correlation between the expert’s objective evaluation of the voice quality and the voice user who perceives it when the voice quality is degraded^[4]. This is supported by the fact that there are many patients who seek an otolaryngologist with a complaint of globus sensation even in the absence of specific voice disorders^[6]. In order to properly evaluate voice disorders and to grasp treatment outcomes, not only objective evaluation but also subjective evaluation of voice users should be considered^[5,7,8]. Functional voice disorders aim primarily at correcting improper use of voice, not surgeries or medical interventions to restore normal phonation function, and direct treatment is known to be more effective in improving voice quality than indirect treatment^[9].

This study was to look at the results of subjective evaluation and objective examination after providing intervention through a series of voice quality improvement program designed by the researchers for professional voice users with functional voice disorders. To this end, we set up the following research questions. First, are there any significant differences in the voice disorder index and the vocal fatigue index before and after applying the voice quality improvement program? Second, are there any significant differences in the acoustic indices (SF0, jitter, shimmer, HNR) before and after applying the voice quality improvement program?

Method

The participants of this study were 10 musical actors/actresses living in Seoul and Gyeonggi area. They were all diagnosed with functional voice disorders by an otolaryngologist, and the specific types of voice disorders can be found in [Table 1]. The age ranged from 19 to 29 years with an average of 24, and the musical actors/actresses’ careers ranged from five months to seven years and six months variously.

Table 1. Information of participants

Sex	Age (Year)	Career (Year)	Type of Voice Disorders
Male	29	1.5	Muscle tension dysphonia
	19	2.5	Vocal nodule
	20	0.5	Chronic edema
	26	2.0	Chronic edema
	23	4.7	Vocal nodule

Sex	Age (Year)	Career (Year)	Type of Voice Disorders
Female	25	7.6	Irregular vocal cords mucous membrane
	25	4.8	Vocal nodule
	24	1.0	Vocal nodule
	24	6.5	Vocal nodule
	24	5.5	Vocal nodule

The data collection took about three months from June 11 to September 13, 2018. The orientation and the pre evaluation were conducted for all participants prior to proceeding with the intervention program. The program was implemented a total of 8 sessions for 60 minutes once a week. One week after the end of the program, the post evaluation for all of them was conducted. The specific research progress is as follows.

1. Developing and implementing the program: In

order to improve the voice quality of the participants, it was necessary to correct erroneous voice production ways and train vocalization according to the voice production principle. Only by approaching the fundamental problem of the interaction and movement of highly complex vocal organs can solve the inveterate problem of voice quality properly. Therefore, we divided into four steps such as posture, respiration, vocal folds contact, and voice quality based on the order of voice production, and then in order to improve the function of each step, a five-step voice quality improvement program was developed and applied to all participants as follows.

Step 1: Since the posture of the singer necessarily affects the respiratory function, the posture correction was performed during singing. Leaning against the wall, the head, shoulders and hips were attached to the wall, and the ears, shoulders and pelvis were aligned in a straight line when viewed from the side, and the jaws was pulled in the direction of the body so that the head was not bowed down.

Step 2: The degree of improvement of respiratory function was identified by implementing the respiratory measurements using simple instruments for measuring inspiratory capacity such as Medline’s Incentive Spirometer – 4,000ml Capacity and One-Way Valve so that the subject was able to recognize the respiratory function and participate actively in the training.

Step 3: If the respiratory function was judged to be degraded, Ultrabreathe (Tangent Healthcare, Ltd.) was

used to train the muscles involved in respiration. After the abdominal was inflated for effective movement of the diaphragm, it was directed to show the movement of the thorax.

Step 4: Hypofunctional voice disorders is characterized by disappearing vibration or stiffness of the vocal folds and by widening glottis chink. Therefore, vocal folds contact training such as vocalization was performed using a wooden tongue depressor to induce smooth and proper vocal folds contact and respiratory support. The vowels were induced to phonate correctly by snapping the wood tongue depressor with the teeth.

Step 5: As a way to improve acoustic characteristics and induce the right singing which is an important factor in voice quality, five steps were trained in sequence, such as Semi-Occluded Vocal Tract Exercises, SOVTEs to descend the larynx position and the opening of the throat which increased the voice quality by adjusting the length and width of the resonance cavity^[10]. SOVTEs used voiced consonant [v], [z], nasal consonant [m], [n], [ŋ], rounded vowel [o], [u], lip trill and tongue trill to close a part of the vocal tract, while the rest was relaxed by using physiological phenomenon such as yawn/sigh and was done by expanding the cross-sectional area of the resonance cavity. At this time, it was required to parallel to vocal folds contact training.



Figure 1. An Example of SOVTEs

2. Evaluation of voice quality

1. Subjective voice quality evaluation:

Subjective voice evaluation used two tools. First, The Korean Version of the Singing Voice

Handicap Index (K-SVHI)^[11] is a subjective evaluation that measures the effects of voice disorders on the quality of life in people such as singers who using voice. This tool has a total of 36 questions and is intended to assess the degree of effects on physical, emotional, economic and social areas with a five-point scale. Next the Vocal Fatigue Index (VFI)^[12] is used to assess the degree of vocal fatigue of participants felt. This tool has a total of 19 questions and consists of three parts. That is, it is divided into 11 questions related to the degree of vocal fatigue and avoidance of voice use, 5 questions related to physical discomfort due to vocal fatigue, and 3 questions related to improvement of symptom due to rest after voice use. VFI is also on a five-point scale.

Subjective voice evaluation allowed the participants to rate after reading the questions themselves. The reliability of the pre evaluation was measured by re-evaluating all participants two times before the intervention program. Although the tools had the same 5-point scale from 0 to 4, the total number of questions was different. So the first author summed these scores and converted them into percentages to measure the reliability of the pre evaluation as the difference between the two evaluations. As a result of it, the percentage error value of the total score of K-SVHI was 3.337% and the percentage error value of the VFI was 5.657%, indicating that the reliability of the pre evaluation data was high. Therefore, the first test data were used to compare with the post test data, in order to exclude the familiarity due to retest.

2. Objective voice quality evaluation: In this study, computer-based Praat (v.6.0.33) was used as the objective voice evaluation tool. The acoustic indices of interest to the authors were jitter(%), shimmer(%), harmonic to noise ratio(HNR, dB), and speaking fundamental frequency (SF0) which are commonly used in the objective voice evaluation^[4]. Jitter and shimmer are acoustic indexes mainly examining the stability of voice. Jitter shows the pitch, that is, irregularity in the frequency of voice production, and shimmer shows the loudness, that is, irregularity in the intensity of

voice production^[13]. It is used to objectively measure the periodicity of vocal folds vibration and to observe the presence or absence of voice disorders, severity, voice quality, and voice change of patients^[4,13]. HNR is an index of how much noise is mixed in a voice and is especially important when evaluating hoarse voices. To obtain these quantitative data, the first author recorded it by allowing the participants to phonate three times a/vowel for at least five seconds and analyzed the length of 1.5 seconds of it. In addition, since SF0 needs to get the mean value of the speaking frequency, the researcher made the subjects read the extracts from the first part of the ‘A Fall Admiration’ paragraph which is often used in voice evaluation and recorded the best results to analyze it^[14]. The microphone used was Supe Uni-Directional Condenser Microphone (320E) and the subjects were examined at a 45-degree angle while keeping the distance between the subjects and the microphone at 30cm in a closed room without noise.

- 3. Statistical processing:** To examine whether our program was effective for the participants, the improvement of the subjective voice quality or not was compared by pre-post K-SVHI score and VFI score and the improvement of the objective voice quality or not was compared with pre and post values for jitter, shimmer, HNR, and SF0. Statistical verification was implemented by paired sample *t*-test using Statistical Package for Social Sciences (SPSS, version 25), the mean and standard deviation (SD) of each result were compared and the significance level was set to 1%.

Results and Discussion

The result of the subjective evaluation after applying the intervention program showed that both K-SVHI score and VFI score were decreased. Both evaluations mean higher score is that the degree feeling the problem about their voice is worse and lower score is that the degree feeling the problem about their voice is less. As shown in [Table 2], the two evaluation scores were significantly lower than before applying the program and the difference between the pre and post scores was also statistically significant[K-SVHI ($t = 4.05, p < .01$), VFI ($t = 3.99, p < .01$)]. This means that the program has improved the voice problems and vocal fatigue of participants

Table 2. T-test results for subject evaluation score differences (N = 10)

Index	Pre/ post-	Score	Mean	SD	<i>t</i>
K-SVHI	Pre-	70.20	39.20	30.59	4.05 **
	Post-	31.00			
VFI	Pre-	35.60	16.20	12.86	3.99**
	Post-	19.40			

** $p < .01$

The objective evaluation results after applying the program showed that SF0 and HNR were higher than before applying the intervention program, and the jitter and the shimmer were lower than before applying the intervention program [Table 3]. The higher the HNR, the better the quality of voice, while the lower the jitter and shimmer, the better the quality of voice. As a result of statistically verifying the difference of pre and post test scores, SF0 did not show statistically significant difference, but jitter, shimmer and HNR showed statistically significant difference[sF0($t = -1.39, p > .01$), jitter ($t = 4.06, p < .01$), shimmer ($t = 4.26, p < .01$), HNR ($t = -4.96, p < .01$)]. This means that the voice quality of the participants has been objectively improved. However, it seems that there was no significant difference in SF0 to be due to intentionally maintaining a constant speaking fundamental frequency in the test before and after intervention because the participants were musical actors with relatively good voice control ability.

Table 3. T-test results for objective evaluation score differences (N = 10)

Index	Pre/ post-	Total score	Mean	SD	<i>t</i>
SF0	Pre-	165.48	-3.17	7.25	-1.39
	Post-	168.65			
Jitter (%)	Pre-	0.45	0.02	0.02	4.06**
	Post-	0.22			
Shimmer (%)	Pre-	4.06	2.14	1.59	4.26**
	Post-	1.92			
HNR (dB)	Pre-	17.91	- 5.88	3.75	-4.96**
	Post-	23.79			

** $p < .01$

Conclusion

The results of this study show that voice quality can be improved by modifying and training the existing inappropriate voice production method at each stage such as respiration, phonation, resonance, and articulation. In

particular, our program was designed to be easily used by anyone. K-SVHI and VFI as subjective evaluation tools and Praat as objective evaluation tools, are easy to download and use online and directions are also simple. Just as you adjust and train your lifestyle according to specific and efficient programs for your physical beauty or strength, naturally repeating the procedure presented in this study to daily life will be an appropriate training method to improve or maintain quality of voice.

Our study involved patients with various medical diagnoses, and our program has been shown to be effective for all of them, regardless of their cause or type. However, further research is needed since the difference in effects by the type of medical diagnosis was not identified due to the small number of participants. This study is meaningful to show that the voice quality of functional voice disorder patients can be improved by training the control ability of vocal organs through the program combined with classical vocal music phonation.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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The Study of the Correlation between Cognition Function and Quality of Sleep in the Elderly

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Abstract

Background/Objectives: Sleep function affects human health, Recently, studies on various variables affecting mental health management and cognitive function of elderly people are being actively conducted due to the increase of elderly population. The purpose of this study was to investigate the correlation between cognitive function and quality of sleep in the elderly.

Method/Statistical Analysis: The participation was 33 normal elders over 65-year-old. Cognition function was evaluated with the Montreal Cognitive Assessment (MoCA), and quality of sleep was evaluated with sleep Scale A. The data were then analyzed for frequency and correlation by using statistical software (SPSS 21.0).

Findings: The average age of the study subjects was 82.4 years. The average MoCA score was 17.1 ± 3.8 and sleep scale A score was 29.6 ± 8.9 . The results of MoCA and sleep scale A showed a positive correlation ($r = .417, p < .05$).

Improvements/Applications: The results of the study show that the lower the quality of sleep in the elderly, the lower the cognitive function. The results of this study will discuss whether sleep quality can be used to predict mental health in older adults.

Keywords: MoCA, Sleep Scale A, Elderly, Cognition, Correlation.

Introduction

Sleep affects various factors in human health. Sleeping an average of 7 hours a night, average sleep quality was better related to health, affect balance, satisfaction with life, and feelings of tension, depression, anger, fatigue, and confusion than average sleep quantity^[1]. Sleep disorders in the elderly are a common problem, show various symptoms such as difficulty sleeping and maintaining sleep, frequent arousal,

frequent use of sleeping drug, and excessive daytime sleepiness^[2].

In the study of factors affecting the quality of sleep of the elderly in the community, there were significant differences in sleep quality between income, exercise time, and subjective health and higher the depression, the lower the quality of sleep^[3]. As the elderly population increases, studies on various variables affecting mental health management and cognitive function of the elderly are being actively conducted. The analysis of factors related to mental health of the elderly showed that the higher quality of life, the less stress, depression, and suicidal thoughts^[4].

Changes in cognitive function in old age vary from person to person, but Changes in cognitive function according to the normal aging process and disease of dementia are important social issues. Recently, studies

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on the correlation between cognitive decline and sleep in the elderly have been actively conducted. However, the majority of studies have been conducted on subjects that show decreased cognitive function, such as dementia^[5-7].

We recognized the need for the study of the correlation between cognitive function and sleep quality in normal elderly people. The purpose of this study was to evaluate MOCA and sleep scale A of normal elderly, to measure cognitive function and sleep quality, and to investigate the relationship between cognitive function and sleep quality.

Method

This study is correlation study. The purpose of this study is to investigate the cognitive function and sleep quality of the elderly, to identify the correlation between cognitive function and sleep quality.

This study surveyed 40 elderly people over 65 years old. The subjects is normal elderly who performed independent activity of daily living (ADL), not have impaired hand function due to past medical history. The subjects of this study are as follows. Those who understand the purpose of this study, agree to participate, and respond appropriately to the evaluation items. We visited the senior welfare center, explained the evaluation tool and the purpose of the study to the facility manager, and received permission and cooperation to proceed with the research.

The Montreal Cognitive Assessment (MoCA) is an assessment tool developed to screen patients with mild cognitive impairment (MCI). The assessment takes 10 minutes and is a 30-point cognitive screening test. Evaluation items are as follows; Visuospatial/executive, naming, memory, attention, language, abstraction, delayed recall, orientation. MoCA is a screening tool useful for detecting mild dementia or MCI in subjects with a score of 25 or higher on the Mini-Mental State Examination (MMSE).The use of this assessment tool can identify older people at risk of developing dementia in older people who have been diagnosed with MCI^[8-9].

The Sleep Scale A is a questionnaire consisting of 15 questions to measure the quality of sleep. Available for all age groups, each question describes symptoms of sleep quality. The details of the question are whether it takes long to fall asleep or sleepy after waking up in the morning. The response consists of a Likert 4 point

scale, ranging from 1 point is ‘almost always’ to 4 point is ‘almost never’. The score is a minimum of 15 and a maximum of 60, which means that the higher the score, the higher the quality of sleep. Cronbach’s α is 0.75^[10].

In this study, 7 of the 40 responses were excluded from insufficient data and 33 data were analyzed. SPSS 21.0 Version program was used, and the general characteristics of the subjects, MoCA, and the quality of sleep were used descriptive statistics. The correlation between MoCA and sleep quality was analyzed by Pearson’s Correlation Coefficients.

Result and Discussion

- 1. General characteristics of the subjects:** The general characteristics of the study subjects are as follows. 45.5% were male and 54.5% were female. The most common age group was 80 years of age and older (60.6%). In the past year, 66.7% of patients visited the hospital, 27.9% of the subjects had arthritis. 84.8% subjects did not smoke and 75.8% did not drink alcohol[Table 1].
- 2. MoCA and sleep scale A score of participants:** The MoCA and sleep scale A scores of the participant were as follows. The average score of cognitive function was 17.1±3.8, and the quality of sleep was 29.6±8.9[Table 2].

Table 1. General characteristics of participants (N = 33)

Characteristic	Categories	N(%)
Gender	Male	15(45.5)
	Female	18(54.5)
Age	70-74	6(18.2)
	75-79	7(21.2)
	More than 80	20(60.6)
Diseases	No	12(36.4)
	Arthritis	9(27.3)
	HTN	3(9.1)
	Diabetes	2(6.0)
	Heart disease etc	1(3.0) 6(18.2)
Smoking	No	28(84.8)
	yes	5(15.2)
Drinking	No	25(75.8)
	yes	8(24.2)

Table 2. MoCA and sleep scale A score of participants (N = 33)

Categories	M±SD
MoCA	17.1±3.8
Sleep scale A	29.6±8.9

The differences of cognitive function and sleep quality according to smoking and drinking were examined. First, the difference of cognitive function and sleep quality according to smoking status was checked. The non-smoking group had higher sleep quality score than the smoking group, but there was no significant difference. On the other hand, the smoking group showed a higher cognitive function score than the non-smoking group, but there was no significant difference. Second, the cognitive function and sleep quality according to drinking status were checked. The drinking group had higher scores of cognitive function and sleep quality than the non-alcohol group[Table 3].

Finally, the correlation between MoCA and sleep scale A scores were as follows and there was a significant positive correlation($r = .417, p < .05$)[Table 4].

Table 3. Differences in cognitive function and sleep quality according to smoking and drinking

Categories	Group	N	MoCA	Sleep scale A
Smoking	Non-smoking	28	16.9±3.9	29.9±9.2
	smoking	5	17.6±3.3	28.0±7.5
Drinking	Non-Drinking	25	16.64±4.0	28.92±9.0
	Drinking	8	18.38±2.8	31.63±8.8

Table 4. Correlation between MoCA and sleep scale A

	MoCA	quality of sleep
MoCA	1	.417*
Sleep scale A	.417*	1

* $P < .05$

Discussion

The results of this study find that there was a positive correlation between cognitive function and sleep quality. Recently, research on the relationship between cognitive function and sleep has been an issue. However, most of the studies were based on subjects with diseases such as chronic respiratory disease or mild cognitive impairment. This study is meaningful because it is a result of the correlation between cognitive function and

sleep quality in normal elderly people.

Review the results of the preceding study. First, the analysis of the relationship between sleep quality, cognitive function, depression and daily activities of the elderly in long-term care facilities showed no correlation between sleep quality, cognitive function, depression and daily activities, but depression and cognitive function^[11].

The second study confirmed the nighttime sleep polymorphism test and cognitive function in normal elderly and MCI group. As a result, there was no significant difference in nighttime sleep characteristics between the two groups, but it was confirmed that working memory was decreased in the normal elderly who had difficulty maintaining nighttime sleep. In this study, the majority of the problems of subjects with low scores on sleep quality are nighttime sleep difficulties^[12].

The third study examined the correlation between sleep quality and cognitive function in patients with chronic respiratory disease and found a significant correlation between sleep patterns and cognitive function^[13].

Next we will discuss the qualitative data of this study. Sleep disorders of the subjects with low scores in sleep scale A include: Sleep apnea, insomnia, often wake up at night. Two people who had low scores on sleep quality were taking sleeping pills for insomnia. Others said they could not sleep unless they consume alcohol. In a study that investigated the quality of sleep in older adults, The items with the lowest score were ‘get up often’ and ‘it’s hard to fall asleep’ after waking up^[3]. This is similar to the results of this study.

The suggestions of this study are as follows. First in this study, there was no statistically significant difference, but further research is needed to investigate the cognitive function and quality of life according to alcohol consumption and smoking. Second, it is necessary to study the detailed correlation between s factors of cognitive function and sleep quality. Third, based on the results of this study, we hope that future sleep quality can be used as an index for predicting mental health of the elderly.

Conclusion

The purpose of this study was to investigate the relationship between cognitive function and sleep quality in normal elderly people. MoCA was used to check

cognitive function, and Sleep Scale A was evaluated to check sleep quality.

As a result of measuring the cognitive function and sleep quality of the normal elderly, it was confirmed that there is a correlation between the cognitive function of the elderly and the amount of sleep.

The previous study also confirmed that there is a correlation between cognitive function and sleep quality. This study is meaningful in that it prepared basic data for utilizing the sleep quality of the elderly as an index for predicting mental health..

Further research is needed to determine the relationship between component of cognitive function and sleep quality. And It will need to expand the number of study subjects.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Effects of Acute Exercise Intensities on Blood Lipid and Growth Factors in Middle School Students with Intellectual Disabilities

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Abstract

Objectives: The purpose of this study was to examine the effects of acute exercise intensities on changes in blood lipids and growth factors in middle school students with intellectual disabilities.

Method: The study participants were randomly assigned into low intensity (n = 8), moderate intensity (n = 9) and high intensity (n = 9) groups. Acute exercise intensities was classified into low intensity (40~54% HRR), moderate intensity (55~69% HRR) and high intensity (70~85% HRR) using heart rate reserve (HRR). Blood lipids (total cholesterol, Triglyceride, high-density lipoprotein cholesterol, Low-density lipoprotein cholesterol) and growth factors (insulin-like growth factor-1, growth hormone, thyroxine, thyroid stimulating hormone) were measured before and after executing the physical activity program.

Findings: According to the results for blood lipids, high-density lipoprotein cholesterol (HDL) was significantly increased in the high-intensity group compared to the low-intensity group. For growth related hormones, insulin-like growth factor-1 (IGF-1) was significantly increased after exercise in the high-intensity group compared to the moderate-intensity group.

Applications: When the same amount of acute exercise was given to middle school students with intellectual disabilities, HDL was found to increase by the largest amount in the high-intensity group. IGF-1 was also found to be most effective in the high-intensity group. Future studies need to comprehensively account for sex and level of obesity.

Keywords: *Acute Exercise, Exercise Intensity, Intellectual Disabilities, Blood Lipid, Growth Factors.*

Introduction

People with intellectual disabilities have higher levels of C-reactive protein (CRP), which is a factor in inflammation and muscle atrophy, than non-disabled people and, coupled with their poor physical activity participation and inadequate diet, results in low exercise performance and high exercise fatigue^[1]. In addition, their below-average intellectual ability and

lack of adaptive behaviour make it difficult to acquire information on the nervous system and acquire new information and technologies^[2]. Their low physical fitness levels, and high obesity rates leads to a decline in motor function as their age increases, high mortality, which requires effective weight management^[3, 4].

Lack of exercise in adolescence is closely associated with obesity and cardiovascular risk factors^[5, 6]. It is also an important factor that affects adult health as well as adult disease^[7]. Nevertheless, there are many studies related to the health benefits of regular exercise for adolescents without disabilities, but there are only a few studies on physical activity whose subjects are adolescents with intellectual disabilities^[7, 8].

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Table 1. Demographic characteristic of the participants

Characteristics	Low intensity group (n = 8)	Moderate intensity group (n = 9)	High intensity group (n = 9)
Female, n(%)	2(25%)	3(33%)	3(33%)
Age (year)	15.75±0.46	15.78±0.44	16.00±0.00
Height (cm)	165.01±7.66	161.10±7.34	164.32±6.05
Weight (kg)	60.88±19.65	58.14±16.50	60.21±10.57
Body mass index (kg/m ²)	24.56±14.27	27.10±13.47	25.19±11.76
VO ₂ max (Ml/kg/min)	59.04±8.50	54.90±14.99	55.44±10.12

Long-term regular exercise is reported to have a positive effect on blood lipids and reduce body fat and abdominal fat, reducing the risk of cardiovascular disease^[9]. It has been shown to directly stimulate adolescent growth-related hormones and contribute to tissue growth and development^[10]. This exercise effect can be considered an adaptation phenomenon due to acute exercise performed at an appropriate amount and intensity. However, most of the studies on blood lipids and growth-related hormones according to acute exercise intensity have been conducted on non-disabled subjects. The results showed a decrease in triglyceride (TG) after moderate intensity exercise, but there was only either no change in high-density lipoprotein cholesterol (HDL-C) or increased HDL-C after high intensity exercise^[11, 12]. Since each researcher has a difference in the exercise intensity and exercise amount used with the subjects, there is a lack of information on which exercise intensity is effective for adolescents with intellectual disabilities. In addition, growth-related factors are expected to be affected by exercise intensity, but the basis for this has not yet been identified.

Therefore, this study conducted simple acute exercise according to three exercise intensity groups for middle school students with growing intellectual disabilities. The purpose of this study is to examine its effects on changes in blood lipids (total cholesterol: TC, TG, HDL-C, Low-density lipoprotein cholesterol: LDL-C) and growth factors (insulin-like growth factor-1: IGF-1, growth hormone: GH, thyroxine: T4, thyroid stimulating hormone: TSH).

Method

1. Participants: This study conducted a convenience sampling of 26 middle school students with mild intellectual disabilities attending special classes in the city of A. Random sampling was performed for the 26 selected participants, dividing them into

groups as follows: nine in the high intensity group (HIG), nine in the moderate intensity group (MIG) and eight in the low intensity group (LIG). The physical characteristics of the study subjects are shown in [Table 1]. Approval for the study was obtained from the Institutional Review Board at The Y University Research Ethics Committee

2. Procedure: The maximum oxygen intake and maximum heart rate were measured using Balke-Ware protocol to set the individual exercise intensity of each participant^[13]. Participants wore portable wireless breathing gas analyzers (K4b², Cosmed, Italy) and wireless heart rate monitors (RS-400, POLAR, Finland).

After a maximal graded exercise testing (GXT), a week was given for resting and this study was conducted. Acute physical exercise intensity was divided into low intensity (40-54% HRR), moderate intensity (55-69% HRR), and high intensity (70-85% HRR) exercise groups using heart rate reserve (HRR)^[14]. Blood samples were collected before and after training to compare changes in blood variables and growth-related factors according to exercise intensity in acute physical activity programs.

3. Measures: The acute exercise program consisted of an aerobic training, and a fitness training exercise program using one's body. The wireless heart rate monitor RS400 was used to set and maintain exercise intensity for each group. The heart rate and exercise time for each set exercise intensity were entered into the heart rate monitor, and an alarm was set when the lower and upper values were measured so that they could be checked during the exercise.

In order to equalize the amount of exercise, the daily exercise amount was calculated to be 10%^[15] of the basic metabolic rate, and the exercise time was calculated as equivalent to 200kcal consumption for

each subject and applied individually.

The blood lipids of TC, TG, HDL-C, and LDL-C were analyzed using a blood analyzer (VITROS DT 60 II, Johnson & Hohnson Co. USA). Analysis of growth-related factors of IGF-1, GH, T4, and TSH was performed using radioimmuno assay (RIA). The analysis of all measurement data was performed by S clinical pathology center.

4. Data Analysis: All data collected in this study was analyzed via the SPSS ver. 22.0 program. To verify the difference of blood lipids and growth-related factors according to acute exercise intensity groups (LIG, MIG, HIG), premeasured values were set as covariates and an analysis of covariance (ANCOVA) was performed. Bonferroni was used for post hoc testing by group. Effect Size (ES) was presented as η^2 (eta). In terms of behavioural science, the effect size was interpreted by η^2 standard (Large: .14,

Medium: .06, Small: .01) as proposed by Cohen [15]. The significance level of all data was set to $\alpha = .05$.

Result

1. Blood Lipids: In order to verify the difference in blood lipid changes by acute exercise intensity (low, moderate, high intensity), the results of ANCOVA with the premeasured values set as covariates are shown in [Table 2]. TC (F = .536), TG (F = 1.895) and LDL-C (F = .305) did not show significant differences by exercise intensity. On the other hand, HDL-C (F = 4.108) showed significant difference according to acute exercise intensity. Post hoc test results showed that HIG was significantly lower than LIG ($p < .05$).

In terms of effect of blood lipid by intensity of acute exercise program, triglycerides (η^2 (eta) = 0.141) and HDL-C (η^2 (eta) = 0.263) showed large effects size.

Table 2. Covariance of blood lipids by acute exercise intensity group

		Pre-test Mean±SD	Post-test Mean±SD	Adjust post-test Mean±SE	F-value	η^2
TC	LIG (n = 8)	141.56±27.72	147.89±28.44	150.83±3.24	.536	0.045
	MIG (n = 9)	143.11±18.48	154.00±29.61	155.32±3.23		
	HIG (n = 9)	148.44±31.75	158.67±30.01	154.41±3.25		
TG	LIG (n = 8)	99.11±53.34	121.22±52.05	115.22±13.09	1.895	0.141
	MIG (n = 9)	91.78±49.10	113.33±49.47	110.75±12.93		
	HIG (n = 9)	67.78±31.58	72.44±22.41	81.03±13.29		
HDL	LIG (n = 8)	47.89±9.60	45.89±11.01	52.07±1.73	4.108*	0.263
	MIG (n = 9)	55.44±12.08	55.44±9.71	54.54±1.71		
	HIG (n = 9)	60.11±16.28	64.67±17.41	59.39±1.77		
LDL	LIG (n = 8)	85.56±25.97	88.56±23.53	85.45±2.69	.305	0.026
	MIG (n = 9)	81.00±22.89	86.44±32.72	88.24±2.69		
	HIG (n = 9)	81.44±27.96	86.44±29.13	87.76±2.69		

Unit: mg/dl cm, *: $p < 0.05$, TC; total cholesterol, TG; triglyceride, HDL; high-density lipoprotein cholesterol, LDL: low-density lipoprotein cholesterol, LIG: low intensity group, MIG: moderate intensity group, HIG: high intensity group, SD; standard deviation, SE; standard error

2. Growth Factors: In order to verify the difference of growth-related factor change by acute exercise intensity, the pre measured values were set as covariates. The results of ANCOVA are shown in [Table 3]. GH (F = 1.700), T4 (F = 1.023) and TSH (F = 3.111) did not show statistically significant difference. On the other hand, IGF-1 (F = 3.991)

showed significant difference by acute exercise intensity. Post hoc test results showed that HIG was significantly higher than MIG ($p < .05$).

In terms of effect of blood lipid by intensity of acute exercise program, it showed large effect size on IGF-1 (η^2 (eta) = 0.258) and TSH (η^2 (eta) = 0.213).

Table 3. Covariance of growth factors by acute exercise intensity group

		Pre-test Mean±SD	Post-test Mean±SD	Adjust post-test Mean±SE	F-value	η ²
IGF-1	LIG (n = 8)	400.22±87.30	471.44±88.31	474.70±21.56	3.991*	0.258
	MIG (n = 9)	390.00±71.99	448.44±104.77	460.11±21.69		
	HIG (n = 9)	422.33±66.90	557.11±70.19	542.18±21.78		
GH	LIG (n = 8)	2.95±2.00	4.35±4.70	4.19±0.90	1.700	0.129
	MIG (n = 9)	1.76±2.05	2.60±2.74	3.49±0.94		
	HIG (n = 9)	3.61±2.83	2.59±2.04	1.85±0.93		
T4	LIG(n = 8)	7.96±1.02	8.53±1.16	8.30±0.22	1.023	0.082
	MIG (n = 9)	7.75±1.07	7.89±1.33	7.86±0.22		
	HIG (n = 9)	7.47±0.91	7.78±1.10	8.04±0.22		
TSH	LIG (n = 8)	2.00±0.80	2.63±0.77	3.36±0.39	3.111	0.213
	MIG (n = 9)	2.63±1.14	3.71±2.45	3.22±0.39		
	HIG (n = 9)	2.50±1.87	4.70±4.19	4.46±0.39		

unit: ng/mL ,*:

p<0.05, IGF-1; insulin-like growth factor-1, GH; growth hormone, T4; thyroxine, TSH: thyroid stimulating hormone, LIG: low intensity group, MIG: moderate intensity group, HIG: high intensity group, SD; standard deviation, SE; standard error.

according to groups in order to compare/analyze changes in blood lipids and growth related factors under conditions that consume the same calories for middle school students with intellectual disabilities.

Discussion

In this study, three acute exercise intensities (low, moderate, and high) were performed differently

According to the results, blood lipids in HDL-C were significantly higher in HIG than in LIG as shown in [Figure 1].

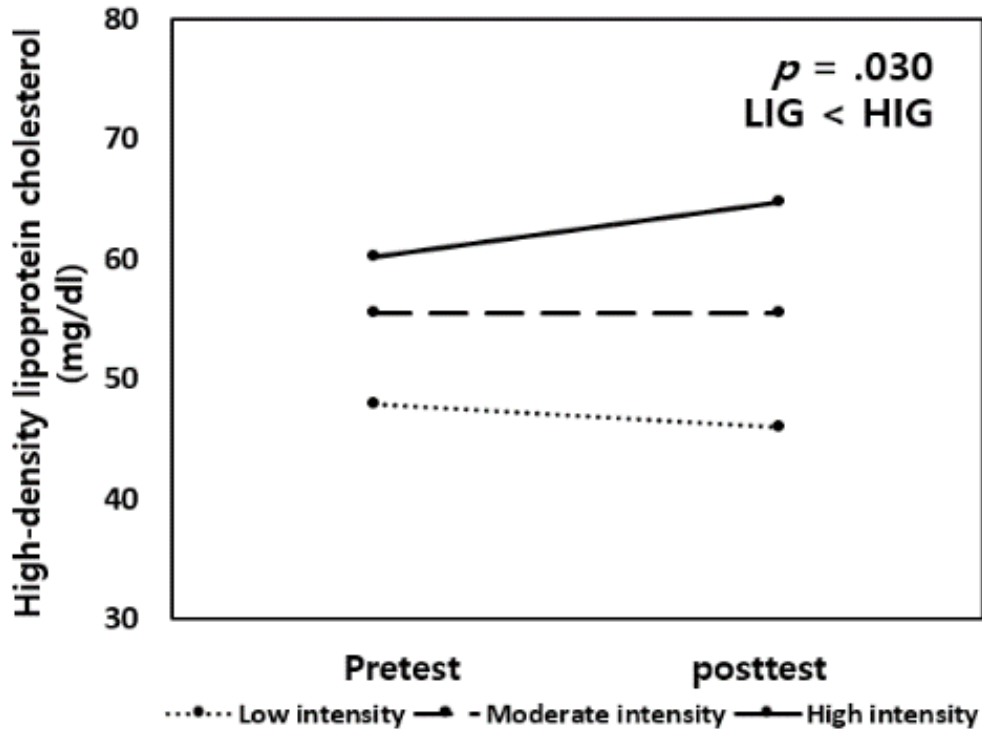


Figure 1. Changes in high density cholesterol with acute exercise intensity

LIG: Low intensity group, HIG: high intensity group:

According to a study comparing blood lipids by acute exercise intensity among university students, triglycerides decreased by more than 10%, from 80%~90% of the individual's lactate threshold (LT), 90 minutes after exercise. For HDL-C, the increase in concentration was greater in LT 90%~100% than during other intensity [16]. Another study examined changes in HDL-C with 70% LT and LT for healthy elderly and reported a significant increase in 24-hour HDL-C in LT [17]. Regarding exercise intensity and blood lipids, Wood et al. [18] reported that low intensity exercise would

not significantly change blood lipoprotein levels, but that high intensity exercise can increase blood HDL-C levels and decrease TG and a reduction in HDL-C could promote the development of atherosclerosis. It is thought that the repetitive increase in HDL-C at high intensity exercise can further stimulate the increase of HDL-C, which is manifested by long-term exercise adaptation.

In growth-related factors, IGF-1 was significantly increased more in HIG than MIG after exercise as shown in [Figure 2].

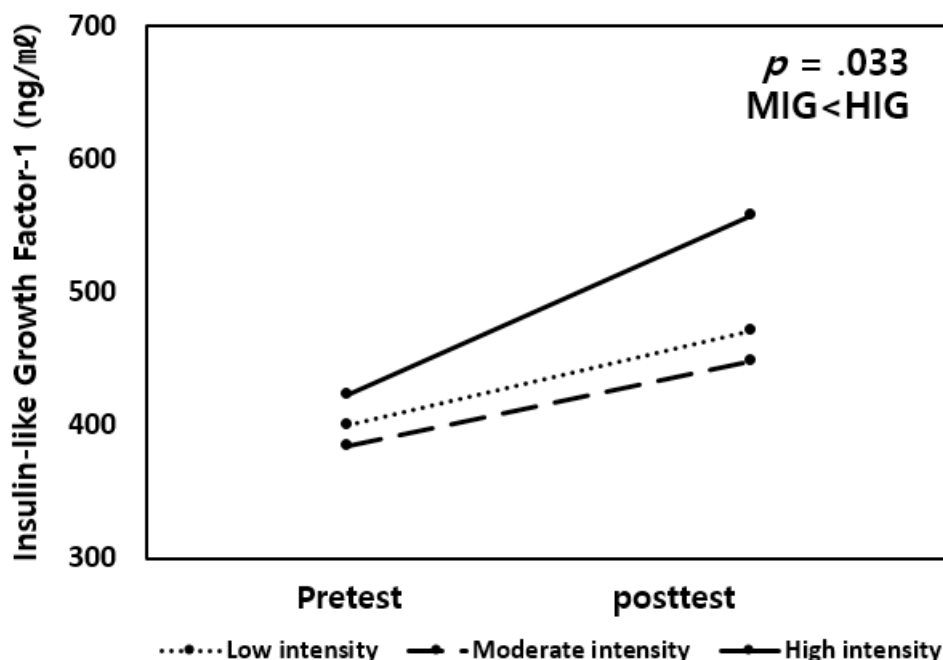


Figure 2. Changes in insulin-like growth factor-1 with acute exercise intensity

MIG: moderate intensity group, HIG: high intensity group

Previous studies confirmed that IGF-1 concentrations were highest at 65%~70% HRmax, suggesting that further studies are needed to examine the response of IGF-1 after exercise at specific exercise intensities [19]. In this study, IGF-1 showed a significant increase during high intensity exercise, but not during moderate intensity, and that there was no significant difference in GH. This result is consistent with the result that GH is increased more in low intensity exercise [20], and that the increase of GH production is independent of each other regardless of an increase in IGF-1 concentration [21, 22].

According to the recently updated 2018 Physical Activity Guidelines for Americans [23], acute physical

activity alone can lower blood pressure, improve sleep, and strengthen the body's ability to convert blood sugar into energy. In this study, targeting adolescents with intellectual disabilities, high intensity exercise in acute exercise increased HDL-C and increasing the synthesis of IGF-1. Based on these findings, more attention and follow-up studies are needed for the physical activity or exercise of adolescents with intellectual disabilities.

Conclusion

When middle school students with intellectual disabilities were given the same amount of exercise by acute exercise intensity, it was confirmed that high

intensity exercise increased HDL-C and had a significant effect on IGF-1. If middle school students with intellectual disabilities continue to perform high intensity exercises in the future, positively changed factors may be further stimulated to prevent cardiovascular disease and to have a positive impact on growth. As this study did not consider the sex and obesity level of people with intellectual disability, further study is necessary considering other factors such these.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Comparison of Blue Light Blocking Effects of Tips and Tinted Lenses for Dental Light Curing Machines

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Abstract

Background/Objectives: This study aimed to examine the blue-light blocking effect according to the curing light tip and the color of the protective eyeglass lens for the operator's eye protection.

Method/Statistical Analysis: The transmittance of light with a wavelength between 200 and 900 nm was measured three times at 1.8 nm intervals using a UV-vis spectrophotometer (LAMBDA 265, Perkinelmer, Inc.). Then the average values obtained were compared for analysis. The visible- and blue-light transmittances of all the tips and tinted lenses were examined, and the ratios of blue light in the transmitted visible light were analyzed to compare the blue-light blocking effects.

Findings: The transmittance of visible light with a wavelength between 380 and 750 nm was highest in the yellow lens (60.58%), followed by company B's tip (55.23%), company A's tip (51.46%), the orange lens (47.48%), company C's tip (41.53%), and the red lens (41.00%). The blue-light transmittance was 0.14% in company A's tip for the curing light gun, 0.75% in company B's tip, and 0.12% in company C's tip, which were all very low. Among the tinted lenses, the orange lens had the lowest blue-light transmittance (0.20%), the red lens had a blue-light transmittance of 6.59%, and the yellow lens had the highest blue-light transmittance (12.53%). For the analysis results of the ratio of blue light in the transmitted visible light, it was 0.27% for company A's tip, the best blue-light blocking rate, and 20.68% for the yellow lens, the worst blue-light blocking rate. The ratios of blue light in the transmitted visible light for companies B and C's tips were 1.35 and 0.29%, respectively, showing that they have a good blue-light blocking effect.

Improvements/Applications: The curing light tips and orange lens used for the analyses in this study showed a blue-light blocking effect. In the case of blue-light blocking by tinted lenses, further studies are required because the blocking rate may vary depending on the lens tint concentration.

Keywords: *Curing light tip, tinting, lens, blue light, blocking.*

Introduction

Humans need light to identify the natures, shapes, directions, and locations of objects as well as the distances between them, and to perceive space and the objects they

want to know. Light is divided into two types: natural light obtained from the sun, including that from visible light that can be perceived by the human eye as well as infrared to ultraviolet light; and artificial light made for convenient use according to human needs^[1,2]. In the case of natural light obtained from the sun, the available time for human use is limited to daytime, the bright time of day. The artificial light made to address this limitation can help people perform activities in places where things are invisible due to darkness, or at various time zones, which greatly helps expand the range of human activities and the convenience of life.¹

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Artificial light not only provides convenience in daily life but also utilizes a different wavelength of light. As it has various transmittances to and interactions with materials according to its wavelength, it is used for the diagnosis and treatment of various diseases, such as gamma rays applied to cancer cells, X-ray used to diagnose and treat diseases by checking the inside of the human body, and treatment using infrared rays. Its effects were confirmed by the results of various studies^[3-7].

In the field of dentistry, X-ray, which is artificial light necessary for panoramic, standard, bitewing, and occlusal imaging, is used to accurately determine the conditions of the patient's periodontal tissue, dental components, and jaw bone, where the teeth are situated. In addition to X-ray, light is also utilized for the composite resins used to repair the teeth during dental treatment. The use of a light curing gun that irradiates blue light to cure plastic composite resins is also a therapeutic process using light^[8-10].

As such, the utilization of artificial light in various medical fields has spurred the development of many technologies, but to see the therapeutic effect of the light irradiated for treatment, a large amount of light should be irradiated for a short time. It also causes side effects as well as the action for treatment^[7,11].

In particular, during the light irradiation process, the practitioners and assistants who have to treat patients while checking the treatment site are exposed to a large amount of light irradiated by the light curing gun for a short time. The risk exposure is even likely to be higher when there are many patients who need to be treated using the light curing gun. Wearing appropriate safety glasses to block the light during the treatment process will minimize the exposure to the side effects, although the light is not completely blocked^[12,13]. This study aimed to investigate the color and transmittance of the most effective lens that maximizes light blocking and minimizes the risk of exposure to light while using the light curing gun among the various lights used in dentistry.

Method

For curing the plastic composite resins used for tooth restoration, artificial blue light is irradiated using a light curing gun. The light is irradiated for a short time, but a large amount of light is irradiated, directly or indirectly stimulating the operator's eyes. To minimize

this stimulation of the light curing gun operator's eyes by the blue light, the manufacturers of light curing guns sell these with tips. This study intended to find an efficient method of blocking light by measuring the light transmittances of these tips and of eyeglass lenses tinted with red, yellow, and orange dyes that are expected to block blue light.

The transmittances of light with a wavelength between 200 and 900 nm were measured at 1.8 nm intervals using a UV-vis spectrophotometer (LAMBDA 265, PerkinElmer, Inc.) [Figure 1]. The transmittances of the curing light tips and eyeglass lenses were measured three times, respectively, and then the average values were compared for analysis.

The transmittances of the visible and blue light of all the curing light tips and tinted eyeglass lenses were examined [Figure 2,3], and the ratios of blue light in the transmitted visible light were analyzed to compare the blue-light blocking effects. Based on the regulations of ANSI Z80.3 1986, visible light was classified as light between 380 and 750 nm, and blue light as light between 380 and 500 nm.

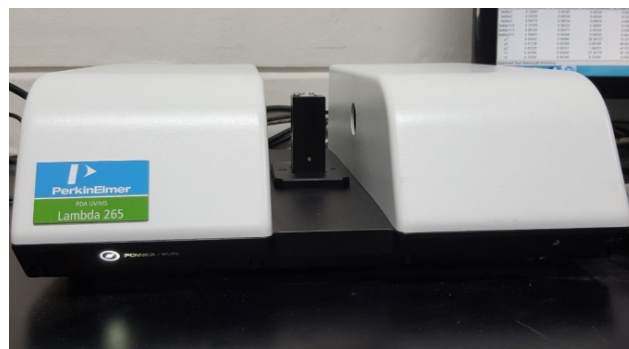


Figure 1. UV-vis spectrophotometer (LAMBDA 265, PerkinElmer, Inc.)



Figure 2. Curing light tips and eyeglass lenses tinted with red, yellow, and orange dyes.

Result and Discussion

Using a UV-vis spectrophotometer, the light transmittances of three companies' curing light tips and eyeglass lenses tinted with red, yellow, and orange dyes within the 200-900 nm wavelength range were measured [Figure 4]. In the visible-light region (380-750 nm), the curing light tips and tinted eyeglass lenses showed different light transmittance spectra according to the wavelength, which indicates that the light transmittance is different depending on the curing light tip and eyeglass lens color concentration.

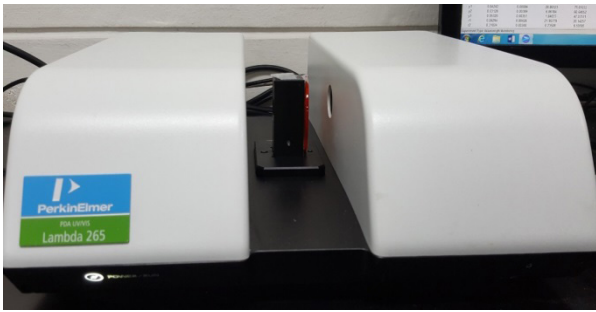


Figure 3. Light transmission process after mounting the UV-vis spectrophotometer (LAMBDA 265, Perkinelmer, Inc.) and lens.

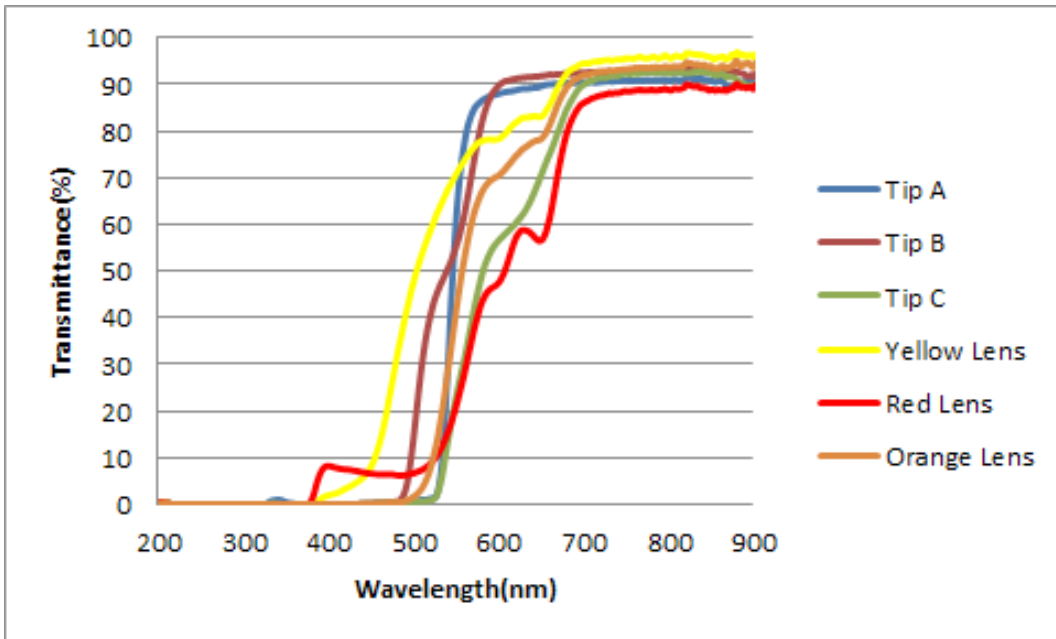


Figure 4. Spectral transmittance curves of dental curing light tips for blue-light blocking and tinted eyeglass lenses.

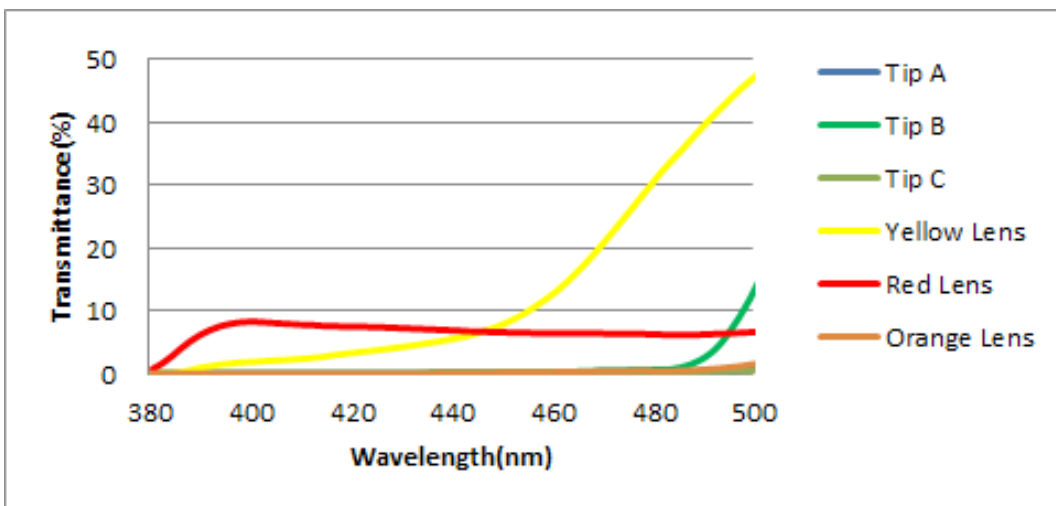


Figure 5. Spectral transmittance curves of dental curing light tips and tinted eyeglass lenses in the blue-light (380-500nm) region

The spectral distribution of only the blue-light region within the 380-500 nm wavelength range is shown in Figure 5. Among the three companies' curing light tips, those of companies A and C showed almost similar spectra, and there was no difference in the distribution of the spectrum. Only company B's curing light tip showed a slight difference near the 500 nm wavelength. Among the tinted eyeglass lenses, the red lens showed a nearly constant transmittance spectral curve in the blue-light region while the yellow lens showed increased light transmittance near the 450 nm wavelength. The orange lens showed a spectral distribution with almost no blue-light transmission, like companies A and C's curing light tips.

Among the light transmittances within the 380-750 nm wavelength measured using a UV-vis spectrophotometer (LAMBDA 265, Perkinelmer, Inc.) [Table 1], the visible-light transmittance was highest (60.58%) for the yellow lens, followed by 55.23% for company B's curing light tip, 51.46% for company A's curing light tip, 47.48% for the orange lens, 41.53% for

company C's curing light tip, and 41.00% for the red lens. The blue-light transmittance within the 380-500 nm wavelength region was 0.14% for company A's curing light tip, 0.75% for company B's curing light tip, and 0.12% for company C's curing light tip, which were all very low (less than 1%). Among the tinted eyeglass lenses, the orange lens had the lowest blue-light transmittance (0.20%), the red lens had 6.59% blue-light transmittance, and the yellow lens had the highest blue-light transmittance (12.53%). For the analysis results of the ratio of blue light in the transmitted visible light, it was 0.27% for company A's curing light tip, the lowest, indicating that such curing light tip has the best blue-light blocking rate. The ratio of blue light was 20.68% for the yellow lens, showing that such lens has the worst blue-light blocking rate. Companies B and C's curing light tips both had a good blue-light blocking effect, with the ratios of blue light out of the visible light being 1.35 and 0.29%, respectively. On the other hand, the red lens had a low blue-light blocking effect, similar to the yellow lens (16.07%).

Table 1. Light transmittances of dental curing light tips for blue-light blocking and tinted eyeglass lenses

Wavelength (nm)	Light Transmittance (%)					
	Company A (Tip A)	Company B (Tip B)	Company C (Tip C)	Yellow Lens	Red Lens	Orange Lens
380-750 (Visible light)	51.46	55.23	41.53	60.58	41.00	47.48
200-380 (Blue-light)	0.14	0.75	0.12	12.53	6.59	0.20
Blue-light/Visible light	0.27	1.36	0.29	20.68	16.07	0.42

Conclusion

All the curing light tips that were used in the analysis in this study showed an excellent blue-light blocking effect, and the orange lens showed a similar blue-light blocking effect by the curing light tips. In the case of the yellow and red lenses, the blue-light blocking effect was low. Further experiments are needed to determine whether the yellow and red lenses can produce as much blue-light transmittance as the orange lenses. For this purpose, further research is needed to compare the blue-light transmittances by tint concentration.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Difference of Health Consciousness According to Living Environment and Economic Level of the Elderly in the Urban-Rural Complex Area

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Abstract

Background/Objectives: The purpose of this study was to provide the basic data to develop suitable health and welfare services for the elderly living in urban-rural complex area, by investigating their living environment, economic level and health consciousness.

Method/Statistical Analysis: This study was conducted on the elderly living in K city, Gyeonggi-do. The data was collected by using survey method, which was designed to find out the living environment, economic level, and health consciousness of the elderly in the urban-rural complex area. The data were analyzed by using PASW 18.0 statistical program, descriptive statistics analysis was conducted to analyze the frequency and ratio of each item, and chi-square analysis(χ^2) was conducted to find out the difference in health consciousness between living environment and economic level.

Findings: The more they had economic difficulties, the higher they watched TV and listened to radio. and the higher the desire for health and exercise programs. Especially, the elderly living alone had poor living environment and economic level, plus high restriction on health and exercise.

Improvements/Applications: It appears that elderly living alone in urban-rural complex area have a high desire to participate in health and exercise programs, which is thought to require attention and research to remove restrictions on physical activity programs for elderly living alone.

Keywords: *Urban-rural complex areas, Elderly, Living environment, Economic level, Health consciousness.*

Introduction

The health condition of residents of urban area worldwide is much better than that of residents of rural areas. Many positive aspects of urban life, such as

high employment rate, high income, better educational opportunities and access to health care, encourage migration from rural to urban. However, recent studies show that the benefits of urban life and health condition can be eroded by the adverse effects of the urban environment - for example - the increase in fat on the diet, and the sedentary lifestyle can be them^[1]. Risk factors for cities with health risks include substandard housing, congested living conditions, contaminated food, unclean water, inadequate sanitation, poor solid waste treatment services, air pollution and congested traffic^[2].

As the society continuously changes to aging society, more and more elderly will be willing to live

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in urban-rural complex area where the urban areas and rural areas coexist. Further, in order to satisfy their leisure and needs, and the migration to urban-rural complex area will increase, and it will lead to a continuous increase in interest in living environment, economic level and health consciousness in urban-rural complex area. Therefore, the purpose of this study is to present basic data for the provision of health and welfare services suitable for urban-rural complex area by identifying living environment, economic level and health awareness among the urban-rural complex area.

Method

1. Research Subject: This study was conducted to the elderly living in K-city, in Gyeonggi-do, and a survey on living environment, economic level and

health awareness was conducted - by distributing 220 questionnaires, consisting of nominal scale. The response to the questionnaire was carried out in a one-on-one manner by the researchers and the auxiliary researchers, and if the study subjects did not respond during the response process, the question was re-asked after explaining the whole process that this survey will be used for statistical purposes. The questionnaire was retrieved through this procedure, but the survey response in Part 11 was excluded as it was not considered appropriate for the analysis by the researchers and the ancillary researchers. In addition, if the answer is avoided again, ‘no answer’ exists as a blank. The questionnaire used in the study is part 209, with the general characteristics of the study subjects as shown in Table 1.

Table1: Physical Characteristic (M±SD)

Variables	Classification	Frequency	Percentage (%)
Gender	Male	61	29.3
	Female	147	70.7
Age	Under 60	5	2.8
	Under 65	4	2.2
	Under 70	14	7.7
	Under 75	62	34.3
	Under 80	42	23.2
	80 years old or older	54	29.8
Education	Not educated	55	27.1
	Elementary School (School dropout)	65	32.0
	Middle School (School dropout)	37	18.2
	High School (School dropout)	29	14.3
	University	17	8.4
Religion	Christian	93	44.5
	Catholicism	21	10.0
	Buddhism	27	12.9
	Other religion	2	1.0
	Shamanism	66	31.6
Marital Status	Unmarried	16	7.7
	Married	133	63.6
	Divorce	22	10.5
	Remarriage	2	1.0
	Died after marriage	36	17.2

*Sum total can not 209

- 2. Research Tool:** This study was to find out how the living environment and economic level of the elderly in urban-rural complex area affect the difference in health consciousness among the elderly in the region. In this regard, it was reorganized around the questionnaires of the Seoul Senior Welfare Center and the W General Social Welfare Center, which were consisted of a nominal scale among the survey questionnaire for the needs of local residents. The first content adequacy test was conducted by researchers, ancillary researchers and social workers, and questions that were not suitable for the purpose of this study were excluded. The secondary content adequacy level was constructed based on the advice of a group of experts (the director of the senior welfare center, the professor of physical education and economics). The factors in the response questionnaire consist of total 28 questions, with 11 questions for living conditions, 7 questions for economic level, and 10 questions for health awareness.
- 3. Data Processing Method:** All data processing was analyzed using the PASW 18.0 Statistical Program. A technical statistical analysis was conducted to analyze the frequency and percentage of each question, and a chi-square analysis(χ^2) was conducted to find out the differences between living conditions and economic standards in terms of health consciousness. The significance level was set to $\alpha = 0.5$.

Result and Discussion

- 1. Living Environment:** The results of the analysis of living conditions in this study are summarized as follows. The living conditions of senior citizens in urban-rural complex area are as shown in Table 2. 46.6% of them were living in a monthly renting places, and only 36.1% of them were actually living in the house of their own or their spouses. As for economic conditions, 92.8% of the respondents were beneficiaries of national basic livelihood. As for the current residence period, 74.6% for living there for less than 10 years, 14.4 percent for less than 20 years and 4.8% for more than 40 years. As for cohabitation, the ratio of elderly living alone was significantly higher- 63.2% were living by themselves, and 26.8% were living with their spouses. When seeing the aspect 'The frequency of contact with children', 42.3% contacted with their children more than 1-2 times a month, and

29.1% only met their children during holidays/family events. As for heating in winter, 63.2% used urban gas, and 19.1% just used electric pads. 43.4% of them used less than 100,000 won, and 28.5% answered that administrating cost and housing cost were way too expensive, and 26.4% answered that their house rental fees were high. 33.8% replied that they cleaned their toilet 1-3 times a week, and the satisfaction level of residence was high with 7-8 out of 10 points, 36.4%.

In order to improve the living environment of the elderly, it is necessary to prepare various activation plans and infrastructure to improve the living environment for the elderly in order to design the future of old age, not to be satisfied with the present.

- 2. Health consciousness according to living environment and economic level:** The results of the analysis on health consciousness according to living environment and economic level of this study are as follows. Table 2 shows the result of a chi-square analysis of health consciousness according to the living conditions and economic standards of the elderly in the urban-rural complex area. 21.6% answered that they are 'not quite healthy', and 'paying monthly rent for their house', 15.7% answered 'in a bad physical condition', and 'paying monthly rent for their house', and their χ^2 was $p = .889$. 83.9% of the respondents said that they were 'receiving basic living allowances' and 'taking treatment and medication', and χ^2 was $p = .576$. 40.5% answered that they were alone, and had neurological disorder, and 15.0% replied 'living alone' and 'had internal diseases'. 6.5% of people answered that they were 'receiving less than 500,000 won a month', and 'not that healthy' - χ^2 was found out to be $p = .060$. Regarding the way making their living and serious health problems, 56.8% answered that they were living basic living allowances from government, and had neurological disorders. Then 24.6% followed that they were having internal diseases. Their participants answered and their χ^2 was $p = .001$. Regarding the living expenses and activity of daily living, 22.0% answered that 'mainly pays for administrative fees' and 'managing daily living in a fairly good way' ($p = .051$). 27.0% of the respondents said that they were having economic difficulties and health activity difficulties, and the main reason of that was their economic burden. ($\chi^2 p = .001$) In response to health and leisure

activities, TV/radio watching and listening was the highest(24.0%),and the main reason was also their economic difficulties.(p = .152). In addition, the respondents who answered that they were very difficult in economic condition were the highest, with 17.6% of respondents saying that they needed health and leisure programs such as health classes (p = .147). It is shown that the more economically difficult it is, the higher people had the desire for a health class. However, it is believed that they were replacing leisure time with TV and radio listening due to economic difficulties. The frequency of meeting with children and their ability to perform daily activities were very good at meetings at family or family gatherings, which was 10.6%, and others showed the same frequency(p = .071). TV/Radio watching and listening was 34.1%, using city gas for winter heating method, health and leisure activities, and TV/radio watching and listening were relatively high at 8.7% using electric blanket(P = .716). In terms of residential satisfaction and difficulties in health activities, the ratio of residential satisfaction

of 7-8 points and economic burden to health life was 19.4% and χ^2 was p = .078. In addition, if the residential satisfaction level is 7-8, 16.0% was required for the health class(yoga, dan jeon breathing, Qigong exercise) and χ^2 was p = .078. The minimum wage and the degree of health were 6.5%, except for other opinions, when the minimum wage was less than 500,000 won and not healthy, it was high, and χ^2 was p = .060. In terms of monthly income, treatment and medication, imports of less than 600,000 won, treatment and medication were 48.3% and χ^2 was p = .016.

According to the elderly statistics^[3], more than half of the average daily leisure time of people aged 65 or older was spent on watching TV or other media in 2014, and was reported to be spending leisure time outside of media viewing(i.e. social activities, religious, cultural and sports activities). It is also known that demographic characteristics such as age, gender, marital status, education level, economic level, residential area and employment status affect the quality of health-related life for the elderly.

Table 2: Health consciousness statistics

Variables		Classification Frequency (%)					χ^2
		Not very healthy	Not healthy	Normal	Healthy	Very healthy	
Home Ownership/ Health level	Self Spouse	19(9.3)	31(15.2)	13(6.4)	11(5.4)	0(0)	.889
	Children	3(1.5)	3(1.5)	0(0)	0(0)	0(0)	
	Chonseil rent	2(1.0)	2(1.0)	1(.5)	1(.5)	0(0)	
	Monthly rent	32(15.7)	44(21.6)	12(5.9)	7(3.4)	1(.5)	
	Other	8(3.9)	8(3.9)	2(1.0)	4(2.0)	0(0)	
Economic situation/ Treatment & medications intake		Yes	No				
	National Basic Livelihood Security	171(83.9)	19(9.3)				.576
	Near poor group	3(1.5)	0(0)				
	Normal	9(4.4)	2(1.0)				
Cohabitation/ disease		Nerve	Internal	Sensory	Mental	Other	
	Elderly alone	81(40.5)	30(15.0)	1(.5)	2(1.0)	14(7.0)	.102
	Married Couples	27(13.5)	17(8.5)	2(1.0)	2(1.0)	3(1.5)	
	Children Generations	2(1.0)	1(.5)	0(0)	0(0)	1(.5)	
	Children + young children generational	2(1.0)	0(0)	0(0)	1(.5)	0(0)	
	Other	8(4.0)	6(3.0)	0(0)	0(0)	0(0)	
Meeting frequency with child/Activities of Daily Living		Very fine	Fine	Normal	It's not okay	Not very fine	
	Everyday	4(2.6)	5(3.3)	1(.7)	1(.7)	1(.7)	.071
	1-2 times a month	4(2.6)	11(7.3)	9(6.0)	6(4.0)	3(2.0)	
	Holiday /family	16(10.6)	9(6.0)	10(6.6)	8(5.3)	1(.7)	
	Do not meet	13(8.6)	5(3.3)	2(1.3)	7(4.6)	3(2.0)	
	Other	16(10.6)	10(6.6)	4(2.6)	1(.7)	1(.7)	

Variables		Classification Frequency (%)					χ^2
		No activity	TV & Radio	Janggi, Buduk, Hwatu play	Music & Art	Newspaper & Books	Physical activity
Winter heating method/Health & Leisure activity	City Gas	16(7.7)	71(34.1)	5(2.4)	17(8.2)	6(2.9)	.716
	Oil boiler	7(3.4)	14(6.7)	1(.5)	1(.5)	1(.5)	1(.5)
	Briquette	2(1.0)	3(1.4)	0(0)	0(0)	0(0)	0(0)
	LPG	1(.5)	0(0)	0(0)	0(0)	0(0)	0(0)
	Electric carpet	10(4.8)	18(8.7)	2(1.0)	0(0)	3(1.4)	7(3.4)
	Blanket	0(0)	1(.5)	0(0)	0(0)	0(0)	0(0)
	Other	1(.5)	2(1.0)	0(0)	0(0)	0(0)	1(.5)
			Economic burden	Lack of time	Lack of facilities	Health problems	Other
Resident Satisfaction/ Health activity difficulties	1-2 points	10(5.0)	0(0)	1(.5)	5(2.5)	2(1.0)	.078
	3-4 points	5(2.5)	0(0)	0(0)	5(2.5)	1(.5)	
	5-6 points	13(6.5)	0(0)	1(.5)	15(7.5)	1(.5)	
	7-8 points	39(19.4)	1(.5)	2(1.0)	24(11.9)	8(4.0)	
	9-10 points	15(7.5)	1(.5)	1(.5)	34(16.9)	17(8.5)	
		Health Class	Learning Class	Hobby classes	Information class	Janggi, Buduk	
Resident Satisfaction/ Health and Leisure Needs Program	1-2 points	3(1.9)	1(.6)	3(1.9)	1(.6)	2(1.3)	.223
	3-4 points	0(0)	1(.6)	2(1.3)	0(0)	0(0)	
	5-6 points	11(7.1)	2(1.3)	4(2.6)	1(.6)	0(0)	
	7-8 points	25(16.0)	13(8.3)	11(7.1)	8(5.1)	6(3.8)	
	9-10 points	18(11.5)	19(12.2)	18(11.5)	4(2.6)	3(1.9)	
		Not very healthy	Not healthy	Normal	Healthy	Very healthy	
Minimum wage/ Health level	Less than 200,000 won	2(1.3)	2(1.3)	1(.6)	0(0)	0(0)	.060
	Less than 300,000 won	5(3.2)	5(3.2)	3(1.9)	2(1.3)	0(0)	
	Less than 500,000 won	4(2.6)	10(6.5)	11(7.1)	3(1.9)	0(0)	
	Pay-free	3(1.9)	4(2.6)	1(.6)	4(2.6)	0(0)	
	Other	32(20.8)	45(29.2)	8(5.2)	8(5.2)	1(.6)	
		Yes	No				
Monthly income/ Treatment & medications intake	Less than 200,000 won	5(2.5)	0(0)				.016
	Less than 400,000 won	53(26.1)	5(2.5)				
	Less than 600,000 won	98(48.3)	6(3.0)				
	Less than 800,000 won	14(6.9)	4(2.0)				
	Over 800,000 won	13(6.4)	5(2.5)				
		Nerve	Internal	Sensory	Mental	Other	
Cost-of-living/disease	A child's allowance	3(1.5)	3(1.5)	0(0)	0(0)	1(.5)	.001
	Earned income	1(.5)	1(.5)	0(0)	0(0)	0(0)	
	Living expenses/Pension	113(56.8)	49(24.6)	3(1.5)	3(1.5)	16(8.0)	
	Spouses income	1(.5)	1(.5)	0(0)	0(0)	0(0)	
	Other	2(1.0)	0(0)	0(0)	2(1.0)	0(0)	
		Very fine	Fine	Normal	It's not okay	Not very fine	
Cost-of-living Where to use/ Activities of Daily Living	principal food & Corrosion Cost	14(6.7)	7(3.3)	10(4.8)	6(2.9)	3(1.4)	.051
	Residence cost	38(18.2)	46(22.0)	25(12.0)	21(10.0)	7(3.3)	
	Hospital & Drug Cost	2(1.0)	10(4.8)	3(1.4)	4(1.9)	2(1.0)	
	Hobby life/Social activity expense	4(1.9)	0(0)	0(0)	0(0)	0(0)	
	Other	5(2.4)	0(0)	1(.5)	1(.5)	0(0)	
		Economic burden	Lack of time	Lack of facilities	Health problems	Other	
Degree of economic difficulty/Health activity difficulties	Very difficult	55(27.0)	0(0)	0(0)	31(15.2)	4(2.0)	.001
	Slightly hard	21(10.3)	1(.5)	3(1.5)	28(13.7)	8(3.9)	
	Average	5(2.5)	0(0)	1(.5)	20(9.8)	12(5.9)	
	Not very difficult	1(.5)	0(0)	1(.5)	5(2.5)	4(2.0)	
	Not difficult at all	2(1.0)	1(.5)	0(0)	0(0)	1(.5)	

Variables		Classification Frequency (%)					χ^2
		No activity	TV & Radio	Janggi, Buduk, Hwatu play	Music & Art	Newspaper & Books	Physical activity
Degree of economic difficulty/ Health & Leisure activity	Very difficult	20(9.6)	50(24.0)	2(1.0)	7(3.4)	4(1.9)	7(3.4)
	Slightly hard	10(4.8)	31(14.9)	4(1.9)	4(1.9)	4(1.9)	9(4.3)
	Average	5(2.4)	19(9.1)	0(0)	3(1.4)	2(1.0)	10(4.8)
	Not very difficult	2(1.0)	6(2.9)	2(1.0)	3(1.4)	0(0)	0(0)
	Not difficult at all	0(0)	3(1.4)	0(0)	1(.5)	0(0)	0(0)
Degree of economic difficulty/Health and Leisure Needs Program		Health Class	Learning Class	Hobby classes	Information class	Janggi, Buduk	
	Very difficult	28(17.6)	10(6.3)	20(12.6)	8(5.0)	4(2.5)	.147
	Slightly hard	13(8.2)	13(8.2)	6(3.8)	5(3.1)	3(1.9)	
	Average	8(5.0)	13(8.2)	9(5.7)	1(.6)	4(2.5)	
	Not very difficult	6(3.8)	0(0)	4(2.5)	0(0)	0(0)	
Not difficult at all	2(1.3)	1(.6)	1(.6)	0(0)	0(0)		

Conclusion

The purpose of this study was to examine the living environment, economic level, and health consciousness of the elderly in urban-rural complex area. The 220 questionnaires for senior citizens in K City, Gyeonggi Province, were interviewed in a one-on-one manner and 11 questions were excluded due to lack of response during the interview. In the case of the answer questionnaire, non-response questions were included. The retrieved questionnaire presented the results through technical statistics and a chi-square analysis. Through this process, the following conclusions were reached.

First, the percentage of ‘monthly rent in housing’ was high among living conditions, and the proportion of people who were provided with basic living allowance was high. In particular, the percentage of elderly people living alone was relatively high, and the frequency of meetings with their children was only being made during holiday seasons and family event days. Regarding residence heating during winter season, the number of elderly people who spend the winter with electric blankets was found to be relatively high, and excessive housing management costs and high rents were found to be the difficulties of living environment.

Second, they were not having good ‘health consciousness’ considering living environment and economic level. The ratio of the elderly living on a monthly rent was the highest, and especially the recipients of the National Basic Livelihood Security showed more disease and medication. Also, the elderly living alone had more diseases. The higher the economic difficulties, the more restricted the health activities, while the desire

for health-related programs was high.

Urban-rural complex area are being developed from rural areas to urban areas, and elderly people often do not respond to the changing environment rapidly. In addition, the elderly living alone are exposed to many social problems, and in this study, the elderly living alone have relatively higher rate of economic and environmental difficulties. Especially, the more economic difficulties, the higher the desire to participate in health and exercise programs, which is considered to be more highlighted in health and physical education field for future development and solution making. Through this study, it is necessary to focus on the elderly living alone and to take care of the field that eliminates the constraints participating in the exercise program related to health and follow-up research is necessary.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Effects of 8-Week High Intensity Combined Exercise on Body Composition, Blood Lipid and CRP in Obese Middle Aged Men

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Abstract

Background/Objectives: This study was built up to delve into the effects of high-intensity combined exercise on body composition, blood lipid and CRP for 8 weeks obese men living in Korea. For this purpose, treatment effects were divided into 8 weeks high intensity complex exercise group and control group.

Method/Statistical Analysis: The purpose of this research was to study obesity men in their 50s. The study selected subjects who did not participate in periodic physical activity program in the last year. A total of 16 subjects were divided into 8 high-intensity combined exercise group and 8 control group. Basic statistical analysis was performed on high intensity combined exercise group and control group. 2-way ANOVA was performed to investigate the effects of 8 weeks high intensity compound exercise.

Findings: 8 weeks of high-intensity combined exercise among obese middle-aged men in their 50s showed significant differences in body weight, muscle mass, body fat (%) and WHR, and significant differences in TG, TC, HDL-C, and LDL-C in blood lipids. The CRP showed significant interaction effects in the high intensity combined exercise group and the control group.

Improvements/Applications: High intensity combined exercise showed positive changes in body composition, blood lipid and CRP in middle-aged men. This suggests that high-intensity exercise may have effect to men in their 50s with extended life.

Keywords: High Intensity Combined Exercise, Body Composition, Blood Lipid, CRP, Obese Middle Aged Men.

Introduction

The World Health Organization announced that 1.9 billion adults are now overweight and 600 million of them are now suffering from obesity worldwide. In

addition, obesity has now become a global epidemic^[1-2]. In Korea, 17.8% of the 11,467 billion won of socioeconomic costs are caused by obesity problem accounted for over a year, and 52.9% of the total losses are concentrated in the 30s to 50s, which is so-called as a productive population. Therefore, it has become a more crucial problem, and it is urgent to prepare for the obesity measures of Korean men in their 50s who are being hit by obesity^[3]. As such, obesity is now being considered as a major risk factor for heart disease, high blood pressure, diabetes and stroke, and is closely associated with decreased life expectancy, cognitive dysfunction and poor quality of life^[4]. Obesity is a major cause of various non-communicable diseases (NCDs), including

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life-threatening and non-fatal diseases. Obesity is also leads one of the factors which leads to premature death and physical disability in adulthood [5].

In middle age, they experience physical aging and experience significant physiological changes, such as changes in appearance, weak physical function, vitality and metabolism, and memory and intelligence decline due to cognitive decline. In addition, a decrease in immune function along with cell aging reduces the resistance to disease or external stress, increasing the likelihood of developing chronic diseases[6].

In this period, not only physical strength rapidly declines, but various physiological functions shows declining aspect, which increases the risk of adult disease. Gradually obesity, hypertension, cardiovascular disease, diabetes, etc. may occur[7]. In particular, middle-aged men having white-collar jobs have a sedentary lifestyle and are prone to obesity due to lack of physical activity and sedentary life style and negative changes in body composition[8]. Likewise, increased sedentary activity is accompanied by decreased energy consumption, energy imbalance, and fat accumulation- and ultimately brings fat tissue enlargement, a major feature of obesity caused by calorie intake and consumption imbalance, leads

to negative changes in each organ in the body. It also negatively affects individual psychological factors and finally leads to a deterioration in overall quality of life[9]. Appropriate physical activity improves dyslipidemia, weight and BMI[11],and resistance exercise reduces the risk of developing cardiovascular disease by increasing insulin sensitivity and lowering LDL-C levels[10].

Therefore, this study is an effective exercise prescription program for obesity middle-aged men’s obesity management and cardiovascular disease by comparing and analyzing the effects on high blood lipid, CRP and body composition after 8 weeks of high-intensity combined exercise for obese men in their middle age. The purpose of this study is to present the basic data.

Method

1. Subject of Study: This study was conducted to study was to study obesity men in their 50s. The study selected subjects who did not participate in periodic physical activity program in the last year. A total of 16 subjects were divided into 8 high-intensity combined exercise group (HCG) and 8 control group (CG). The physical characteristics of the study subjects are shown in Table 1.

Table 1: Physical Characteristic of Subjects (M±SD)

Group	N	Age (yr)	Height (cm)	Weight (kg)	Muscle (kg)	Fat (%)
CG	8	54.22±1.27	172.68±3.01	85.95±5.62	59.63±2.36	30.37±3.71
HCG	8	53.29±1.01	173.08±3.24	84.03±4.94	57.73±4.33	31.28±3.61

2. Exercise Program: In this study, the exercise method was 4 days a week for 8 weeks. The high-intensity combined exercise group had undergone a program which included 10 minutes of warm-up, 20 minutes of resistance, 20 minutes of aerobic exercise, and 10 minutes of cool down. The control group was required to maintain daily life as usual for 8 weeks.

In the high-intensity combined exercise group, the warm-up exercise was performed by stretching the upper body and the lower body. The resistance exercise and the aerobic exercise, which were the main exercise, reset the exercise intensity every week. Resistance exercise was performed at 80% level based on 1RM, and aerobic exercise was set

at 80% target heart rate through Polar Heart Rate Analyzer (Polar Electro, Finland). High-intensity combined exercise programs are explained in details at <Table 2>.

Table 2: Exercise Program

Division	Intensity	Combined Exercise
Periods (8week)	Resistance exercise (1RM 80% each 1week/10 repetition 2set/20min)	Squat, Press (bench, leg, shoulder), Leg curl, Barbell curl, Lat pull down, Lunge
	Aerobic exercise (target heart rate 80% each 1week, 20min)	Treadmillrun and walking

3. Measurement method and equipment: The body composition was performed using Inbody

770 Bio Space (Korea). Blood lipid and CRP test was performed before and after 8 weeks of high-intensity combined exercise. The blood was taken to maintain an empty stomach for 12 hours and stable for 30 minutes before the blood was drawn. Blood was collected from the brachial vein by using a disposable syringe. The collected blood was centrifuged at 3000 RPM using a centrifuge and commissioned to a nuclear medical institution for analysis.

4. Data Analysis: Basic statistical analysis was performed on high intensity combined exercise group and control group. 2-way ANOVA was

performed to find out the effects of 8 weeks high intensity compound exercise. The significance level was conducted at .05.

Result and Discussion

1. Body COmposition: According to <Table 3>, there was an interaction effect on body weight (p = .001), body fat(p = .001), WHR (p = .012) and muscle mass (p = .001) in the 8-week high-intensity combined exercise group (HCG) and the control group (CG). This suggests that high-intensity combined exercise has a meaningful effect on body composition change.

Table 3: Body Composition ANOVA

Factor	Group	Pre	Post	P
Weight (kg)	CG	85.95±5.62	86.61±5.52	Group*period: .001 Group: .040 Period: .001
	HCG	84.03±4.94	77.41±3.47	
Fat (%)	CG	30.37±3.71	30.52±3.79	Group*period: .001 Group: .399 Period: .001
	HCG	31.28±3.61	26.18±4.68	
WHR (waist-hip ratio)	CG	.90±.01	.90±.01	Group*period: .012 Group: .575 Period: 1.00
	HCG	.90±.018	.89±.01	
Muscle (kg)	CG	59.63±2.36	59.51±2.66	Group*period: .001 Group: .642 Period: .001
	HCG	57.73±4.33	59.78±3.92	

2. Blood Lipid: According to <Table 4>, there was an interaction effect on TG(p = .006), TC(p = .001), HDL-C(p = .005) and LDL-C(p = .001) in the 8-week high-intensity combined exercise group (HCG) and the

control group (CG). This suggests that high-intensity combined exercise has a significant effect on blood lipid change.

Table 4: Blood Lipid ANOVA

Factor	Group	Pre	Post	P
TG (mg/dl)	CG	109.50±47.07	107.87±46.80	Group*period: .006 Group: .882 Period: .004
	HCG	133.62±58.49	90.37±23.96	
TC (mg/dl)	CG	170.50±29.17	172.50±38.18	Group*period: .001 Group: .297 Period: .001
	HCG	174.00±28.56	138.00±16.81	
HDL-C (mg/dl)	CG	56.12±8.23	56.87±9.10	Group*period: .005 Group: .082 Period: .001
	HCG	46.12±5.22	54.00±5.45	
LDL-C (mg/dl)	CG	105.37±27.30	109.25±29.22	Group*period: .001 Group: .685 Period: .002
	HCG	113.37±22.40	91.62±12.16	

3. CRP (C-reactive protein): According to <Table 5>, there was an interaction effect in CRP in the 8-week high-intensity combined exercise group (HCG) compared to the control group (CG). This suggests that high-intensity combined exercise has a significant effect on CRP.

Table 5: CRP ANOVA

Factor	Group	Pre	Post	P
CRP (mg/dl)	CG	.115±.05	.112±.05	Group*period: .014 Group: .626 Period: .011
	HCG	.146±.10	.055±.01	

Discussion

This study was conducted to compare the differences in blood lipids, CRP, and body composition of 8-week high-intensity complex exercise for obese middle-aged men. For the purpose of presentation, the following is a comparative analysis based on the results of this study and previous studies.

Looking at previous studies on changes in body composition through combined exercise in middle-aged men, Mateus et al^[11] reported that aerobic(50–85% of VO² peak) and resistance (6–10 RM) target obese middle-aged men. Sixty minutes of training, three times per week, and 24 weeks of training showed positive effects on body composition. Donges et al^[12] reported significant improvement in body weight and body fat percentage of body composition after 12 weeks of muscle strength, aerobic exercise and combined training in sedentary middle-aged men. Mohammadi, Khoshnam & Khoshnam^[13] reported significant improvements in body composition in three groups of 12 weeks of aerobic, strength and combined exercise in middle-aged men. Changes in body composition are age-related and have a strong genetic predisposition. It is also affected by environmental factors such as nutrition, disease and physical activity and changes with age, especially in men. Changes in body composition depend on the type, intensity and duration of exercise program^[14].

These results indicate that intense activity can be an effective stimulus to body composition changes, especially high intensity activity, which greatly reduces body weight, BMI, body fat percentage, body fat and waist. This is consistent with the findings presented in the study^[15] that vigorous exercise can be the target of total energy intake and that energy consumption during exercise may be more effective than moderate activity.

Therefore, high-intensity combined exercise performed in this study may play an important role in maintaining health by improving the body composition of obese middle-aged men through the direct metabolism of body fat due to the direct burning of body fat and the increase of muscle mass.

Looking at previous studies on changes in blood lipids through complex exercise in middle-aged men, Seo^[16] reported positive changes in blood lipid after 12 weeks of complex exercise for middle-aged men. The study of Nam & An^[17] reported the effect of blood lipids after a combined exercise for 8 weeks in middle-aged obese men. Atashak, Stannard & Azizbeigi^[18] reported that eight weeks of combined exercise program intervention in overweight middle-aged men was effective in reducing blood lipid LDL-C and TG and increasing HDL-C.

In addition, a study by Byun & Woo^[19] found that 8 weeks of combined exercise in obese men was effective in significantly reducing blood lipid TC, LDL-C, and TG. In this study, a 8-weeks High intensity combined exercise program was conducted to the obese male participants who were in their middle ages, and the program showed significant differences in high-density lipoprotein cholesterol (HDL-C), triglyceride (TG), low-density lipoprotein cholesterol (LDL-C) and total cholesterol (TC) among blood lipids.

These results happen since exercise brings 1) the increase of lipid utilization activity in mitochondria through exercise, 2) the enhancement of glycogen synthase function, 3) the influx of active muscles of free fatty acids in blood and 4) activates the use of lipoprotein and phosphorlipid as energy sources^[20]. Therefore, the high-intensity combined exercise performed in this study is effective in improving the blood lipid of obese middle-aged men and is considered a suitable exercise program to prevent health promotion and cardiovascular disease.

Several previous studies were conducted on the change of C-reactive protein (CRP) through complex exercise in middle-aged men and Libardi et al^[14] conducted a study concentrating on strength, endurance and complex training of middle-aged men. However, as a result of examining the effect on the level, there was no statistically significant difference before and after exercise training. Another group of researchers, Mohammadi, Khoshnam & Khoshnam^[13] reported a

significant improvement in CRP in three groups after 12 weeks of aerobic, strength and combined exercise in middle-aged men. In addition, Jung & Lim^[21] reported that 12 weeks of combined exercise for middle-aged obese men significantly reduced their CRP levels.

In this study, a 8-weeks High intensity combined exercise program was conducted to the obese male participants who were in their middle ages, and the program showed significant differences in CRP. Results of the studies suggest that CRP was reduced by inhibition of inflammation due to the decrease of fat cells - which was all due to high-intensity combined exercise programs^[22]. Therefore, the high-intensity combined exercise performed in this study is thought to help improve the circulatory system by reducing CRP levels and suppressing cardiovascular inflammation in obese middle-aged men.

Conclusion

It is associated with blood-related atherosclerosis as the leading cause of death and deterioration of health in middle-aged men. This study was conducted for 8 weeks of high-intensity combined exercise in obese men in their 50s. High intensity combined exercise showed positive changes in body composition, blood lipid and CRP in middle-aged men. This suggests that high-intensity exercise will have effects to men in their 50s with extended life.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Effects of Lower Body Muscle Exercise on Blood Lipids and Homocystein

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Abstract

Background/Objectives: The purpose of this study was to investigate the effect of lower body center strength exercise on blood lipid and homocysteine in middle-aged men. For this purpose, 20 middle-aged men in their 40s were divided into 10 lower body muscle exercise group and 10 control group. The subjects were selected for those who have not participated in regular exercise and weight loss programs in recent years.

Method/Statistical Analysis: The LBMG's treatment program was followed by muscle exercise around the lower body for 60 minutes, 3 times a week for 12 weeks. CG was to maintain a normal life without any treatment during the 12 weeks of the experiment. Mean and standard deviation of each group and treatment time were calculated and 2-way ANOVA was performed to analyze the treatment effect. The significance level was verified at .05 level

Findings: 12 weeks of lower body muscle exercise showed significant differences in blood lipid variables such as triglyceride, high density lipoprotein, low density lipoprotein, total cholesterol and homocysteine.

Improvements/Applications: The purpose of this study was to investigate the effect of 12 weeks of lower body muscle exercise on blood lipid and homocysteine change. Lipoprotein, total cholesterol, and homocysteine showed positive improvement. In this respect, strength training of the large muscle center of the lower body is considered to be effective in improving blood lipid.

Keywords: Lower Body Muscle Exercise, Blood Lipid, Homocysteine, Middle Aged Men.

Introduction

Korea has already entered the aging society in August 2018, with 12.95 million people (24.5%) in 2030 and 18.85 million people (41%) are expected in 2060^[1]. This implies that people living in this society now will have to live their long middle age than any other

previous generation. In order to live a long middle age, economic ability must be followed even after retirement. However, career and jobs, which are the basis of people's economic ability - are now in such an instable state due to low lifelong employment rate, collapses of the social structure and de-hiring^[2]. In particular, Korean men, now in their 40s, have experienced the rise and fall of the Korean economy since entering the job market during the 1997-1998 financial crisis. Moreover, middle-aged men are known to be vulnerable in various health conditions^[3].

Inactive and sedentary lifestyle is the primary risk factor for coronary artery disease. However, middle-aged men had shown that they have higher risk factors than women, including sedentary life style, smoking,

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hypertension, and hyperlipidemia. Middle-aged men could increase the incidence of type 2 diabetes, hyperlipidemia, hypertension, and atherosclerotic cardiovascular disease with complication of obesity- and they were four times more likely to develop cardiovascular disease than men in their 20s-30s, and also the mortality rates have been reported to be three times higher^[4].

Several risk factors for coronary heart disease (CHD) have been found out by studies examining various properties such as genetic markers, lifestyle and health status^[5-6]. In addition, most chronic diseases are associated with a number of unhealthy lifestyle factors, including smoking, unhealthy foods, sedentary activities and excessive alcohol consumption^[7]. The long-term health effects of several different unhealthy lifestyle patterns tend to interact to each other rather than simply being added, and changing life styles have been considered as effective intervention strategies for the management of various chronic diseases^[8].

Physical activity and regular exercise not only can prevent metabolic syndrome and also can lower the occurrence rate of various degenerative diseases, but also can prevent disease, reduce premature mortality and extend lifespan. In addition, higher fitness levels have a positive effect on the prevention and treatment of metabolic diseases such as obesity and diabetes, and the importance of exercise^[9-10].

Muscle strengthening program is one of the exercising method which can effectively improve muscle function. It enables various types of exercise by using various magnetic weight and exercise method using gravity or weight device. It is a representative method of

resistance exercise with excellent activity and relatively easy activity^[11].

It is widely known that muscular strength, cardiovascular endurance, and balancing tend to decrease when people get older^[12-14]. Physical strength reduces cardiovascular risk by up to 50% in the middle age, prevents the development of triglyceride (TG), total cholesterol and low density lipoprotein (LDL) risk factors, and increases high density lipoprotein (HDL) levels^[15-17]. In addition, homocysteine blood concentrations are known as independent cardiovascular risk factors^[18], and the increase of homocysteine is known to be associated with increasing the risk of cardiovascular disease, cognitive disorders, cancer, chronic renal failure and other chronic diseases^[19]. Therefore, this study was conducted to build up the basic data for effective exercise prescription program for prevention of chronic and cardiovascular diseases by comparing and analyzing the effects on blood lipid and homocysteine after 12 weeks of lower body muscle exercise in middle-aged men.

Method

1. Subject of Study: The purpose of this study was to investigate the effect of lower body center strength exercise on blood lipid and homocysteine in middle-aged men. For this purpose, 20 middle-aged men in their 40s were divided into 10 lower body muscle exercise group (LBMG) and 10 control group (CG). The subjects were selected for those who have not participated in regular exercise and weight loss programs in recent years. The physical characteristics of the study subjects are shown in Table 1.

Table1: Physical Characteristic of Subjects (M±SD)

Group	N	Age (Yr)	Height (cm)	Weight (kg)	Fat (%)
LBMG	10	41.35±2.55	175.60±1.24	87.02±5.62	28.56±1.48
CG	10	42.38±2.23	172.82±1.80	85.60±4.94	29.36±2.40

2. Exercise Program: The LBMG’s treatment program was followed by muscle exercise around the lower body for 60 minutes, 3 times a week for 12 weeks. CG was to maintain a normal life without any treatment during the 12 weeks of the experiment. The exercise intensity of the LBMG was set by the researcher by setting the intensity and duration of

the program in consideration of the exercise ability of each subject. Prolonged rest and sugar intake during exercise were limited. The environmental homogeneity of LBMG and CG was secured. The main program of LBMG was 10 minutes each for warm-up and cool-down. Warm-up and cool-down were performed with stretching around the

upper body and lower body. The main exercise was maintained at 65-75% based on 1RM. Exercise events consisted of programs for strengthening lower body muscle exercise. Lower body exercise programs are shown in <Table 2>.

Table 2: Lower body exercise Program

Variable	Treatment program	Time/intensity
Warm-up/cool-down	Upper/lower stretching	Each 10min
Main exercise	Squat, plank, crunch, leg raise, leg press, leg extension, lunge, stiff legged deadlift	40min/1RM<75%, 10times, 2-3set, 2-3min rest

3. Measurement method and equipment: The body composition was performed using Inbody 770 Bio Space (Korea). Blood lipid variables such as triglyceride, high density lipoprotein, low density lipoprotein, total cholesterol and homocysteine were

analyzed before and after 12 weeks of experiment. 24 hours fasting time was maintained before blood test, and blood was collected by nurse and referred to medical center for analysis.

4. Data Analysis: Mean and standard deviation of each group and treatment time were calculated and 2-way ANOVA was performed to analyze the treatment effect. The significance level was verified at .05 levels.

Result and Discussion

1. Blood Lipid: According to <Table 3>, there was an interaction effect on TG (p = .016), TC (p = .001), HDL-C (p = .001) and LDL-C (p = .001) in the lower body muscle exercise group (LBMG) compared to the control group (CG). This suggests that lower body muscle exercise has a significant effect on blood lipid change.

Table 3: Blood Lipid ANOVA

Factor	Group	Pre	Post	P
TG (mg/dl)	LBMG	137.42±26.22	120.21±24.85	Group*period: .016 Group: .563 Period: .012
	CG	120.77±37.68	120.34±33.96	
TC (mg/dl)	LBMG	198.40±27.38	174.49±31.68	Group*period: .001 Group: .590 Period: .001
	CG	176.45±34.89	182.74±44.32	
HDL-C (mg/dl)	LBMG	53.62±9.90	61.32±6.94	Group*period: .001 Group: .038 Period: .004
	CG	51.48±7.63	50.80±7.67	
LDL-C(mg/dl)	LBMG	122.00±20.43	103.04±23.27	Group*period: .001 Group: .156 Period: .005
	CG	116.94±26.91	119.31±28.86	

2. Homocysteine: According to <Table 4>, there was an interaction effect in homocysteine (p = .001) in the lower body muscle exercise group

(LBMG) compared to the control group (CG). This suggests that high-intensity combined exercise has a significant effect on homocysteine.

Table 4: Homocysteine ANOVA

Factor	Group	Pre	Post	P
Homocysteine (umol/L)	LBMG	14.41±2.78	12.56±2.54	Group*period: .001 Group: .005 Period: .001
	CG	13.27±2.35	13.07±1.99	

Discussion

This study was conducted to build up the basic data for effective exercise prescription program to prevent chronic and cardiovascular diseases. 12 weeks exercise program was designed, and the following explains the results by comparing and analyzing the effects on blood lipid and homocysteine after 12 weeks of lower body muscle exercise in middle-aged men.

Physical fitness reduces the cardiovascular risk by up to 50% in middle age, prevents the development of triglyceride (TG), cholesterol (TC), and low density lipoprotein (LDL) risk factors and increases high-density lipoprotein (HDL) levels^[20]. High levels of homocysteine in the blood are also emerging as a new risk factor for health as an independent factor inducing arteriosclerosis along with blood lipids^[21]. In addition, a decrease in homocysteine concentration is associated with a reduced risk of cardiovascular disease, and plasma homocysteine concentration increases with age^[22]. Physical exercise reduced the risk of cardiovascular disease^[23-24] and is now reported that exercise appears to alter blood homocysteine levels^[25].

When delving into previous studies on changes in blood lipids through muscle exercise in middle-aged men, Shim^[26], has shown that the improvement of blood lipids was reported in obese middle-aged men who performed pilates exercise three times a week for 12 weeks (with mid-level intensity) for 65 minutes each time. Additionally, Boo^[27] also reported positive effects of blood lipids through the results of effective resistance exercise to strengthen upper and lower body strength with an exercise program, which was carried out 4 sets per week for 8 weeks, 3 sets (12 times in each set) of using 60~80% intensity of 1~RM. In the study of Eem, Cho & Lee^[28], circuit exercise with 50~60% intensity of HRR for 40 minutes was carried out for 8 weeks, three times a week, 40 minutes each - and did show an improvement in blood lipids. In addition, the study by Shim & Kim^[29] also reported the effect of resistance movements with 50-80% intensity of HRR, twice a week, every 50 minutes, for 15 weeks.

When reviewing the previous studies which dealt with changes in homocysteine through muscle exercise in middle-aged men, Steenge et al^[30] reported that blood homocysteine levels were significantly reduced after 8 weeks of resistance training in adult men. Furthermore, several studies dealt with exercise programs which

had effects on decreasing homocysteine levels^[31]. Previous studies have also suggested that homocysteine concentrations decrease after resistance training^[32], but aerobic exercise training has been shown to be less or no effective in reducing homocysteine levels^[33].

In this study, the lower body muscle exercise of 1RM 65-75% was performed for 12 weeks - three times a week, 60 minutes each for middle-aged men, and the results showed a significant difference in blood lipid and homocysteine. These results suggest that it could reduce the concentration of homocysteine in the blood, because the resistance exercise requires more protein metabolism, increases the protein synthesis for skeletal muscle contractile activity and it also increases protein retention in muscle^[32].

This decrease in homocysteine levels in blood which was demonstrated by resistance training studies seems to be related to exercise, intensity, and exercise performance rather than walking and stair climbing activities^[34]. In addition, one of the mechanisms associated with homocysteine function in cardiovascular disease is due to a decrease in HDL levels. Homocysteine reduces HDL concentration in plasma by inhibiting liver synthesis of apoprotein A, which presents in HDL. Reduced HDL concentrations and increased homocysteine levels may increase the risk of cardiovascular disease^[22].

As described above, the lower body muscle exercise conducted in this study is considered as an effective exercise program, which can prevent cardiovascular diseases by improving blood lipids and homocysteine - by strengthening the thigh muscles of human body. In addition, it is considered that further research is needed to develop realistic and diverse exercise programs and to verify the effects of the results of applying these findings to the field.

Conclusion

The purpose of this study was to investigate the effect of 12 weeks of lower body muscle exercise on blood lipid and homocysteine change. Lipoprotein, total cholesterol, and homocysteine showed positive improvement. In this respect, strength training of the large muscle center of the lower body is considered to be effective in improving blood lipid. Based on this program, various weight loss and metabolic syndrome improvement programs are needed.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Anticariogenic effect of *Sambucus williamsii* var. *Coreana* NAKAI (*S. Williamsii*) Extract on Against *Streptococcus Mutans*

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Abstract

Background/Objectives: The purpose of the present study was to assess the anticariogenic effects of *Sambucus williamsii* var. *coreana* NAKAI (*S. williamsii*) extract against *Streptococcus mutans* (*S. mutans*).

Method/Statistical Analysis: *S. williamsii* purchased from Foodsynergy Co., Ltd. (Seoul, South Korea). Dried *S. williamsii* were then crushed and percolated in 70% ethanol, and concentrated *S. williamsii* extract was applied to *S. mutans* diluted to 5×10^5 CFU/ml at the concentrations of 0, 2.5, 5, 10, 20, and 30 mg/ml. Then the colony-forming units (CFUs) were evaluated at 6 and 24 h.

Findings: The *S. williamsii* extract against *S. mutans* had an minimal inhibitory concentration (MIC) of 20 mg/ml and an minimum bactericidal concentration (MBC) of 30 mg/ml at 6 h, and an MIC of 10 mg/ml and an MBC of 20 mg/ml at 24 h. As the concentration of *S. williamsii* extract increased, the *S. mutans* was more clearly killed over time. The application of *S. williamsii* extract to *S. mutans* has an anti-dental-carries effect.

Improvements/Applications: *S. williamsii* extract promotes oral health promotion by inhibiting the growth of *S. mtans*. It could be used as an effective oral anticariogenic agent.

Keywords: *Sambucus williamsii* var. *coreana* NAKAI (*S. williamsii*), Anticariogenic agent, *Streptococcus mutans*, Anti-dental caries, Oral health.

Introduction

Bacteria stay in the teeth, palates, gingiva, tongue, and buccal mucosa, which have suitable conditions for the bacterial characteristics^[1]. In the world, dental caries (tooth decay) and periodontal (gum) diseases are the most common oral disease, known as cause of tooth loss among adults^[2]. Dental caries is one of the most common and costly diseases. Caries are caused by of the bacteria *Streptococcus mutans* (*S. mutans*). It is most

closely related to dental caries and is mainly found in dental plaque^[3]. *S. mutans* is characterized by high acid resistance compared with other bacteria, and maintains its metabolism continuously even at a low pH^[4].

It is said that oral disease causes difficulty of food intake, pain, discomfort, and dissatisfaction with appearance^[5]. Tooth loss has been reported to reduce the chewing capacity, narrowing the range of foods that one can consume, and to decrease the quantity and quality of meals, making it difficult to maintain one's health and fitness^[6]. Therefore, oral health refers to the state of the oral-related tissues that allow people to eat, speak, and socialize without discomfort, thereby contributing to systemic health^[7]. For this reason, health promotion refers to healthcare that changes the individual's environment or health habits and brings about a higher level of well-being^[8].

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Resistant bacteria were found in most antibiotics commonly used in the treatment of infectious diseases, making it difficult to maintain oral health^[9]. Therefore, research on substitutes is underway, and research on natural products to search for new materials with pharmacological activity has been actively conducted worldwide for plants and the like^[10].

Sambucuswilliamsii var. *coreana* NAKAI (*S. williamsii*) is a deciduous shrub belonging to Caprifoliaceaesambucus, which grows in the marshes and valleys of mountains^[11]. *S. williamsii* is a medicinal substance widely used in folk remedies that is known to alleviate swelling and pain and improve blood circulation, and to have anti-inflammatory action^[12]. Therefore, the purpose of this study was to apply *S. williamsii* to the typical dental-caries-inducing bacteria, *S. mutans*, to confirm the possibility of its use as an anti-caries material and to promote oral health.

Method

S. williamsii preparation: The dried *S. williamsii* used in this study was purchased from Foodsynergy Co., Ltd. (Seoul, South Korea). After adding 70% ethanol to crushed *S. williamsii*, an extract was obtained at 60°C for 12 h. The extract was filtered using filter paper (Whatman No. 2, Tokyo, Japan), and the *S. williamsii* extract was concentrated using a rotary vacuum evaporator (N-1300E.V.S. EYELA Co., Tokyo, Japan). The concentrated *S. williamsii* was lyophilized using a freeze dryer (Ilshin Lab Co., South Korea). The sample was stored at -20°C after dilution.

Bacterial Strains: In this experiment, *S. mutans* (KCTC 3065/ATCC 25175) was used after the subculture in brain heart infusion (BHI) broth. *S. mutans* was incubated in BHI at 37°C for 24 h, and was diluted at a 5×10^5 ratio.

Antimicrobial activity by S. williamsii extract concentration: 100 µL of cultured *S. mutans* (5×10^5 colony-forming units; CFUs/ml) was inoculated into a 24-microwell plate containing BHI broth in which *S. williamsii* extract was added at each concentration (0, 2.5, 5, 10, 20, and 30 mg/ml). The total volume of each mixture was 1 ml. The microplate was incubated anaerobically for 6 and 24 h at 37°C, and then the mixture in each well was uniformly smeared in an agar medium and then cultured at 37°C for 24 h to check the number of CFUs.

Statistical Analysis: Student's t-test was conducted to identify the changes that could have occurred after 6 and 24 hours. The difference in each concentration was evaluated through one-way analysis of variance (ANOVA), followed by the Tukey test at $\alpha = 0.05$. Significance analysis of the inhibitory effect was carried out using Ver. 21.0 (SPSS Inc., Chicago, IL, USA)

Result and Discussion

In modern times, the concept of health has evolved into the concept of physical, mental, and social well-being, not merely the absence of physical illness, and as the relationship between quality of life and health has been emphasized, the interest in the impact of oral health on quality of life has also increased^[13]. Due to the increased interest in oral health, the prevention rate of oral diseases is higher than those of other diseases, but people in developed and developing countries still suffer from oral diseases^[14].

Pathogens usually exist as normal bacterial flora, but when the number of specific bacteria increases or decreases in the normal bacterial flora in the oral cavity, it causes diseases like dental caries and periodontal disease, leading to pain and eating disorders, and results in tooth loss. It is also a major cause of bad breath and may cause social problems for the people afflicted with such condition^[15]. Today, there is a comprehensive understanding of the concept of health, and the health behavior with regard to the teeth or oral conditions and their consequences must be considered together. Thus, general bodily health with poor oral health cannot be considered a healthy state^[16].

The widespread use of antibiotics has led to a dramatic decrease in the incidence of bacterial disease, but it has led to an increase in disease due to the bacteria that have become resistant to antibiotics^[17]. For this reason, studies have been actively conducted on the separation and application of natural antimicrobials with superior antimicrobial activity and safety due to the side effects of synthetic antifungal agents, to prevent dental caries and to promote the avoidance of chemical substances^[18]. Therefore, this study was conducted to apply *S. williamsii* extract as a substitute for chemical substances in the treatment and prevention of dental caries induced by *S. mutans*.

The antibacterial effect of *S. williamsii* extract against *S. mutans* was evident with increasing concentration and over time [Figure 1]. Figure 1(a) presents the change

in CFUs according to the application of *S. williamsii* extract after 6 h, and Figure 1(b), after 24 h. As shown in Figure 2, the death rate of *S. mutans* at 6 h depending on the concentration of *S. williamsii* extract was 2.90×10^7 at 0 mg/ml, 1.48×10^5 at 2.5 mg/ml, 4.34×10^4 at 5 mg/ml,

8.73×10^2 at 10 mg/ml, 4.90×10^1 at 20 mg/ml, and 0 at 30 mg/ml. On the other hand, the death rate at 24 h was 1.02×10^{11} at 0 mg/ml, 5.67×10^7 at 2.5 mg/ml, 3.80×10^7 at 5 mg/ml, 4.33×10^6 at 10 mg/ml, 0 at 20 mg/ml, and 0 at 30 mg/ml.

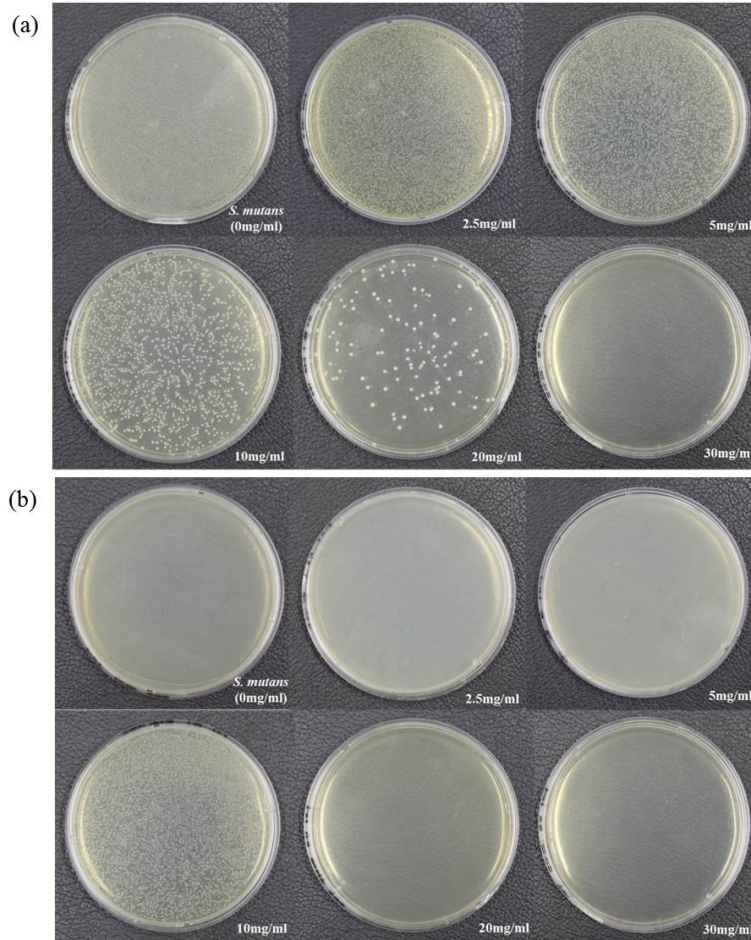


Figure 1. Anticariogenic activity of *S. williamsii* extract against *S. mutans* (A) after 6 h and (B)24 h

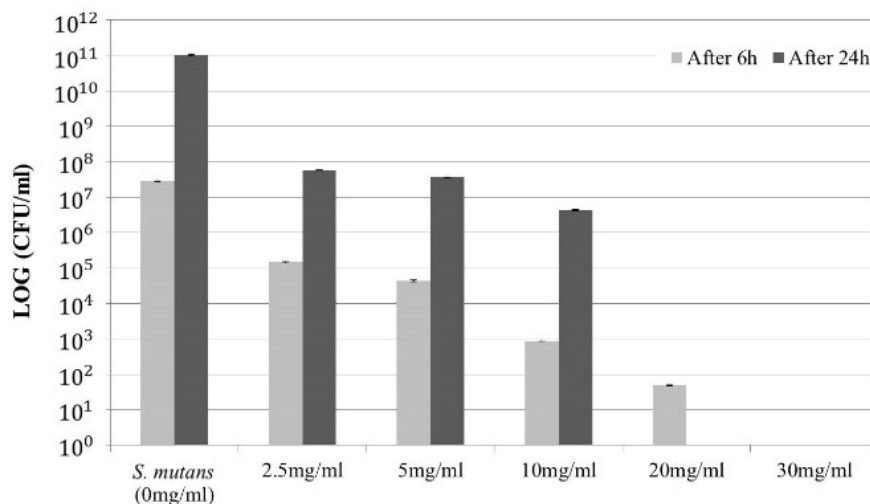


Figure 2. The survival rate of *S. mutans* by *S. williamsii* extract

According to statistical test for the significance of the difference between the death rates at 6 and 24 h, respectively, there was no significant difference from 20 mg/ml ($P>0.05$). This means that the time did not affect the killing of the bacteria at 20 mg/ml. In the change

according to the concentration, there was a statistically significant evidence ($P<0.05$), but in between groups, except for *S. mutans* (0 mg/ml), for which *S. williamsii* extract was not treated, there was no difference depending on the concentration [Table 1].

Table 1. The mean±SD number of CFUs and P-value of the antibacterial activity by *S. williamsii* extract

Group	<i>S. mutans</i> (0mg/ml)		2.5mg/ml		5mg/ml		10mg/ml		20mg/ml		30mg/ml		ANOVA P-Value
	Mean ±SD	t-test P-Value	Mean±SD	t-test P-Value	Mean ±SD	t-test P-Value	Mean ±SD	t-test P-Value	Mean ±SD	t-test P-Value	Mean±SD	t-test P-Value	
6h	2.90±0.1 10 ^{7a}	0.000*	1.48±0.4 10 ^{5b}	0.004*	4.34±0.8 10 ^{4b}	0.008*	8.73±0.9 10 ^{2b}	0.004*	4.90±0.1 10 ^{1b}	0.149	0 ^b	-	0.000*
24h	1.02±0.8 10 ^{11a}		5.67±0.3 10 ^{7b}		3.80±0.1 10 ^{7b}		4.33±0.2 10 ^{6b}		0 ^b		0.000*		

*The significant difference for 6h and 24h comparison by student t-test ($P<0.05$)., * Different letters (a and b) by the presented statistically significant result of the one-way ANOVA and post hoc Tukey HSD ($P<0.05$)

The results of this study proved that the application of *S. williamsii* extract to *S. mutans* has an anti-dental-caries effect. As the concentration of *S. williamsii* extract increased, the *S. mutans* was more clearly killed, showing a distinct antimicrobial activity over time. The minimal inhibitory concentration (MIC), which is the minimum concentration of bacteria that cannot be visibly detected, and the minimum bactericidal concentration (MBC), which the concentration at which the bacteria are completely killed, were 20 and 30 mg/ml, respectively, at 6 h. At 24 h, MIC and MBC were 10 and 20 mg/ml, respectively. The concentration at which the antimicrobial activity actively occurred, and at which the bacteria were completely killed, was confirmed to be 20 mg/ml. The statistical analysis showed no significant difference between the changes that occurred at 6 and 24 h at 20 mg/ml, which means that there was a difference in CFUs but there was no statistical difference between the antibacterial effects that occurred at 6 and 24 h.

As for the anti-dental-caries effect of natural extracts, a previous study reported that the MIC and MBC values of *Cyperusrotundus* extract on *S. mutans* in the study was 225 and 450 mg/ml^[19]. When the fact that an antibacterial effect was shown in such study by applying an extract at a higher concentration compared to the present study is considered, the inhibitory effect against *S. mutans* was low compared to *S. williamsii* extract, and *S. williamsii* can be said to have a higher antibacterial effect. According to the study of Antonio et al.^[20], the antibacterial activities of *Coffeacanephora* extract MIC and MBC for *S. mutans* were 7±2 and 160±0

mg/ml. This result showed that *S. williamsii* extract has a higher antimicrobial activity than *Coffeacanephora* extract. Therefore, it can be concluded that *S. williamsii* extract has an excellent effect as an anticariogenic agent against *S. mutans*, and can thus be employed as a natural antibacterial agent in oral care products.

Conclusion

In this study, the application of *S. williamsii* extract to *S. mutans* was shown to be effective in preventing dental caries. The *S. williamsii* extract against *S. mutans* had an MIC of 20 mg/ml and an MBC of 30 mg/ml at 6 h, and an MIC of 10 mg/ml and an MBC of 20 mg/ml at 24 h. In the near future, *S. williamsii* extract may conceivably be used as an effective anti-dental-caries substance for dental caries prevention as for natural medicines.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Development of a Medical Phantom to Evaluate the Function of Low Dose 3D MDCT

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Abstract

Background/Objectives: Low dose radiation-based CT imaging is a technology that dramatically improves the information on borders between similar substances but with difference in density. The findings will serve as basic data in developing a CT phantom dedicated for X-ray phase differential imaging.

Method/Statistical Analysis: To evaluate the benefits of a phantom for low dose 3D MDCT, SOMATOM Definition ASH (Siemens, Germany) CT scanner that produces 128 slices of images with one rotation was used. The auto-exposure condition (AEC) was applied as it is frequently used in clinical settings for high dose CT. After the image was acquired, a qualitative analysis was conducted to verify the practical use in a clinical setting.

Findings: In order to evaluate the images acquired from the in-house produced medical phantom and the resolution in the image space, the phantom must be made of substances that have a similar actual atomic number as water. It is practical to produce the phantom for 3D CT by mixing a pure liquid and powder. The absorption, dispersion and phase differential images acquired through the low dose X-ray device were analyzed on a 5 point Likert scale. The absorption image scored 4.3 points for liquid form and 3.50 points for powder form. Both the dispersion image and the phase differential image scored 3.00 points for the liquid form and 4.50 points for the powder form, indicating that the liquid form produces better quality images in the absorption image, while the powder form produces better images in dispersion or phase differential images. The differences were statistically significant ($p < 0.05$).

Improvements/Applications: The findings show that for dispersion and phase differential images, compared to the absorption images, substances in powder form rather than liquid form are conducive to better images. These findings are expected to be of use in the field of medical imaging to produce images with high diagnostic value using low dose radiation.

Keywords: *Low dose CT, image quality, phantom, performance evaluation, radiation.*

Introduction

CT tests have the patient enter a column-shaped machine that generates X-rays to produce a cross-section of the human body. CT, unlike the simple X-ray, has less overlapping of structures and thus allows for more accurate viewing of the lesion^[1, 2].

With the progress made in CT technology, CT can be used for early detection of diseases no matter where the site is, present an approach to invasive tests and facilitate follow-up after treatment. It is thus often used for the diagnosis, treatment and management of any small diseases that cause anatomical changes. With such progress, it is expected that CT will become within several years, an essential part of early radiological tests or initial tests upon admission, just as liver function tests^[3-10].

X-ray is classified as a grade 1 carcinogen by the WHO, along with alcohol and tobacco. As such, when

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undergoing CT or PET-CT imaging, great care is needed. The total number of CT's taken in Korea increased from 5.25 million cases in 2010 to 7.7 million in 2015. The number of CT equipment, too, increased from 2147 units in 2011 to 2300 units in 2016. This translates into 4.5 units for every 100,000 citizens, which is higher than the OECD average of 2.5 units per same number of people. But during individual check-ups, often CT tests are done unnecessarily. According to a survey by Seoul Medical Center in 2015, the maximum exposure to radiation through optional tests such as CT on the abdomen, lungs or PET CT is on average 14.82mSv. This is four times the radiation exposure Korean citizens are subject to during their daily life over a year (3.6mSv)^[4,11].

The biological effects caused by ionizing radiation in medical setting can be categorized as definitive effects and possible effects. The former is the radiation that goes over the threshold of when the radiation absorbed by the human body triggers a response in the tissue. In most cases, it causes the death of cells and can only occur when a majority of cells exposed to radiation die^[12].

X-ray phase differential imaging technology dramatically improves the information on borders between similar substances but with a difference in density, using data from phase differentials. It is applied to low dose CT imaging. Compared to existing imaging technologies that leverage the difference in the level of X-ray absorbed, low dose radiation can be used to generate high quality images ^[8-12]. However, there is a lack of studies on phase differential CT imaging, and no studies on CT phantoms where phase differential imaging has been applied.

As such, in this study, a CT phantom for the exclusive use of X-ray phase differential imaging was produced to acquire an absorption image and a phase differential image and evaluate the image quality and amount of data from the images. The findings will provide basic data for the development of CT phantoms used in phase differential imaging.

Subjects and Methodology

1. Evaluation of the function of CT using an in-house produced phantom: To evaluate the benefits of a phantom for low dose 3D MDCT, SOMATOM Definition ASH (Siemens, Germany) CT scanner that produces 128 slices of images with one rotation was used [Fig. 1]. The auto-exposure condition

(AEC) was applied as it is frequently used in clinical settings for high dose CT [Table 1].

Table 1. Table title

Parameter	Value
Technique	Adult-Helical
kVp	80
mA	84
Time per rotation (sec)	0.6
mAs _{eff}	35
Scan Field of View	66×66
exposure time(sec)	0.416
Table speed (mm/rot)	26.5
Pitch	0.828
Reconstructed Scan Width (mm)	5



Figure 1.3D MDCT imaging device

2. Production of a phantom for the evaluation of low dose CT: A phantom was produced in the lab to evaluate the function of low dose 3D MDCT. To evaluate images, the phantom was produced in two types – one made with powder materials and another made of liquid materials. The phantom consisting of polyethylene was made into a column with a diameter of 3×1cm and five holes with a diameter of 0.5cm. Phosphor, calcium, calcium from anchovies, aluminum and carbon powder were placed in the holes, To acquire absorption, dispersion and phase differential images, the distance between the focal point and the object was set at 300mm, the fixed grid was placed at 700mm, and the distance between the focal point and the director was set at 1,448mm. The exposure conditions were 22kVp, 20mA and 630msec.

For the liquid phantom, a column with a diameter of 3×1cm and five holes with a diameter of 0.5cm.

Water, sodium chloride, soybean oil, silicone oil and a phosphor solution were placed in an envelope and placed inside the holes. The conditions were set as the same for the powder phantom. The distance between the focal point and the object was set at 300mm, the fixed grid was set at 700mm, and the distance between the focal point and the director was set at 1,448mm to acquire an image under the exposure conditions of 22kVp, 20mA and 630msec.

3. **Image evaluation method:** After the image was acquired, a qualitative analysis was conducted to verify the practical use in a clinical setting. The contrast, detection rate of lesions, and the distinctness of the borders were reviewed for five groups (1: Very low, 2: Low, 3: Average, 4: High, 5: Very high). A team consisting of two medical doctors in radiology and three radiologists with more than 10 years of experience conducted the evaluation.
4. **Statistical Analysis:** For data analysis, SPSSWIN (Ver 13.0) was used. Verification of the significance of the mean value of the radiation exposure measured in the control group and the experiment group was done through a t-test and ANOVA. The significance level of all statistics was set at $p < 0.05$.

Study Results and Review:

1. **Evaluation of the practical benefits of an in-house produced medical phantom for low dose 3D CT:** The phantom consisting of polyethylene was made into a column with a diameter of 3×1cm and five holes with a diameter of 0.5cm. Phosphor, calcium, calcium from anchovies, aluminum and carbon powder were placed in the holes. This phantom was used to evaluate the low dose 3D CT.

The liquid phantom is a column with a diameter of 3×1cm and five holes with a diameter of 0.5cm. Water, sodium chloride, soybean oil, silicone oil and a phosphor solution were placed in an envelope and placed inside the holes. In addition, to evaluate the image spatial resolution, phosphor, calcium, aluminum and barium were placed in holes with a diameter of 0.1 cm, 0.2 cm, and 0.3 of the medical phantom produced.

For the liquid phantom, a column with a diameter of 5×10 cm made of polyethylene and holes with a diameter of 0.5 cm were created. Water, phosphor, calcium,

aluminum and barium in liquid form were injected into the holes for the images to be acquired.

The images acquired from high dose CT using a medical phantom in powder form were as seen in [Fig. 2]. An image of the water, phosphor, calcium, aluminum and carbon substances showed that a distinction of concentration was possible for water and carbon, while for phosphor, calcium and aluminum the high unit density led to images with beam hardening.

The high dose CT imaging test results using a medical phantom in powder form are as seen in [Fig. 2]. Depending on the type of substance, due to beam hardening, evaluation on the image's spatial resolution varied. This shows that to evaluate the spatial resolution in images from CT, substances with a similar actual atomic number to that of water must be used. This finding is expected to be important when producing a medical phantom for CT in the future.

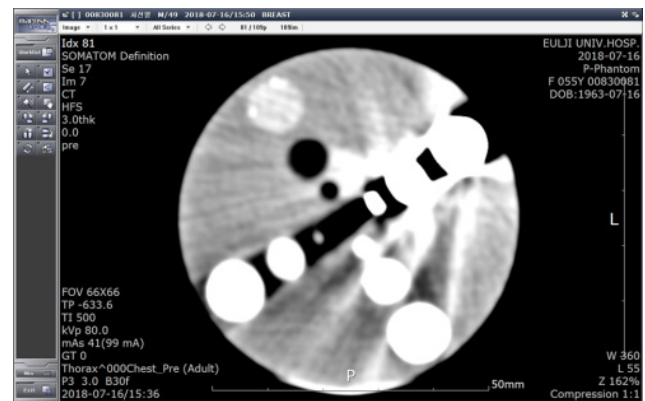


Figure 2. Images acquired from the medical phantom in powder form to evaluate the spatial resolution

To evaluate the practical benefits of a medical phantom made of liquid substances, a 3D CT image was acquired after placing water, phosphor, calcium from anchovies, aluminum and carbon powder inside the phantom. The 3D CT image of a liquid phantom [Fig. 3] shows that for substances with a similar valid atomic number to that of water, three dimensional distinction was difficult. Meanwhile, images acquired when water and powder were mixed, showed a decent three dimensional distinction as seen in [Fig. 3]. This finding indicates that when producing a medical phantom for low dose 3D CT, a mix of liquid and powder is beneficial.

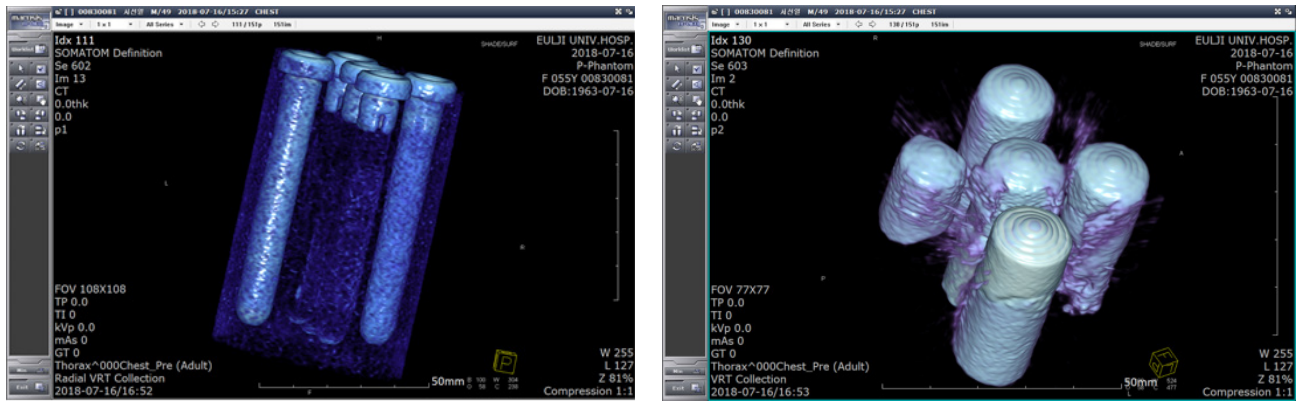


Figure 3. Image acquired for the medical phantom made of a mix of liquid and powder substances

2. Findings from the evaluation of low dose X-ray images: To produce a phantom that would enable evaluation of the function of low dose 3D MDCT, absorption, dispersion and phase differential images were acquired using low dose X-ray. The liquid phantom is a column with a diameter of 5×1cm and five holes with a diameter of 0.5cm. Water, sodium chloride, soybean oil, silicone oil and a phosphor solution were placed in an envelope and placed inside the holes.

Absorption, dispersion and phase differential images were acquired using the in-house produced phantom. The distance between the focal point and the object was set at 300mm, the fixed grid was set at 700mm, and the

distance between the focal point and the director set at 1,448mm. Radiation was applied under the conditions of 22kVp, 20mA and 630msec.

Images acquired from a medical phantom made of liquid substances showed that there was a distinction in contrast for different substances in the absorption image. In the dispersion and phase differential images, more difference was found in the amount of data provided rather than in the contrast [Fig. 4]. In particular, when industrial silicone oil was used, there was a distinct difference in the dispersion and phase differential images compared to in the absorption image. This seems to be due to the difference in the valid atomic number.

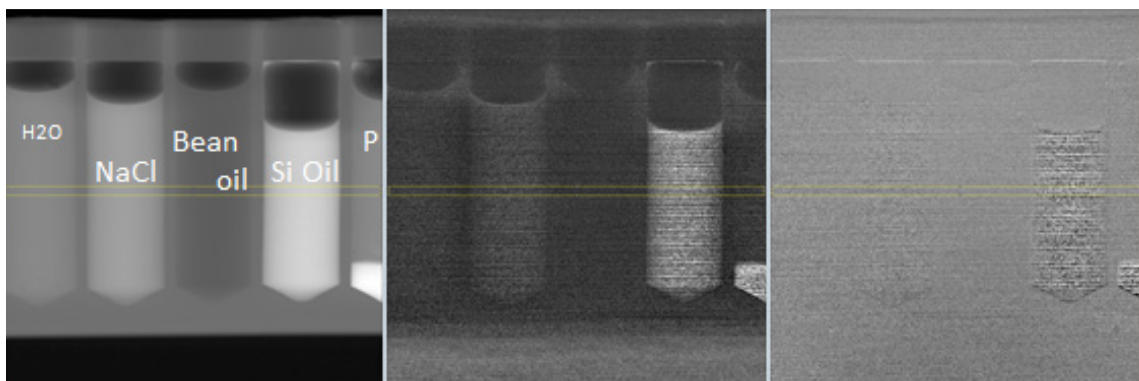


Figure 4. Image Absorption, dispersion and phase differential images of the liquid phantom

The powder medical phantom is a column with a diameter of 5×1cm and five holes with a diameter of 0.5cm. Phosphor, calcium, calcium from anchovies, aluminum and carbon powder were placed in the holes. To acquire absorption, dispersion and phase differential

images, the distance between the focal point and the object was set at 300mm, the fixed grid was placed at 700mm, and the distance between the focal point and the director was set at 1,448mm. The exposure conditions were 22kVp, 20mA and 630msec.

While in the absorption image there was a difference in contrast for different substances of the powder phantom, the distinctiveness in contrast between calcium or phosphorus was subtle, making it difficult

to tell them apart. Meanwhile, in the dispersion and phase differential images, there was a relatively greater difference in the amount of data provided in the image, rather than a difference in contrast [Fig. 5].

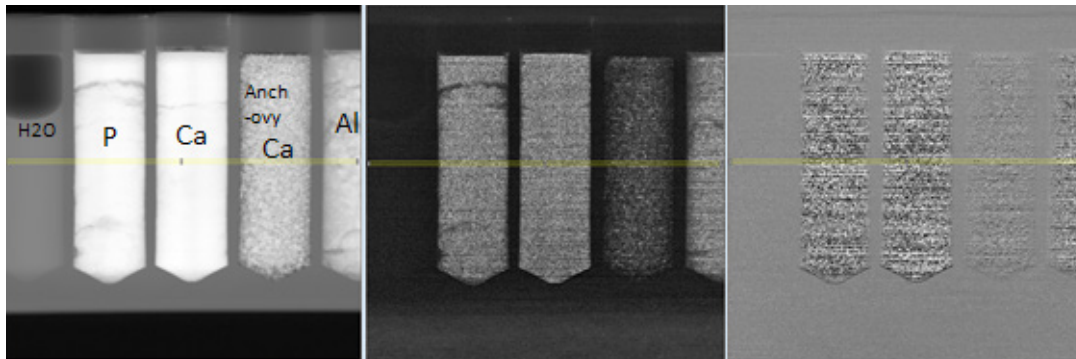


Figure 5. Image Absorption, dispersion and phase differential images of the liquid phantom

The absorption, dispersion and phase differential images acquired using a low dose X-ray imaging device were analyzed on a 5 point Likert scale. In the absorption image, the score was 4.30 points for the liquid phantom and 3.50 points for the powder phantom. In the dispersion and phase differential images, the score was 3.00 points for the liquid phantom and 4.50 points for the powder phantom. The image quality was higher in the liquid phantom for the absorption image and in the solid phantom for the dispersion and phase differential images. There was also a statistically significant difference ($p < 0.05$).

The findings suggest that compared to the absorption image, in the dispersion image and phase differential image, the powder phantom is more conducive to higher quality images. As such, it is expected to use more widely in acquiring images that offer high diagnostic value through low dose X-ray imaging.

Conclusion

A CT phantom for X-ray phase differential imaging was produced in the lab to analyze its practical benefits in high dose CT. The absorption, dispersion and phase differential images were acquired from low dose X-ray devices to evaluate the image quality and the amount of information provided by the image.

The evaluation showed that in order to evaluate the spatial resolution of images acquired, the medical phantom for the CT must be made of substances with a

similar valid atomic number to that of water, and that it is best that the phantom be made with a mix of liquid and powder substances.

An analysis of the absorption, dispersion and phase differential images acquired from low dose X-ray imaging devices on a 5 point Likert scale showed that the score for the absorption image was 4.30 points for the liquid phantom and 3.50 points for the powder phantom. In the case of dispersion and phase differential images, the score was 3.00 points for the liquid phantom and 4.50 points for the powder phantom, this indicates that the liquid phantom is more beneficial for the absorption image and the powder phantom is more beneficial for dispersion and phase differential images in acquiring high quality images. There was a statistically significant difference in this ($p < 0.05$).

In the above experiments, the dispersion and phase differential images, compared to the absorption image, was better at producing images for substances in powder form rather than in liquid form. This finding is expected to have many applications in the field of imaging technologies to produce images with high diagnostic value using low dose X-ray.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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A Study on the Optometrist' Images between Major Students and Non-major Students

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Abstract

Background/Objectives: This study was designed to assess the actual state of optometrist' image, to determine their identity, and to provide fundamental feedback to improve their image.

Method/Statistical Analysis: The study involved 303 students, 179 of whom were majoring in optometry, while 124 were not. The subjects were asked to answer an online questionnaire survey in order to analyze optometrist' images. The collected data were compared and analyzed at a significance level of 0.05 using SPSS 18.0.

Findings: In terms of optometrist' general image, optometry major students rated it 3.75, while non-major students gave it 4.02 points ($p < 0.05$). The traditional image scored 4.15 and 4.0, respectively; the social image scored 3.70 and 3.54; the professional image scored 4.18 and 4.02; the social participation image scored 3.66 and 3.48; and the interpersonal relationship image scored 3.92 and 3.70. The scores for all images were statistically significantly different ($p < 0.05$).

Improvements/Applications: The results suggested that optometrist, both as a group and individually, need to make efforts in social voluntary service and social contribution to improve their social participation image, as well as efforts toward social status image improvement to enhance their social image.

Keywords: department of optometry, optometrist' images, traditional image, social image, professional image, social participation image, interpersonal relationship image

Introduction

Health care occupations are meant to serve the disadvantaged. Therefore, persons in these occupations need to serve others, and it is very important that they have aligned personal beliefs and attitudes. Thanks to digital information, consumers today have more medical knowledge, are more interested in health care, and have a higher perception of medical service. As a result, there is a demand for more and better medical

services.^[1-2] Optometrist have been required to not only provide such services as eyesight measurement, making and processing glasses, and selling glasses and lenses, but also to offer a variety of different services to meet customers' needs. In other words, as experts in eye health, they are socially requested to deliver comprehensive information and knowledge about glasses and lenses, eye operations, and ophthalmology (eye diseases).^[3] Fast technological development and innovation have been helping humans to improve their living standards. With the greater acquisition of information, people have been increasingly realizing the importance of the eyes and have become more interested in eye health. In this context, optometrist' social roles have become more significant.

In a situation in which half of the national population wears glasses or lenses, optometrist play a critical role in

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eye health and have a responsibility toward the public’s quality of life based on functioning eyes. Optometrist not only measure customers’ eyesight to make and process proper optical glasses and provide some medical services for the eyes, but they also sell glasses and lenses. Therefore, their image is very important^[4]

An image is a sense of one’s feeling received from a person or an object. It represents the belief, sense, or impression of an object exiting one’s mind. The occupational image reflects something general and typical of a particular occupation. The external image of an occupation is formed in consideration of the characters and characteristics of the people with that occupation, their types of jobs, life, pay, work conditions, and welfare, and the impression of the occupation.^[5] The internal image of an occupation is created by the efforts made by the occupational group and each individual. It takes a lot of time and effort to create a positive image, whereas it is very easy for an individual’s incorrect behavior and attitude to give a negative image of the occupation. For this reason, an occupational image is very hard to manage. People of many different occupations make efforts to improve their occupational image. These efforts go in the direction of finding one’s occupational identity and developing it further. It is important to assess the image of optometrist, who take care of the public’s eye health, to enable them to improve it in the future.^[6]

This study analyzed a variety of images of optometrist held by students majoring in optometry (major students) and students not majoring in optometry (non-major students). The study results can be used as fundamental feedback to help establish the true image of optometrist.

Method

In order to compare and analyze optometrist’ images, an online questionnaire survey was conducted on 179 students who were majoring in optometry and 124 who were not (a total of 303 students) from May to June 2019.

The questionnaire consisted of 20 questions (four questions for each of five images). All the questions in the questionnaire were answered on a 5-point Likert scale (5: strongly agree, 4: agree, 3: somewhat agree, 2: somewhat disagree, 1: disagree, 0: strongly disagree). The full score for each image was 20 points, and the mean was based on the four questions. Cronbach’s α ,

which represented the reliability of the questionnaire on optometrist’ images, was 0.95, reflecting very high reliability. The collected data were applied to SPSS 18.0 at a significance level of 0.05 in order to compare and analyze optometrist’ images.

The questionnaire used in this study was created by modifying and supplementing a questionnaire about images of medical occupations to make it applicable to optometrist. For a comparative analysis of optometrist’ images, their images were categorized into five types: their traditional image, which is related to their qualifications (cleanliness and neatness, reliability, frankness and honesty, immediate reaction and response to customers’ requests); their social image, which is related to optometrist’ social roles (high intelligence, high social status, management of eye health, provision of abundant information about the eyes); their professional image as experts in eye health (skillfulness and professionalism, accurate measurement of eyesight and making of glasses, occupational pride, abundance of ophthalmological knowledge); their social participation image, which is related to their social contribution and voluntary service (social recognizability, efforts for the public’s eye health, level of social contribution [voluntary activity], valuableness and effectiveness of job); and their interpersonal relationship image, which is related to their communication with patients and kindness (kindness, cooperativeness and good relationship, non-authoritative communication, comfort and reliability).

Result and Discussion

The general characteristics of the study subjects are presented in Table 1. Regarding the age and name given, major students and non-major students had significantly different images of optometrist ($p < 0.05$). Students in their 20s had somewhat better images of optometrist than those in their teens, and students who called optometrist “Sir” and “Ma’am” or “optician” had better images of optometrist.

Table 1. The general characteristics of the study subjects

Variable	Division	Major Students	Non-Major Students
sex	Male	81	44
	Female	98	80
Age	18-19	78	63
	20-27	101	61

Variable	Division	Major Students	Non-Major Students
Habit of visiting	Existing optical shop	124	86
	New optical shop	55	38
Title	Teacher	94	49
	Optician	32	17
	Sister and uncle	7	13
	Anything else	46	45
Right expression of optical shop	Wrong answers	38	67
	Correct answers	141	57

The correlations in the optometrist' images are presented in Table 2. All the image types (traditional image, social image, professional image, social participation image, and interpersonal relationship image) had statistically significant correlations ($p < 0.05$). Table 3 presents a comparison of optometrist' traditional image and social image between major students and non-major students. Yoo's research on the traditional image of nurses revealed a score of 3.42, which was somewhat lower than the score of 4.09 points for optometrist' traditional image in this study.^[7] In the present study, major students rated optometrist' traditional image 4.15 and non-major students rated it 4.00, whereas in Yoo's study, there was a large difference between major students (3.99) and nonmajorstudents (3.20).^[8] In the question about whether "optometrist are clean and neat, and immediately react and respond to customers' requests",

both student groups gave high marks. In the question about whether "optometrist are frank and honest", major students and non-major students respectively gave 3.89 and 3.78 points, which was relatively low. The image that optometrist, who also manage sales, are not frank and honest can seriously harm customer reliability. Therefore, it is necessary to improve the image of optometrist. In Park et al.'s research on the images of emergency medical technicians, major students and non-major students gave 4.11 and 3.84 points, respectively, to the social image of emergency medical technicians.^[9] In the question about whether "optometrist are highly intelligent", major students gave 4.02 points (the highest score).

In the question about whether "optometrist offer a lot of information on the eyes", non-major students gave 3.86 points (the highest score). In the question about whether "optometrist have a high social status", both major and non-major students gave the lowest scores: 2.86 and 2.84 points, respectively. In Park et al.'s study, in the question about whether "emergency medical technicians have a high social status", both major and non-major students gave the lowest scores: 2.48 and 2.53 points, respectively.^[9] The social status is the position in society and the organizational influence on society. To develop optometrist' social image, it is necessary to improve their image in order to increase their social status.

Table 2. The correlations in the optometrist' images

Variable	Traditional image	Social image	Professional image	Social participation image	Interpersonal relationship image
Traditional image	1				
Social image	.671*	1			
Professional image	.667*	.738*	1		
Social participation image	.608*	.755*	.681*	1	
Interpersonal relationship image	.600*	.598*	.624*	.610*	1

* $p < 0.001$

Table 3. A comparison of optometrist' traditional image and social image between major students and non-major students

Traditional image and Social image	Major students		Non- Major students	
	Mean	SD	Mean	SD
Cleanliness and neatness	4.30	.608	4.24	.589
Reliability, frankness and honesty	4.13	.706	3.96	.820
Immediate reaction	3.89	.820	3.78	.851
Response to customers' requests	4.26	.720	4.01	.770
Total	4.15	.595	4.00	.604
p	.03			
High intelligence	4.02	.771	3.79	.802
High social status	2.86	1.116	2.84	1.039
Management of eye health	4.01	.824	3.64	1.099
Provision of abundant information about the eyes	3.93	.874	3.86	1.014
Total	3.70	.692	3.54	.801
p	.05			

Table 4. A comparison of optometrist' professional image and social participation image between major students and non-major students

Professional image and Social participation image	Major students		Non- Major students	
	Mean	SD	Mean	SD
Skillfulness and professionalism	4.18	.619	4.02	.702
Accurate measurement of eyesight and making of glasses	4.28	.689	4.12	.771
Occupational pride	3.98	.811	3.88	.812
Abundance of ophthalmological knowledge	4.18	.760	3.99	.864
Total	4.18	.619	4.02	.702
p	.02			
Social recognizability	3.18	1.134	3.27	1.062
Efforts for the public's eye health	3.97	.824	3.68	.967
Level of social contribution [voluntary activity]	3.56	1.101	3.14	1.157
Valuableness and effectiveness of job	3.92	.806	3.81	.843
Total	3.66	.792	3.48	.833
p	.05			

Table 5. A comparison of optometrist' interpersonal relationship image between major students and non-major students

Interpersonal relationship image	Major students		Non- Major students	
	Mean	SD	Mean	SD
Kindness, cooperativeness	4.22	.729	4.10	.658
Good relationship	4.08	.778	3.86	.810
Non-authoritative communication	3.63	1.121	3.43	1.091
Comfort and reliability	3.74	1.067	3.39	1.124
Total	3.92	.708	3.70	.654
p	.00			

Table 6. A comparison of optometrist' images between major students and non-major students

Variable	Total image		Traditional image		Social image		Professional image		Social participation image		Interpersonal relationship image	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Major students	4.02	.617	4.15	.595	3.70	.692	4.18	.619	3.66	.792	3.92	.708
Non-major students	3.75	.686	4.00	.604	3.54	.801	4.02	.702	3.48	.833	3.70	.654
Total	3.91	.659	4.09	.603	3.64	.742	4.12	.658	3.58	.813	3.83	.694
p	.00		.03		.05		.02		.05		.00	

Conclusion

Overall, major students had a more positive image of optometrist than non-major students, and particularly of their professional image, which scored the highest at 4.12 points. Their social participation image scored the lowest, at 3.58. Both major students and non-major students gave the highest scores (4.30 and 4.24, respectively) in answer to the question related to optometrist' traditional image about whether "optometrist are clean and neat". Since optometrist are experts in eye medical service, their hygiene was perceived as the highest. Although optometrist have an occupational mission to serve the public's eye health, their social participation image scored the lowest. In light of this, optometrist need to make efforts toward social contributions and voluntary service in order to improve their social image. Both major students and non-major students gave the lowest scores (2.86 and 2.84) in answer to the question related to optometrist' social image about whether "optometrist have a high social status". Therefore, optometrist, both collectively and individually, need to make efforts to improve their social status.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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The Study of Swedish Massage on Anxiety Situation and PPT in Stressed Office Workers

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Abstract

Background: The purpose of this study was to investigate the effects of Swedish massage on anxiety and pressure pain threshold in office workers with psychological stress.

Method: Sixty office workers with psychological stress were randomly assigned to experimental group 1 and control group. They were assigned into either a Swedish massage group (Experimental group 1, n = 30) or a resting group (Control group, n = 30). A single measurement mediated Swedish massage and rest for 20 minutes and was measured before and after intervention.

Findings: In state trait anxiety inventory (STAI), there were significant differences between before and after the experiment and between the two groups ($p < .05$). The pressure pain threshold (PPT) of the upper trapezius increased in the Swedish massage group ($p < .05$).

Application: These findings indicate that, the Swedish massage applied to stressed office workers showed a significant difference in increase of PPT and decrease of STAI.

Keywords: Swedish massage, STAI, PPT, Stress, Office Workers.

Introduction

At present, there are many studies that indicate chronic stress has a detrimental effect on health. Stress has been shown to be associated with immune function and cardiovascular disease^[1]. According to Bae's study, stress impairs the anti-inflammatory effects of the immune system, leading to chronic infections, chronic immune diseases, or cancer as well as other physiological disorders^[2]. Hawkins's found that about 760 depression, stress or anxiety occurred in 100,000 workers. Moreover, most people would agree that stress can have a negative impact on health, but they don't

know how to prevent or cope with it. Other studies have shown that long-term psychological stress can interfere with psychological and physiological functions and can be more easily infected with diseases that can put more stress on life in addition to causing disease^[3,4,5].

It is very important to find ways to reduce stress that can adversely affect the body. There are a variety of physical therapies that can induce positive emotions through proper stimulation of the skin. Among them, Swedish massage is a treatment that can relieve stress and fatigue by promoting muscle relaxation, and it has been reported to have a significant effect on blood pressure reduction, especially in women^[6]. Massage is a standard treatment used in many countries, whose principle is to apply pressure to muscles in the direction of the blood flow to the heart; it comprises five main techniques that most therapists use in the United States^[7,8,9]. There have been few studies related to treating stressed office workers through Swedish massage, and most of them are applied for the purpose of alleviating muscle spasms and

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relaxing muscles, although they can help to relieve stress, too. Swedish massage is a method that can effectively apply the five (effleurage, petrissage, friction, tapoment, vibration) according to each situation. Therefore, the purpose of this study is to provide evidence that Swedish massage can be used to relieve stress from the stressed office workers by comparing and analyzing state trait anxiety inventory and pressure pain threshold related to stress when Swedish massage is applied to stressed workers.

Method

1. Subject: The subjects of this study were 60 stressed office workers with 9 points or more on a Psychosocial Well-being Index-short form (PWI-SF) scale, who work at K branch in D city. They were randomly assigned into either a massage group (Experimental group 1, $n = 30$) or a resting group (Control group, $n = 30$). The experiment was conducted in a comfortable light treatment room where the room temperature was maintained between 22 and 24°C. The subject was placed directly on the massage table and a wedge-shaped knee support was placed under the knee at 70° flexion of the hip. Relaxation was allowed. After the experiment began, it blocked conversations, phone sounds, other noises, and electromagnetic waves that could act as variables in the experiment, minimizing the irritation of the surroundings, preventing the subject from sleeping during the experiment, and closing the eyes and taking part in the experiment comfortably. The study consisted of two massage majors, and two massage majors performed massage for 20 minutes. For the massage group, Swedish massage was performed twice on the neck and shoulder for 10 minutes each session, and the resting group rested in the lying position for 20 minutes [Figure 1].

Both groups were provided with the same conditions of time and surroundings. STAI and PPT were measured before and after the experiment. The subjects were fully informed of the purpose of the study, and they gave informed consent prior to entering the study. Only those who have no skin conditions, have no history of thrombosis treatments, do not take prescription medicines related to the cardiovascular system, and agree to perform the same daily activities as usual were included in the study.

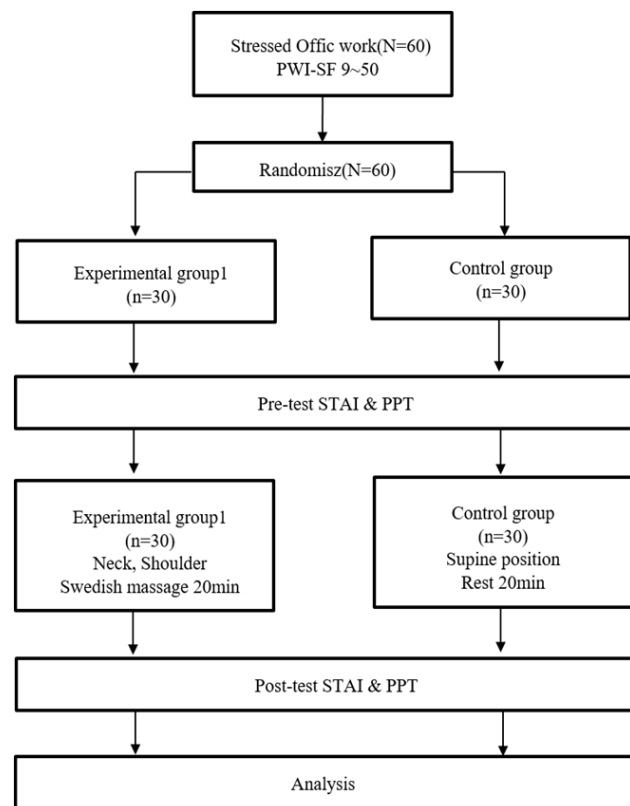


Figure 1. Design of experimental procedure

2. Measurement tools:

- 1. State trait anxiety inventory (STAI):** The state trait anxiety inventory (STAI) test before and after the Swedish massage was self-reported and consisted of 20 questions asking how they felt at the very moment in a specific situation, and their levels of feelings were assessed on a 4-point scale^[10].
- 2. Pressure pain threshold (PPT):** Pressure pain threshold (PPT) is measured using an Algometer (Algometer, Sammons Preston, USA, 2010) to assess the pressure pain level at the pain trigger point of the upper trapezius. Subjects sit comfortably in the chair, take an upright position, mark the superior-angle of the shoulder bone, and make it vertical, and as the pressure was gradually increased at a rate of 1lb/sec, they were told to voice “ah” at the point of unbearable pain, and then the pressure gauge reading was measured at that moment in lb/cm². The trigger point of the upper trapezius of the dominant hand was measured and it was used as PPT. After three measurements at the same location, the mean value is used for the analyses. Measurements

before and after massage application were used as comparators^[11] [Figure 2].



Figure 2. Pressure pain threshold measuring method

3. Statistical Analysis: All statistical analyses in this study were conducted using SPSS ver. 21.0 program. One-Way ANOVA test was used to confirm the general characteristics of the subjects. For the normality test between the two groups, Kolmogorov-Smirnov was used, and for the change of dependent variables before and after intervention, the corresponding sample t-test was used, and One-Way ANOVA was used to compare the effects between the two groups. All statistical significance probability (α) of the data were .05.

Result

According to the general characteristics and homogeneity test, although control group with average age of 37.80 years was older than Experimental group 1 with average age of 37.40 years, there were no significant differences between the two groups; although control group with average height of 169.17 cm was taller than Experimental group 1 with average height of 167.07 cm, there were no significant differences between the two groups; although control group was heavier with average weight of 63.97kg than Experimental group 1 with average weight of 61.57kg, there were no significant differences between the two groups; although Experimental group 1 was greater with mean BMI of 22.30 kg/m² than Experimental group 1 with mean Body mass index (BMI) of 22.03 kg/m², there were no significant differences between the two groups. Although in PW, control group was higher with mean value of 23.23 points than Experimental group 1 with mean value of 23.20 points, there were no significant differences between the two groups.

1. STAI: In STAI, there were significant differences between before and after the experiment and between the two groups ($p < .05$). It was judged that Experimental group 1 was lower than control group [table 1].

Table 1: The immediate effects of Exp. 1 group on anxiety (N = 60)

Parameter	Exp. group 1 (n = 30)	Control group (n = 30)	F	p
STAI (before)	36.80±4.67a	36.47±4.83	.074	.78
STAI (after)	30.57±4.65*	36.77±4.28	28.862	.00

Exp : Experimental group 1, STAI: State trait anxiety inventory, a: mean±standard deviation., *: Within-subjects comparison $p < .05$, : Between-subjects comparison $p < .05$

2. PPT: PPT was a variable to determine the level of pain when pressure was applied, which showed significant differences between before and after the

experiment ($p < .05$). But the differences between the two groups were not significant [Table 2].

Table 2: The immediate effects of Exp. 1 group on PPT (N = 60)

Parameter	Exp. Group 1 (n = 30)	Control group (n = 30)	F	p
PPT (lb/cm ²) (before)	11.85±3.83 a	12.19±3.29	.133	.71
PPT (lb/cm ²) (after)	13.87±4.03*	12.40±3.29	2.417	.13

Exp : Experimental group 1, PPT: Pressure pain threshold, a: mean±standard deviation., *: Within-subjects comparison $p < .05$

Discussion

The purpose of this study was to investigate the effects of Swedish massage on the change of STAI and its impact on PPT in stressed office workers. After 20 minutes of massage, there were significant differences in STAI value in Experimental group 1. This suggests that the rhythmic stimulus induces, through a somatosensory area in the skin, increased activity of the vagus nerve, i.e. hyperfunction of parasympathetic nerve, resulting in psychological stability, which leads to differences in STAI between before and after the massage and between the two groups.

Bessel's reported that treatments such as massage are upward treatments enough to restore control of the vagus nerve^[12]. PPT showed significant differences in Experimental group 1 between before and after the treatment, but there were no significant differences between the two groups. Wall's pain theory showed that proper mechanical stimulation on the skin can reduce pain^[13]. Therefore, the rhythmic mechanical stimulation in Experimental group 1 is considered to bring about emotional stability due to the relaxation of muscles and the effects of upregulation. Kim's study of the effects of the experimental group on the activity of the sympathetic nervous system, anxiety, pain, and pressure pain thresholds in the subjects with psychological stress suggested that the scores on the state anxiety scale were relatively lower in the experimental group, which was similar to the outcome of this study^[14]. Farzane's compared the effects of two Swedish massage techniques on vital signs and anxiety in healthy women. Vital signs and anxiety levels were checked for 10 patients who had Swedish massage on their legs, arms, and face, and 10 who had Swedish massage on their back, neck, and chest groups. Vital signs were significantly decreased in both groups and there was no significant difference in anxiety score after massage^[15]. Felipe's study examined the effects of massage on cyclic rhythm, pain, stress index and quality of life in patients with myalgia syndrome. A total of 24 subjects were subjected to a total of 24 Swedish massages twice a week for 3 months and 40 minutes per session. After 3 months, pain was reduced, stress index was decreased, quality of life was improved, but cortisol concentration was not affected by massage treatment^[16]. Najafi's study looked at the effects of massage and music on pain, anxiety and relaxation in burn patients. Of the 240 subjects, 60 were provided with music, 60 were provided with massage, 60 were provided with both music and massage, and the remaining 60

were provided with rest after being treated for general burns; each group had 20-minute intervention per day for a three-day period. In all three groups, the intensity of pain and anxiety decreased and the level of relaxation increased. There were no significant differences between the groups that received intervention, but the effects of the group that received both the massage and music at the same time showed greater effects^[17]. Alsdair's conducted a study on the effects of Thai massage and Swedish massage on fatigue and energy depletion states. Ten subjects received Thai massage and ten subjects received Swedish massage for 45 minutes per session for a period of six weeks. Both types of massage showed improvement in sleep quality, relaxation, stress relief, muscle tone relief and physical and mental well-being^[6]. Therefore, it suggests that appropriate stimulation in Experimental group 1 alleviates state anxiety.

Conclusion

Swedish massage can induce effective relaxation with five different techniques, leading to a decrease in STAI and an increase in PPT. Therefore, it should be considered as an important factor in physical therapy for stressed subjects. The limitation of this study is that it is difficult to generalize the research results because only stressed workers participated in the study. Also, the single measurement design of the intervention does not reveal how long the actual effects will last. In future studies, it is expected that results can be generalized through studies with various types of subjects.

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Effects of Interest Inducing Activities Programs on the Attention and Self-efficacy of School-aged Children

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Abstract

Background/Objectives: The purpose of this study is to investigate the effects of interest inducing activities program (IIAP) within three type on attention and self-efficacy in school-aged children.

Method/Statistical Analysis: This study was conducted on 22 children except 3 out of 25 elementary school children registered in the center. In addition, they were classified into craft activities, reading activities, physical activities. To determine the change in the child's attention and self-efficacy, Harris & Harris Grid Test, and self-efficacy questionnaire are used.

Findings: There was no statistically significant difference in attention through IIAP in three groups ($p > 0.05$). In the self-efficacy, there was a statistically significant difference among the groups ($p < 0.05$). And there was no statistically significant difference in attention and self-efficacy among the groups according to IIAP ($p > 0.05$).

Improvements/Applications: We suggest it is important to develop programs for voluntary participation and children's attention and self-efficacy.

Keywords: School-aged children, Interest inducing activities, Attention, Self-efficacy, Motivation.

Introduction

Excessive use of smart phones by elementary school students reduces the need and physical activity of children, which can lead to deterioration of writing ability, attention and learning efficiency by imbalance of physical development and simplification of thinking^[1]. Interest-inducing activities in elementary school age focus on a task and interest in a variety of task activities.^[1] This is an important factor in the learning

process and can help improve attention and self-efficacy by using play, art, music, and fairy tales, which are of interest to low-grade elementary school children with low attention and high aggression, as treatment tools^[2,3]. Attention is the cognitive function required for the information acquisition of school-age children, which is especially important for forming the basis of the learning process. As a factor, the development of elementary school years positively affects children's learning ability and creativity^[4-7]. Therefore, the purpose of this study is to find out how it helps the elementary school children's self-efficacy and attention through the interest inducing activities program (IIAP), which includes handicrafts, reading, and physical activities that can be easily applied to school age children. In addition, this study attempts to identify the differences in children's attention and self-efficacy in three types of interest-inducing activities

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Method

In this study, a total of 22 children were selected from 9 male and 13 females, except for three children who did not meet the criteria. Three children were excluded from the selection due to attention deficit hyperactivity disorder (ADHD), disease and dyslexia. The criteria for the study were based on children without orthopedic, neurological, or cognitive problems, who could follow three levels of instruction, read and write, and no other disease. In this method, the Harris & Harris Grid Test (HHGT) was used as attention assessments to investigate the effect on concentration of elementary school students. The test randomly arranged numbers from 1 to 100 in squares of 10×10 , 25 cm wide and 25 cm long, and the participants looked for the numbers indicated by the examiner for 60 seconds and displayed them on the numbers. 1 point was calculated for each number found. In addition, the evaluation of the number plate arranged differently for each test minimized the errors due to the learning effect, and the cases where the participants found different numbers or the same numbers in succession were excluded from the score. In this assessment, the higher the score could mean the higher attention and the Self-Efficacy Questionnaire (SEQ) for self-efficacy evaluation was consisting of 24 items including 7 questions of confidence, 12 items of self-regulating efficacy, and 5 items of preference for task difficulty in self-efficacy component. The higher the score is 120, the higher the self-efficacy. In this study, SEQ was given individually and scored by providing an example for each item that is difficult to understand. HHGT and SEQ was used to evaluate this before and after IIAP. IIAP consisted of three activities: handicraft activity, reading activity physical activity. and before starting the IIAP, Participating children identified the desired program through a questionnaire and classified it into groups. The program was conducted twice

a week for three weeks, for a total of 60 minutes per session. After four weeks, the program was evaluated to be change in children's attention and self-efficacy. The handicraft activity was one of the following: clay work, mosaic, water beads, and corrugated cardboard. Reading activities were performed differently per session, including introducing books, reading books, making books, introducing favorite book scenes, and watching movies based on the books. physical activities included football, simple football, mating, tagging, handkerchief, number racing, simple dodgeball, and badminton according to the difficulty. For the study analysis, data were analyzed using SPSS 21.0. The general characteristics of the subjects were analyzed using descriptive statistics. The differences of HHGT and SEQ between groups before and after IIAP were used by the corresponding paired t-test, and the differences of HHGT and SEQ among the groups before and after IIAP using one-way ANOVA. Statistical significance was $\alpha = 0.05$.

Result and Discussion

1. General characteristics of the subjects: General characteristics of children who participated in this study are shown in [Table 1]. Of the 22 subjects, 10 were male (45.45%), 12 were female (54.55%), and the average age was 9.86 years old, average height 133.52cm, average weight 34.02kg. Handicraft activities group (HAG) consisted of 1 male (12.5%), 7 female (87.5%), average age 8.88 years old, average height 123.50cm, average weight 27.28kg. And reading activities group (RAG) was 2 males (40%), 3 women (60%), mean age 10 years, mean height 131.58cm, mean weight 36.84kg. Lastly, physical activities group (PAG) consisted of 5 males (55.5%), 4 females (44.5%), average age 10.67 years old, average height 140.83cm, average weight 38.44kg.

Table 1. General characteristics of subjects

Variables		TPG (N = 22)	HAG (N = 8)	RAG (N = 5)	PAG (N = 9)
Sex	M	M (10, 45.45%)	M (1, 12.50%)	M (3, 60%)	M (5, 55.50%)
	F	F (12, 54.55%)	F (7, 87.50%)	F (2, 40%)	F (4, 44.50%)
Age (point)		9.86±1.64	8.88±0.99	10.00±2.35	10.67±1.32
Height (cm)		133.52±11.96	123.50±5.55	131.58±14.01	140.83±11.77
Weight (kg)		34.02±13.69	27.28±3.56	36.84±13.88	38.44±17.66

MS±D: mean standard deviation, M: male, F: female, TPG: total participation group, HAG: handicraft activities group, RAG: reading activities group, PAG: physical activities group

2. Comparison of attention and self-efficacy through IAAP in groups: [Table 2] shows a comparison of attention before and after the IIAP applied to the children. First, HAG changed to 2.40 before and 5.80 after IIAP, RAG group to 3.13 before and 4.13 after IIAP, PAG to 4.22 before and 5.33 after IIAP. There was no statistically significant difference in

both groups ($p > 0.05$). In addition, HAG was 69.13 before and 77.38 after IIAP, and the RAG was 79 before and 89 after IIAP. PAG increased from 80.44 before to 86.78 after IIAP and showed a statistically significant difference in RAG and PAG ($p < 0.05$), whereas HAG showed no significant difference ($p > 0.05$).

Table 2. Comparison of attention and self-efficacy through IAAP in three groups.

Variables		Before	After	T	p
HHGT	HAG (N = 8)	3.131.73	4.1301.25	-1.32	0.23
	RAG (N = 5)	2.402.51	5.8002.59	-2.26	0.09
	PAG (N = 9)	4.222.68	5.3303.00	-1.34	0.21
SEQ	HAG (N = 8)	69.1318.42	77.3809.98	-1.80	0.11
	RAG (N = 5)	79.0009.38	89.0009.43	-9.13	0.01*
	PAG (N = 9)	80.4411.67	86.7811.10	-5.32	0.01*

M±SD : mean standard deviation, * $p < 0.05$, HAG: handicraft activities group, RAG: reading activities group, PAG: physical activities group, HHGT: harris & harris grid test, SEQ: self-efficacy questionnaire

3. Comparison of attention and self-efficacy through IIAP among the groups: The attention and self-efficacy among the groups through IIAP applied to the HAG, RAG and PAG showed a difference before and after the table 3, but there was no statistically significant difference ($p > 0.05$) [Table 3].

Table 3: Comparison of attention and self-efficacy at IIAP among the groups

Variables		Change before and after	F	p
HHGT	HAG (N = 8)	1.002.14	1.60	0.23
	RAG (N = 5)	3.403.36		
	PAG (N = 9)	1.112.47		
SEQ	HAG (N = 8)	8.2512.94	0.33	0.72
	RAG (N = 5)	10.002.45		
	PAG (N = 9)	6.338.00		

MSD : Mean Standard Deviation, HAG: handicraft activities group, RAG: reading activities group, PAG: physical activities group HHGT: harris & harris grid test SEQ: self-efficacy questionnaire

IIAP in school-age children into handicraft activities, reading activities, and physical activities. Through this, we confirmed how the IIAP affects the attention and self-efficacy of participating children. First, there was no significant difference in the attention of the three groups after IIAP. It was difficult to control the noise and external environment that occurred during the process of inducing interest programs in the first place, and this restriction was a negative factor in the attention of participating children^[8]. Therefore, blocking negative environmental factors in the execution of IIAP is considered to be a major factor in increasing attention. And HAG did not have a positive effect on the self-efficacy after IIAP. This is primarily due to the lack of initiative in children’s initiatives in autonomous selection of activities and materials and the composition of programs. These factors are considered to be important for children to increase their motivation and active participation in IIAP and thereby increase their self-efficacy^[9,10]. However, the activities of this study had structural problems that made it difficult for children to prepare and select the materials that they needed autonomously in preparation. In addition, high dependence of children occurred during the program process. These factors may have negative effects on children’s activity leadership.

Discussion

Based on previous studies, this study classifies

On the other hand, the self-efficacy of participating

children improved in reading and physical activities in RAG and PAG. These results expressed their own opinions through the process of selecting and reading the books that the participating children wished to read and presenting them in their own products. In addition, the process of presenting the child's own reading results to other friends is considered an important process for improving the child's self-efficacy^[11,12]. Physical activities consisted of sessions focused on the activities desired by the participating children to induce voluntary participation and divided the activities into two teams. In addition, physical activities organized sessions centered on the activities desired by participating children to induce voluntary participation. In the case of physical activities, the team is divided into two teams to work together for the positive results of their teams to plan strategies and actively present personal opinions on how to proceed with the activities. These results were consistent with the results of previous studies that the higher the motivation to participate in sports activities, the higher the self-efficacy, and the healthy relationship experience and interaction with peers led to many changes in improving the self-efficacy of children^[13]. Therefore, it is considered that the environmental factors affecting children's self-efficacy and especially voluntary participation are very important for the program consisting of children's voluntary motivation and active participation in reading and physical activity. Lastly, this study hypothesized that there would be a difference in attention and self-efficacy according to the characteristics of handicraft, reading, and physical activities. Through these results, it was considered that the contents and environment that enable children's motivation and voluntary participation are important variables in the concentration and self-efficacy of children. Therefore, it will be important to find out whether environmental differences, as well as program differences, influence children's motivation and voluntary participation in subsequent studies. This study has the following limitations. First, due to differences in age, gender, and physical condition of the group, it is not possible to generalize the characteristics of the child, it is not possible to control environment when conducting IAP. Based on these limitations, it is considered that future research should be conducted in consideration of the surrounding environment and the personal characteristics of children. In addition, it is difficult to interpret the meaning of the effect due to the short arbitration period.

Conclusion

This study focuses on self-focused and self-focused programs in 22 elementary school children enrolled in the children's center by applying an interest-inducing program consisting of craft activity, reading activity and physical activity for 4 weeks. The change in efficacy was evaluated and the following results were obtained. First, there was no statistically significant difference between before and after concentration in the three groups of interest-induced programs ($p > 0.05$). However, self-efficacy showed statistically significant difference between reading and physical activity ($p < 0.05$). Second, there was no statistically significant difference in concentration and self-efficacy between the three groups of interest-induced programs ($p > 0.05$). Through this, it is considered that it is important to consider not only the systematic program for enhancing the concentration and self-efficacy of the child but also the environmental factors related to the motivation and voluntary participation of the child in the program composition process.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Comparison of Nurse Teachers and General Teachers and Nurses Happy Planet Index

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Abstract

Background/Objectives: The purpose of this study is to suggest alternatives for being happier by measuring teachers and nurses' happy planet index among women who enter professions and by grasping factors that have impacts on clinical nurses' happiness.

Method/Statistical Analysis: This study conducted a survey of a total of 727 teachers and looked into surveys that have 19 questions on the happy planet index and 7 questions on general characteristics. SPSS WIN 23.0 was used as the data analysis method and multivariate analysis of variance(MANOVA) was used to analyze differences in the happy planet index among groups and multiple regression analysis was used to analyze factors that had impacts on the happy planet index.

Findings: The results of this study showed that correlation among the happy planet index and the housing possession and monthly income and working experience was statistically significant and that factors that had impacts on the happy planet index were age and marriage and religion and educational background.

Improvements/Applications: As for the study results, it is reckoned that potential developments and motivation programs that improve self-respect and self-consciousness and that can contribute to organizations should be developed for improvements in the happy planet index of clinical nurses who have very little work experience.

Keywords: Nurse, Happy planet Index, Nurse teachers, General teachers, Psychological well-being.

Introduction

The interesting conversation topic of modern men living in busy daily life is 'happiness.' As an economy develops, the recognition that a rise of incomes is not everything of happiness is being strengthened and interests in mental quality of life or happiness along with material riches increase^[1] Men want happier and

more pleasant life unlike the past when men should be concerned about living from hand to mouth to appease their hunger. Because the definition of happiness is different, depending on individual viewpoints and what you feel about happiness and unhappiness is different even in identical conditions, depending on individual values, defining it in a word is difficult^[2].

Then, what is happiness? As for the concept of happiness, it was defined as delight gotten from enough satisfaction and pleasure in life or blessed and good fortune in Korean standard unabridged dictionary and 'happy' that meant happiness in English stemmed from the word 'happ', an ancient Scandinavian language and meant a fortune or an opportunity^[3]. Also, Socrates, a western philosopher said that happiness was 'summum

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bonum', a state satisfied with everything as the best state that humans can enjoy. Aristoteles said that happiness was summum bonum' that all nature was oriented towards and an excellent activity of a soul pursuing virtue. Epicurean school or utilitarians identified happiness with pleasure.

The study in happiness recently is carried out from ancient philosophers and in many academic fields. Then, happiness is decided by any factor? As for early studies in individual happiness or level of satisfaction of life [4], age and health and education level and income and extroversion and rathymia and religion and marriage and self-respect are suggested as factors that had impacts on happiness.

The study showed that sex or intelligence had not significant impacts on happiness, but men who have young and healthy ages and high levels of education and high incomes and who are outgoing and optimistic and don't worry and have their religions and got married and have high levels of self-respect and the will to work and appropriate aspiration were happier than those who didn't [5].

The study in happiness can largely be divided into two things. First, levels of subjective well-being focusing on subjective judgement on happiness is high. This means satisfaction levels of individual life is high.

Psychological well-being includes self-acceptance and positive interpersonal relationship and autonomy and self-control on the environment and purpose of life and personal growth. Also, the results of foreign studies showed that sex wasn't the factor that had big impacts on happiness experiences [6-9].

Studies for revealing factors that had impacts on happiness in Korea is recently conducted [10,11].

The results of the study showed that men felt happier than women about leisure and social status and self-development and inner-direction and social · political · cultural environment and spouse's love and trust and appearance and health. However, figuring out factors that discriminatorily have impacts on men and women's happiness is a more important thing rather than figuring out any group among men and women experiences more happiness and less happiness [5]. Studies related to the happy planet index have been conducted with various terms such as subjective quality of life and subjective well-being and satisfaction level of life and happiness [12].

The proportion of women among economically active population rose from 49.2% in 2009 to 53.6% in 2009 every [13].

Thus, the purpose of this study is to suggest alternatives for being happier by measuring teachers and nurses' happy planet index among women who enter professions and by grasping factors that have impacts on happiness.

Method

1. Study subject and Study tool: This study figures out three groups' general characteristics. This study measures and compares three groups' happy planet index.

The group of nurse teachers asked the survey in 178 elementary and middle and high schools of C region and the group of general teachers asked the survey in 10 schools and the group of nurses asked the survey in more than 500 sick beds under agreement and cooperation from departments of five medical institutions. 178 surveys from the group of nurse teachers and 291 surveys from the group of general teachers and 301 surveys from the group of nurses were returned. Except for imperfect cases among returned surveys, a total of 727 people including 168 nurse teachers and 277 general teachers and 282 nurses were chosen as final subjects.

Tool questions were composed of a total of 19 questions including one question on family and marriage and three questions on personal relationship and one question on regional society and two questions on daily life and two questions on economic stability and three questions on job and three questions on health and one question on housing. It was considered that the more points of an 11 point Likert scale from 0(very low) to 10(very high) are high. Surveys on subjects' general characteristics such as age and marital status and religion and educational level and position and working experience and monthly income were conducted.

2. Data Collection Method and Data Analysis

Method: The data collection period was from September 1, 2018 to September 30, 2018. Self-administered questionnaires were written. Collected data was entered and analyzed with SPSS WIN 18.0. Subjects' demographical characteristics were analyzed with the frequency and percentage and average and standard deviation. The multivariate analysis of variance (MANOVA) and post hoc

test (Scheffe test) were carried out to compare differences in variables that had impacts on the happy planet index among groups.

Spearman’s correlation analysis was used to analyze the relationship between the happy planet index and variables. Multiple regression analysis was used to analyze factors that had impacts on the happy planet index.

Result and Discussion

1. Subjects’ demographical characteristics: Nurse teachers were 168 women (23.1%) and general teachers were 277 women (38.1%) and nurses were 282 (38.8%) and the total number of them was 727 women. Single women were 404 women (55.6%) and married women were 323 women (44.4%) and women in cohabiting families were 625 women (86.0%) and women without cohabiting families were 102 women (14.0%). Women who graduated from universities were the highest (46.5%) and women who graduated from two-year or three-year colleges were 263 women (36.2%) and women who completed graduate schools were 126 women (17.3%). Women who had their religions were 382 women (52.5%) and women who hadn’t their religions were 345 women (47.5%) and 513 women (70.6%) owned their houses and 214 women (29.4%) lived in yearly and monthly rental houses. 454 women’s average amount of sleep was 7 to 8 hours each day and figures (62.4%) were the highest and 259 women (35.6%) slept under 6 hours and 14 women (1.9%) slept more than 9 hours [Table 1].

2. Comparison of each group’s Happy Planet Index: General teachers’ average happy planet index was 6.83 points, the highest points. There were significant differences in them ($p < .001$) [Table 2]. As for factors related to the happy planet index such as psychological stability and family (marriage) and personal relationship and regional society and daily life and economic stability and job and health and housing possession, happy planet index of the group of nurse teachers and of general teachers was higher than the group of nurses. The recent OECD (Organization for Economic Co-operation and Development [OECD]) happiness index compares the state of well-being based on 11 themes that OECD essentially checked in fields of material living conditions and quality of life^[14]. The similar study.

Table 1. Demographics of the Participants (N = 727)

Variables	N/Mean	%/SD
Age	34.29	9.09
Work experience	9.97	8.84
Individual income	249.40	83.08
Family income	549.72	614.71
Marital status		
Yes (Married)	323	44.4%
No (Single)	404	55.6%
Living status		
Living alone	102	14.0%
Living with others	625	86.0%
Education		
Diploma	263	36.2%
Bachelor degree	338	46.5%
Master or doctoral degree	126	17.3%
Religion		
Yes (Have)	382	52.5%
No (Haven’t)	345	47.5%
Housing ownership		
Living in own house	513	70.6%
Rent house	214	29.4%
Sleeping hours		
<6 hours	259	35.6%
7-8 hours	454	62.4%
>9 hours	14	1.9%

Result showed that clinical nurses’ happiness index that was 2.94 points (5 point scale), average happiness index points to use OECD Better Life Index was shown as the moderate size^[15]. It can be implied that factors related to clinical nurses’ happiness index such as psychological stability and family (Marriage) and personal relationship and regional society and daily life and economic stability and job and health and housing possession were related to the happiness index.

3. Correlation between factors related to happiness: Correlation between age and work experience was 921 ($p < .01$), very high figures and correlation between individual monthly income and work experience was 859 ($p < .01$) and correlation of age was 851 ($p < .01$) and correlation between the happy planet index and housing possession was 758 ($p < .01$), high figures. Correlation between martial status and work experience was 543 ($p < .01$), moderate figures and correlation between martial status and individual monthly income was 488 ($p < .01$), moderate figures. Correlation between individual monthly income

and the happy planet index was 348 ($p < .01$) and correlation between individual monthly income and housing possession was 320 ($p < .01$) and correlation between individual monthly income and household monthly income was 312 ($p < .01$). Correlation between age and the happy planet index was 328 ($p < .01$) and correlation between age and housing possession was 303 ($p < .01$). Correlation between the happy planet index and individual monthly income was 348 ($p < .01$) and correlation between the happy planet index and marital status was 306 ($p < .01$) and correlation between the happy planet index and work experience was 305 ($p < .01$) in consecutive order. Correlation between cohabiting family and marital status was $-.452$ ($p < .01$) and correlation between cohabiting family and age was $-.240$ ($p < .01$). There were significantly negative correlation [Table 3]. The result showed that the more clinical nurses' ages increased, the more high their work experiences because increase in clinical experiences made monthly income increase. As shown in the study of 2013 other than Nam moon hee's study, this corresponded to the result that the more women got married and had their positions and earned high annual incomes, the more high the happiness index was^[16]. It is reckoned that this was shown because a sense of self-satisfaction and a sense of accomplishment based on relaxed and stable life were felt and increased. Also, it is reckoned that improvements in organizational cultures and establishments of measures were needed to improve the happiness index of clinical nurses who had low work experiences.

4. Factor that has an impact on happiness: Variables showing the significant correlation diagram were age and marital status (yes) and religion (yes) and educational background (university) and household monthly income and the average amount of sleep per day (7 to 8 hours) and explanatory power (14.9%) [Table 4]. The happiness index when women got married was .019. When women had their cohabiting families and religions and graduated from universities and monthly incomes of families were high, those had impacts on happiness. This was similar to the result that income was the factor that affected on happiness in the study which conducted the survey of America's nursing university students^[16]. As shown in study's analysis results, it can be found out that clinical nurses' happiness index increased when there were cases described above. It is thought that potential developments and motivation programs that improve self-respect and self-consciousness and that can contribute to organizations should be developed because improvements in clinical nurses' happiness index are important things to improve qualitative levels of clinical nursing. Malee and others in 2009 said that rather than personal elements, organizational elements that had impacts on happiness of people working in nursing universities such as professional advance in job and characteristic of job and work environment and welfare had impacts on happiness. Things that nurses maintain high quality professionalism and keep doing challenging works are factors that have impacts on happiness^[16].

Table 2: Comparison of Happiness index among, Health-education teachers General teachers and Nurses

Variables	Mean±SD			F	Post-hoc test
	Health-education teachers 1	General teachers 2	Nurses 3		
Psychological stability	7.08±1.65	7.23±1.44	6.32±1.40	29.26***	1>3, 2>3
Family (marriage)	7.13±2.02	7.39±1.67	6.49±1.76	18.45***	1>3, 2>3
Personal relationship	7.19±1.50	7.24±1.26	5.92±1.39	16.60***	1>3, 2>3
Community	6.80±1.72	6.87±1.42	5.92±1.39	33.51***	1>3, 2>3
Daily life	6.54±1.60	6.42±1.64	4.90±1.76	74.86***	1>3, 2>3
Economic stability	6.38±1.71	6.35±1.60	5.05±1.48	59.12***	1>3, 2>3
Job	6.51±1.62	7.11±2.07	5.44±1.52	62.58***	1>3, 2>3, 1>2
Health	6.28±1.50	6.28±1.41	5.08±1.50	57.60***	1>3, 2>3,
Housing ownership	6.53±1.92	6.60±1.64	5.44±1.69	37.50***	1>3, 2>3
Total happiness index	6.71±1.34	6.83±1.08	5.70±1.15	75.06***	1>3, 2>3

In MANOVA analysis, $F = 12.22$ (Pillai's test) $p < .001$; *** $< .001$

Table 3: Inter-correlation among study variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age	-									
2. Marriage	.609**	-								
3. Living lonely	-.240**	-.452**	-							
4. Religion	.246**	.159**	-.108**	-						
5. Education	.107**	.162**	.108**	.013	-					
6. Work experience	.921**	.543**	-.235**	.225**	.059	-				
7. Individual income	.851**	.488**	-.172**	.232**	.109**	.859**	-			
8. Family income	.254**	.130**	-.138**	.105**	.012	.248**	.312**	-		
9. Housing ownership	.303**	.258**	-.091*	.122**	.096**	.286**	.320**	.134**	-	
10. Sleeping hours	.021	.044	-.08	.003	.074*	-.020	.045	.006	.074*	-
11. Happiness index	.328**	.306**	-.059	.168**	.183**	.305**	.348**	.080*	.758**	.155**

*p<.05; **<.01; ***<.001

Table 4: Regression analysis of happiness index among the participants

Predictors	Beta	R ²	F	p
Age	-.007	14.9%	5.88	<.001
Marriage (married = 1)	.019			
Living lonely	-.010			
Religion (yes = 1)	.097			
Education (bachelor = 1)	-.024			
Family income	.184			
Sleeping hours (7-8 hours = 1)	.175			

Conclusion

This study conducted in order to provide basic data for nurses’ happy life by grasping clinical nurses and general teachers and nurse teachers’ happy planet index and determining factors that had impacts on the happy planet index.

First, general teachers’ average happy planet index was the highest 6.83 points and nurse teachers’ average happy planet index was 6.71 points and clinical nurses’ average happy planet index was 5.70 points.

Second, the result that analyzed correlation of happiness index factors in this study showed that correlation between the happiness index and housing possession was .758(p<.01) and the more work experience increased, the more high the happiness index was.

Third, the result from multiple regression analysis to analyze factors that had impacts on happiness showed

that the variable showing significant correlation diagram was age, -0.007 and affected happiness significantly.

It is thought that if studies in factors that have impacts on the happiness index such as work environment and characteristic as well as clinical nurses’ personal factors are tried based on these study results in the future, studies with a high level of reliability and validity is carried out.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Cognition and Behavior of Oral Health in Preschool Parents

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Abstract

Background/Objectives: This study was conducted to investigate the oral health cognition and behavior of 83 children's parents. The results of this study were as follow. First, the questionnaire consisted of eight items on oral health behavior and three items on parental oral health cognition. Improper oral health care behavior responses resulted, and the necessity of fluoride application of oral health awareness scored lower than the necessity of oral health education and regular dental checkups.

Method/Statistical Analysis: Targeting a total 83 parents at daycare centers in the C region, September 2018-October 2018, this study distributed the home notification, questionnaire, and research consent form to each home through their children. The completed research consent forms and questionnaires were collected by the daycare centers from the children.

Findings: The three times of brushing daily, two-three minutes of brushing each time, and the '1/3, 1/2 of the toothbrush for the amount of toothpaste used received the most responses. Many respondents changed their toothbrushes every four weeks. 72.3% of respondents used fluoride toothpaste, and 72.3% of respondents were controlling food and snacks containing sugar. 73.5% of parents were receiving regular oral examination, and 30.0% of parents received it once a year. 84.3% of parents were using secondary oral hygiene products. The average oral health perception was 4.26 while the necessities of fluoride application, regular dental examination, and oral health education averaged 3.59, 4.63, and 4.63 respectively.

Improvements/Applications: It would be necessary to vitalize the oral health project and oral health education for parents and children, and also to have accurate and systematic studies on more inclusive and diverse elements.

Keywords: Oral health, Oral health cognition. Oral health behavior; Preschool parents, Oral health education.

Introduction

Korea is conducting the oral health project for pregnant women and infants under the plan of oral

health project of Article 5 (establishment of oral health project basic plan) of the Oral Health Act, and also intends to conduct oral health education at kindergartens and schools, group brushing, fluoride mouth-rinsing, oral health diagnosis, and continuous oral healthcare through the school oral health project under Article 12, Clause 3, No. 1 of the enforcement ordinance of the Oral Health Act. According to Article 16, Clause 1 of the enforcement ordinance of the Oral Health Act, the oral health education plan for pregnant women and infants should be established and conducted every year (some revised legislation of the Oral Health Act, Korea, 2016). Compared to the policy, however, the oral

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health education for pregnant women and preschoolers is not actively performed. As the one-time education at educational institutes for children is neither continuous nor systematic, it has been reported that the effects of education are unacceptable^[1]. In the preschool age, it is necessary to prevent oral diseases by regularly visiting the dentist, and also to be educated about regular oral examination/treatment, fluoride application, dietary control, and oral care while the oral health could be improved by parents' education, guidance, and care at home^[2].

Contrary to emphasizing the treatment in the past, the direction of medical science is gradually changing to preventive medicine. Dentistry is also changing from treatment-centered to prevention-centered. The necessity of prevention-centered education is emphasized.

Considering the change in eating habits, increased intake of sticky saccharic processed food, high experience rate of dental caries, and high rate of early tooth extraction caused by the modernization and urbanization from the late 20th century, the oral health education that could prevent it proactively should be preceded first. As a period of moving beyond the nurturer's care because of social changes related to childcare caused by changes in family structure or increase of parents' social activities, approximately 80% of young children age three-five are enrolled at kindergarten or childcare facilities^[3] while the children's use of childcare institutes is also increasing. Even though the snacks, drinks, and food provided by childcare institutes include many foods causing dental caries such as bread, yogurt, and drinks^[4]. The education at kindergarten or childcare facilities, and homes is not sufficient. On top of supporting educational media or training of diverse educational method, it would be necessary to develop the oral health education programs based on close cooperation with families.

The oral health behavior refers to the general attitude towards oral health and the behavioral characteristics, and the factors affecting individuals' oral health behavior are considerably diverse^[5]. Once there is a problem with oral health, it has effects on the overall health. The oral symptoms have effects on the oral functions, which impact the subjective oral health condition again and affects the quality of life. As the parents' oral health perception has effects on their children's oral health behavior, there should be more research on the characteristics of parents, and oral health education and programs suitable for the oral health

perception and behavior^[6]. Such oral health education programs fully considering the oral health perception and behavior, would make parents realize more the effects on the improvement of oral health level and the enhancement of oral health^[7-8]. Thus, the purpose of this study was to establish the basic data for the development of a customized oral health education program and its method by understanding the parents' oral health perception and behavior.

Method

- 1. Method:** Targeting a total of 83 parents at kindergartens in C region, September 2018-October 2018, this study distributed the home notification, questionnaire, and research consent form to each home by their children. The completed research consent forms and questionnaires were collected by the kindergartens by the children again.
- 2. Materials:** On top of the questions about the general characteristics such as age and sex, the questionnaire was composed of eight questions about parents' oral health behavior and three questions about parents' oral health perception. Using the SPSS 22.0 Program, this study conducted the frequency analysis on the general characteristics of the subjects and the measured variables.

Result and Discussion

- 1. Oral Health Behavior:** In the oral health behavior of the research subjects, regarding the number of brushing daily, three times (65.1%) was the most. In case of the brushing duration per each time, two, three minutes (38.6%) were the most. Regarding the toothpaste used for brushing, the 'use of 1/3 and 1/2 of the toothbrush' showed the same frequency as 34.9%. In case of the toothbrush change period, the change of it once in four weeks (42.2%) was the most. 72.3% of the parents were using the fluoride toothpaste while the 72.3% of the parents were controlling the food and snacks containing sugar. 73.5% of the parents were receiving the regular oral examination, and the annual regular examination showed the highest percentage (30.1%). 84.3% of the parents were using the secondary oral hygiene products, and currently, 72.3% of the parents were using the fluoride toothpaste. 53.0% of the guardians responded that they received the brushing education from a health center or clinic [Table 1].

Table 1. Oral Health Behavior

Variables	Section	Frequency	Valid Percentage
Guardian’s number of brushing daily	One time	2	2.4
	Two times	19	22.9
	Three times	54	65.1
	Four times or more	8	9.6
Guardian’s brushing time	30 seconds	2	2.4
	One minute	12	14.5
	Two minutes	32	38.6
	Three minutes	32	38.6
	More than three minutes	5	6.0
Guardian’s amount of toothpaste	As big as a bean	21	25.3
	1/3 of toothbrush	29	34.9
	1/2 of toothbrush	29	34.9
	3/2 of toothbrush or more	4	4.8
Guardian’s toothbrush change period	Two weeks	6	7.2
	Three weeks	14	16.9
	Four weeks	35	42.2
	Five weeks or more	28	33.7
Guardian’s use of fluoride toothpaste	Use	60	72.3
	Do not use	23	27.7
Guardian’s control of food and snacks containing sugar	Control	60	72.3
	Do not control	23	27.7
Guardian’s regular oral examination	Every six months	16	19.3
	Once a year	25	30.1
	A year or longer	20	24.1
	Do not schedule examination	22	26.5
Oral hygiene secondary products in use+	Use	70	84.3
	Do not use	13	15.7
Place where the guardian has received the education of brushing method	Never learned it	3	3.6
	School	19	22.9
	Home	11	13.3
	Health center or clinic	44	53.0
	Others	6	7.2

2. Oral Health Perception: In the oral health perception of the subjects, the necessities of fluoride application, regular dental examination, and oral health education were shown as average 3.59, average 4.55, and average 4.63 respectively while the oral health perception was average 4.26 [Table 2].

Table 2. Oral Health Perception

Variables	Mean±SD	Range
Necessity of fluoride application	3.59±0.11	1-5
Necessity of regular dental examination	4.55±0.77	1-5
Necessity of oral health education	4.63±0.68	1-5

Discussion

The modern medical science is changing from the treatment-centered to the prevention-centered^[9]. To improve the oral health, it is emphasized to conduct health education that could influence health, knowledge, attitude, behavior, and the healthy behavioral aspect of each community member. Also, there have been many studies reporting that the parents’ oral health knowledge and behavior would play a crucial role in the establishment of children’s oral health, and they would also have major effects on the family health and education^[10-13].

According to the subjects' oral health behavior revealed in this study, in the number of brushing daily, less than three times was 25.3%, and 16.9% of the respondents brushed their teeth for less than a minute. Such improper brushing habits could influence children. Also, the necessity of regular dental examination was 4.55 of the highest 5 while 26.5% of the respondents did not receive regular oral healthcare. This means that they do not practice regular oral healthcare even though they feel the necessity to do so.

In the oral health perception, the necessities of regular dental examination and oral health education were shown as 4.55 and 4.63 respectively of the highest 5 while the necessity of fluoride application was shown as low as 3.59. The awareness of effects and convenience of fluoride application may be low.

Considering the change of eating habits, increased intake of sticky saccharic processed food, high experience rate of dental caries, and high rate of early tooth extraction caused by the modernization and urbanization from the late 20th century, to effectively practice oral health and to prevent the oral diseases of preschoolers, the oral health education for the continuous oral healthcare of children and parents should be preceded first.

The oral health condition has effects on the quality of life, and the parents' oral health perception has effects on the oral health behavior of their children. The oral health education programs could realize the effects on the improvement of oral health level and the enhancement of oral health. It would be necessary to have more studies on the characteristics of parents, and the specialized oral health education suitable for the oral health perception and behavior.

Conclusion

This study examined the oral health perception and behavior targeting a total of 83 parents at kindergartens in C region September 2018-October 2018, and the results of analyzing the questionnaires composed of eight questions about oral health behavior and three questions about oral health perception are as follow. Using the SPSS 22.0 Program, this study conducted the frequency analysis on the general characteristics of the subjects and the measured variables.

First, the three times of brushing daily, two-three minutes of brushing per each time, and the '1/3, 1/2 of the toothbrush for the amount of used toothpaste

received the most responses.

Second, many respondents changed their toothbrushes every four weeks. 72.3% of the respondents used the fluoride toothpaste, and 72.3% of the respondents were controlling the food and snacks containing sugar.

Third, 73.5% of the parents were receiving the regular oral examination, and the 30.0% of the parents received it once a year. 84.3% of the parents were using the secondary oral hygiene products.

Fourth, the average oral health perception was 4.26 while the necessities of fluoride application, regular dental examination, and oral health education were average 3.59, 4.63, and 4.63 respectively.

Such results show the necessities of fluoride application, regular dental examination, and oral health education for parents, and also their improper oral healthcare behavior, which would have indirect effects on children. Thus, in the future, it would be necessary to vitalize the oral health project and oral health education for parents and children, and also to have the accurate and systematic research on more inclusive and diverse elements.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Big Data Analysis for Child Well-being on Academic Research

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Abstract

Background/Objectives: This study is to examine the well-being of child in the world of child's life such as development, education, and play in a phenomenological manner.

Method/Statistical Analysis: We based data collected through educational and academic information sources (RISS) search as big data, and analyzed the keywords and the network analyzed by the 'well-being', 'wellness' and 'Chamsari' keywords. The frequency, ranking, and connection of the keywords were analyzed through the process of processing the collected unstructured text into the data suitable for research and analysis.

Findings: This study tried to reveal the reality of child well-being through phenomenological perspective based on the understanding of experts about child well-being through academic big data analysis. The results of the study showed that psychological themes such as activities, body, emotion, subjectivity, and psychology were highly linked with child's well-being. Child who live well in the phenomenological attitude exhibition were distinguished from adults and they were justifying adult control and intervention by refracting them as immature beings. In addition, it points out that the uniqueness of individual existence undermines the originality of the existing child, and furthermore, it can realize the child's disaster by expanding the unique life style of the child's existence by the advancement of the fusion of expression through the subjective expression of the unique individual existence experienced by the child, and the dialogue based on the ethics with the other.

Improvements/Applications: This study suggests that the ideological foundation of living and human public service should be prepared.

Keywords: *Child Well-being, child wellness, big data, child development, child education, child play, phenomenological manner.*

Introduction

In 2015, the UN General Assembly was held in Incheon and adopted 17 Sustainable Development Goals (SDGs) which include "Well-being" and "Quality Education". It showed keen interest from the world in the role of education for "Child Well-being" and

understanding of the meaning of child well-being. Additionally, it was also seen as the mankind's efforts for spirit, practice, their orientation and attitude to open the communal future world by reflecting on human well-being in the course of development of human civilization and technologies through the understanding of child well-being^[1-2]. If we ask ourselves again about the question of child well-being, "how to live well?" means that, of course, "what do we have to do to live well?", or the questions of "what can we know" and "what can we do". They are all difficult questions to answer. But we all want to live well. Therefore, it is also a question that is constantly being asked by oneself and mankind^[3].

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It is no exaggeration to say that human culture

is a culture of technology. As such, the technology, science and human civilization have developed into one integrated dynamic mechanism that cannot be separated^[4]. Technical civilization has contributed to the co-prosperity of mankind, but has also given rise to the phenomenon of human alienation. Modern child are living precariously on the spire of the most innovative technological civilization with imminent singularity that artificial intelligence surpasses humans^[4]. Child well-being is a question of “how can child perceive and form their own world in order to explore their own world well?” In addition, it can be also seen as creating an educational and social support system for this goal^[1]. To this end, adults around them should look at the very existence of child as they are. Through the various phenomena and languages that look into child well-being, we should not only improve our understanding of child well-being but also come up with support measures for child well-being. Through the Web (the meaning of information access through the Internet,

such as web sites and web pages) where human perception and consciousness are actively expressed and shared in language, we are able to have access to a common understanding of child well-being^[2].

The vast amount of data on the Web is called big data. Big data analysis takes an empirical approach to analyze such big data with logic and mathematical approaches for the “3V” characteristics of “Volume,” “Velocity” and “Variety.” Furthermore, big data is also defined as “5V” with added “Value, Insight” and “Very Complexity”^[5-7].

Three big questions in philosophy are: “how to live”, “how to know?” and “how does that happen”; while child well-being asks “how can a child perceive and organize his/her own world and move forward to this world?” To this end, we need to look inside and outside the child’s living world and look back at the adults inside the phenomenon^[8-10].

“From the subject of recognizing the world and the object of the world, how far in that sense can child go into the situation itself?”, “how close can child experience and perceive things?”, and “how can they finally reveal that knowledge?”: these questions are the purpose of child well-being’s big data analysis.

Method

This study defined academic works gathered from

academic databases used by domestic and foreign experts as big data and collected academic data on the subject of ‘well-being’, ‘wellness’ and ‘Chamsari (referring to “well-being” in Korean)’ on the academic research information service (www.riss.kr). The collected text data were compiled by removing unnecessary terms, symbols, numbers, etc. and adding terminologies to refine the data, and dividing the sentences into minimum units through the morphological analysis technique among natural language processing techniques. Based on the frequency and relationship of the key keywords, the researchers wanted to reveal their understanding and perception of the phenomenon.

The frequency, ranking, and connection of the keywords were analyzed through the process of processing the collected unstructured text into the data suitable for research and analysis^[11]. First of all, a word frequency analysis table was presented through the keyword analysis and visualization analysis was performed on the data. Second, the relationship between major keywords was analyzed through the keyword network analysis. Betweenness centrality was a measure of centrality in a graph based on shortest paths. Eigenvector centrality is a measure of the influence of a node in a network. We analyzed the statistical analysis of the study by using R studio.

Result and Discussion

1. Child Well-being on Domestic Academic Research: According to the frequency analysis of big data keywords, experts’ data on child well-being showed that there were about 60 times more overseas studies (12,239 cases) than domestic studies (206 cases), indicating that interest in and research on child well-being is taking place overseas more actively than in Korea. The analysis of big data keywords for domestic academic research on child well-being is as follows in Table 1 and Figure 1. The main theme related to child well-being was the words such as body, physical, and activity. And the main related words were activity, body, education, nurture, play and toys. Interest in physical health was higher than that in emotions, society and spirit. The main topics of play, education and nurture in child reflected high interest and understanding in play, development and upbringing environment as to child well-being.

Table 1. Frequency analysis and betweenness centrality of Major Words among the Words Related to the Child Well-being on Domestic Academic Research

Frequency Analysis			Betweenness Centrality		
Ranking	Keyword	Frequency	Ranking	Keyword	Centrality
1	Child	44	1	Wellness	1515
2	Physical	20	2	Child	1403
3	Activity	18	3	Well-Being	872
4	Behavior	16	4	Activity	212
5	Play	16	5	Child	142
6	Body	14	6	Physical	112
7	Child	14	7	Education	108
8	Infant	14	8	Parenting	86
9	Well-being	14	9	Toy	80
10	Design	12	10	Play	60

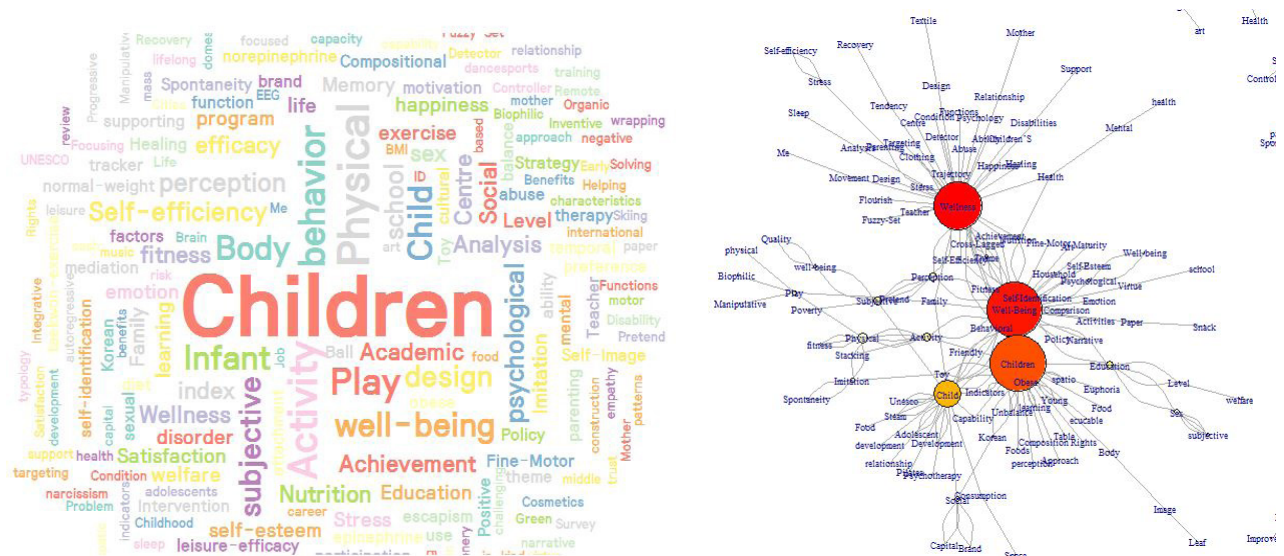


Figure 1. Keywords Visualization and Network analysis of Child Well-being on Domestic Academic Research

2. Child Well-being on International Academic Research: The big data-based keyword analysis results of international academic studies on child well-being are as follows in Table 2 and Figure 3. The main topics related to child well-being were words such as body, subjective, health, family, spirit, and emotion.

The key associations were subjective, psychological, emotional, social, mental and spiritual. The studies were highly interested in the study of the subjective cognition and perception of existence of child well-being and the importance of the psychological, social, emotional and spiritual environment around child for child well-being.

spirituality. In Korea, it is also necessary to understand and pay attention to the child's disaster based on the OECD's Child Well-Being Indicators (physical, housing and environment, educational, health and safety, risk behavior, quality of school life) and the UN Convention on the Rights of Child (survival, protection, development, participation)^{[8-9][11]}.

Conclusion

Discussion and conclusion of big data research to provide basic data for the preparation of measures for child well-being are as follows: first, overseas academic research was being conducted more vigorously compared to Korea's domestic academic research on child well-being, showing the need for more increased interest and researches in child well-being. So we should consolidate the basis of the solution for child well-being. Second, while domestic studies for child well-being mostly focused on visible patterns of behavior, such as child's body, activities and play, overseas research sheds light on child well-being in various ways with a diverse approach to philosophy and theory, such as cognitive subject, sentiment, spirit and spirituality. Thus, Korea needs to provide in-depth insights into their human and physical surroundings and interactions between child for child well-being, thereby creating a virtuous cycle of new horizon and convergence on play, development and education for child well-being through social consensus neck stretching and extensor reinforcement exercise, which are commonly used in clinicians.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Effect of Sanitizers and Disinfectants in *Staphylococcus Saprophyticus*

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Abstract

Background/Objectives: In the dental environment, handpiece or ultrasonic scaler used in treatment causes aerosols and various pathogenic microorganisms. Many types of pathogens cause infectious diseases. This study is to identify surface disinfectants suitable for the management of *Staphylococcus saprophyticus* bacterial species, one of the causes of infection in medical institutions to use them as standardized surface management resources for infection control in dental clinic.

Method/Statistical Analysis: Commonly used 7 types of disinfectants were classified to select commercialized disinfectants. Samples were taken by rubbing the surface of the unit chair with a sterile swab. In order to check the bacterial species cultured in the medium, a single colony was purely separated by streaking. To identify the bacterial species, DNA was extracted from the bacteria and PCR was performed. the mean and standard deviation of each group. One-way ANOVA and Scheffe's post-test were carried out to identify the clear zone of paper discs and significant differences between groups.

Findings: The test for bacterial identification was carried out for the surface flora of the unit chair. As a result, *S. saprophyticus* was identified on the surface. According to the result of comparative analysis of the clear zone size of each disinfectant, sodium hypochlorite (NaOCl), a chlorine disinfectant was found to have the highest disinfection effect (8.52mm), followed by Distell, an ammonium compound disinfectant (2.72).

Improvements/Applications: The result of the analysis of the clear zone of the disinfectant showed excellent antibacterial activity in 0.3% NaOCl and 0.5% Distel, indicating that they are disinfectants suitable for *S. saprophyticus* used in the study.

Keywords: *Bioaerosol, Disinfectant, Sanitizer, Staphylococcus saprophyticus, Unit chair.*

Introduction

In the dental environment, handpiece or ultrasonic scaler used in treatment causes aerosols and various pathogenic microorganisms^[1]. Many types of pathogens

caused by handpiece treatment using the spraying force of compressed air are likely to cause infectious diseases by floating the treatment space and falling to the surface of the dental equipment^[2]. Staphylococci are Gram-positive cocci that are present in the mucous membranes of the skin and oral throat, and are known to be the main bacteria of purulent inflammation^[3]. Multidrug-resistant bacterial infections called superbacteria are particularly deadly among infections in medical institutions because treatment is difficult. Among them, the typical methicillin-resistant *Staphylococcus aureus* requires further management because it has an infection rate of 62-66% in hospitals and 46-49% in clinics^[4]. Present on human mucous membranes and skin as normal bacteria,

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Staphylococcus aureus not only causes toxin-type food poisoning caused by enterotoxin, but also causes various purulent infections and fatal sepsis, which account for more than 80% of the purulent diseases in the treatment^[5]. In some cases, infections in soft tissues, salivary glands, extraction sites, and alveolar bones may expand to the facial area. Therefore, the importance of *staphylococcus aureus* infection control is very emphasized. Among staphylococci of the same series, *Staphylococcus epidermidis* and *Staphylococcus saprophyticus* (*S. saprophyticus*), which are problematic in clinical trial, are known to be infectious bacteria in hospitals and are at risk in invasive medical devices or in groups with low immunity and sometimes appear in urinary tract infections in young women^[6-7].

In order to manage infection in the dental environment, the Ministry of Health and Welfare implemented a certification system for dental hospitals in 2014 and presented the legislation of medical institution evaluation and infection control standards^[8]. In the United States, the Centers for Disease Control and Prevention (CDC) recommends disinfecting the surface of the unit chairs such as examining tables, switches, and lamp handles contaminated by aerosol formation, etc. after each patient's treatment, or using a protective cover in case of visible contamination. Infection control refers to a management method to prevent or reduce the causes of infection in medical institutions in order to protect patients, staff, visitors and other environments^[9], and various types of disinfectants and sterilizers are used for infection control in dental clinic. Disinfection is an operation that removes the risk of infection by destroying the viability of pathogenic microorganisms using relatively weak sterilizing power and that kills some of the microorganisms, and sterilization is the process of destroying all types of organisms, including gemmula, using physical and chemical method and means complete sterility^[10]. As disinfection and sterilization method commonly used in dental clinics, the autoclaving method is commonly carried out for metal equipment for dental treatment, and chemical disinfection such as glutaraldehyde, physical disinfection such as ultrasound and ultraviolet disinfection are conducted for rubber and plastic materials^[11]. However, accurate cleaning, disinfection and sterilization are important because improper disinfection and sterilization are more likely to lead to cross infections. Jeong et al.^[12] emphasized the importance of sterilization and disinfection method suitable for instruments and equipment by presenting the

research findings that the contamination of bacteria was very high when the surface around the unit chair was not disinfected and pathogens were further spread from the cause of infection when the surface disinfectant was not applied with the proper disinfection method.

Thus, the purpose of this study is to identify surface disinfectants suitable for the management of *S. saprophyticus* bacterial species, one of the causes of infection in medical institutions to use them as standardized surface management resources for infection control in dental clinics.

Method

Samples were taken by rubbing the surface of the unit chair with a sterile swab. 100 µL of each collected sample was dispensed to premade LB medium (Becton; Dickinson and Company, Sparks, MD, USA) and spreading was performed with a sterile glass rod. They were cultured in a culture medium for 24 hours at 37°C and the number of colonies was measured. In order to check the bacterial species cultured in the medium, a single colony was purely separated by streaking. To identify the bacterial species, DNA was extracted from the bacteria and PCR was performed.

S. saprophyticus (KCCM 41662) was purchased from Korean Culture Center of Microorganisms (KCCM). Each microorganism was activated by tryptic soy broth (TSB; BD, Sparks, MD, USA) with 5% sheep blood and was diluted at a 2x10⁶ ratio.

Commonly used 7 types of disinfectants were classified to select commercialized disinfectants. The disinfectants were prepared and used in the ratio shown in [Table 1] immediately before the test as recommended by the manufacturer.

Table 1. List of sanitizer and disinfectant in this study

Variables	Concentration (%)
PBS	100
Alcohol	70
Hydrogen peroxide	3
Sodium Hypochlorite	0.3
Y-Na Solution	2
Distel	0.5
Eco rich	100

100 µL (2x10⁶) of *S. saprophyticus* was applied on a solid LB medium. 30 µL of each experimental group

was dropped onto a paper disc, and it was placed on the LB medium inoculated with the bacteria. After keeping it at 37°C for 24 hours in each environment, the diameter of the clear zone was measured on a paper disc. The average value and standard deviation were obtained after three repeated experiments, to measure the diameter of the clear zone, where the growth was inhibited. The average value of clear zone was calculated, and used for comparative analysis in the results.

SPSS 24.0 program was used for the statistical analysis. Descriptive statistics were used to obtain the mean and standard deviation of each group. One-way ANOVA and Scheffe’s post-test were carried out to identify the clear zone of paper discs and significant differences between groups.

Result and Discussion

1. General characteristics of the bacterial species:

In this study, microorganisms were collected from the surface of the unit chair to measure the contamination caused by these floating bacteria. The test for bacterial identification was carried out for the surface flora of the unit chair. As a result, *S. saprophyticus* was identified on the surface [Table 2].

Table 2. Characterization of *S. saprophyticus*

Family	Staphylococcaceae
Genus	Staphylococcus
Species	Staphylococcus saprophyticus

2. Antimicrobial Activity: Seven disinfectants were applied to *S. saprophyticus* and as a result, the largest clear zone was found in sodium hypochlorite [Figure 1].

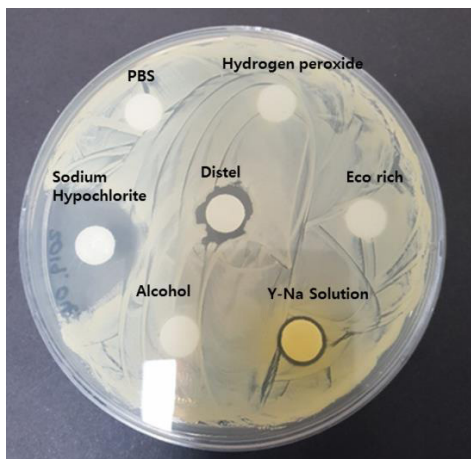


Figure 1. Comparison of death zones by disinfectant

According to the result of comparative analysis of the clear zone size of each disinfectant, sodium hypochlorite (NaOCl), a chlorine disinfectant was found to have the highest disinfection effect (8.52mm), followed by Distell, an ammonium compound disinfectant (2.72) [Table 3].

Table 3. Values of death zone by sanitizer and disinfectant

Variables	Mean	SD	p-value
Control(PBS)	0.00	0.00	0.000***
Alcohol	0.00	0.00	
Hydrogen peroxide	0.00	0.00	
Sodium Hypochlorite	8.51	0.07	
Y-Na Solution	1.14	0.12	
Distel	2.72	0.70	
Eco rich	0.00	0.00	

***: p<0.01

Discussion

As the importance of hospital infections is highlighted in recent years, there is a growing interest in problems with infection control systems in dental clinics. In dental clinics where bioaerosol is generated such as handpieces and ultrasonic scalers, bio aerosols float in the air drop and cause contamination, causing infectious diseases by dental medical instruments^[13-16]. Various instrument surfaces in the dental clinics also warn that infection can be a source of contamination and a source of contamination^[17].

Staphylococcal infections are known as the main infectious organisms, not limited to their area of occurrence. In particular, affecting groups with weak immunity, it is most problematic in neonatal rooms, intensive care units, operating rooms, etc. and sometimes causes community infections by discharge patients^[18-19]. Among them, *S. saprophyticus* is 5 ~ 8 MM in diameter, very glossy, opaque, smooth and convex.

It has been suggested that the water quality of the unit chair is an important issue for both patients and dental staff because it is exposed to water and aerosols derived from the unit chair^[20]. In addition, various previous studies have identified that *S. saprophyticus* is often included among the microorganisms isolated from the unit chair water line^[21]. Based on this finding, water and aerosols in the form of *S. saprophyticus* are believed to be produced in dental clinics. Previous studies have

recommended proper disinfection and sterilization to avoid infection, and experts emphasized the need to follow standard procedures such as risk assessment, patient protection, sterilization and disinfection^[22-23]. Therefore, various disinfectants were applied to find an appropriate method for disinfecting microbial strains.

Disinfection is the process of killing all pathogenic microorganisms except for the spores of bacteria on the surface of the object. It is usually done using liquid chemical disinfectants and the level and duration of the disinfectant is determined depending on the degree of disinfection of the treatment equipment^[24].

NaOCl releases hypochlorous acid to inhibit enzymatic activity in cells and denatures cell proteins, resulting in bactericidal effects. The guidelines of the Society for Healthcare Epidemiology of America (SHEA) and the Infectious Diseases Society of America (IDSA) recommend 0.1% NaOCl (1,000 ppm effective chlorine) for environmental disinfection to prevent the propagation of pathogenic microorganisms^[25]. In this study, 0.3% NaOCl was used according to the manufacturer's instructions. Used at a higher concentration than IDSA, it was considered to show significantly higher killing effect. Among the various disinfectants, the use of chlorine disinfectants was found to be high due to the economic aspects and convenience of use^[26].

The second most effective disinfectant was found to be 0.5% Distel. This disinfectant belongs to the quaternary ammonium disinfectant. Characterized by weak alkali, the quaternary ammonium disinfectant is known to be widely used as a skin disinfectant, preservative, and preserved agent because of its ability to inhibit bacterial culture and sterilization^[27]. In addition, the sterilization effect is excellent in all the pH range, it is a stable disinfectant due to the relatively small influence by temperature.

The third effective disinfectant was 1.14 in 2% Y-Na solution. The most commonly used disinfectant in the world is most effective when used as a 2% buffer solution at pH 7.5-8.5. It can be used as a high level disinfectant and sterilizer for all Gram-positive and Gram-negative bacteria, fungi, viruses (including HBV and HIV) and bacterial spores, including tuberculosis^[28]. However, there is a possibility that toxic substances can be generated when absorbed into plastic products of unit chair, so it is known that caution is required. It is

important to avoid spraying and use personal protective equipment.

In order to carry out higher quality care in addition to the development of dentistry, research on infection control and cross-infection prevention should be carried out continuously. In order to develop a systematic infection control program in Korea, it is necessary to introduce more strict foreign standards for appropriate management for each situation

Conclusion

In this study, *S. saprophyticus*, which affects the surface contamination and causes opportunistic infections, was used to analyze the antimicrobial activity of several disinfectants. The result of the analysis of the clear zone of the disinfectant showed excellent antibacterial activity in 0.3% NaOCl and 0.5% Distel, indicating that they are disinfectants suitable for *S. saprophyticus* used in the study. Based on the above results, a more effective and systematic surface management system is required by analyzing selective killing disinfectants of strains causing specific surface contamination.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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The Effect of Task-based upper Limb Training on Activities of Daily Living and Upper Limb Function in Chronic Stroke Patients

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Abstract

Background/Objectives: The goal of this study was to survey the influence on intervention of task-based upper limb training on activities of daily living and upper limb function in chronic stroke patients.

Method/Statistical Analysis: 32 patients were randomly divided into two groups. For the affected upper limb, the experimental group (N=16) applied the task-based training program (TBTP) and the control group (N=16) performed the non-task-based training (NTBT). Both groups executed 5 times per week, 30 minutes per session for 4 weeks. The paired t-test was used to compare before and after intervention results of each group. The independent t-test was used to compare changes in results between the groups.

Findings: In the TBTP group, the pre-intervention of Fugl-Meyer assessment (FMA) is 46.75 ± 3.75 and the post-intervention score is 50.88 ± 4.92 . In the NTBT group, the FMA had a pre-intervention score of 47.44 ± 4.44 and a post-intervention score of 49.13 ± 5.14 . Both groups showed statistically significant differences before and after intervention ($p < 0.01$). In the TBTP group, the pre-intervention score of Korean versions of modified Barthel Index (K-MBI) was 73.31 ± 6.91 and the post-intervention was 79.00 ± 6.96 ($p < 0.01$) after intervention. The K-MBI score of the NTBT group in before intervention was 78.63 ± 6.32 , after intervention 73.81 ± 6.01 . Both groups showed significant differences before and after intervention ($p > 0.05$). In all assessments, no differences were observed between groups before and after intervention.

Improvements/Applications: This study did not show that TBTP is more effective than NTBT in improving the daily activities and upper limb function of stroke patients.

Keywords: stroke, task-based training, upper limb motor function, chronic patients, daily activities.

Introduction

Stroke is a cerebrovascular disease caused by the bursting or blocking of blood vessels that supply blood to the brain^[1]. This causes various problems, as well as problems of motor function due to paralysis of the body.

In particular, approximately 69% or more hemiplegic patients experience dysfunction of the paralyzed upper extremity^[2]. Exercise disorders in the upper limbs reduce the independence in daily life by limiting the use of functional upper arms^[3]. In rehabilitation of stroke patients, the principle of neuroplasticity is the therapeutic basis. Neuroplasticity is the process in which the brain forms new neurons and lays down new connections between neurons, in response to learning, in order to form a pathway to repeat the learned behavior. This occurs by performing repetitive and active tasks with the paralyzed upper limb^[4]. Recently, a study applying a task-based approach among the treatments for improving the upper

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limb function of stroke patients has been conducted^[5]. The task-based approach focuses on the patient's task performance. This leads to functional improvement by attempting to solve the problems by providing a functional task rather than repeatedly practicing normal movement patterns^[6]. This task-based approach is a functional approach that can be applied to the rehabilitation of patients with neurological impairment. This enables patients to adapt to their surroundings by learning task-specific strategies and improves upper limb movement patterns, dexterity, and manipulation skills^[7]. In addition, unlike the conventional treatment method that repeatedly trained movements, problems assigned to functional tasks are solved through the interaction of the body organs associated with the tasks. This task-based approach can present a variety of functional activities to patients and can help them improve their daily activities^[8]. Therefore, if the upper limb training is carried out with the tasks available in real life, the performance of daily life can be improved more^[9]. Based on the above, this study investigated the effects of task-based training on upper limb function and daily activities in chronic stroke patients.

Materials and Method

In this study, we randomly divided the 32 study subjects into two groups, which in the TBTP group and the NTBT group. (Table 1) These participants met the selection criteria and gave voluntary consent to take part in the study. The criteria for selection were as follows: First, hemiplegic patients of stroke more than 6 months from onset period Second, a score of ≥ 24 in Korean version of the Mini-Mental Status Examination (MMSE-K) Thirdly, a level of \geq Brunnstrom recovery of upper limb stage 4 Fourth, in the line bicection test, patients without unilateral neglect Fifth, patients without musculoskeletal disorders such as joint contracture or limited range of motion

Table 1. Individual information of patients

Characteristics	TBTPG (N=16)	NTBTG (N=16)
Gender (Male/Female)	6/10	8/8
Side of Hemiplegia	Rt.11/ Lt.5	Rt. 10/ Lt. 6
Age (year)	61.43 \pm 9.81	62.01 \pm 8.10
MMSE-K	25.67 \pm 1.05	24.80 \pm 1.46
Onset (Months)	7.60 \pm 1.20	7.20 \pm 1.28

M \pm SD: mean \pm standard deviation. TBTPG: task-based training program group, NTBTG: non-task based training group MMSE-K: mini-mental status examination

Fugl-Meyer Motor Function Assessment(FMA) and Korean Version of Modified Barthel Index(K-MBI) were performed to evaluate in stroke patients. FMA is used to classify hemiplegic patients with stroke as a Brunnstrom recovery stage and to assess functional recovery^[10]. Fugl-Meyer et al. developed an assessment tool by defining 50 detailed movements according to the six stages of recovery in Brunnstrom's hemiplegic patients. Depending on the performance of the evaluation item, 0 to 2 points are given. 0 point is not performed, 1 point is partially performed, and 2 points are divided into complete performed. The overall score ranges from 0 to 100, including upper and lower limbs. There are 33 items in the upper part of the test, which is 66 points. The details of upper limb examination are 18 items for shoulder/ elbow/ forearm, 5 items for wrist, 7 items for hand (finger), and 3 items for upper limb coordination ability^[11]. Sanford et al. reported an inter-rater reliability of 0.96 for upper limb examination^[12]. In this study, only upper limb test items were used for upper limb function evaluation. MBI is one evaluation method for ADL measurement and consists of 10 items^[13]. The K-MBI used in Korea was validated the effectiveness of stroke patients and demonstrated excellent intra-rater reliability (0.87~1.00) and excellent inter-rater reliability (0.93~0.98). A higher score on the K-MBI represents a higher degree of independence in performing basic ADLs^[14].

The task-based program in the study was based on previous research^[15]. The program contents are shown in Table 2.

Table 2. Task-based training program

Program	Method
Turn door open door	Stand about 30cm away from the closed door. Then grab the knocker with the affected hand and turn it to the right to open the door. Pull the door to open about 20cm, then the door to push the door closed.
Pouring water into a cup	Pour half the water into a 1L plastic light kettle. Hold the handle of the kettle with the affected hand and pour up to 2/3 of the plastic cup.
Open and close the beverage bottle	Hold the closed beverage bottle with the hand on the side and fix it. Place the lid on your desk, grab it and turn it to the right to close it.
Lock and release the buttons on the clothes	Lock and release the buttons on the prepared clothes with both hands.

The results of the collected data were analyzed using SPSS (ver. 18.0) statistical program. The values of MBI and FMA were normally distributed and the parametric test were conducted. Homogeneity test was performed on both groups before the assessment. Corresponding sample *t*-tests were performed to compare the differences between the two groups before and after the intervention, and independent sample *t*-tests were used to compare the differences between the groups after the intervention. The statistical significance level was 0.05

Result

1. General characteristics of the subjects:

The overall procedure is as follows: Subjects were divided into the TBTP group (16 patients) and the NTBT group (16 patients). The intervention was conducted for 5 weeks each week for 30 minutes for 4 weeks. For the affected upper limb, the experimental group (N = 16) applied TBTP and the control group (N = 16) performed NTBT. The posture for performing the training is as follows. Sit on the backrest chair, maintain correct posture and place upper limbs on the table. Hip, knee and ankle joints flex at 90 degrees. The overall process of study is as follows. (Figure 1)

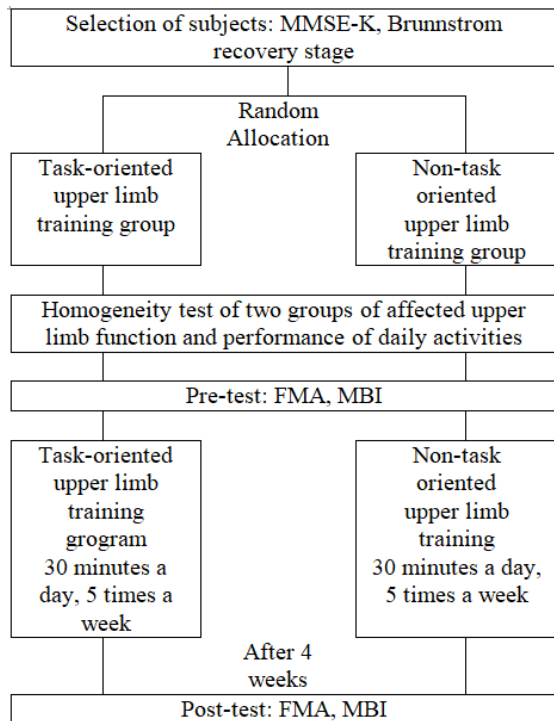


Figure 1. Process of the study

2. Comparison of FMA score during the intervention on each group:

The comparison of FMA scores for

intervention in each group is as follows. (Table 3) The FMA score of the pre-intervention TBTP group was 46.75±3.75 and the post-intervention score was 50.88±4.92. The score of FMA in pre-intervention NTBT group was 47.44±4.44 and post-intervention score was 49.13 ± 5.14. Significant changes in FMA before and after intervention were observed in both groups (p<0.01). However, there was no significant difference between groups before and after intervention (p> 0.05).

Table 3. A comparison of FMA during the intervention on each group

	TBTP group (n=16)	NTBT group (n=16)	F	p
Pre	46.75±3.75	47.44±4.44	0.536	0.470
Post	50.88±4.92	49.13±5.14		
Change	4.13±2.28	1.69±1.78	0.378	0.543
	t	-7.247	t	-3.796
	p	.000***	p	.001**

M±SD: mean±standard deviation. Significance was tested by independent t-test and by paired t-test (*p<0.05, **p<0.01, ***p<0.001) FMA: Fugl-Meyer assessment TBTP: task-based training program, NTBT: non-task-based training

3. Comparison of MBI score during the intervention on each group:

The comparison of K-MBI scores for intervention in each group is as follows. (Table 4) The K-MBI score of the pre-intervention TBTP group was 73.31±6.91 and the post-intervention score was 79.00±6.96. The K-MBI score of the NTBT group before intervention was 73.81±6.01 and the score after intervention was 78.63±6.32. Significant changes in K-MBI were observed in both groups before and after intervention (p < 0.01). However, there was no significant difference between groups before and after intervention (p > 0.05).

Table 4. A comparison of K-MBI during the intervention on each group

	TBTP Group (n=16)	NTBT Group (n=16)	F	p
Pre	73.31±6.91	73.81±6.01	0.507	0.482
Post	79.00±6.96	78.63±6.32		
Change	5.38±3.26	5.06±4.33	0.116	0.736
	t	-6.239	t	-4.231
	p	.000***	p	.002**

M±SD: mean±standard deviation. Significance was tested by independent t-test and by paired t-test (*p<0.05, **p<0.01, ***p<0.001), K-MBI: Korea version of modified barthel index, TBTP: task-based training program, NTBT: non-task based training

Discussion

After the stroke, the physical independence and daily activities of the patient are very important factors in the area of brain damage and initiation of rehabilitation. Therefore, a variety of rehabilitation is needed to minimize the disability of patients after onset and to quickly restore the performance of daily living activities^[16]. At present, various interventions are applied in stroke patients in the treatment, and there is a growing interest in task-based approaches. Therefore, the purpose of this study was to investigate how upper limb function and activities of daily living improved when various programs suitable for daily living activities were applied to patients. Previous study has reported that task-based intervention is effective in improving upper limb function when applied to patients with chronic stroke who have upper limb function impairment^[17]. In addition, repetitive task-oriented training is effective for not only restoring function of stroke patients but also for functioning of daily activities^[18]. The results of this study showed statistically significant increase in the function of the affected upper limb both before and after intervention in both TBTP and NTBT groups. However, there was no statistical significance between the two groups in the group comparison, but the TBTP showed more improvement after intervention than NTBT. Because of the small number of subjects and the short period of intervention, the reason for this study is insufficient to determine the effect on stroke performance. Therefore, follow-up studies should be conducted to increase the number of subjects and to examine the impact of TBTP over a sufficient period of study.

Conclusion

This study did not show that TBTP is more effective in improving upper limb function and daily activities of stroke patients than NTBT. The reason for this is that the number of subjects in the study was small and the duration of intervention was short. Therefore, in future studies, if the number of subjects is increased and the basis of TBTP is established after sufficient study period, it may be an effective therapeutic approach to improve the function and daily activities of the stroke patients.

Ethical Clearance: Kangwon National University

Source of Funding: Nil

Conflict of Interest: Nil

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The Effects of Task-oriented Mirror Therapy on the Upper Extremity Function and Brain Activation in Chronic Stroke Patients

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Abstract

Background/Objectives: This study was conducted to examine how task-oriented mirror therapy changes the upper extremity function and brain activation in chronic stroke patients.

Method/Statistical Analysis: This study applied mirror therapy to two stroke patients and used a paired t-test to examine the differences before and after treatment and the Telescan program to examine the brain activation.

Findings: As a result of examining the upper extremity function after mirror therapy, the Fugl-Meyer Assessment scores improved from 21.0 ± 1.41 before treatment to 24.5 ± 1.71 after treatment, and the Wolf Motor Function test scores also improved from 27.0 ± 5.66 to 33.5 ± 6.36 . The brain activity also increased after treatment.

Improvements/Applications: The use of mirror therapy in stroke patients improved the recovery of upper extremity function and increased the brain activation.

Keywords: Stroke, mirror therapy, neuroplasticity, upper extremity function, brain activation.

Introduction

Strokes cause problems related to sensation, vision, perception, cognitive thinking, and language, and most patients experience difficulties in moving or activities due to motor impairment^[1]. The less severe the initial disability, the more prognosis the stroke is. The degree of recovery is very difficult due to the large individual differences, and the motor dysfunction remains in

about 50% or more patients, and the upper extremity dysfunction is particularly prominent^[2]. About 30%-66% of stroke patients have difficulties in daily activities due to paralyzed hands and are unable to recover their motor function. Therefore, paralysis of upper extremity in stroke patients is one of the fatal effects in daily living^[3].

In order to promote recovery of impaired motor function or to acquire new motor function, plasticity changes of the brain nerves involved in motor functions are essential^[4]. The ultimate goal of treatment in stroke patients is to restore brain function by improving neural plasticity, to restore normal posture and motion, and to reduce abnormalities in posture and muscle tone to ensure efficient movement^[5].

Recently, various treatment strategies based on neuroplasticity have been used to recover from

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strokes, such as action observation, imagery training, mirror therapy, virtual reality, robot-assisted therapy, and constraint-induced movement therapy^[6]. These intensive task-trainings have been shown to improve motor function in stroke patients, but have been shown to be generally costly and time consuming^[7]. Among these treatment method, mirror therapy is a simple, economical, and effective method which places a mirror between the arms or legs so that the normal movement of the non-affected side is shown to provide normal movement on the affected side^[8]. This is possible through the mechanism called mirror neurons, and Ramachandran invented the 'mirror box' to help alleviate phantom limb pain^[9]. It can also increase motivation and efficiency by providing task-oriented treatment during mirror therapy^[10]. The task-oriented approach is lead to the active use of damaged upper limbs by improving the ability of daily living and by providing a more effective treatment method composed of various functional activities^[11]. In addition, this study suggest that as a mediation for the improvement of cognitive function and daily living behavior of stroke patients, it can actively try to solve problems by providing functional tasks^[12].

Mirror neurons were initially found in several brain regions of the monkey, premotor cortex(PMC), inferior parietal lobule(IPL), and superior temporal sulcus, a mechanism called the mirror neuron system^[13]. Previous studies using functional magnetic resonance imaging (fMRI) found that networks similar to mirror neuron systems exist in humans^[14], and suggested that these networks engage in new motor skills through observational learning and facilitate skill acquisition after strokes^[15].

Recent advances in brain science and brain mapping technologies have led to the development of neurophysiological changes and motor function recovery mechanisms by functional magnetic resonance imaging (fMRI), positron emission tomography (PET), and electroencephalogram (EEG)^[16]. EEG is a simple, relatively inexpensive, and noninvasive method that provides useful information for directly observing functional changes in the cerebral cortex^[17]. EEG measurement can be applied to patients with various diagnoses such as brain damage, alcoholism, and depression to examine the functional state of the brain in real-time while focusing on a specific task^[18].

Human thoughts and actions depend on brain activity and are shown in the form of brain waves^[19].

To improve the recovery of the upper limbs of stroke patients, the damaged regions of the brain must be reconstructed^[20]. Therefore, the purpose of this study is to examine how task-oriented mirror therapy changes the upper extremity function and brain activation in chronic stroke patients.

Materials and Method

- 1. Participants:** The participants of this study were two males, and the study was performed after explaining the purpose and method of the study and obtaining a consent from the participants. The participants were selected by the following criteria: (1) Patients who survived beyond 6 months after stroke onset, (2) patients without unilateral neglect and visual impairment, (3) Patients who can follow instructions and communicate with MMSE-K scores above 24, (4) patients with no previous exposure to mirror therapy. This study excluded (1) those who have other neurological damage or surgical conditions other than stroke and (2) those who take antipsychotic drugs.
- 2. Intervention:** The mirror therapy was performed by placing a mirror in the median sagittal plane of the participant, then placing the paralyzed arm behind the mirror, and moving the paralyzed arm along with the reflected movement of the normal arm. The participants carried out the tasks with the normal hand during mirror therapy. The tasks involved 6 different movements: (a) wrist flexion and extension, (b) finger opposition, (c) hand grasp and release, and (d) using chopsticks. Each task was performed for 5 minutes for a total of 30 minutes and the treatment was performed 4 times a week for one month.
- 3. Measure:** The Fugl-Meyer Assessment (FMA) was used to evaluate functional changes in the sub-regions of the upper extremity. The Brunnstrom Approach was used to distinguish detailed movements by classifying the functions of stroke patients into 50 categories. Zero to 2 points are given according to the performance level, and out of a total of 100 points, the test corresponding to arms consists of 33 items for 66 points and 34 points for legs.

The Wolf Motor Function Test (WMFT) is a tool developed to evaluate the upper extremity function in stroke patients, which consists of a total of 17

items (2 items for muscle strength measurement, 15 items for functional tasks). Each item is performed for 2 minutes, and functional ability score is evaluated on a 6-point scale (0-5).

EEG was performed by attaching electrodes on the participant’s scalp before they received mirror therapy. The electrodes were attached according to international standards (10%-20%). The electrodes were attached after removing sweat and wiping grease layers with alcohol swabs before the EEG measurements to improve the signal quality. The brain activation was confirmed through brain mapping by visually examining changes in the regions of the brain during mirror therapy.

4. Data analysis and statistics: This study used a paired t-test to examine the effects of mirror therapy on upper extremity function and used the Telescan program (LAXTHA Inc.) to examine brain activation during mirror therapy.

Results

1. The effect of mirror therapy on upper extremity function: As a result of examining the upper

extremity function of the participants, the functional changes of FMA and WMFT are as follows.

As shown in [Table 1], the FMA scores improved from 21.0±1.41 before treatment to 24.5±1.71 after treatment and showed a statistically significant difference. The WMFT scores also improved from 27.0±5.66 to 33.5±6.36 and showed a statistically significant difference.

Table 1. Comparison of FMA & WMFT scores before and after mirror therapy

Evaluation	Pre-test	Post-test	t	P
FMA	21.0±1.41	24.5±1.71	-2.33	.02*
WMFT	27.0±5.66	33.5±6.36	-3.11	.04*

The values are mean±standard deviation, FMA, WMFT. p<0.05 by paired t-test.

2. The effect of mirror therapy on brain activation: The results of examining the brain activation of the participants are as follows.

As shown in [Figures 1 and 2], both participants exhibited higher brain activation after mirror therapy.

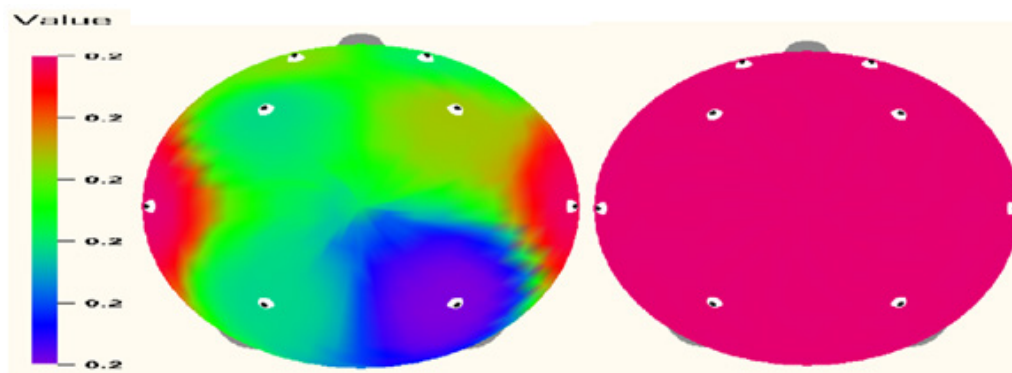


Figure 1. Brain activation before and after mirror therapy in participant 1

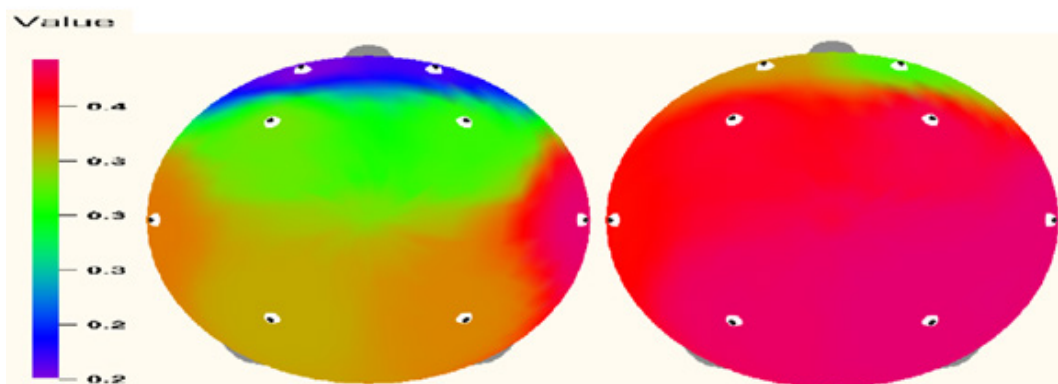


Figure 2. Brain activation before and after mirror therapy in participant 2

Discussion

Stroke is one of the leading diseases that cause problems in the upper extremity. This makes it difficult to perform tasks such as stretching, grasping, manipulating, and moving objects, and causes problems in daily activities^[21]. Mirror therapy is a treatment method to recover the function of paralyzed limbs by observing the movement of the normal limbs reflected in the mirror. Many previous studies have shown recovery of upper limb functions by mirror therapy. However, patients get bored due to repeating simple movements during the treatment and the treatment effects are not always consistent^[22]. Therefore, this study provided tasks combining simple and functional movements to improve the effects of recovering upper limb functions and to increase the concentration of the participants.

Similar to the results of this study, there are reports showing that stroke patients recovered FMA upper extremity functions by receiving mirror therapy including traditional occupational therapy. Both patients who received simple mirror therapy and those who received task-oriented mirror therapy showed improved upper limb functions, and the latter showed about 10% more improvement compared to the former. The functional improvement of complex movements was limited when the therapy was focused on simple movements, but task-oriented mirror therapy continuously improved upper extremity function^[23]. Since the hands of an individual are connected in time and space^[24], the effect of the treatment can be generalized by properly using both hands during task-oriented treatment^[10]. Although mirror therapy does not involve the movement of paralyzed limbs, it has similar neurological effects and produces benefits similar to those from bilateral movement.

The brain activation also increased during mirror therapy. Leocani et al. (2001) reported that increased beta-wave activity during movement influences the activation of the cerebral cortex^[25], and described that the area of the cerebrum first activated gradually activates other areas of the cerebrum while performing the task^[26].

The limitation of this study is that it cannot be generalized because of the small number of participants. However, it was found that task-oriented mirror therapy increased both the upper extremity function and the brain activity of stroke patients. Ultimately, the reconstruction of the brain is necessary to improve the function of stroke patients. Mirror therapy increased the brain activation,

so additional method to improve motor function should be considered.

Conclusion

This study was performed to examine how task-oriented mirror therapy changes the upper extremity function and brain activation in stroke patients. As a result of examining the upper extremity function of two stroke patients after mirror therapy, both patients showed improved FMA and WMFT scores and increased brain activation. Therefore, more functional movements need to be included rather than simple movements in the task-oriented mirror therapy of stroke patients to improve the quality of life.

Ethical Clearance: Kangwon National University

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Conflict of Interest: Nil

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An Effect of Communication Training Program on Communication Skills and Empathic Ability

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Abstract

Background/Objectives: The purpose of this study is to investigate how the communication training program effects on communication skills and empathy ability in dental hygiene students.

Method/Statistical Analysis: 21 students who wanted to participate in the communication program and 23 students who did not want to participate in the program were set as the control group. After implementing the communication program, we evaluated the improvement of communication skills and empathy before and after the program. The communication program consisted of 4 sessions (2-3 hours per session)

Findings: Unlike the control group, the experimental group showed statistically significant effect of the program in both communication ability and empathy ability. Dental hygiene students have a good understanding other's perspectives, while their ability to overcome stereotypical thinking and creative communication is low.

Improvements/Applications: Communication program is effective in improving communication ability and empathy ability, so more detailed and specialized programs should be developed to cultivate communication skill and empathy ability.

Keywords: *Communication training program, Dental hygiene, Communication skill, Empathy ability, Pay attention, Creative communication.*

Introduction

Communication, which is continuously conducted in personal relations through verbal and nonverbal interactions, is essential to the development of personal relations^[1], and serves as an important means to develop individuals' personalities as well as their relationships with other people^[2]. The ability to communicate effectively is necessary in the formation of amicable personal relations. Communication ability refers to the capability to exchange both verbal and nonverbal messages between participants, and necessitates

performance of the complex task of conveying one's own message and accepting that of others^[3]. Empathic ability is indispensable in verbal and nonverbal communication and verbal and nonverbal communication based on empathic ability is important to the communication ability^[4].

Empathy, a concept often used in sociology and psychology, is the internal mental capacity to feel the emotions and experiences of other person as if they are one's own^[5]. Empathy is the basic foundation of personal relations. Empathic understanding in human relations induces altruistic motives and increases prosocial behavior^[6]. A previous study showed that the communication ability of college students has a significant effect on their adaptation to college life, and that those who listen well to others have a higher adaptability to both society and college life^[7]. In addition, information delivery capacity, listening

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capacity, communication ability suitable to subjects, and empathic ability has been proposed as the communication capabilities that college students in Korea currently need to cultivate^[8]. The ability to communicate effectively enables one to grow appropriately, and is necessary for all college students. However, this ability is more important for college students majoring in dental hygiene, because dental hygienists are required to display the ability to effectively communicate with various types of personal relations in dental clinic^[9].

A Communication training program in the curriculum for dental hygiene is necessary to foster the development of dental hygienists equipped with communication ability based on empathic ability. However, there has been little research about empathic ability and communication ability. The present study was conducted to investigate the improvement of communication ability and empathic ability in dental hygiene students by means of the communication training program, as well as to provide the fundamental data necessary to determine the directions of the major curriculum.

Method

The present study was conducted with 44 college students majoring in dental hygiene. The 23 subjects who were willing to participate in the communication training program were allocated to the experimental group, and the 21 subjects those who did not participate in the program were allocated to the control group. The present study was approved by the Institutional Review Board of B University (IRB Office-007).

The communication training program was conducted from May to June 2019. The numbers of subjects were 21 in the experimental group and 23 in the control group. After completion of the communication training program, subjects' improvement in communication ability and empathic ability was evaluated. The communication training program consisted of four sessions, each session 2 to 3 hours long. The program included E-disc testing and group discussion in Week 1, detailed practice according to the E-disc test results in

Week 2, communication method in industries in Week 3, and communication scenario preparation in various settings in Week 4.

The inventory used in the present study was that reconstructed by Jeon^[10] with reference to the communication ability scale for college students and adults, developed by Lee et al.^[11], and the Empathy Index prepared by Bryant^[12] and translated into Korean by Park^[13]. The questionnaire for measuring communication ability included 49 questions related to seven subfactors, specifically information gathering, paying attention, overcoming stereotypical thinking, creative communication, self-revealing, leading communication, and understanding another's perspective. The questionnaire for measuring empathic ability included 30 questions related to cognitive empathy ability and emotional empathy ability.

In the present study, the communication ability and empathic ability of the college students majoring in dental hygiene were measured before and after implementation of the communication training program. The homogeneity of the two groups was tested by a t-test before the experiment. An ANCOVA was performed to analyze the differences between the experimental group and the control group after completion of the training program. The statistical analysis was performed using the SPSS 22.0 software program.

Result and Discussion

- 1. Students' communication ability and empathic ability prior to the program:** [Table 1] shows the students' communication ability and empathic ability prior to the program. The average communication ability scores were 3.31 in the experimental group and 3.26 in the control group; these scores were not significantly different. No differences were found between the two groups in any of the seven sub-categories. The average scores for empathic ability were 3.57 in the experimental group and 3.54 in the control group, again with no significant difference between the two.

Table 1. Pre-test

Variables	EG	CG	t value	P
	Mean±S.D.	Mean±S.D.		
Communication Skill				
Total	3.31±0.27	3.26±0.21	-0.70	0.49
Information gathering	3.46±0.44	3.34±0.37	-1.05	0.30
Pay attention	3.55±0.36	3.44±0.39	-0.96	0.34
Overcoming stereotypical thinking	2.72±0.45	2.71±0.40	-0.05	0.96
Creative Communication	2.91±0.32	2.80±0.26	-1.33	0.19
Self-reveal	3.43±0.58	3.54±0.47	0.70	0.49
Leading communication	3.28±0.55	3.30±0.39	0.14	0.89
Understanding other’s perspective	3.82±0.55	3.70±0.31	-0.96	0.34
Empathy Ability				
Total	3.57±0.48	3.54±0.30	0.90	0.83
Cognitive empathy	3.56±0.51	3.54±0.36	0.78	0.90
Emotional empathy	3.58±0.53	3.54±0.31	0.83	0.78

* p<.05 ** p<.01, EG: Experimental group, CG: Control group

2. Change after the program: [Table 2] shows the students’ communication ability and empathic ability after the program. The communication ability score of the experimental group was 3.62, higher than that of the control group (3.18). Among the sub-categories, the scores of the experimental group were higher than those of the control group in information gathering, paying attention, overcoming stereotypical thinking, creative communication, leading communication, and understanding other’s perspective (p < .05). The empathic ability score of the experimental group was 3.62, higher than that of the control group (3.25). The scores of the experimental group were also higher in the categories

of cognitive empathy ability and emotional empathy ability.

As shown in Table 1 & 2, the communication ability score was increased by the communication training program in the experimental group from 3.31 to 3.59, but the score was decreased in the control group from 3.26 to 3.18. Similarly, the empathic ability was slightly increased in the experimental group from 3.57 to 3.61, while it was decreased in the control group from 3.54 to 3.25. The scores in the experimental and control groups, which showed no significant difference prior to program, did show a significant difference after the program (p < .05).

Table 2. Post-test

Variables	EG	CG	t value
	Mean±S.D	Mean±S.D	
Communication skill			
Total	3.59±0.39	3.18±0.33	-4.12**
Information gathering	3.63±0.50	3.18±0.38	-3.40**
Pay attention	3.73±0.45	3.21±0.56	-3.06**
Overcoming stereotypical thinking	2.80±0.45	2.31±0.60	-3.34**
Creative Communication	3.08±0.51	2.63±0.31	-3.58**
Self-reveal	3.59±0.65	3.37±0.62	-1.11
Leading communication	3.58±0.59	3.20±0.52	-2.25*
Understanding other’s perspective	3.91±0.52	3.44±0.52	-3.05**

Variables	EG	CG	t value
	Mean±S.D	Mean±S.D	
Empathy ability			
Total	3.61±0.51	3.25±0.40	-2.74**
Cognitive empathy	3.60±0.53	3.27±0.44	-2.22*
Emotional empathy	3.65±0.57	3.23±0.43	-2.81**

* $p < .05$ ** $p < .01$, EG: Experimental group, CG: Control group

Discussion

In the diverse medical environment, empathy-based communication ability is emphasized as a capability with which dental hygienists should be equipped^[9]. The present study was conducted to investigate improvements in communication ability and empathic ability in college students majoring in dental hygiene by means of the communication training program, and to provide the fundamental data necessary to determine the directions of the curriculum.

As shown in Table 1 and 2, the communication ability in the experimental group was increased from 3.31 to 3.59. In contrast, that of the control group was slightly decreased from 3.26 to 3.18. While the two groups did not show a difference in communication ability prior to implementation of the training program, they showed a significant difference after the implementation. The average communication ability identified in a previous study using the same questionnaire was 3.77, slightly higher than those of the subjects of the present study^[14]. This finding highlights the need to provide a training program for effective communication to students majoring in dental hygiene.

With respect to the subfactors of the communication ability, as shown in Table 1, the scores in the areas of paying attention and understanding other's perspective were, respectively, 3.55 and 3.82, slightly higher than those of other subfactors. Since paying attention is an ability that has a positive effect on social adaptation, the ability of the subjects to pay attention to others may be used as an important communication skill in their future clinical settings. In contrast, the scores of overcoming stereotypical thinking and creative communication were, respectively, 2.72 and 2.91, and these scores were not significantly changed even after implementation of the communication program.

The ability to overcome stereotypical thinking is closely related to the capacity to communicate smoothly

with the various patients that dental hygienists meet in the clinic. The ability to overcome stereotypical thinking may be increased not only through communication training with individuals of a variety of backgrounds, but also as a result of undergoing various experiences^[15]. Therefore, the college students may need to participate in a variety of voluntary services, and an innovative teaching method including various communication skills may be necessary. The lack of creative communication may be related to the unique features of the dental hygiene major. The students majoring in dental hygiene may not have the space for developing creative thinking, because the lectures are designed as training for skills requiring accuracy and agility, such as prevention of dental diseases and cooperation in dental treatment. Further studies may need to be conducted using an in-depth open-type questionnaire to investigate the causes of the lack of creative communication ability in the subjects. In addition, a customized communication training program may need to be developed to improve the students' ability in the two subfactor areas.

Understanding other's perspective was increased in the experimental group from 3.59 to 3.9, but it was decreased in the control group from 3.7 to 3.4 (Tables 1 and 2). The ability to understand other's perspective has been reported as an essential element of communication ability, as it is closely related to the abilities to pay attention and empathize^[16]. Understanding other's perspective is also considered an essential aspect of communication ability in the communication with the patients that the hygienists will encounter in dental clinics. Therefore, emphasis should be placed on the ability to understand other's perspective in developing a communication training program customized to the major.

With respect to the empathic ability scores before and after implementation of the program, as shown in Tables 1 and 2, the scores were increased in the experimental group but slightly decreased in the control

group. A similar pattern was found in the sub-categories of cognitive empathy and emotional empathy. As the empathic ability is closely related to the communication ability, these two factors have been reported to have mutual mediating effects^[17]. In addition, empathic ability is necessary to develop good relationships with others and is closely related to prosocial behavior^[18].

In the present study, as the empathic ability was decreased in the control group after implementation of the program, a significant difference was observed between two groups. This result may be related to the period when the post test was conducted, is not necessary during the final examinations. The result may be consistent with those of previous reports that found that the stress induced by studies had a negative effect on communication^[19, 20]. A similar pattern was found in empathic ability. These results suggest that a communication training program for students majoring in dental hygiene should be prepared by investigating the categories in which the subjects lack ability, in order to provide programs customized to individual majors and individual subjects.

The present study was conducted to investigate the effect of the communication training program on the improvement of communication ability and empathic ability in the students majoring in dental hygiene. This study has several limitations. First, the results of the present study have limited generalizability to all students majoring in dental hygiene, because the subjects of the present study were students majoring in dental hygiene at a single university located in Chungnam. Second, since the present study was dependent upon a self-reporting questionnaire, the results of the present study may have a low objective reliability owing to the possibility of self-defending and subjective thinking by the subjects. Third, the present study did not take into consideration the background variables and the various factors that may affect the communication ability of the college students, including academic grades, income level, and family environment.

However, the present study is significant because the improvement of the communication ability and empathic ability of the students majoring in dental hygiene was investigated after implementation of the communication training program. The results of the present study may be used as fundamental data to prepare a systematic program to improve the communication ability and empathic ability of college students.

Conclusion

The results of the present study showed that the communication training program is effective in improving the communication ability and empathic ability of college students majoring in dental hygiene. With regard to the subfactors, the students majoring in dental hygiene showed high communication ability scores in paying attention to others and understanding other's perspective, but showed low scores in overcoming stereotypical thinking and creative communication. Therefore, communication training programs or courses customized to individual subjects may be needed in preparing a communication training program for students majoring in dental hygiene.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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A Study on the Standardization of the 6-Minute Walking Test for Elderly Koreans

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Abstract

Background/Objectives: 6-minute walking distance is a method for evaluating cardiopulmonary function and assessing physical performance. However, the data used in clinics are calculated from Americans. So we measure distance for Asians.

Method/Statistical Analysis: In this study, measurement of 6-minute walking distance was performed according to the 2003 American Thoracic Society guidelines. We measured the 6-minute walking distance, body mass index, oxygen saturation, heart rate, and blood pressure.

Findings: The mean 6-minute walking distance of elderly Koreans was found to be 458.5 m. The mean 6-minute walking distances for elderly Korean men and women were determined to be 470.01 m and 452.18 m, respectively, with a statistically significant difference ($p < 0.05$).

Improvements/Applications: Although Koreans do not represent all Asians, it is necessary that calculations of the 6-minute walking distance are tailored for the Asian population or using the body muscle mass weight.

Keywords: 6-minute walking test, aerobic exercise, cardiopulmonary capacity, Asian, elderly population.

Introduction

In many countries, the rapid increase of the elderly population has led to an increase in the number of patients with cardiovascular diseases such as heart failure and coronary heart disease. Excessive exercise can adversely affect the health of the elderly. Therefore, a test is needed to evaluate the function of the cardiovascular system and prescribe individualized aerobic exercise levels. The 6-minute walk test (6MWT) is a field walk test developed to evaluate the condition, prognosis,

and appropriateness of treatment for cardiopulmonary diseases based on the 12-minute run test developed in 1978 [1]. The measurement method is simple and inexpensive as the walking distance is calculated by measuring the speed of an individual walking as fast as possible for 6 minutes, and it is widely used in clinical settings to estimate the maximum oxygen consumption using an equation [2]. Therefore, the 6MWT, which is continuously used all over the world [3], is considered a useful test for patients with chronic cardiopulmonary disease [4].

In addition, the 6MWT is a useful tool for evaluating pedestrian endurance in terms of function, and it is a criterion for determining the degree of mobility in individuals [5-7]. As such, the 6MWT is a commonly used walking test because of its ease and simplicity, and it is effectively used for predicting maximum athletic performance in many population groups [8].

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Since the 6MWT is widely used, various researchers have developed several equations to calculate the standard walking distance using physical characteristics such as height, weight, and sex [9].

However, a single formula cannot reflect the differences in demographic, physical, environmental, and physiological characteristics of each region, which lead to discrepancies in values between subjects and countries. Consistent progress has been made on the standardization of the 6-minute walking distance [10,11].

Moreover, the 6MWT currently in use was developed for use 20 years ago, and the average body size of people has increased since then. A 6MWT different from that used for Westerners is needed for Asians as the 6MWT currently in use was developed for Westerners [12].

Many countries are already working on 6MWT standardizations that reflect their demographic, physical, environmental, and physiological characteristics; however, there is a lack of research on this aspect, in Asia. Therefore, this study aimed to standardize the 6MWT tailored for the demographic characteristics of elderly Asians by constructing a database using measurements of the standard 6-minute walking distance of elderly Koreans aged 65 and above.

Method

This study was reviewed by the Institutional Review Board. From June 1, 2017 to May 31, 2018, a cross-sectional survey was conducted on 300 elderly people over 65 years of age who agreed to participate in the study in S city, Gyeonggi-do. Subjects with a body mass index (BMI) of 35 kg/m² or higher and those with cardiopulmonary disease, neurological disorders, orthopedic diseases associated with pain while walking, or other diseases that could affect the test were excluded from the study.

The 6MWT: The 6MWT was based on the 2003 American Thoracic Society guidelines [13]. A biosignal meter was used to measure BMI, oxygen saturation (SPO₂), heart rate (HR), and blood pressure (BP). For safety during the study, leg pain, dyspnea, and chest pain were evaluated using a leg pain scale, a dyspnea scale, and a chest pain scale, respectively.

Intervention: Height, weight, and BMI were measured as general subject characteristics. For uniformity, all the measurements were made indoors

and the subjects were provided with shoes. The subjects undertook two 6MWTs and the longer distance covered was recorded. In addition, SPO₂, HR, and BP were measured before and after the test.

Data Analysis: The SPSS 20.0 program was used in this study to calculate the mean 6-minute walking distance according to sex and the 6-minute walking distance for all the subjects. Correlation analysis was conducted to determine the effect of each variable. The significance level (α) for verifying statistical significance was 0.05.

Result and Discussion

- General characteristics of subjects and 6MWT results:** The 106 men enrolled in this study had a mean age of 76.66 ± 4.18 years, a mean height of 166 ± 5.27 cm, a mean weight of 65.58 ± 9.45 kg, and a mean BMI of 28.16 ± 3.57 kg/m². The 194 women in this study had a mean age of 74.01 ± 4.75 years, a mean height of 154.3 ± 5.97 cm, a mean weight of 57.9 ± 7.56 kg, and a mean BMI of 29.53 ± 3.6 kg/m² (p<0.05) (Table 1).

Table 1. General characteristics and mean 6-minute walking distance of elderly Koreans

	Men (n=106)	Women (n=194)	t	p
Age (years)	76.66 ± 4.18	74.01 ± 4.75		non
Height (cm)	166 ± 5.27	154.34 ± 5.97		non
Weight (kg)	65.58 ± 9.45	57.9 ± 7.56		non
BMI (kg/m ²)	28.16 ± 3.57	29.53 ± 3.6		non
6MWT distance (m)	470.02 ± 77.31	452.18 ± 64.39	2.134	.034

* mean ± standard deviation BMI: body mass index 6MWT: 6-minute walking

- Correlation Analysis:** Correlation analysis revealed a positive correlation between the 6-minute walking distance and the height of subjects. In other words, the taller the subject, the longer the 6-minute walking distance. On the other hand, a negative correlation was found between the BMI and age of the subjects. In other words, the lower the BMI, the younger the age, and the longer the 6-minute walking distance. Of the characteristics considered, age correlated the most with the 6-minute walking distance (r = -.286), followed by height (r = .172), and BMI correlated the least (r = -.080) (Table 2).

Table 2. Correlation coefficient

		6MWT	Height	BMI	Age
6 MW	Pearson	1	.172**	-.080	-.286**
	Significance		.003	.167	.000
Height	Pearson	.172**	1	-.254**	-.064
	Significance	.003		.000	.272
BMI	Pearson	-.080	-.254**	1	.002
	Significance	.167	.000		.972
AGE	Pearson	-.286**	-.064	.002	1
	Significance	.000	.272	.972	

** p< 0.01 level, 6MW: 6-minute walking, 6MWT: 6MW test, BMI: body mass index

We analyzed the factors affecting the 6-minute walking distance, and they included height, weight, and age. The 6-minute walking distance was found to have a positive correlation with height and a negative correlation with age. However, we found that weight had no effect on the walking distance (Figure 1). The aim of this study was to investigate the standardized 6-minute walking distance of elderly Koreans aged 65 years and above and to build a database. Speed and endurance are the main factors that determine mobility during walking [6], and they are frequently used for the prediction and evaluation of community walking ability [5]. For this purpose, 6MWT has been used in many studies [5,6,14].

The mean 6-minute walking distance of men was 470.02 m and that of women was 452.18 m. In an earlier study, mean values were 598.5 ± 57.92 m for men and 580.9 ± 47.80 m for women. The age of the subjects in this earlier study differed from that of the subjects in our study, but the result is consistent with our correlation analysis finding of a negative correlation between the 6-minute walking distance and age. Another previous study reported a mean 6-minute walking distance of 250 m in patients with hemiplegia [6], and yet another study reported a mean 6-minute walking distance of 516 ± 195 m in patients with chronic obstructive pulmonary disease [15]. Although the 6MWT has been performed for healthy adults and for certain disease groups, there has not been sufficient research aimed at determining the 6-minute walking distance of elderly Koreans; therefore, direct comparisons cannot be made. This study makes it possible to assess the current health levels of elderly Koreans.

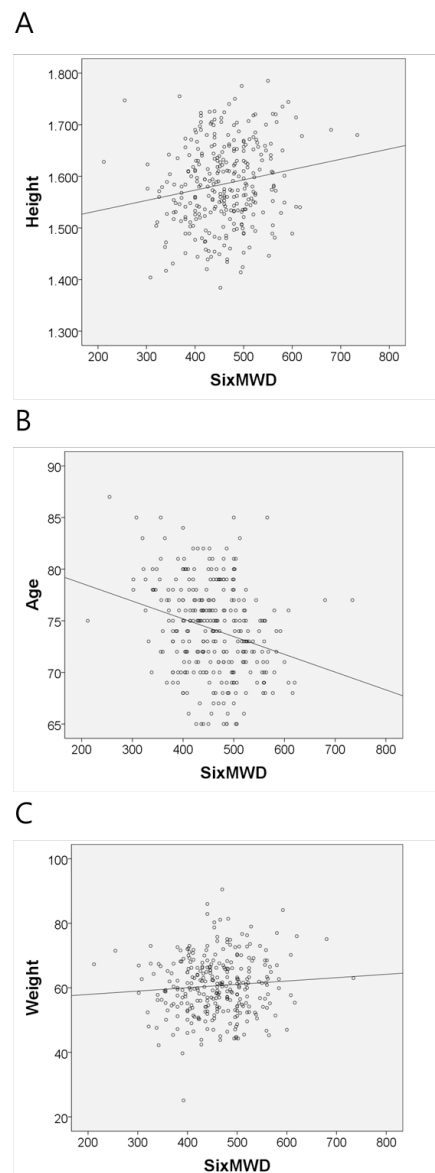


Figure 1. Analysis of Factors Affecting 6-Minute Walking distance

A, Correlation between the walking distance and height. The R value is 0.3. B, Correlation between walking distance and age. The R value is 0.07. C, Correlation between walking distance and weight. The R value is 0.0003.

In a 1998 study by Enright and Sherrill, 2 formulas were put forth to calculate the expected 6-minute walking distance according to sex, and they are as follows: expected 6-minute walking distance for healthy elderly men = $(7.57 \times \text{height}) - (5.02 \times \text{age}) - (1.76 \times \text{weight}) - 309$ m and expected 6-minute walking distance for healthy elderly women = $(2.11 \times \text{height}) - (2.29 \times \text{weight}) - (5.78 \times \text{age}) + 667$ m^[16]. Using the formulas above and the mean values of the general subject characteristics, the expected 6-minute walking distance for men was found to be 447.37 m, which is 22.65 m less than the 470.02 m determined in this study and accounts for a -5.06% difference. Likewise, the expected 6-minute walking distance for women was found to be 432.29 m, which is 19.89 m less than the 452.18 m determined in this study and accounts for a -4.6% difference. In comparison with the above-mentioned previous study, the mean heights of our subjects were 10 cm less in men and 8 cm less in women. From the calculations, it is evident that height, weight, and age are important factors. However, our study showed that weight had no effect on walking distance (Figure 1). It appears that this was because we used only weight. It remains to be analyzed whether the weight was because of excess fat or muscle. The results of this study may necessitate new calculations that take body muscle mass into consideration.

The 6MWT formula is widely used because of its ease of use. However, deviations are considered as resulting from differences in development time, cultural, and environmental characteristics. Therefore, to develop a formula that reflects the environmental and racial characteristics of Asians, studies were conducted on a larger number of elderly people to build a database. Further research is likely to be needed in various countries.

Conclusion

The aim of this study was to investigate the standard 6-minute walking distance of elderly Koreans. Our results showed a mean 6-minute walking distance of 470.01 m. The difference between the mean walking distances of men and women was 17.8 m; this means that, on average, men cover longer walking distances

than women. Based on the above results, elderly Koreans can measure their own 6-minute walking distance and compare their measurements with the mean value determined in this study. In addition, cardiopulmonary disease may be used as a criterion for the field walking test to measure aerobic capacity and the results can then be compared with those of healthy elderly individuals.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Study on the Relationship between General Health and Oral Health According to Diabetes

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Abstract

Background/Objectives: In this study, the relation between the health level and oral health in middle aged according to the diabetes were examined.

Method/Statistical Analysis: For this study, raw data were requested to Korea Centers for Disease Control and Prevention and among them, the data for 3,049 citizens in D Metropolitan City were analyzed. The statistical software R program was used for the analysis.

Findings: In the results of performing multiple logistic regression analysis taking the diabetes as dependent variable, the cases having the chronic disease, dyslipidemia, arthritis, and inconvenient mastication and the case that they did not brushing the tooth after breakfast and before sleep were shown significantly high ($p < 0.05$).

Improvements/Applications: This study was intended to verify the needs of prevention for the efficient oral health management in patients with diabetes and to be utilized as basic data to develop the product for oral health improvement in the patients with diabetes.

Keywords: *Diabetes, Chronic disease, Health, Oral Health, Happiness Index.*

Introduction

Diabetes is the chronic disease that the glucose is increased by the lack of insulin, and secondarily, the complications such as retinopathy, renal disorder, stroke, angina, myocardial infarction, oral diseases, etc. are caused. The complications of diabetes appear in various forms as a result that various metabolic disorders are caused. Among them, as a 6th complication of diabetes, the periodontal disease has been reported^[1-2]. The intra-oral symptoms that appear in the patient with diabetes are periodontal disease, dental caries, xerostomia, tooth

loss, gingivitis, cheilitis, burning sensation of soft tissue, etc.^[3], and particularly, it has been reported that since the patient with diabetes has higher glucose concentration in saliva than normal person, dental caries appears more^[4]. In addition, it has been reported that Decayed Missing Filled Teeth Index (MDFT index), which shows the objective oral health condition, is measured high in the patient with diabetes than the normal person, and the longer the period of illness, the higher the tooth loss index is^[5]. Out of the oral characteristics of diabetes, the periodontal disease is the representative chronic disease and mostly cause the destruction of periodontal tissues in the adults such as gingival bleeding, gingival recession, periodontal pocket formation, destruction of alveolar bone, etc. and in severe case, cause teeth loss^[6]. Periodontal diseases appear associated with diverse diseases like specific systematic diseases or metabolic syndrome^[7], particularly, in case of diabetes, it has trend that the periodontal diseases are serious^[8], and the prevalence of gingivitis and periodontal disease in

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the patient with diabetes is higher than in the normal person. The research results on the quality of life related oral health also reported that the better the diabetes is managed, higher the quality of life and the mental health problem in the patient with diabetes such as depression, etc. is high than in the normal person^[9]. In the research on the quality of life related to oral health, most of the responders answered that the oral health has important effect on the quality of life and there is a research results that reported that the improvement of oral health has positive effect on the quality of life^[10-11]. Currently the awareness on the association of diabetes, chronic diseases with oral health and the importance of oral health is being increased. However, the awareness of oral diseases management is still low for the reason that it does not affect life. Therefore, this study examined the association of the systemic health with the oral health according to diabetes, through which it confirms the needs to prevent the oral disease for the efficient oral health management in the patient with diabetes and provides the basic data to develop the products for oral health improvement in the patient with diabetes.

Method

For this study, raw data of the 2015 Community Health Survey were requested to Korea Centers for Disease Control and Prevention and among them, the data for 3,049 citizens in D Metropolitan City were analyzed. For the analysis, the statistical software R program was used and the significance level was 0.05.

For the general characteristics and healthy lifestyle practice variables, the frequency analysis and chi-square test were performed for the age, education level, marital status, household income, current smoking habit, lifelong drinking habit, medium level of physical activity practice according to the gender. Chi-square test was performed for the chronic disease and subjective health level, happiness index, oral health and the level of oral health practice. Multiple logistic regression analysis was performed for the chronic disease, oral health and level of oral health practice taking the diabetes as dependent variable.

Result and Discussion

1. General characteristics of the subjects: In the results of analyzing the general characteristics according to gender, in the education level, the women graduated the elementary school were

72.4%, the highest ($p < 0.001$). In the marital status, the divorced, widow, separated women were 74.2%, the highest and followed by the single man, the women having spouse, etc in order ($p < 0.001$). In the household income, the women from 500,000 to 1,000,000 won were 63.4%, the highest and followed by women from 1,000,000 to 3,000,000 won and women more than 5,000,000 won ($p < 0.05$). In the current smoking habit, 89.4% of the men had smoking habit and 64.1% of the women did not have smoking habit ($p < 0.05$). In the lifelong drinking habit, 80.1% of the women did not have drinking habit and 50.5% of the men had drinking habit ($p < 0.05$). In the medium level of physical activity practice, 59.2% of the women did not engage in physical activity ($p < 0.05$) [Table 1].

2. Chronic Disease, Subjective Health level and Happiness Index according to Diabetes: In the group without having diabetes, the case that did not have hypertension was 92.2%, significantly high and in the group having diabetes the prevalence of hypertension was 25.8% ($p < 0.05$). For the dyslipidemia, in the group without having diabetes, the case that did not have dyslipidemia was 90.3%, significantly high and in the group having diabetes. The prevalence of dyslipidemia was 26.99%. For the arthritis, in the group without having diabetes, the case that did not have arthritis was 88.6%, significantly high, and in the group having diabetes, the prevalence of arthritis was 22.4% ($p < 0.05$). For the asthma, in the group without having diabetes, the case that did not have asthma was 87.8%, significantly high, and in the group having diabetes, the prevalence of asthma was 22.0% ($p < 0.05$). For the depression, in the group without having diabetes, the case that did not have depression was 87.2%, significantly high, and in the group having diabetes, the prevalence of depression was 23.5% ($p < 0.001$). For the subjective health level, in the group without having diabetes, the case that the subject health level is good was 94.5%, significantly high, and in the group having diabetes, the case that the subjective health level is 'poor' was 26.8% ($p < 0.05$). For the happiness index, the case that did not have diabetes was 6.99 ± 4.711 , high. Generally, in case that did not have diabetes, the chronic diseases appeared low and the subjective health level and happiness index were high [Table 2].

Table 1. General characteristics of study subjects

Variable	Categories	Male		Female		Total		p-value
			%		%		%	
Age								
	40 -59	838	45.2	1,016	54.8	1,854	60.8	0.959
	60 or older	539	45.1	656	54.9	1,195	39.2	
Education Level¹								
	Elementary school	186	27.6	488	72.4	674	22.2	0.000
	Middle school	157	45.8	186	54.2	343	11.3	
	High school,	417	42.2	570	57.8	987	32.5	
	College or higher	609	59.1	422	40.9	1,031	34.0	
Marital Status								
	Single	55	65.5	29	34.5	84	2.8	0.000
	Has spouse	1,164	49.3	1,198	50.7	2,362	77.5	
	Divorced, Widow, Separated	155	25.8	445	74.2	600	19.7	
Household Income								
	0.5-1 million won	183	36.6	317	63.4	500	16.4	0.000
	1-3 million won	467	45.6	558	54.4	1,025	33.6	
	3-5 million won	428	47.7	470	52.3	898	29.5	
	5 million or more	299	47.8	327	52.2	626	20.5	
Currently Smoking								
	Yes	473	89.4	56	10.6	529	17.3	0.000
	No	904	35.9	1616	64.1	2,520	82.7	
Lifelong Drinking								
	Yes	1,271	50.5	1,244	49.5	2,515	82.5	0.000
	No	106	19.9	428	80.1	534	17.5	
Medium Level of Physical Activity Practice²								
	Yes	556	53.6	481	46.4	1,037	34.0	0.000
	No	821	40.8	1,189	59.2	2,010	66.0	
Total		838	45.2	1,016	54.8	3,049	100.0	

1. Education Level : Include graduates of relevant educational institution or higher those who are studying, , completed, dropout and leave of absence

2. Practice rate of medium level of physical activity: (Number of persons who practiced the medium level of physical activity more than 30 minutes a day for more than 5 days a week / Number of subject) ×100

* p-value calculated by χ^2 -test

3. Oral Health and Oral Health Practice Level according to Diabetes: In the subjective health level according to diabetes, in the group without having diabetes, the case that responded 'Good' was 90.7%, the highest, and in the group having diabetes, the case that responded 'Good' was 9.3%, the lowest ($p<0.05$). For the level of experiencing the inconvenient mastication, the case that responded 'Not inconvenient' was 90.1%, the highest ($p<0.05$) and for the annual oral health examination, those who responded to receive examination was 88.6%, the highest ($p<0.05$). The annual scaling experience

was 89.3%, significantly high ($p<0.05$) and for the subjective periodontal tissue health level, 89.8% responded 'Significantly good' ($p<0.05$). In case of the group having diabetes, since those who responded 'Yes' for the toothbrushing after breakfast was 9.2%, low ($p<0.05$), those who responded 'Yes' for the toothbrushing after lunch was 11.7% ($p<0.05$), low and those who responded 'Yes' for the toothbrushing before sleep was 10.0%, low, in case of the group having diabetes, the toothbrushing after meal was not managed well ($p<0.05$) [Table 3].

Table 2. Chronic Disease, Subjective Health level and Happiness Index according to Diabetes

Variable	Categories	Diabetes Diagnosis				Total		p-value
		Yes (n=400)		No (n=2,649)				
			%		%		%	
Hypertension								
	Yes	231	25.8	664	74.2	895	29.4	0.000
	No	169	7.8	1,985	92.2	2,154	70.6	
Dyslipidemia								
	Yes	161	26.9	438	73.1	599	19.7	0.000
	No	238	9.7	2,210	90.3	2,448	80.3	
Arthritis								
	Yes	108	22.4	375	77.6	483	15.8	0.000
	No	292	11.4	2,274	88.6	2,566	84.2	
Asthma								
	Yes	20	22.0	71	78.0	91	3.0	0.011
	No	380	12.8	2,578	87.2	2,958	97.0	
Depression								
	Yes	59	23.5	192	76.5	251	8.2	0.000
	No	341	12.2	2,457	87.8	2,798	91.8	
Subjective Health Level								
	Good,	62	5.5	1,075	94.5	1,137	37.3	0.000
	Fair	160	12.8	1,088	87.2	1,248	40.9	
	Poor	178	26	486	73.2	664	21.%	
Happiness Index (Mean±SD)								
		6.60 ± 6.125		6.99 ± 4.711		6.80 ± 5.418		0.142
Total		400	13.1	2,649	86.9	3,049	100	

* p-value calculated by χ^2 -test

4. Multiple Logistic Regression Analysis on Chronic Diseases according to Diabetes: In the group having diabetes, the case having hypertension was 3.117 times higher than the case without having hypertension ($p < 0.05$), the case having dyslipidemia was 2.320 times higher than the case without having dyslipidemia and the case having arthritis was 1.328 time than the case having arthritis ($p < 0.05$) [Table 4].

5. Multiple Logistic Regression Analysis on Oral Health according to Diabetes: In the group having diabetes, the case that had inconvenient toothbrushing was 2.119 times higher than the case that did not ($p < 0.05$), the case that brushed tooth after breakfast was 0.627 times ($p < 0.001$) the case that did not, and the case that brushed tooth before sleep was 1.591 times higher than the case that did not ($p < 0.05$) [Table 5].

Table 3. Oral Health and Oral Health Practice Level according to Diabetes

Variable	Categories	Diabetes Diagnosis				Total		p-value
		Yes (n=400)		No (n=2,649)				
			%		%		%	
Subjective Oral Health								
	Good,	66	9.3	644	90.7	710	23.3	0.000
	Fair	109	9.5	1,036	90.5	1,145	37.6	
	Poor	225	18.8	969	81.2	1,194	39.2	

Variable	Categories	Diabetes Diagnosis				Total		p-value
		Yes (n=400)		No (n=2,649)			%	
			%		%		%	
Inconvenient Mastication Experience								
	Inconvenient	146	21.8	523	78.2	669	21.9	0.000
	Fair	57	14.4	339	85.6	396	13.0	
	Not Inconvenient	197	9.9	1,787	90.1	1,984	65.1	
Annual Oral Health Examination								
	Yes	160	11.4	1,240	88.6	1,400	45.9	0.011
	No	240	14.6	1,409	85.4	1,649	54.1	
Annual Scaling Experience								
	Yes	145	10.7	1,214	89.3	1,359	50.1	0.026
	No	182	13.5	1,170	86.5	1,352	49.9	
Subjective Periodontal Tissue Health								
	Good	187	10.2	1,638	89.8	1,825	67.4	0.000
	Poor	141	16.0	740	84.0	881	32.6	
Toothbrushing after Breakfast								
	Yes	359	13.8	2,243	86.2	2,602	85.4	0.008
	No	41	9.2	405	90.8	446	14.6	
Toothbrushing after Lunch								
	Yes	216	11.7	1,638	88.3	1,854	60.8	0.003
	No	184	15.4	1,009	84.6	1,193	39.2	
Toothbrushing after Sleep								
	Yes	139	10.0	1,252	90.0	1,391	45.6	0.000
	No	261	15.8	1,396	84.2	1,657	54.4	
Total		400	13.1	2,649	86.9	3,049	100	

* p-value calculated by χ^2 -test

Table 4. Multiple Logistic Regression Analysis on Chronic Diseases according to Diabetes

	B	S.E.	Wald	df	Sig. Level	Exp(B)	95% of EXP(B) C.I.	
							Lower Limit	Upper Limit
Hypertension (Yes)	1.137	.117	93.955	1	.000	3.117	2.477	3.922
Dyslipidemia (Yes)	.841	.123	46.548	1	.000	2.320	1.822	2.954
Arthritis (Yes)	.284	.138	4.245	1	.039	1.328	1.014	1.741
Asthma (Yes)	.158	.279	.322	1	.570	1.171	.678	2.022
Depression (Yes)	.555	.170	10.662	1	.001	1.742	1.248	2.430
Constant	-2.704	.089	929.586	1	.000	.067		

Reference group: Hypertension (No), Dyslipidemia (No), Arthritis (No), Asthma (No), Depression (No).

Table 5. Multiple Logistic Regression Analysis on Oral Health according to Diabetes

	B	S.E.	Wald	df	Sig. Level	Exp(B)	95% of EXP(B) C.I.	
							Lower Limit	Upper Limit
Inconvenient Mastication (Inconvenient)	.751	.151	24.863	1	.000	2.119	1.577	2.846
Inconvenient Mastication (Fair)	.302	.183	2.708	1	.100	1.352	.944	1.937
Annual Oral Health Examination (No)	.061	.132	.212	1	.645	1.062	.821	1.375
Annual Scaling Experience (No)	.080	.131	.368	1	.544	1.083	.837	1.401
Toothbrushing after Breakfast (No)	-.467	.196	5.683	1	.017	.627	.427	.920
Toothbrushing after Lunch (No)	.189	.129	2.166	1	.141	1.208	.939	1.555
Toothbrushing before Sleep (No)	.464	.136	11.571	1	.001	1.591	1.217	2.079
Constant	-2.676	.143	352.770	1	.000	.069		

Reference group: Subjective Periodontal Tissue Health Level (Good), Inconvenient Mastication (Not inconvenient), Annual Oral Health Examination (Yes), Annual Scaling Experience (Yes), Toothbrushing after Lunch (Yes), Toothbrushing before Sleep (Yes).

Conclusion

In case of group having diabetes, out of the chronic diseases, the hypertension, dyslipidemia, arthritis, asthma, depression were shown significantly high and the subjective health level was also shown poor ($p < 0.05$). In case of the group having diabetes, since the subjective periodontal tissue health level was poor, the level of inconvenient mastication was inconvenient and the subjective oral health level was poor, it was observed that they had the oral health management problem. In the oral health practice level, it was shown that they did not receive the annual oral health examination or the scaling, and particularly, did not brush the tooth after breakfast and lunch and before sleep ($p < 0.05$). In the results of performing multiple logistic regression analysis taking the diabetes as dependent variable, the cases having the chronic disease, dyslipidemia, arthritis, and inconvenient mastication and the case that they did not brushing the tooth after breakfast and before sleep were shown significantly high ($p < 0.05$). In conclusion, for the oral health management in the patient with diabetes, diverse measures such as the management of complications of the chronic diseases, the development of systematic practice educational program related to oral health, etc. should be prepared at national level. Particularly, the strategic management measures for the single males of 60 years or older who have low income and low education level are needed desperately.

Ethical Clearance: Not required

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Analysis of Factors Affecting the Depression and Quality of Life in the Family Taking Care of Dementia Patients

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Abstract

Background/Objectives: This study was intended to identify the factor having influence on the stress, depression and the quality of life in the family who care the patient with dementia.

Method/Statistical Analysis: For this study, raw data were requested to Korea Centers for Disease Control and Prevention and among them, the data for 150,802 citizens of 45 years or older in D Metropolitan City were analyzed. For the analysis, the statistical software R program was used and the significance level was 0.05.

Findings: Out of the factors having influence on the family who are cohabitating with the patient with dementia, the factors having influence on the quality of life were age, benefit of basic living security, lifelong drinking, days of medium level of physical activity, diabetes, arthritis, subjective oral health level, subjective health level, experience of depression, etc..

Improvements/Applications: This study was intended to provide the basic data to develop the programs for the health improvement and the health education of the family who care the patient with dementia

Keywords: *Dementia, Cohabitation, Family, Stress, Depression, Quality of life.*

Introduction

The psychological symptom that shows the highest frequency out of the psychological symptoms experienced by the primary caregivers of the patient with dementia is the depression^[1]. In the United States, it was reported that 30-50% of the caregivers of the patient with dementia have depression^[2]. The factors that deteriorate the depressive symptoms of the family caregiver of the patient with dementia are relationship with family^[3], disease duration, level of problem behavior or functional and cognitive disorder, daily

living activity, existence of assistant caregiver, etc^[4-5]. It has been reported that the greater the dependency of the patient with dementia in the daily living activity and the more severe the level of problem behavior, the higher the level of depression or level of stress in the family caregiver^[6]. As the patient with dementia is increased, for the patient, the quality of life is degraded by diverse irreversible symptoms around the cognitive and behavior disorders^[7] and for the primary caregiver, the quality of life is degraded by the stress in caring the patient^[8]. Since the caregivers are likely to become hidden patient or second patient by experiencing diverse negative emotions together with care burden^[9-10], the problem in the primary caregiver should be considered as a part of the problem of patient with dementia and the effort to support the family of patient with dementia is needed. The caregivers of patient with dementia are complaining of negative perception on the dementia, lack of information on the social support resources related to treatment of dementia and lack of time to taking care

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of their own life due to long-term care of the patient with dementia^[11]. Integrated educational program for the family of caring the patient with dementia should be provided and therefore, this study was intended to provide the basic data to development the program for health improvement and health education of the family members who are taking care of patient with dementia by identifying the factor having influence on the stress, depression and the quality of life in the family members who are taking care of the patient with dementia.

Method

For this study, raw data of the 2015 Community Health Survey were requested to Korea Centers for Disease Control and Prevention and among them, the data for 150,802 citizens of 45 years or older in D Metropolitan City were analyzed. For the analysis, the statistical software R program was used and the significance level was 0.05. The general characteristics of the research subjects were divided by the cohabitation with the patient with dementia and the frequency analysis and Chi-square test were performed for the gender, age, educational level, marital status, household income, beneficiary of basic living security. Chi-square test and independent sample t-test were performed for the factors related to smoking habit, drinking habit, hypertension, diabetes, hyperlipidemia, arthritis, depression, etc, by the stress. For the factors related to the family cohabited with the patient with dementia

and the depression, the logistic regression analysis was performed and for the factors related to the quality of life, multiple linear regression analysis performed. For the quality of life index (EQ-5D index), the index that aggregates the 3 level of technical system for the current state of 5 items (exercise capability, self-management, daily activities, pain/inconvenience, anxiety/depression) of the quality of life related to health. EQ-5D index has the value between 1 and 1 and the closer to 1, the higher the quality of life.

$$=1-(0.0081+0.1140*M2+0.6274*M3+0.0572*SC2 +2073*SC3+0.0615*UA2+.2812*UA3+0.0581*PD2 + 0.2353*PD3+0.0675*AD2+0.2351*AD3).$$

Result and Discussion

- General Characteristics and Healthy Life Behavior:** The family cohabitating with the patient with dementia was average 1.3% showing low cohabitation rate. The cohabitation with the patients with dementia was high in the subjects of 75 years or older (p<0.001), of the graduates of the elementary school or below (1.6%)(p<0.001), of single (2.1%) (p<0.001), from 500,000 won to 1 million won of household income (1.7%) (p<0.001), who did not drink for entire life (1.6%)(p<0.001), and who cannot practice the medium level of physical activity (1.4%) (p<0.001) [Table 1].

Table 1. General Characteristics of Study Subjects Unit: N (%)

Categories	Total		Cohabitation with Patient				Proportion of Cohabiting with Patient (%)		p-value
			Yes	No	Yes	No			
Gender									
Male	66,282	(44.0)	889	(1.3)	65,393	(98.7)	889	(44.6)	0.582
Female	84,520	(56.0)	1,106	(1.3)	83,414	(98.7)	1,106	(55.4)	
Age									
45-64	86,874	(57.6)	940	(1.1)	85,934	(98.9)	940	(47.1)	0.000
65-74	36,521	(24.2)	413	(1.1)	36,108	(98.9)	413	(20.7)	
75 or older	27,407	(18.2)	642	(2.3)	26,765	(97.7)	642	(32.2)	
Education Level ¹⁾									
Elementary school	56,670	(37.6)	915	(1.6)	55,755	(98.4)	915	(45.9)	0.000
Middle school	24,765	(16.5)	295	(1.2)	24,470	(98.8)	295	(14.8)	
High school,	43,068	(28.6)	482	(1.1)	42,586	(98.9)	482	(24.2)	
College or higher	26,030	(17.3)	301	(1.2)	25,729	(98.8)	301	(15.1)	

Categories	Total		Cohabitation with Patient				Proportion of Cohabiting with Patient (%)		p-value
			Yes		No				
Marital Status									
Single	2,958	(2.0)	62	(2.1)	2,896	(97.9)	62	(3.1)	0.000
Has spouse	111,783	(74.2)	1,573	(1.4)	110,210	(98.6)	1,573	(79.0)	
Divorced, Widow, Separated	35,877	(23.8)	356	(1.0)	35,521	(99.0)	356	(17.9)	
Household Income									
0.5-1 million won	45,621	(30.3)	755	(1.7)	44,866	(98.3)	755	(37.8)	0.000
1-3 million won	54,482	(36.1)	734	(1.3)	53,748	(98.7)	734	(36.8)	
3-5 million won	30,878	(20.5)	299	(1.0)	30,579	(99.0)	299	(15.0)	
5 million or more	19,821	(13.1)	207	(1.0)	19,614	(99.0)	207	(10.4)	
Currently Smoking									
Yes	23,518	(15.6)	307	(1.3)	23,211	(98.7)	307	(15.4)	0.979
No	127,281	(84.4)	1,688	(1.3)	125,593	(98.7)	1,688	(84.6)	
Lifelong Drinking									
Yes	116,694	(77.4)	1,447	(1.2)	115,247	(98.8)	1,447	(72.6)	0.000
No	34,093	(22.6)	546	(1.6)	33,547	(98.4)	546	(27.4)	
Medium Level of Physical Activity Practice²⁾									
Yes	50,613	(33.6)	609	(1.2)	50,004	(98.8)	609	(30.5)	0.004
No	100,148	(66.4)	1,385	(1.4)	98,763	(98.6)	1,385	(69.5)	
Total	150,791	(100.0)	1,995	(1.3)	148,796	(98.7)	1,995	(100.0)	

1) Education Level : Include graduates of relevant educational institution or higher those who are studying , completed, dropout and leave of absence

2) Practice rate of medium level of physical activity: (Number of persons who practiced the medium level of physical activity more than 30 minutes a day for more than 5 days a week / Number of subject) ×100

*p-value calculated by x²-test

2. Chronic Disease According to Cohabitation with Patient with Dementia: In case of the family who are cohabitating with the patient with dementia, they were diagnosed with hypertension (1.4%), diabetes (1.7%), arthritis (1.6%) asthma (1.9%) and depression (2.8%) (p<0.001). In the results of

analyzing the diagnosis of chronic diseases in the subjects within the group that is cohabitating with the patient with dementia, the hypertension was 39.8%, arthritis was 25.6%, diabetes was 18.6%, depression was 14.6%, asthma was 4.9%, in order [Table 2].

Table 2. Chronic Disease Unit: N(%)

Categories	Total		Cohabitation with Patient				Proportion of Cohabiting with Patient (%)		p-value
			Yes		No				
Hypertension									
Yes	55,273	(36.7)	794	(1.4)	54,479	(98.6)	794	(39.8)	0.003
No	95,502	(63.3)	1,201	(1.3)	94,301	(98.7)	1,201	(60.2)	
Diabetes									
Yes	21,806	(14.5)	372	(1.7)	21,434	(98.3)	372	(18.6)	0.000
No	128,973	(85.5)	1,623	(1.3)	127,350	(98.7)	1,623	(81.4)	
Hyperlipidemia									
Yes	28,626	(19.0)	362	(1.3)	28,264	(98.7)	362	(18.2)	0.375
No	121,854	(81.0)	1,622	(1.3)	120,232	(98.7)	1,622	(81.8)	

Categories	Total		Cohabitation with Patient				Proportion of Cohabiting with Patient (%)		p-value
			Yes		No				
Arthritis									
Yes	31,229	(20.7)	510	(1.6)	30,719	(98.4)	510	(25.6)	0.000
No	119,518	(79.3)	1,483	(1.2)	118,035	(98.8)	1,483	(74.4)	
Asthma									
Yes	5,284	(3.5)	98	(1.9)	5,186	(98.1)	98	(4.9)	0.001
No	145,502	(96.5)	1,897	(1.3)	143,605	(98.7)	1,897	(95.1)	
Depression									
Yes	10,318	(6.8)	290	(2.8)	10,028	(97.2)	290	(14.6)	0.000
No	140,411	(93.2)	1,700	(1.2)	138,711	(98.8)	1,700	(85.4)	
Total	150,791	(100.0)	1,995	(1.3)	148,796	(98.7)	1,995	(100.0)	

*p-value calculated by χ^2 -test

3. Subjective Stress, Subjective Oral Health Level and Subjective Health Level According to Cohabitation with Patient with Dementia:

In case if the family who are cohabitating with the patient with dementia, the case of feeling high subjective stress level was 2.2%, the case of poor subjective oral health level was 1.5%, the case of poor subjective health level was 2.0%. The case that feels little subjective stress level was 40.6%, the case of poor subjective oral health level was 55.5%,

the case of poor subjective health level was 44.2%, shown relatively higher proportion in the relevant group [Table 3].

4. Happiness Index and Quality of Life according to Cohabitation with Patient with Dementia:

In case of family who do not live together with the patient with dementia, the happiness index was $7.22 \pm .897$, not significant but high and the quality of life was 0.8946 ± 0.17497 , significantly high ($p < 0.001$) [Table 4].

Table 3. Subjective Stress, Subjective Oral Health Level and Subjective Health Level Unit: N(%)

Categories	Total		Cohabitation with Patient				Proportion of Cohabiting with Patient(%)		p-value
			Yes		No				
Subjective Stress Level									
Feel a lot	33,822	(22.4)	743	(2.2)	33,079	(97.8)	743	(37.4)	0.000
Feel a little	76,001	(50.4)	807	(1.1)	75,194	(98.9)	807	(40.6)	
do not feel	40,849	(27.1)	439	(1.1)	40,410	(98.9)	439	(22.1)	
Subjective oral health level									
Good,	28,428	(18.9)	328	(1.2)	28,100	(98.8)	328	(16.4)	0.000
Fair	50,693	(33.6)	559	(1.1)	50,134	(98.9)	559	(28.0)	
Poor	71,670	(47.5)	1,108	(1.5)	70,562	(98.5)	1,108	(55.5)	
Subjective Health Level									
Good,	43,995	(29.2)	443	(1.0)	43,552	(99.0)	443	(22.2)	0.000
Fair	62,467	(41.4)	670	(1.1)	61,797	(98.9)	670	(33.6)	
Poor	44,333	(29.4)	882	(2.0)	43,451	(98.0)	882	(44.2)	
Total	150,791	(100.0)	1,995	(1.3)	148,796	(98.7)	1,995	(100.0)	

*p-value calculated by χ^2 -test

Table 4. Happiness Index and Quality of Life

Categories			N Average		Standard Deviation	p-value
Happiness Index						
Cohabitation with Patient	Yes	1,995	7.08	±	10.217	0.558
	No	148,807	7.22	±	7.897	
EQ5D						
Cohabitation with Patient	Yes	1,995	0.8063	±	0.28794	0.000
	No	148,807	0.8946	±	0.17497	

5. Multiple Logistic Regression Analysis according to Depression in Family who Cohabitate with Patient with Dementia: For the variable having significant influence on the depression, the female showed 1.918 times significantly higher than the male, the age group of 45 to 64 years old showed 1.706 times significantly higher than the group of 74 years or older. (p<0.001). For the subjective periodontal tissue health level, ‘Poor’ was shown 1.573 times than ‘Good’, for the subjective stress level, ‘Case that feels a little’ was shown 2.371 times and ‘Case that feels a lot’ was shown 8.991 times higher than ‘Case that does not feel’ and for the subjective health level, ‘Fair’ was shown 2.253

times and ‘Poor’ was shown 2.553 times higher than ‘Good’ (p<0.001) [Table 5].

6. Factors having Influence on Quality of Life of Family Who are Cohabiting with Patient with Dementia: The factors having influence on the quality of life were age (p<0.001), recipient of basic living security benefit (p<0.05), lifelong drinking (p<0.05), Days of medium level of physical activity (p<0.05), doctor’s diagnosis of diabetes (p<0.05), doctor’s diagnosis of arthritis (p<0.05), subjective oral health level (p<0.05), subjective health level (p<0.001) and experience of depression (p<0.001) and the explanation power was 25.1% [Table 6].

Table 5. Multiple Logistic Regression Analysis according to Depression

Variables	B	S.E.	Sig. Level	Exp(B)	95% of EXP(B) C.I.	
					Lower Limit	Upper Limit
Gender (Male)	.652	.203	.001	1.918	1.288	2.856
Age (45~64)	.534	.229	.020	1.706	1.089	2.671
Age (65~74)	.194	.239	.418	1.214	.759	1.941
Recipient of basic living security benefit (No)	.270	.244	.269	1.309	.812	2.112
Currently Smoking (No)	.433	.250	.083	1.543	.945	2.517
Lifelong Drinking (No)	.145	.197	.460	1.156	.787	1.700
Medium Level of Physical Activity Practice (No)	.134	.175	.445	1.143	.811	1.612
Hypertension (Yes)	.091	.181	.615	1.095	.768	1.561
Diabetes (No)	.067	.211	.752	1.069	.707	1.615
hyperlipidemia (No)	.209	.202	.301	1.233	.829	1.832
Arthritis (Yes)	.034	.193	.858	1.035	.709	1.512
Asthma (Yes)	.172	.366	.637	1.188	.580	2.433
Subjective oral health (Poor)	.453	.167	.007	1.573	1.135	2.181
Subjective Stress (Feel a little)	.863	.175	.000	2.371	1.681	3.343
Subjective Stress (Feel a lot)	2.196	.364	.000	8.991	4.407	18.344
Subjective Health (Fair)	.812	.251	.001	2.253	1.377	3.686
Subjective Health (Poor)	.937	.205	.000	2.553	1.706	3.818
Constant	-1.083	.506	.032	.339		

p-value calculated by multiple logistic regression

Table 6. Multiple linear Regression Analysis of Causal Factors having Influence on the Quality of Life

Variable	B	b	t	p-value
Constant	.966		6.698	.000
Gender ¹	-.020	-.030	-.932	.351
Age ²	-.103	-.150	-5.155	.000
Recipient of basic living security benefit ³	.042	.075	2.733	.006
Currently Smoking ⁴	.001	.001	.018	.985
Lifelong Drinking ⁵	-.049	-.070	-2.363	.018
Medium Level of Physical Activity Practice ⁶	-.075	-.096	-3.391	.001
Hypertension ⁷	-.008	-.012	-.428	.669
Diabetes ⁸	.047	.060	2.136	.033
hyperlipidemia ⁹	.000	.000	.017	.987
Arthritis ¹⁰	.054	.077	2.683	.007
Asthma ¹¹	-.017	-.013	-.457	.648
Subjective Stress ¹²	.021	.049	1.675	.094
Subjective oral health ¹³	-.035	-.071	-2.518	.012
Subjective Health ¹⁴	-.132	-.280	-9.514	.000
Depression ¹⁵	.147	.164	5.662	.000

F = 22.724 p<0.001 R² = 0.251 Adjust R² = 0.240 Durbin-Watson = 1.931

1) Male, Female. 2) 45-64, 65-74, 75 or older. 3)~15) Yes, No., p-value calculated by Multiple Regression Analysis.

Conclusion

The influence on the depression in the family who are cohabitating with the patient with dementia was significant high in the male, age group of 45 - 64 years old, when the periodontal tissue health level is poor, when feeling the stress a lot, and when the health level is poor (p<0.001). Out of the factors having influence on the family who are cohabitating with the patient with dementia, the factors having influence on the quality of life were age, benefit of basic living security, lifelong drinking, days of medium level of physical activity, diabetes, arthritis, subjective oral health level, subjective health level, experience of depression, etc.. In conclusion, when developing the health improvement program to prevent the depression in the family who are living with the patient with dementia, the quality of life will be improved if it is developed for the age from 45-65 years old, married couple of family type together with development of the lifestyle improvement program for drinking and oral health management of the spouse without dementia and the prevention program for alleviation of overstress. It is deemed that these results can contribute to providing the basic data to develop the program for health improvement and health education of the family who are caring the patient with dementia when establishing the policy on the dementia.

Ethical Clearance: Not required

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Conflict of Interest: None of the authors of this study has any financial interest or conflict with industries or parties.

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Effects of Low-Dye Taping Applied to Chronic Stroke Patients on Gait Speed

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Abstract

Background/Objectives: This study examines the effects of the normal biomechanical maintenance of the feet through Low-Dye taping on the gait treatment in chronic stroke patients and presents the basis of clinical intervention.

Method/Statistical Analysis: In this study, 5 cm-wide elastic tapings was applied to improve gait ability in 20 chronic stroke patients. Low-Dye taping was applied for foot alignment. Gait was measured by BTS G-walk (G-walk, BTS, Italy). In this study, taping was applied after the initial assessment, and post measurement was performed after 30 min of taping to examine the immediate effects of taping on the gait parameters. The main outcome of this study is gait speed, and the secondary outcomes are cadence and stride length.

Findings: The research group showed significant increases in gait speed and cadence except for the stride length at 30 min after applying the taping.

Improvements/Applications: After applying the Low-Dye taping to chronic stroke patients, their gait speed and cadence showed significant differences due to the effects of ankle joint alignment and medial longitudinal arch lift and support. Therefore, Low-Dye taping was effective in improving the gait ability of chronic stroke patients.

Keywords: Stroke, Low-Dye taping, gait, Balance, Simulator Exercises.

Introduction

Feet support the body weight in standing position, absorb shock during gait, provides the driving force required for body movement, and maintains balance while the center of gravity of the body is moving. Furthermore, the biomechanical changes of the feet can cause musculoskeletal diseases and gait disorder. During gait, the feet are subject to medial-lateral and anterior-posterior shear forces in addition to a vertical pressure

in stance phase. However, the feet provide dynamic and static stability by forming medial longitudinal arch on the sagittal plane and transverse arch on the coronal plane. Furthermore, the dynamic stability of the ankle joint is maintained by the muscular forces of the intrinsic and extrinsic muscles. During gait, the feet control excessive forward movement of the contralateral lower limb while supporting the ground in the stance phase and enable movement in the swing phase. In addition, the tibialis posterior muscle plays the role of absorbing shock under a body weight by adjusting the medial longitudinal arch while the feet are in contact with the support surface^[1].

The ankle joint motion disorder of stroke patients causes abnormal weight support and gait patterns. Limitation in the plantar flexion of the ankle joint decreases push-off during gait, which shortens the step length. Moreover, among the gait parameters, cadence,

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velocity, and stride length are decreased while the single support and double support are increased, the weight supports of the feet are asymmetrical and the medial longitudinal arch cannot be maintained. As a result, the shock absorption of the ground reaction force becomes limited^[2]. In standing position, the weight passes through the talonavicular joint and pushes down the talus, which lowers the medial longitudinal arch. Flat foot is a condition where the medial longitudinal arch is continuously lowered or abnormally low, in which the ligament of the foot, the plantar fascia, and the posterior tibial tendon are over-extended^[3]. In the stance phase during gait, the flat foot decreases the forward movement of the center of gravity of the body and increases the ground reaction force^[4]. These problems resulting from the biomechanical changes of the feet and ankle joint decreases the input of proprioceptive information, causing balance disorder and falls. Furthermore, lower limb damage occurs during activities of daily living and sports activities^[5].

Low-Dye taping applied to flat foot treatment was first introduced to clinical practice by Ralph Dye. Low-Dye taping is to attach a tape that induces supination of the ankle. It has the effects of decreasing the pressures on the heel and the front part of the pronated foot and decreasing the pronation by normalizing the navicular alignment^[6]. Furthermore, it can support the medial longitudinal arch, normalize the biomechanical changes of the feet, reduce the shock caused by increased ground reaction force during gait, and prevent joint damage that may occur in sports activities or activities of daily living. The maintenance of normal medial longitudinal arch also has positive effects on gait^[7].

Improvement of gait ability is critical for independent daily activities of chronic stroke patients and the gait function is the criterion for recovery of motor disorder. Therefore, much time is spent on gait treatment. This study examines the effects of the normal biomechanical maintenance of the foot by Low-Dye taping on the gait treatment of chronic stroke patients and the present basis of presents the basis of clinical intervention.

Materials and Method

Study Subjects Ethical Consideration: Taping was applied after the initial evaluation, and post measurement was performed 30 min after taping application to determine the immediate effects of taping on the gait parameters.

The main outcome of this study is gait speed and the secondary outcomes are cadence and stride length.

1. G-walker: To measure the spatiotemporal gait parameters after taping application, BTS G-walk (G-walk, BTS, Italy) embedded with a three-axis accelerometer, a magnetometer, and a gyroscope was used. The G sensor was positioned at the fifth lumbar vertebra using a belt for measurement. The sensor stabilization was measured in an upright position before measurement, and then the gait parameters were measured. For measurement, the start button was pressed and then the subject was instructed to walk freely on an 8 m walkway. When it was determined that sufficient data were collected, the researcher pressed the stop button and collected the data. This equipment can measure the analysis duration, cadence (number of strides per min), speed (average gait speed), stride length (average distance from the heel of a foot to the heel of the same foot), gait cycle duration (average distance to the heel strike of one foot) step length (average distance from the heel of one foot to the heel of the other foot), stance phase duration (ratio of time during which the left and right feet support the ground in a gait cycle), swing phase duration (ratio of time during which the left or right foot is in the swing phase in a gait cycle), double support duration (ratio of time during which both feet support the ground in the stance phase), single support duration (ration of time during which only one foot is supporting the ground in the stance phase), strides elaborated (accurate number of strides used in analysis). In this study, the gait speed (m/s), cadence (steps/min), and stride length (m) were collected from the G-studio program.

2. Intervention Method: Five cm-wide elastic tapings was applied to improve the gait ability of stroke patients. First, Low-Dye taping was applied for foot alignment^[7]. The longitudinal anchor taping was attached from the fifth metatarsal head, which is on the outside of the foot, to the first metatarsal head by pulling the taping from the lateral to the medial direction. The transverse arch support taping was attached along the sole from the lateral to the medial direction. The transverse arch support taping was attached to the heel, the arch, and metatarsal head of the foot, in the direction from the heel to the metatarsal head [Figure 1] [Figure 2].



Figure 1. Low-dye taping



Figure 2. Low-dye taping

Data Analysis: The statistical data analysis was performed using the statistical software package SPSS 20.0 (SPSS Inc., Chicago, IL, USA). For the general characteristics of the subjects, the mean and standard deviation were obtained by using descriptive statistics. The normality test was performed by the Shapiro-Wilk Test. In addition, paired t-test was performed to examine the effects of taping on the spatiotemporal gait parameters. The alpha value for statistical significance level was set to .05.

Findings:

1. **General Characteristics of Subjects:** [Table 1] lists the general characteristics of the subjects.

Table 1. General characteristics

Classification	Experimental Group (n=20)
Gender (male/female)	16/4
Paretic side (right/left)	9/11
Age (years)	60.75±10.90
Height (cm)	164.60±6.45
Weight (kg)	65.15±6.08
K-MMSE (point)	27.15±1.09
Onset (month)	12.15±2.43
K-MMSE, Korean version of the Mini Mental State Examination	

2. **Effects of intervention on gait parameters:** The research group showed significant increases in gait

speed and cadence after taping application for 30 min, but stride length showed no significant increase [Table 2].

Table 2. Changes of gait parameters in the experimental group before and after the intervention

Classification	Pre-test	Post-test	P
Gait Speed	84.24±16.06	90.97±19.51	.024*
Cadence	.76±.22	.83±.22	.002*
Stride Length	1.10±.21	1.13±.18	.107

Discussion

The anatomical deformations of feet influence the tactile stimulation input during motions in various environments and decrease the stability of posture control during standing position and gait. Furthermore, the decreased stability of posture control causes injuries in the activities of daily living and sports activities. The structural deformations of the feet have a greater effect on dynamic stability than static stability. Treatment of foot deformation can increase the limits of stability of posture control and improve physical functions^[8]. Foot deformation due to abnormal muscle tone and muscle weakness of the hemiplegic side causes more pronation deformation than supination deformation, and limits weight support and physical movement while the foot is in contact with the ground^[9]. The pronation deformation of stroke patients does not affect gait more than supination deformation. However, due to the reduced medial longitudinal arch, the sole pressure is concentrated on a specific site, which increases the instability of the ankle joint and affects gait^[10].

Low-Dye taping applied to the pronated foot can control excessive pronation by decreasing the medial pressure and increasing the lateral pressure on the sole^[11]. Furthermore, it can raise the medial longitudinal arch that has been lowered by the decrease of the excessive muscular activity of the tibialis anterior muscle and the descended navicular, and can maintain the stability of the ankle joint during standing on one foot. This stability of the ankle joint allows the body to maintain normal weight load while the foot is in contact with the ground^[12].

The parameters according to the change in the sole pressure and the extrinsic muscles of the ankle joint after applying Low-Dye taping were not measured. The foot deformation of stroke patients is different from

the pronation deformation of normal persons caused by muscle tone and anatomical changes following the damaged central nervous system. However, the significant changes in the gait parameters after applying Low-Dye taping seem to have enabled the maintenance of ankle joint alignment and the lift and support of the medial longitudinal arch, which had a positive impact on the stable weight support and weight movement during gait. In this study, Low-Dye taping was applied to subjects who could walk, but further studies are needed on the balance parameters related to weight support and movement following the foot deformations of stroke patients in the future.

Applying the Kinesio taping to chronic unstable ankle joints decreases the body sway in the base of support during standing on one foot^[13] and has the effect of muscle tone control and proprioceptive information input in patients with central nervous system impairment^[14]. After applying the Kinesio taping to the ankle joints of chronic stroke patients, gait speed increased due to the increased motion of the ankle joint^[15]. Furthermore, after applying the Low-Dye taping, velocity, stride length, and cadence increased among the gait parameters^[7].

Conclusion

In this study, after applying Low-Dye taping to the feet using an elastic tape for 30 min, gait speed and cadence increased significantly, but the stride length did not increase. The elasticity of the elastic tape used in this study is focused on supporting motion rather than fixing. Inelastic taping fixes the arch of the foot and simply increases the arch during motion, whereas elastic taping supports the motion in the supination direction until the foot becomes pronation by using elasticity. Therefore, in this study, the gait speed increased because the elasticity of tape during middle stepping, toe touch, and toe push raised the arch (hoist effect). In addition, number of steps per min increased, and the stride length also increased, although it was not statistically significant. It showed an increase in the number of steps and movement at the same distance during gait, which supports the result of the increased gait speed. However, this study had a few limitations, the concrete effects on gait parameters were not presented, the application time of Low-Dye taping was short, and the effects of the elastic and inelastic taping method were not clarified. Low-Dye taping had a positive effect on gait despite the short application time, which suggests that it is helpful for improving the

gait function of chronic stroke patients. In the future, qualitative research is required to present the basis for expanding the application scope of Low-Dye taping in clinical practice.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Low-Dye taping applied to chronic stroke patients.

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The Effect of Participation in Mentoring Program on Adjustment to College Life, Major Satisfaction, and Interpersonal Relationship Skill in the Nursing Students

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Abstract

Background/Objectives: This is a descriptive research to investigate the effects of mentoring program participation on the adjustment to college life, major satisfaction, and interpersonal relationship skill in the nursing students.

Method/Statistical Analysis: The study subjects were 200 college students majoring in nursing and data collection was conducted from October 1 to 10, 2018. Collected data were analyzed by t-test and ANOVA.

Findings: Upon the study results, participation in the mentoring program showed the positive impacts on the adjustment to college life($t=-7.029$, $p<.001$), major satisfaction($t=-4.993$, $p<.001$), and interpersonal relationship skill ($t=-5.715$, $p<.001$).

Improvements/Applications: Therefore, it is required to develop a variety of approaches and programs to operate efficient and effective mentoring system.

Keywords: *Adjustment, Interpersonal relationship, Mentoring program, Nursing students, Satisfaction.*

Introduction

In the midst of rapidly changing social conditions, college plays an important role in making individuals cultivate their abilities to recognize their identities and adjust themselves to college life. For students to recognize their identities and adapt to school life, adjustment to college life, satisfaction with major, skill in human relations are important. Adjustment to college life is not only important as it is, but is more

important because it affects their studies in college, and future career^[1]. It also affects drop-out of school among students. Drop-out rate is one of important indicators in evaluating school qualities. As factors affecting drop-out of school, individual factors such as student's devotion to education, college selection, and elements related with major have been reported^[2].

Accordingly, to help students adjust themselves to college life and improve themselves, many colleges have adopted the mentoring system. Mentoring is the activity where the person called mentor guides, directs, and consults mentee, and helps mentee develop capacities and potentials in knowledge and technology learning, and in human relations^[3]. It has been long from the time when private companies adopted the mentoring system to train new employees, and, recently, it is applied to various other areas including schools. In schools, mentoring is the system where students in senior school

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years who have experiences and knowhow in school life and major guide and advise students in junior school years, and teaching and learning between mentor and mentee are made by daily interactions among them. To help students adapt to school life and feel satisfied with school life, many colleges adopt mentoring programs^[4]. Through the relationship between mentor and mentee, support for growth, future direction, and feedback on consultation are provided^[5].

Adjustment to college life provides students with opportunities to satisfy social and psychological desires in addition to intellectual desires, and with the basis to live as social members with desirable attitudes^[6]. Adjustment to college life is related with various demands in college environment such as learning, skillful human relations, and emotional aspects, and is determined by whether a student can successfully respond to them autonomously and independently^[7]. When a student accepts and positively responds to scholastic, social, and psychological demands of college, the student can satisfy intellectual desires by college education and establish positive self image^[8].

Satisfaction with major is the process of evaluating the department the student belongs to in the perspective of his or her future career or expectation of job. If a student is not satisfied with his or her major, problems like low grades and mal-adjustment to school life, etc. can happen. In contrast, the student highly satisfied with his or her major participates actively in classes and other campus life, and makes efforts to achieve his or her goal^[9]. The student who is highly satisfied with school life tends to adapt well to social life after graduation, and succeed in the society^[10].

Interpersonal relationship are an important condition determining happiness of life, an important goal of life, and an important element in living as a member of society. In particular, college days are an important period of psycho-social development when students are required to be psychologically, emotionally, and socially independent from his or her parents, and build new and various human relations. And, the times are also the period when students experience their own development by establishing self-identity based on close Interpersonal relationship^[11].

As described above, mentoring program is discussed as a method for human growth and teaching^[12], and the mentoring relationship is considered as providing

positive role-model^[13]. Previous researches have proved that mentoring program is effective in improving self-efficacy and adaptation to school life^[14]. In the case of nursing school students, with increasing sense of burden and stress caused by the requirements of learning knowledge, and mastering skills in clinical training and clinical works, they can lose interest in their major or have difficulty in adapting to school life. Therefore, this study relationship skill dy intends to examine the effects of mentoring program on adaptation to school life, satisfaction with major, and interpersonal relationship skill in the nursing students.

Method

Research Design: This research is a descriptive survey research to examine the effect of participation in mentoring program on adjustment to college life, satisfaction with major, and interpersonal relationships skill in the nursing students.

Research Subjects: The objects of this research are 200 students belonging to a specific nursing department. The size of the sample was calculated using the GPOWER 3.1.2 system. The minimum number of samples needed to do multiple regression analysis with 5 predictive factors, effect size .15, significance level .05, and statistical power .90 was 116. This research conveniently collected data from 200 objects.

Research Tools:

Mentoring Scale: This study used the mentoring scale which had been developed by Noe^[15], and revised by Kim^[16]. The scale consists of 20 questions, and respondents are asked to respond to each question on the 5-point Likert scale.

Adjustment to school life: To measure adjustment to school life, this study used the scale developed by Kim^[16]. The scale consists of 8 questions, and respondents are asked to mark their answers on the 5-point Likert scale. In this study, Cronbach's alpha was .966.

Interpersonal relationship skill: To measure Interpersonal relationship skill, this study used the scale revised by Kim^[16]. Cronbach's alpha of this study was .920.

Satisfaction with major: To measure satisfaction with major, this study used the scale revised by Lee^[17]. The scale consists of 18 questions: 5 questions on

general satisfaction; 7 on perception satisfaction; 3 on satisfaction with curriculum; 3 on satisfaction with human relations. Those questions were also measured with Likert scale where higher points means higher satisfaction. In Lee [17]'s study, Cronbach's alpha was .90, and the value of this study was .920.

Data Analysis: Collected data was analyzed with SPSS/WIN 22.0. To examine general characteristics of survey respondents, this study acquired real numbers, percentages, means and standard deviations using descriptive statistics. To examine whether there is any difference in general characteristics for the following variables like participation in mentoring program, adjustment to school life, satisfaction with major, and skill in human relations, this study used t-test and ANOVA. To examine the effect of participation in mentoring program on adjustment to school life, satisfaction with major, skill in human relations, this study used t-test.

Result

1. General characteristics of respondents: [Table 1] General characteristics of respondents are shown in Table 1. The proportion of gender is 39 males (19.5%) and 161 females (80.5%). The proportion of students per school year is 100 freshmen (50%) and 100 sophomores (50%). In evaluation of relationship with mentors, 63% responded that it was 'So, so'. The number of those who attended the mentoring program one time or more during the past year was 105 (52%), while 95 students (48%) did not participate in such a program.

Table 1. General Characteristics of Subjects (n=200)

Characteristics	Categories	N(%)
Gender	Male	39(19.5%)
	Female	161(80.5%)
Grade	1	100(50%)
	2	100(50%)
Relationship with mentors	Very good	14%
	Good	19%
	Moderate	63%
	Bad	2%
	Very Bad	2%
Mentoring program one time or more during the past year	1 or more times	105 persons (52%)
	1 time or less	95 persons (48%)

2. The effect of general characteristics on adjustment to college life, satisfaction with major, and Interpersonal relationship skill: [Table 2] The effects of general characteristics on adaptation to college life, satisfaction with major, and skill in human relations are shown in Table 2. The effect of mentor on such variables are significant: adjustment to college life (p=.001), satisfaction with major (p=.001), and interpersonal relationship skill(p=.000). The group of students who have close relations with their mentors were found to be high in points of Likert scale answering those questions on adjustment to college life (3.51±.80), satisfaction with major 3.78±.51), and interpersonal relationship skill (3.78±.51).

Table 2. The effect of general characteristics on adjustment to college life, satisfaction with major, interpersonal relationship skill (n=200)

Characteristics	Categories	Adjustment to College Life		Satisfaction with Major		Interpersonal Relationship Skill	
		M±SD	t or F(p)	M±SD	t or F(p)	M±SD	t or F(p)
Gender	Male	2.68±.85	-1.183	3.45±.52	-2.111	2.81±.83	-1.935
	Female	2.86±.92	(.238)	3.64±.51	(.036)	3.11±.91	(.054)
Grade	1	2.80±.83	1.407	3.51±.45	.647	2.95±.77	1.201
	2	2.63±.89	(.161)	3.46±.58	(.518)	2.80±.93	(.231)
Relationship with mentors	Very good	3.51±.80	17.19 (.001)	3.78±.51	4.73 (.001)	3.77±.70	21.48 (<.001)
	good	3.06±.69		3.63±.53		3.17±.80	
	Moderate	2.49±.74		3.38±.48		2.65±.66	
	Bad	2.25±1.47		3.48±1.14		2.11±1.92	
	Very bad	1.00±.00		3.31±.42		1.07±.64	

3. The effect of mentoring program on adjustment to college life, satisfaction with major, and interpersonal relationship skill: [Table 3] The effects of mentoring program on adjustment to college life, satisfaction with major, and interpersonal relationship skill are shown in Table 3: adjustment to college life ($t=-7.029$, $p<.001$), satisfaction with major ($t=-4.993$, $p<.001$), and interpersonal relationship skill ($t=-5.715$, $p<.001$).

Table 3: Mentoring program participations on adaptation to the university life, satisfaction in major, and interpersonal relationship skill

	Mentoring program (Yes) N=95	Mentoring program (No) N=105	t	p
	M±SD	M±SD		
Adaptation to the university	3.12±.75	2.35±.79	-7.029	<.001
Satisfaction in major	3.67±.46	3.32±.52	-4.993	<.001
Interpersonal relationship skill	3.21±.78	2.67±.80	-5.715	<.001

* $p<0.05$, ** $p<0.01$

Discussion

This study was performed to examine whether participation in mentoring program among nursing students are effective in improving adjustment to college life, satisfaction with major, and interpersonal relationship skill.

It was found that participation in mentoring program has positive effect on adaptation to life in the department and college. Satisfaction with major, and skill in human relations. Previous researches have also found that students who participated in mentoring programs are higher in adaptation to life in the department and college^[1,16]. We could identify that mentoring program is an effective program to raise satisfaction with school life because such a program builds close relationship between mentor and mentee and helps mentee search for future career and prepare for it. In addition, as the relationship between mentor and mentee can be crucial in making the mentoring program successful, the systematic and efficient plans to build mutually positive trust relationship should be considered first. In particular, as nursing school students, objects of this research, tend to have fixed careers, systematic advice of mentor on mentee’s career, information on clinical training, and

emotional support, etc. can be effective mentoring in mentee’s college life. Besides, mentoring program was found to have positive effects on self growth and development like improvement of self respect^[18], and career identity^[19].

As satisfaction with major is the process of evaluating the department one belongs to, in view of one’s future career and expectation on future job^[20], it is an element affecting career choice. Data analysis of this research found that participation in mentoring program has positive effect on satisfaction with major. So, such a program is effective in growth and development of college students. Previous researches have also found that participation in mentoring program have positive effects on learning achievement and learning attitudes, and stimulates motive to study, raises pride, and reduce psychological burden of learning^[21]. When we combine such findings, we can infer that mutual interaction between mentor and mentee can affect on only their learning achievement, but continued learning. Therefore, it seems desirable to continue to do researches on mentoring in various aspects.

Interpersonal relationship skill are knowhow on how to avoid hurting other person’s emotion and make other person comfortable. As poor human relations can result in mal-adjustment to school life, skill in human relations are important to adjust oneself to environment called college. In particular, as nurses should have cooperative and close relations with their patients as well as members of the medical team, such skill are important requirement nurses should be equipped with. This research found that participation in mentoring program has positive effect on forming positive human relations. Oh, Kim & Lee^[22] also found such positive effect of mentoring program on forming positive human relations. Noe^[15] discovered that the more mentee perceives the role of mentor, the more he or she can improve mental capacity and self-efficacy, and that mentor program has positive effect on psycho-social relations. With the experiences of relations with mentor, mentee can improve skill in human relations, and cultivate the capacity to understand oneself, positive attitudes, and leading attitudes^[23].

Based on findings of this research, we can understand the process of growth and development of participants in mentoring program. As the relationship between mentor and mentee is socialization process of nursing school students to be professional nurses, it seems necessary to consider adopting mentoring

program as a non-course program in nursing college to help nursing school students grow themselves such as adaptation to school life, satisfaction with major, and skill in human relations. Accordingly, when a college operates mentoring program, it seems necessary to perform customized mentoring for each student focusing on improving adaptation to life in the department and college. Satisfaction with major, and interpersonal relationship skill. It should also consider specific conditions of schools.

Conclusion

This research was performed to identify the effect of participation in mentoring program on adjustment to college life. Satisfaction with major, and interpersonal relationship skill in the nursing students. Data analysis found out that participation in mentoring program has positive effect on those variables. The objects of this research are nursing students. Thus, this research suggests that it is desirable to do future researches applying mentoring program to students in various majors.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Evaluation of Effective Sound Insulation Method for Noise Generated by MRI

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Abstract

Background/Objectives: MRI is a popular method in modern diagnostic medicine. However, MRI equipment produces 65 to 130 kHz noise when operated, which can cause patients to feel anxious or fear enclosed spaces. To lower the level of noise, method such as earplugs and headsets have been used.

Method/Statistical Analysis: In this study, the researchers tried to find out the effective sound insulation method by measuring the degree of noise heard by the patients and evaluating the difference of noise by sound insulation material. A sound meter was placed in a water phantom made outside the magnetic field of the MRI to measure the noise using four sequences (EPI, T1, T2, GRE) and compared it to the sound felt by the patient.

Findings: As a result, the average noise felt by the patient was measured to be 92.5 dB at EPI, 73.1 dB at T1, 87.4 dB at T2, and finally 74.4 dB at GRE. The average noise when the earplug was worn was measured to be 84.4 dB at EPI, 66.3 dB at T1, 79.4 dB at T2, and 67.7 dB at GRE. The average noise value when the headset was worn was measured to be 78.2 dB at EPI, 61.3 dB at T1, 74.4 dB at T2, and 65.3 dB at GRE. Finally, the average noise when both earplug and headset were simultaneously worn was measured to be 77.4 dB at EPI, 60.5 dB at T1, 73.3 dB at T2, and 63.4 dB at GRE respectively. Based on the above result, the most effective sound insulation was made when both earplug and headset were worn at the same time, the next effective sound insulation method was headset wearing, and the least sound insulation method was earplug wearing.

Improvements/Applications: If it is not possible to apply a fundamental management method to eliminate the causes of noise, which is difficult to practice in actual clinical practice, it is suggested that hearing protection gear should be actively used to reduce the degree of noise-exposed to patients.

Keywords: *Magnetic resonance imaging, headset, earplug, noise, Sound insulation.*

Introduction

Nuclear Magnetic Resonance (NMR), initially published in 1946 by Purcell and Block researchers,

was able to provide imaging ability by the development of gradient magnetic fields by Laterbur of New York State University in 1973. Thus, the device was named Nuclear Magnetic Resonance Imaging (NMRI), which combines nuclear magnetic resonance and imaging. It is now commonly referred to as MRI by omitting the initial letter N of Nuclear. MRI uses nuclear magnetic field and non-ionizing radiation to generate nuclear magnetic resonance in the nucleus of the body, imaging the density and physicochemical characteristics of the nucleus ^[1]. Therefore, MRI (Magnetic Resonance Imaging) is harmless to the human body, unlike X-ray

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or CT (Computed Tomography) and is widely used in the modern diagnostic medicine [2]. However, these MRI devices generate the noise of 65 ~ 100 dB for 1.5 Tesla, and close to 120 ~ 130 dB for 3.0 Tesla MRI equipment. In addition to the extremely narrow magnet bore of MRI, patients often complain of anxiety or claustrophobia during MRI because the patient's movement is limited to the maximum. As a result, MRI scanning may be delayed or interrupted. [3-4]. To reduce such anxiety, the current clinical practice uses music therapy that provides the music that the patient likes during MRI scanning [5], communicates with the patient through broadcasting [6], and simultaneously communicates with music therapy [7], which has been reported to reduce the psychological tensions of patients and makes them feel stable and consequently reduces anxiety. However, above method do not remove the real noise generated during MRI. Therefore, the method of managing the cause of the noise should be applied to reduce the amount of sound reaching the patient. However, the method of Hennel F et al (1999), which reduces the noise by smoothing the slope of the electric signal input to the coil, has a limitation in that the resolution of the image is lowered[8].

Since the numerical value of noise generated from MRI may cause an anxiety in patients, it is necessary to take measures to deal with it [9]. In the actual clinic, earplugs and headsets are used to reduce noise reaching patients.

Previous studies have identified the amount of noise generated by MRI, but there is no study that measures the amount of noise that patients experience after wearing sound insulation gear. Through this study, the researchers tried to find an effective sound insulation method that reduces the noise value that reaches the patient by measuring the degree of noise actually heard by the patient and comparing and evaluating the noise of each sound insulation material.

Method

- 1. Materials for Experiment:** As the material of the above experiment, RION's NL-42, an international standard Class 2 (normal) sound measuring instrument, was used. As a phantom, a hand-made water phantom was used. The size was 270 mm × 230 mm × 240 mm, the material was PP, and its purpose was to insert a noise meter [Figure 1].



Figure 1. Experimental material

- 2. Experimental Method:** The experiment was conducted in MRI room (3.0T Intera system Philips MRI), which was generally inspected, and noise was measured and evaluated by placing it at the end of the MRI, which is not affected by the magnetic field. [Figure 2] shows the experiments placing a sound meter in the phantom based on the method of sound insulation to the patient using earplug, headset and both earplug and headset at the same time without

sound insulation material. The noise was measured and compared by 4 method of earplug wearing, headset wearing and both earplug and headset wearing with 4 sequences (EPI, T1, T2, GRE) after measuring the noise that the patients felt. In order to increase the reliability of the experiment, total five measurements were performed, and the values at 5, 15, 25, 35, 45, and 55 seconds were recorded for 60 seconds by each sequence.



Figure 2. Measuring method (a) General MRI noise (b) Earplugs (c) Headset (d) Earplugs + Headset

3. Statistics: The average noise value of sequence by each method was obtained utilizing SPSS software Ver.25.

Result

[Table 1] shows the results of measurement and comparison of noise using sound insulation method. [Figure 3] is a graph showing the results of the comparison. At EPI, the highest noise-sequence, the average noise value of patients was 92.5 dB and the average value of noise when insulated by earplug was 84.4 dB. The one when insulated by headset was 78.2 dB and the one when insulated by both earplug and headset at the same time was 77.4 dB respectively. At T1 sequence, the average noise value of patients was 73.1 dB and the average value of noise when insulated by earplug was 66.3 dB, the one insulated by headset was 61.3 dB, and the one insulated by both earplug and headset at the same time was 60.5 dB. At T2 sequence, the average noise value of patients was 87.4 dB, the average noise value when insulated earplug was 79.4 dB, the average noise value when insulated by headset sound was 74.4 dB and the one when insulated by both earplug and headset at the same time was 73.3 dB. Finally, the average noise of the patients at GRE sequence was 74.4 dB. The average noise value when insulated by earplug was 67.7 dB, the average noise value when insulated by headset was 65.1 dB, and the one when insulated by both earplug and headset was 63.4 dB respectively. This shows that the noise is insulated most when earplugs and headsets are worn at the same time. The headset was then the second, and the earplug was third in sound insulation.

Table 1. Measured Value [Unit : dB(A)]

Sequence	General	Earplug	Headset	Earplug + Headset
EPI	92.5	84.4	78.2	77.4
T1	73.1	66.3	61.3	60.5
T2	87.4	79.4	74.4	73.3
GRE	74.4	67.7	65.1	63.4

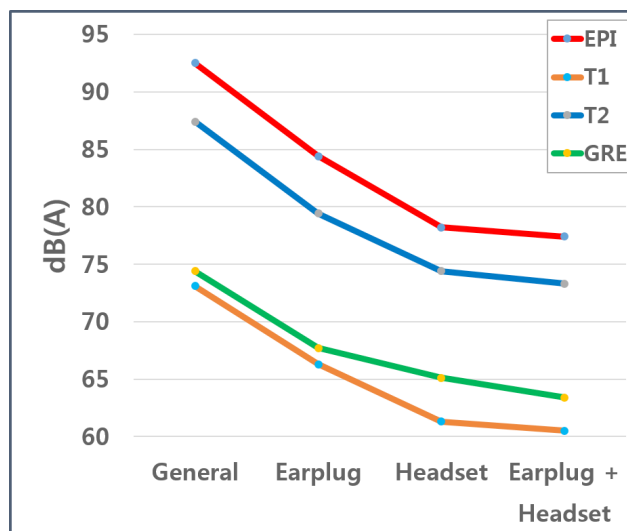


Figure 3. Measurement Value Graph

Discussion

The noise at the EPI sequence was from 92.5 dB to 77.4 dB and decreased up to by -15.1 dB, about 16.3%, and the sound at the T1 sequence was from 60.5 dB to 73.1 dB, and decreased up to by -12.6 dB, about 17.2%. The noise at T2 sequence was from 73.3 dB to 87.4 dB and decreased up to by -14.1 dB, about 16.1%, and the noise at the GRE sequence was 63.4 dB to 74.4 dB and decreased up to by -11 dB, about 14.8%. The MRI test showed the most significant sound insulation effect of -15.1 dB at EPI sequence, and the sound insulation effect about 16% was achieved by simultaneous wearing of both earplugs and headsets. At EPI sequence, the noise was from 77.4 dB to 92.5 dB and decreased up to -15.1 dB, about 16.3%, and the sound at the T1 sequence was from 60.5 dB at 73.1 dB and decreased up to -12.6 dB, about 17.2%. At the T2 sequence, the noise was from 73.3 dB to 87.4 dB and decreased up to by -14.1 dB, about 16.1%, and the noise at the GRE sequence was from 63.4 dB to 74.4 dB and decreased up to -11 dB, about 14.8%. The MRI test showed the most significant sound insulation effect of -15.1 dB at EPI sequence, and the sound insulation effect of about 16% was achieved by the simultaneous wearing of both earplug and headset.

MRI is one of the most important imaging diagnoses in modern medicine. It is possible to diagnose diseases in a way that is harmless to the human body, not to diagnose diseases using radiation such as X-ray or CT and provides anatomical and pathological information of human tissues unlike other diagnosis method, so the perception that MRI is safe unlike other diagnostic method is widespread to modern citizens. Contrary to the advantages of MRI, however, MRI generates quite a large amount of noise. Although the degree of noise varies slightly between manufacturers and equipment, it generates noise of 65 ~ 100 dB in case of 1.5 Tesla MRI and 120 ~ 130 dB in the case of 3.0 Tesla MRI. Besides, 7.0 Tesla MRI equipment under development is expected to generate even higher noise, which may cause various problems [3]. The short-term exposure to such noise not only temporarily reduces hearing but also causes hearing loss difficult to recover when exposed for a long time [10]. The noise of MRI causes an imbalance between the sympathetic and parasympathetic nerves, causing stress, anxiety [11], and also affects breathing or pulse. It brings physiologically, the sympathetic nerves causing excitement and tension, elevation of blood pressure, excessive secretion of gastric acid, increased heart rate, constriction of blood vessels, and hormonal changes [12]. ‘Noise work’ refers to a work that generates noise higher than 85 dB over 8 hours a day. ‘Intense noise work’ refers to a practice that produces the noise higher than 90 dB at the same time as above. This noise does not cause noise-induced hearing loss, but the noise reaching the patient causes various physiological disorders in the human body [13]. In fact, these noises cause many patients to feel anxiety or claustrophobia during MRI, which often causes delayed examination or movement of the patient resulting in poorly diagnosed images. It is reported that the fundamental management method of noise should be applied to improve the noise generation, but if it is difficult, it should be shielded by hearing protection gear [14]. Although these method are not sufficient to prevent noise with a frequency band between 500 and 1000 Hz, which affects the patient much during the MRI scan [15], this reduces the degree of noise-exposed [2]. Claustrophobia and noise sensitivity were reported to be reduced after the MRI examination [16]. In the case of the previous studies, the amount of noise generated during the MRI test can be identified and evaluated. However, no study measured the degree of noise felt by patients wearing the sound insulation materials during the test. Therefore, in this study, the researchers measured the actual noise level that patients

felt using sound insulation method that are widely used in clinical practice, and then compare and evaluate the noise of each sound insulation material to find an effective sound insulation method that reduce the degree of noise reaching the patient.

The limitations of the study were first, the noise measurement with nonmagnetic material was not made in MRI bore, and the noise was measured in an accessible place. Second, the structure of the human body was much more complicated than the phantom implemented, so indirect measurement was made. Further research needs to measure the noise at the center of MRI using a nonmagnetic noise meter to make the measurement close to the sound heard that patients hear.

Conclusion

This study compares and evaluates the method of insulating the noise generated during MRI test. The most effective method to insulate the noise generated from MRI was wearing both earplug and headset at the same time. The second effective way was wearing a headset and the least effective one was wearing an earplug. When comparing and evaluating the noise values heard by patients, the actual sound insulation value was significant, and the sound insulation effect up to by -15.1 dB, about 16.3% was achieved at EPI sequence. These values are thought to be effective for various physiological functions as well as claustrophobia and anxiety for patients. As a result, it is suggested that hearing protection gears should be used to reduce the level of noise exposed to patients if fundamental management method such as the installation of soundproof hoods on MRI are not available.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Impact of Trademark Rights on a Company's Financial Performance: Focusing on Pharmaceutical Industry in South Korea

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Abstract

Background/Objectives: In recent years, there has been a growing awareness that intangible assets, especially intellectual property, can affect a company's value and competitiveness. To this end, companies are striving to secure intellectual property around patents, and many studies have verified the relationship between patent information and corporate performance from a variety of angles. However, in the field of intellectual property, the focus was mainly on patent information-driven research, and further research on the relationship between trademark and design authority is necessary to clarify the relationship between intellectual property rights and corporate management performance..

Method/Statistical Analysis: The purpose of this study is to verify whether a company's trademark application/registration activity and the persistence of a company's trademark rights affect the company's financial performance through SPSS.

Findings: The amount of trademark application/registration activity of a company and the persistence of trademark rights held by a company both affect the financial performance of the company.

Improvements/Applications: This study verified the relationship between trademark rights and corporate performance, which had been expected only by conjecture, through statistical method. However, the value of a trademark is determined by the market value accumulated by the use of the trademark rather than by the trademark itself. Therefore, follow-up studies are needed to verify statistically through various trademark information for various industries as to whether the acquisition of trademark assets has a positive effect on the company's management performance.

Keywords: *Trademark, Trademark Rights, Trademark Data, Company Performance, Financial Performance.*

Introduction

Due to the continuous development of science and technology and the emergence of new technologies due to the Fourth Industrial Revolution, the importance

of intellectual property is increasing day by day, and securing the intellectual property has become a barometer for measuring the company's management performance and competitiveness. Smith and Parr view Intellectual property as a representative intangible asset that contributes to the company's profit generation^[1], while Edvinsson and Malone refer to intangible assets such as patents and copyrights as innovative capital^[2] ^[3]. Researches that explore the relationship between existing intellectual property rights and corporate management performance have focused on research based on patents. As a result, it is confirmed that sales

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of patent applications and registrations are affecting sales^[4], and that R & D expenditures and patents affect corporate value^[5] and that R & D intensity and patents have a positive effect on economic value-added value per share(EVA)^[6]. Trademarks can be used as a tool to distinguish a company's product from other companies' products, and can be used as a guarantee of quality, identity, etc., which can increase the consumer's preference for the product. Brands already positively recognized by consumers have the effect of reducing marketing costs such as promotions, and can increase the efficiency of communication between companies and consumers^[7]. Furthermore, the company's brand equity increases its influence on growth footing and distribution through brand expansion, and is an additional source of revenue for the company through its actual assets and licensing^[8]. In the situation where the quality and function of products are being leveled due to the steady development of technology, the importance of trademarks and brands as a criterion for differentiation of a company's products or services or a selection of consumers' products is increasing day by day. Companies are aware of this and are making efforts to secure trademark rights. In particular, the Korean pharmaceutical industry corresponds to an industry where the trademark application volume is higher than the cosmetics, electrical and electronic products, clothing, and food industries. And instead of developing new drugs, they are growing by copying and selling expired drugs. Therefore, the ratio of sales by developing new drugs is small compared to that of developed countries, and the ratio of sales by duplicate drugs that rely on sales and marketing rather than technical skills is high. Therefore, although the acquisition and utilization of patents are an important factor in corporate management performance, in the Korean pharmaceutical industry, which focuses on the sales of generic drugs with little quality discrimination, securing the trademark or brand itself will affect corporate performance. The purpose of this study is to statistically verify the trademark information of the pharmaceutical industry, which is expected to have a greater impact on the company's business performance than the acquisition of patent assets.

Method

Existing trademark researches were mainly qualitative researches, such as literature research and survey-based hypothesis testing, in the methodological aspect. In terms of contents, researches on measuring

economic value in the field of marketing and improving its utilization and researches on institutional improvement in the field of law have been conducted^[9]. There were also studies dealing with economic value and business strategy. First, there was a study on the effect of profitability and operating cash flow on brand value through comparison between industries^[10], and studies on product sales strategies based on the theory of brand extension^[11-14]. In addition, trademark rights have enormous rights in their utility and economic feasibility, including profits and publicity effects as property rights due to civil and criminal sanctions on monopoly, property rights, and infringement. If you do not register your trademark as a trademark, you cannot sanction appropriate for unauthorized use by others. Moreover, if someone else applies first, the brand may be taken away and the brand reputation that has been accumulated may be damaged. Furthermore, this study found that trademark rights affect brand value because the act of displaying trademark application number or registration number helps brand marketing^[15]. In terms of indicators to measure the economic profit direction of firms, there was an in-depth study of new application trademarks of Benelux SMEs^[16] and a study to analyze the purpose of trademark application of SMEs through a survey^[17]. In addition, there was a study on the development of a trademark valuation model of a company for the purpose of evaluating trademark value^[18-19].

There are not many research cases that directly analyze and utilize various information of trademark right in relation to this study, but Lee and Lee presented an analysis method using product information of trademark right to analyze industrial convergence^[20]. Yoon et al. Presented a methodology for business intelligence by looking at and analyzing trademark rights as business data^[21]. Yoo and Lee presented a way to judge consumers' perception using trademark data^[22].

In order to extract the trademark index for use in this study, we referred to the indicators in the patent field where research to verify the relationship with management performance among intellectual property rights is active^[23-27].

The subjects of this study were mainly Korean pharmaceutical companies. Among them, more than 50 trademark applications were filed and 59 Korean listed pharmaceutical and bio companies as of 2018. The data was collected using the trademark search system Intomark (www.intomark.com) and patent information

search service (www.kipris.or.kr). The trademark data was extracted by searching each company name as the applicant for the trademark data from 1950 to 2018. The financial statements of each company collected data provided by the Financial Supervisory Service’s electronic disclosure system (dart.fss.or.kr).

Based on the theoretical background so far, the number of trademark application, trademark registration rate, trademark registration per employee, and renewal trademark ratio were selected as independent variables. In addition, as the dependent variable that indicates the company’s management performance, the average sales revenue over five years related to the growth performance was selected. Among the independent variables, the total number of applications, the number of trademark

registrations per employee, the rate of registration were used as a factor of the company’s trademark application/ registration activity, and the renewal trademark ratio was used as a factor of the persistence of trademark rights held by the company.

H1. The amount of trademark application/ registration activity of a company affects its financial performance.

H2. The persistence of the trademarks owned by the company affects the company’s financial performance.

The categories included in the research model are described by the variable and operational definitions shown in [Table 1].

Table 1: Definition of Variables

Variable	Factor	Conceptual Definition	Operational Definition
Independent variable	The amount of trademark application/ registration activity	Number of trademark applications	-
		Number of registered trademarks per employee	Number of registered trademarks/ Number of employees
		Trademark Registration Rate	Number of registered trademarks/ Number of trademark applications
	The persistence of the trademarks owned by the company	Trademark Renewal Rate	Number of renewed trademarks/ Number of registered trademarks
Dependent variable	Financial performance of the company	5-year average sales	Total sales for five years/5

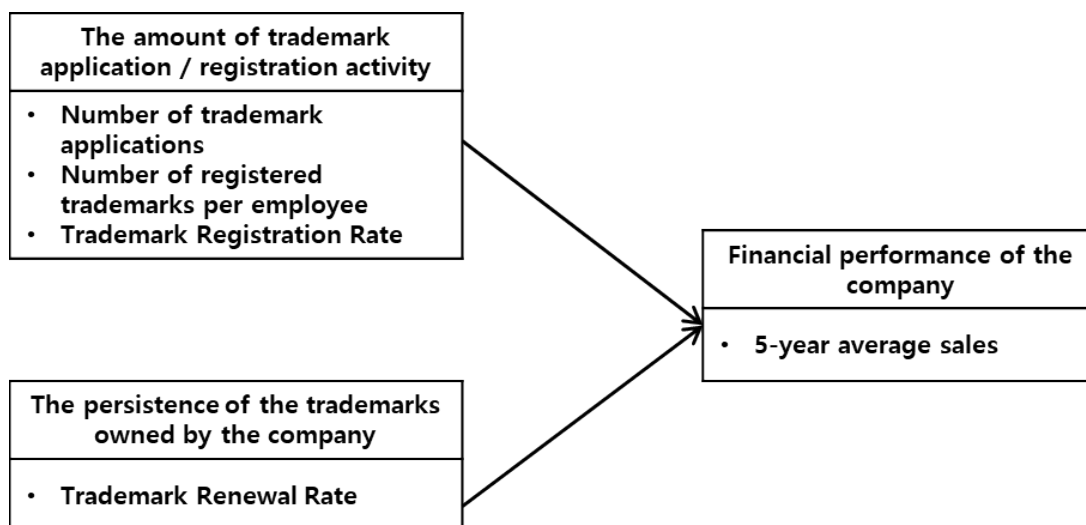


Figure 1. Research model

[Figure 1] shows the research model for empirically analyzing the hypotheses as shown above. In other words, this study used the number of trademark

applications, trademark registration rate, and trademark registration per employee in terms of the amount of trademark application/registration activity. In addition,

we measured the persistence of the trademarks owned by the company as the renewal trademark ratio. The average variable over the last five years, which represents the company’s growth potential, is the dependent variable. The amount of trademark application/registration activity and the persistence of the trademarks owned by the company will be examined through multiple regression analysis.

Result and Discussion

The independent variables in this study are the number of trademark applications, the number of registered trademark per employee, trademark registration rate, and trademark renewal rate in the

trademark quantitative data. The dependent variable is the average sales for five years. Multiple regression analysis showed statistically significant results.

Table 2. Model Summary

Model	R	R ²	Modified R ²	Standard Error of Estimates	Durbin-Watson
1	.698	.487	.449	223375.4681	1.199

As shown in [Table 2], R² = .487 shows 48.7% explanatory power. Durbin Watson is 1.199, which is close to 2 and not close to 0 or 4, so there is no correlation between the residuals, making it suitable for the regression model.

Table 3. ANOVA

Model	Sum of squares	Degreed of freedom	Mean squares	F	p-value
Regression	2557511622918.120	4	638937902729.530	12.805	.000
Error	2694416386353.230	54	49896599747.282		
Total	5250168009271.350	58			

As shown in [Table 3], the F value was 12.805 and the significance probability was .000 (p <.05), so the regression line was found to be suitable for the model.

Table 4. Coefficient

Model	Unstandardized Coefficients		Standardized Coefficient	t	Sig.	Collinearity statistics	
	B	Standard Error	Beta			Tolerance	VIF
Constant	-437392.143	149751.755		-2.921	.005		
Number of trademark applications	177.405	26.191	.815	6.774	.000	.656	1.523
Number of registered trademarks per employee	-216740.155	49374.742	-.528	-4.390	.000	.657	1.523
Trademark Registration Rate	10023.397	2136.717	.525	4.691	.000	.759	1.317
Trademark Renewal Rate	3226.064	1482.022	.239	2.177	.034	.786	1.271

As shown in [Table 4], the effect of the number of trademark applications on the average sales over the five years was adopted because the t value was 6.774 and above ± 1.96, and the significance probability (p value) was 0.000 and p <.05. Second, the effect of the number of registered trademark per employee on sales was adopted because t value was -4.390 and above ± 1.96, and the significance probability (p value) was 0.000 (p <.05). Third, the relation between the trademark registration rate and the sales was selected as t value of 4.691 and significant probability (p value) of 0.000. Finally, the trademark renewal rate was chosen as t value was

2.177 and significant probability (p value) was 0.034. Tolerance limits are all above 0.1, so there is no problem with multicollinearity between independent variables.

According to [Table 4] above, the following regression model can be predicted.

$$5\text{-year average sales} = -437392.1431 + 177.405 \times \text{Number of trademark applications} - 216740.155 \times \text{Number of registered trademarks per employee} + 10023.397 \times \text{Trademark Registration Rate} + 3226.064 \times \text{Trademark Renewal Rate}.$$

Therefore, it can be predicted that the five-year average sales increase as the number of trademark applications, trademark registration rate, and renewal trademark ratio increases. However, the lower the number of registered trademark per employee, the higher the five-year average sales.

Discussion

This study analyzes the amount of trademark application/registration activity and whether the persistence of the trademarks owned by the company affects the firm's financial performance. The amount of trademark application/registration activity of a company was measured by the number of trademark applications, trademark registration rate, and registered trademark per employee. The persistence of the trademarks owned by the company was measured by renew trademarks ratio. In addition, the financial performance of the company was measured by sales, which is used as a key indicator of corporate growth. As a result, first, the hypothesis that the amount of trademark application/registration activity of a company affects its financial performance was adopted. However, in case of trademark application/registration activity, the higher the number of trademark applications and trademark registrations, the higher the average 5-year sales, but the lower the number of registered trademark per employee, the higher the 5-year average sales. This is contrary to the previous findings of the patent but is difficult to generalize because the sample is limited to the pharmaceutical industry. For this, follow-up verification through trademark data of various other industries will be required. Second, the hypothesis that the persistence of the trademarks owned by the company affects the financial performance of the company was also adopted. The high renewal brand ratio means that many products have been satisfying consumers for a long time, and there are many brands with high consumer awareness of the brand and the economic value of the brand is also great.

Conclusion

This study verified the relationship between trademark rights and corporate performance, which had been expected only by conjecture, through actual statistical method. In addition, it is expected to contribute to the development of follow-up research on the development of trademark indices using trademark data, which has not been fully studied yet. However, the limitation of this study is that the data covers only

a very small part of the various trademark data, and the sample is limited to the pharmaceutical industry only. Therefore, in future studies, it is necessary to confirm the meaning of trademark information by further verifying it to other industries by various data among the trademark information.

Ethical Clearance: Not required

Source of Funding: This research was financially supported by Hansung University.

Conflict of Interest: Nil

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The Effect of Recognition Level of Korean Elderly Long-Term Care Insurance System on Effectiveness Recognition

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Abstract

Background/Objectives: The purpose of this study is to investigate the effect of the elderly long-term care insurance system recognition level on effectiveness recognition in Korea. The study focused specifically on the comparison of middle age and old age-related study subjects.

Method/Statistical Analysis: The subjects of this study were middle age people between the ages of 45 and 64 years old, and the old age people were over the age of 65 who were residing in Chungnam, Korea. From July to August 2018, questionnaires were distributed and collected from general residents, and finally, 400 sets of data from 200 middle age and 200 old age data were obtained.

Findings: First, the perception of necessity and necessity of elderly long-term care insurance system was considered positive, and the middle age generation was more positive than the old age generation. In addition, the middle age generation had a high level of recognition that if they needed care, they would utilize care facilities, but would utilize home care services when the spouse also required additional care. Second, elderly care facilities and home service fees were generally recognized and considered as expensive, but such a cost burden did not adversely affect the effectiveness recognition of the elderly long-term care insurance system.

Improvements/Applications: In order to solve the problems in the new elderly care facilities construction process, it is necessary to exchange opinions and converge with each other through constant communication and coordination with the residents, and in addition, business entities should first approach local residents with authenticity regarding their noted care issues and concerns.

Keywords: Long-term care insurance system, Recognition level, Admission motivation, Effectiveness recognition, Middle age, Old age.

Introduction

The elderly long-term care insurance system, which is a representative form of social care in Korea, has been implemented nationwide since 2008, and it was institutionalized at the national level on the basis of the social solidarity principle, improving the quality of life

of elderly people and problems caused by the increase in geriatric diseases^[1]. The benefit types of elderly long-term care insurance system includes: home-care benefits such as visiting care, visiting bathing, visiting nursing, day and night care, short term protection, and other home-care benefits, institution benefits, as well as special cash benefits including family care benefits, special medical benefits, and nursing hospital benefits^[2].

According to a study by Lee ^[3]in 2017, nearly 10 years after the elderly long-term care insurance system was implemented nationwide, showing that the proportion of care by family members was higher than that of public services. Nevertheless, the use of public services for the elderly population is on the rise every

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year. As of April 2010, there were 300,000 elderly people who received long-term care status, 5.6% of the total elderly population, and 260,000 of them were using long-term care services for the elderly^[4].

There is also a growing awareness of the need for elderly long-term care services. Meanwhile, according to the National Health Insurance Corporation's 2009 national awareness survey on elderly long-term care insurance system, the overall perception of the need for the system was very high at 86.6%, but the awareness of the system was 53.1%^[5]. In light of the elderly long-term care insurance system awareness survey in 2017, awareness increased significantly to 77.2%, and necessity to 92.8%^[6].

In addition, the perceived level of elderly long-term care insurance system, which can be operationally defined through recognition of elderly long-term care insurance system, necessity, NIMBY phenomenon for nursing facility, and charge level, is expected to vary from generation to generation in terms of needed services for the elderly in society. Empirical studies also found trends related to differences between generations, but the directions were considered to be different. There are also studies^[7] in which age does not affect the perception of elderly long-term care insurance systems and studies^[8] that the older the age, the higher the awareness of the system and the higher the age, the more interested the person was on understanding care systems for the elderly people who would need those services the most in society.

An improved knowledge of the social system or policy, or the development of an increased knowledge of the policy may affect the behavior of policy subjects or future policy subjects and ultimately affect policy effectiveness^[9]. Therefore, in order to grasp the effectiveness of the welfare policy for the elderly, it is necessary to understand more closely the influence of the recognition level on the system, and it is possible

to predict the necessity to aid in the expansion and contraction of the future system by comparing and analyzing it according to the generation.

The study focuses on the middle age generation between 45 and 64 years old and the old age generation older than 65 years to investigate first, "what is the perceived level of elderly long-term care insurance system?," second, "does the elderly long-term care insurance system have a different recognition level according to generation?," and third, "does the perceived level of elderly long-term care insurance system affect the level of effectiveness?"

Method

1. **Data collection procedures:** The subjects of this study were middle age people between the ages of 45 and 64 years old, and the old age people were over the age of 65 who were residing in Chungnam, Korea. It is noted that from July to August, 2018, questionnaires were distributed and collected from general residents, and finally, 400 sets of data from 200 middle age and 200 old age data were obtained.
2. **Characteristics of subjects:** The sociodemographic characteristics of the middle age generation 200 subjects were 57.0% males, 51.29 years of age on average, and 95.5% of respondents were married. Education level was relatively high with 52.5% of college graduates or higher and 43.5% of high school graduates, 51.0% had religion and 71.0% resided in urban area.

The sociodemographic characteristics of the middle age generation 200 subjects were that 68.0% males, 75.81 years of age on average, and 91.5% of respondents were married. The education level of the subjects showed 65.0% of the subjects having less than middle school education, 69.0% had religion, and 60.0% lived in rural areas.

3. Measurement tools:

Table 1. Measurement tools

Variable	Content	Measurement method
Dependent variable	Effectiveness recognition	It used the single item “Do you think that the elderly long-term care insurance system will ease the burden on families?” and it is composed of a 5 point Likert scale.
Independent variable	Necessity recognition	It used the single item “Do you think there is need for an elderly long-term care insurance system?” and it is composed of a 5 point Likert scale
	Care facility building approval	It used the single item “Would you approve of elderly care facilities near your home?” and it is composed of a 5 point Likert scale
	Care facility fee charging	It used the single item “Do you think the cost of entering elderly care facilities is reasonable?” and it is composed of a 5 point Likert scale
	Home service fee charging	It used the single item “Do you think the cost of home-care benefits service is reasonable?” and it is composed of a 5 point Likert scale

4. Statistics: In this case, the frequency analysis, crosstab analysis, and hierarchical regression analysis were applied using SPSS 21.0.

Result

1. Recognition of elderly long-term care insurance system: The recognition rate of elderly long-term care insurance system of middle age and old age was high with 77.3%, 89.2% of the respondents responded ‘agree’ to the effectiveness of the system, and 2.2% ‘strongly agree’ with 91.4% positive towards the system (average 4.12), and in response to the necessity of the system, ‘agree’ was 54.7% and ‘strongly agree’ was 35.6% with 90.6% (average 4.22) responding positively. However, it is emphasized that 66.3% of the respondents agreed to building a care facility near to their home, with a slightly lower response rate of 3.69.

In service type, on the question of need for care for oneself, 51.8% responded ‘elderly care facilities admission’ and for spouse, 51.5% responded ‘use of home-care benefits’, which was similar levels. Meanwhile, for responses related to elderly care facilities fees, 51% responded that it was ‘rather burdening’ and 58.3% responded ‘average’ for home service use fees, showing that home service use burden is lower than elderly care facilities burden.

2. Differences in recognition of elderly long-term care insurance system by generation: The differences between the elderly long-term care

insurance system awareness was significant in the difference between middle age and old age [Table 2]. The awareness was high both in old age generation (70.5%) and middle age generation (84.0%), but middle age generation was higher.

Table 2: The difference awareness according to generation

	Middle generation N (%)	Old generation N (%)	Chi-square
Know	168(84.0)	141(70.5)	10.370**
Do not Know	32(16.0)	59(29.5)	
**p<.01			

3. The effect of perceived level of elderly long-term care insurance system on the effectiveness recognition by generation: To investigate the effect of awareness level of elderly long-term care insurance system on effectiveness recognition, those who know the elderly long-term care insurance system were separated for analysis in the study. A hierarchical regression analysis was performed [Table 3].

Stage 1 control variables accounted for 4.5% of the effective recognition of elderly long-term care insurance systems, elderly long-term care insurance system recognition explained 39.9%, and the total of 10 variables accounted for 44.4% of the effective recognition of the elderly long-term care insurance system of the middle age generation. Therefore, the necessity recognition of the elderly long-term care insurance system, rather than

the sociodemographic characteristics of the middle age generation, were shown to have had more influence on the effectiveness recognition.

Looking at the influence of individual variables focusing on model II, it was shown that the awareness

of the effectiveness of elderly long-term care insurance system in Korea was higher with higher recognition of necessity and higher agreement to care facility building near the home, and the relative influence of necessity recognition was higher between the two variables.

Table 3. The effect of recognition level of elderly long-term care insurance system on middle generation on effectiveness recognition

		Model I			Model II		
		B	Beta	t	B	Beta	t
Constant term		5.062		7.057***	1.655		2.459*
Stage 1 Socio demographic characteristics	Gender (1=Male)	.246	.175	2.133*	.102	.073	1.114
	Age	-.025	-.159	-1.464	-.011	-.072	-.849
	Marital period	.012	.107	.994	.004	.035	.412
	Education level (1=College graduate)	.021	.015	.184	-.036	-.026	-.407
	Religion (1=Yes)	.149	.108	1.365	.071	.052	.840
	Residence (1=Urban)	-.080	-.051	-.641	-.136	-.087	-1.417
Stage 2 Elderly long-term care system recognition	Necessity recognition				.563	.515	7.870***
	Care facility building approval				.181	.249	3.848***
	Care facility fee charging				.009	.010	.152
	Home service fee charging				-.024	-.027	-.390
		F value=1.260 R ² =.045			F value=12.549*** DR ² =.399 R ² =.444		
*p<.05, ***p<.001							

Next, in the hierarchical regression model for old age generation [Table 4], the Stage 1 control variables accounted for 5.5% of the effective recognition of elderly long-term care insurance system, whereby the elderly long-term care insurance system recognition explained 32.5%, and the total of 10 variables accounted for 38.0% of the effective recognition of the elderly long-term care insurance system of the old age generation. Looking at

the influence of individual variables focusing on model II, it is noted that the awareness of the effectiveness of elderly long-term care insurance system in Korea was seen as higher, with a higher recognition of necessity and higher agreement to care facility building near the home, and relative influence of necessity recognition was higher between the two variables.

Table 4. The effect of recognition level of elderly long-term care insurance system on old age generation one effectiveness recognition

		Model I			Model II		
		B	Beta	t	B	Beta	t
Constant term		4.692		5.387***	1.785		1.916
Stage 1 Socio demographic characteristics	Gender (1=Male)	-.264	-.168	-1.832	-.153	-.097	-1.267
	Age	-.001	-.012	-.116	.011	.099	1.000
	Marital period	-.006	-.092	-.885	-.013	-.211	-2.272*
	Education level (1=College graduate)	-.229	-.065	-.730	-.049	-.014	-.185
	Religion (1=Yes)	.157	.102	1.204	.057	.037	.515
	Residence (1=Urban)	.050	.034	.396	-.122	-.084	-1.131

		Model I			Model II		
		B	Beta	t	B	Beta	t
Stage 2 Elderly long-term care system recognition	Necessity recognition				.281	.332	3.432**
	Care facility building approval				.278	.360	4.160***
	Care facility fee charging				.036	.042	.522
	Home service fee charging				-.028	-.030	-.383
		F value=1.301 R ² =.055			F value =7.953*** DR ² =.325 R ² =.380		
*p<.05, **p<.01, ***p<.001							

Discussion

The corresponding discussions and recommendations that were based on the important results are as follows.

First, the perception of necessity and necessity of elderly long-term care insurance system was considered positive, and the middle age generation was more positive than the old age generation. Also, the middle age generation had a high level of recognition that if they needed care, they would utilize care facilities, but would utilize home care services when the spouse also required additional care. This implies that they would prefer to care for their spouse in the home rather than at a facility when it is possible for them to care for their spouses. In these cases, it is noted that there is a need for a governmental program to be initiated, and this is in the same context as the activation of the day care center, which is being actively promoted by the current government. On the other hand, the old age generation was more likely to consider elderly care facilities, in the case that they needed care or their spouse needed care. This is interpreted that it is difficult to care for oneself and care for a spouse, in a situation where it is often difficult for the elderly to cope with their own physical needs, and they become less independent as they age. Therefore, elderly care facilities need to be expanded for the current elderly generation. At the time in the future, when the middle age generation becomes elderly and needs public care, it is desirable to expand community care such as day care centers and home welfare centers rather than elderly care facilities, which is more likely to be available in the form of the community care provided by the current government.

Second, it is worth noting that the higher the approval level for the construction of the care facility

near the residential area, the more positively recognized is the effectiveness of the system. The necessity of the system was noted at 4.22 out of 5 points, but the approval level related to construction of care facility was noted to be 3.69 points out of 5 points, and this figure was lower than necessity. This shows that there is still a NIMBY phenomenon in effect for elderly care facilities. As a result, confrontation with the local residents is often initiated for these reasons, and in order to easily resolve such conflicts, the business entity promises unconditional incentives to local residents. However, these incentives not only take into consideration the rational judgment of local residents, but also it is not possible to expect realistic solutions in some cases under these circumstances. In order to solve the problems in the new elderly care facilities construction process, it is necessary to exchange opinions and converge with each other through constant communication and coordination with the residents, and in addition, business entities should first approach local residents with authenticity regarding their noted care issues and concerns. A program should be developed in which local residents can participate and encourage volunteering to assist the elderly, to contemplate ways in which elderly care facilities can coexist with local residents in a partnership to manage meeting the needs of the elderly on all levels of care.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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The Effect of Power of Agility of Core Stabilization Exercise by the Musical Type

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Abstract

Background/Objectives: The purpose of this study was to investigate the effects of core stabilization exercise combined with music of various tempo and mode on the power of agility.

Method/Statistical Analysis: 65 healthy adults who did not major in music were recruited and each participant was randomly divided into five groups. All groups were performed core stabilization exercise for 3 weeks. To confirm the effect of core stabilization exercise combined with music of various tempo and mode, they were measured before and after the exercise.

Findings: After applying the core stabilization exercise, the power of agility was improved in all groups, and the fast tempo groups improved the power of agility more than the slow tempo groups. However, there was no significant difference between the major mode and minor mode groups.

Improvements/Applications: Tempo was affected on the power of agility. But mode was not affected on the power of agility.

Keywords: Power of agility, Music, Tempo, Mode, Core stabilization exercise.

Introduction

Recently, a variety of core stabilization exercises have been applied to enhance the physical fitness and exercise performance of the general public and to prevent injuries^[1]. The core muscles are the muscles of the spinal, pelvis, hip, and abdominal muscles that maintain the stability of the vertebrae^[2]. Core stabilization exercises can improve muscle strength, power of agility, flexibility, and balance in high school girls and middle-aged women, accompanied by the training of the gluteus maximus muscle^[3-4]. In addition, it has been reported that female tennis players can positively improve their basic stamina and athletic performance^[5] such as improving

leg strength, muscular endurance, and power of agility^[6]. However, even though exercise is important, exercise is stressful if it is boring and does not cause interest. Therefore, various methods are sought to exercise without physical and psychological stress caused by exercise. Among them, music therapy has been applied to reduce psychological stability and stress from exercise since long time ago^[7]. The effect of this music causes human physical, psychological, and emotional responses, and the rhythm and dynamics of the music motivate them to bring about regular and systematic behavior^[8]. It has been reported that the physical exercise activity using music not only increases exercise ability and coordination but also induces motivation during exercise learning^[9]. Also, it is reported that the rhythm of music has a similarity with human movement and thus affects physical function^[10]. Previous papers showing the effects and effects of music tempo reported that slower tempo music improves concentration than faster tempo music^[11]. It has also been reported that applying a slower tempo improves body flexibility^[12]. The mode consists

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of major and minor. Major is associated with joy and happiness, and minor is associated with sadness^[13-14]. There were not many papers that examined exercise performance ability by applying mode or combining mode and tempo. Therefore, it is necessary to investigate how tempo and mode affect exercise performance and to find a more efficient way to exercise by applying music later on. We measured the wits after three weeks of core stabilization in the experimental group with four music combinations of tempo and mode and the control group without music. We investigated which music is effective in improving the performance of exercise given above.

Method

The subjects of this study were 65 adults who meet the following conditions for Seongnam Senior Experience Complex and fully understood and agreed on the contents of the experiment. The selection criteria were neurological diseases and no hearing impairment, and no orthopedic, symptoms and functional limitations. Before performing this study, the subjects were fully explained about the contents and procedures, and all subjects completed the agreement for the experiment. All groups were randomly assigned to exclude preferences. The general characteristics of the subjects are as follows [Table 1].

Table 1. Physical characteristics of subjects

Item	Number	Age	Height	Weight	Leg length	
					Left	Right
FMjG	13	51.2±1.6a	171.2±8.4	64±10.3	89.7±5.3	89.7±5.5
FMnG	13	51.4±1.5	165.1±7.1	61.9±11.6	86.1±3.9	86.7±3.7
SMjG	13	51.6±1.8	168.9±8.9	66.2±9.3	88.5±4.2	88.6±4.3
SMnG	13	52.3±2.6	170.9±7.3	64.5±11.7	87.7±5.0	87.8±4.6
NMG	13	51.2±1.5	169.2±8.5	61.9±11.8	88.4±4.5	88.6±4.8

^aMean±SD, FMjG: Fast Major Group, FMnG: Fast Minor Group, SMjG: Slow Major Group, SMnG: Slow Minor Group, NMG: No Music Group

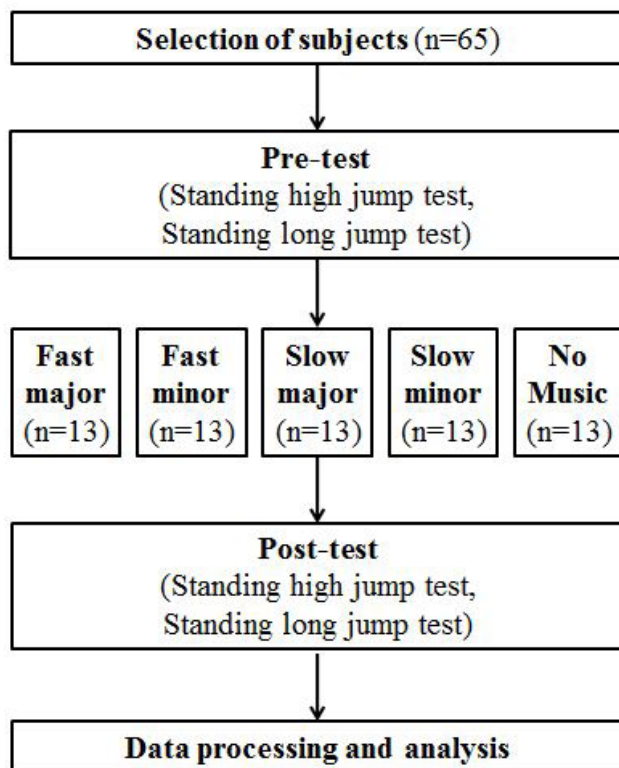


Figure 1. Experimental diagram

The subjects were randomly assigned to five groups: fast major group, fast minor group, slow major group, slow minor group, and no music group. Prior to the experiment, we used the standing high jump test and standing long jump test. And the experiment was conducted for 3 weeks and the core stabilization exercise was performed three times a week. After the experiment, the same method was used to evaluate the change in power of agility [Figure 1].

The power of agility test was standing high jump test and standing long jump test, and this test has been used in many studies^[15]. The standing high jump test is as follows. The subject stands 20cm from the wall and stands side by side with the wall. And the subject jumps as high as possible on the spot, hitting the measuring plate with his fingertips. We measured and recorded the gap between the height of the fingertips in jumping and the height of the fingertips in standing place^[16]. The standing long jump test is as follows. The subject spreads both feet lightly at shoulder width and then stands so that the tip of the foot does not deviate from the reference line. Then land as far as you can. At this

time, measure the distance from the reference line to the nearest landing point(heel line) at right angles. The unit of measurement was recorded in cm and the decimal point was rounded to the second place^[17].

Experiment was conducted in a closed and quiet location. In addition, participants were instructed about the exercise program, and after simple stretching, they lie on the mat and listen to their music through the earphone. The exercise method was performed referring to the method used in the previous paper^[3,18]. The first exercise is the bridge. The subjects lay on a mat and attach both arms to the ground. They bent their knees, attached the soles of the feet to the mat, looking at the ceiling, gave strength to the buttocks and raise their pelvis. They relaxed on the buttocks and repeated the action of lowering their pelvis^[3]. The second exercise is plank. The subjects collect the feet, stretches his arms with the elbows and shoulders at a right angle, and falls down, holding the inverted togu. Keep straight from head to toe^[18]. The bridge exercise was performed in three sets of 10 seconds and the flank exercise in three sets of one minute. After each set, 10-second break was given, followed by a 30-second rest before the next exercise.

Music application of each group is as follows. Fast tempo music was chosen as three songs of allegro music, and slow tempo music was chosen as three songs of quiet and adagio music. And, the major group music was chosen as the major mov music, and the minor group music was chosen as the minor mov music. They listened to the music only during the core stabilization exercise.

The data collected in this study are statistical program SPSS ver. 25.0, and different analytical techniques were applied according to the purpose. First, the analysis of pre- and post-exercise differences was performed using the corresponding sample T-test. The differences between groups after exercise were analyzed using one-way ANOVA. Statistical significance was set at $p < 0.05$.

Result and Discussion

Corresponding sample t-test was used to show the significance of the difference between before and after application of luck program in each group measured by “standing high jump test”. There were statistically significant differences in all groups ($p < 0.05$) [Table 2]. In addition, after exercise program in all groups increased significantly before application [Table 2]. The

results of the ANOVA showed that all groups showed significant differences [Table 3]. There was a significant difference between all groups except the fast major group, the fast major group, and the slow main group ($p < 0.05$) [Table 4].

Corresponding sample t-test was used to show the significance of the difference between before and after application of luck program in each group measured by “standing long jump test”. The results were statistically significant ($p < 0.05$) [Table 2]. In addition, after exercise program in all groups increased significantly before application [Table 2]. Using the ANOVA analysis to see the mean difference between the groups, all groups showed significant differences [Table 3]. There was a significant difference between all groups except the fast major group, the fast major group, and the slow main group ($p < 0.05$) [Table 5].

Table 2. Comparison of before and after in-group for power of agility

Item	DV	Average (a-b)	SD	t	p
Standing high jump	FMjG	8.008	2.143	-13.470	0.000*
	FMnG	8.023	2.545	-11.367	0.000*
	SMjG	4.130	1.983	-7.509	0.000*
	SMnG	4.550	3.242	-5.060	0.000*
	NMG	2.727	1.213	-8.105	0.000*
Standing long jump	FMjG	27.765	21.946	-3.905	0.002*
	FMnG	25.815	5.698	-9.375	0.000*
	SMjG	12.738	8.598	-5.342	0.000*
	SMnG	12.242	18.729	-2.357	0.036*
	NMG	1.973	4.846	-7.421	0.000*

*Mean±SD ($*p < 0.05$), DV: Dependent Variable, a-b: After-Before, SD: Standard Deviation

Table 3. Comparison between groups for each exercise

		Square sum	Mean squared	F	p
Standing high jump	Inter-group	359.568	89.892	31.387	0.000*
	Intra-group	171.841	2.864		
	All	531.409			
Standing long jump	Inter-group	5331.904	1332.976	11.651	0.000*
	Intra-group	6693.064	111.551		
	All	12024.968			

(* $p < 0.05$)

Table 4. Comparison of mean differences between groups for standing high jump test

		Average Difference	P
FMjG	FMnG	-0.446	0.664
	SMjG	3.528	0.000*
	SMnG	0.664	0.000*
	NMG	3.377	0.000*
FMnG	FMjG	0.664	0.962
	SMjG	5.804	0.000*
	SMnG	0.664	0.000*
	NMG	0.446	0.000*
SMjG	FMjG	0.664	0.000*
	FMnG	3.974	0.000*
	SMnG	0.664	0.999
	NMG	3.823	0.009*
SMnG	FMjG	0.664	0.000*
	FMnG	6.250	0.000*
	SMjG	0.664	0.999
	NMG	-3.528	0.005*
NMG	FMjG	0.664	0.000*
	FMnG	-3.974	0.000*
	SMjG	0.664	0.009*
	SMnG	-0.151	0.005*

(*p<0.05)

Table 5. Comparison of mean differences between groups for standing long jump test

		Average difference	P
FMjG	FMnG	1.377	0.999
	SMjG	15.338	0.037*
	SMnG	15.980	0.027*
	NMG	30.888	0.000*
FMnG	FMjG	-1.377	0.999
	SMjG	13.962	0.071
	SMnG	14.603	0.053
	NMG	29.512	0.000*
SMjG	FMjG	-15.338	0.037*
	FMnG	-13.962	0.071
	SMnG	0.642	1.000
	NMG	15.550	0.033*
SMnG	FMjG	-15.980	0.027*
	FMnG	-14.603	0.053
	SMjG	-0.642	1.000
	NMG	14.908	0.046*
NMG	FMjG	-30.888	0.000*
	FMnG	-29.512	0.000*
	SMjG	-15.550	0.033*
	SMnG	-14.908	0.046*

(*p<0.05)

According to the preceding paper on power of agility, the experimental group that listened to fast tempo music was more effective in improving power of agility than the control group that did not listen to fast tempo music^[19]. In this study, as in the previous papers, it was found that fast tempo music listening had the effect of improving power of agility. Previous studies reported that fast tempo induces high arousal in emotions and slow tempo induces low arousal in emotions^[20-21]. Therefore, in this study, high emotional arousal had a positive effect on the improvement of power of agility when applying fast tempo music.

According to the preceding paper, mode is related to emotion^[13-14]. In addition, negative emotions and athleticism of athletes were reported to have a significant relationship^[22]. This suggests that the mode of music affects emotions, and thus the mode of music can affect motility. However, no significant difference was found in the power of agility between major mode and minor mode in this study. This suggests that the difference in emotion through music is not related to the improvement of the power of agility, but more in-depth study is needed.

In this study, the experimental group was randomly selected to exclude the preference for music. However, it was found that the preferred music appreciation had a positive effect on the police's job stress and fatigue reduction^[23]. And previous studies have shown that fatigue and stress caused by sleep deprivation have an effect on exercise performance such as power of agility and balance^[24]. Based on these results, it is expected that if the research is conducted by applying the preference for music in the future, more significant results will be obtained than the previous studies.

Conclusion

The purpose of this study was to investigate the effects of tempo and mode on exercise performance in normal adults. The subjects were divided into five groups: fast major, fast minor, slow major, slow minor, and no music listening. They performed core stabilization exercises three times a week for three weeks. We measure the power of agility before the experiment and evaluated the changes after the experiment, and we came to the following conclusions: First, the fast tempo improves the power of agility more than the slower tempo. Second, there were no significant differences in power of agility between major mode and minor mode applications.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Policy Roadmap for Development Process and Re-establishing Women Friendly City Policy in Korea- Focusing on the Case of Dangjin City

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Abstract

Background/Objectives: The purpose of this study is to suggest the policy task and direction so that the projects for women-friendly city can level by analyzing Dangjin City's women-friendly city building process, by suggesting the Dangjin City's vision and road map for the women-friendly city.

Method/Statistical Analysis: The research conducted trend analysis, questionnaire survey and FGI. For this purpose, we surveyed , 800 citizens (about 0.5% of Dangjin 166,000) were taken as sampling frame and through the quota sampling frame by gender, age and area, total 782 questionnaires (final effective ratio 97.8%) were collected and utilized for analysis. FGI was conducted through 22 people from three groups of citizens, experts and officials.

Findings: As a result, we set up our vision of 'Because woman is happy, your family is happy, your Dangjin', For this vision, 4 major goals of 'Diffusion of citizen's feeling on the women-friendly city', 'Building safety city to live comfortably', 'Building the human-oriented employment environment', 'Inter-regional shared growth without alienation' were established.

Improvements/Applications: The women-friendly city in Korea, it requires the policy direction to establish the policy reflected with regional characteristics and step-by-step and feasible policy sharing with the local resident.

Keywords: Women friendly city, gender equality, gender equality policy, policy road map, women's policy.

Introduction

Woman-friendly city is the administration unit that operates the policy for women so that the men and the

women participate in 'local policy and development process' equally, its benefits are distributed evenly to all the residents, and the growth and safety of women are realized^[1]. The concept was started from 'Rights on the city' started from 1960s across the world, and as the policy making for the gender equality in the country and local government was arisen as an issue, it is focusing currently on building the institutional foundation for gender mainstreaming that leads the sustainable city development ^[2-3]. In our country, the local governments and Ministry of Gender Equality

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and Family are promoting the project to build the local community where the genders are equal. Started from Iksan City in 2009, it has been expanded to 86 cities as of 2018 showing quantitative achievement^[4] of course, there was qualitative achievement in the aspect of policy together with quantitative growth. According to the Excellent Women-friendly City Casebook published by Korean Women's Development Institute, the accomplishments such as establishment of gender equal administrative system, expansion of women's job, improvement of social care welfare service, welfare service improvement and cultural life space preparation, etc. are being introduced^[5].

However, it is doubtful if the policy for the women-friendly city promoted by the government has been promoted in a way of settling down the gender mainstreaming of local community in every place like the cases shown in the excellent casebook. In this situation, this study focused on the women-friendly city building process in Dangjin City. In case of Dangjin City, it was designated as a women-friendly city for the first time as a county unit, but after being elevated to a city, it was dropped out in the re-designation process because its driving force or the policy achievements were not sufficient but was succeeded in second re-designation as a women-friendly city thanks to the strong driving force of the local government and the citizen's participation and efforts. Since such failure and the success are deemed to have great implications in the development of the women-friendly city policy in Korea, this case study was attempted.

Specifically, the purpose of this study is to suggest the policy task and direction so that the projects for women-friendly city can level by analyzing Dangjin City's women-friendly city building process, second, by investigating the demands of the citizens of Dangjin for the women-friendly city building policy, and finally, by suggesting the Dangjin City's vision and road map for the women-friendly city.

Women Friendly City Building Process in Dangjin City: Dangjin City was designated as a women-friendly city for the first time in Chungcheongnam-do in 2010 when it was Dangjin County, and built the foundation for the first stage of women-friendly city from 2010 to 2014. However, Dangjin City was dropped out in the re-designation' because of the incomplete performance of projects compared with the plan due to the lack of securing the women's representation, lack of

cognition on the women-friendly city in overall public sectors and the lack of promotion will in the assessment of the first stage of women-friendly city project^[6-7]. After that, aiming at re-designation as a women-friendly city, Dangjin City prepared the road map to obtain the driving force and carried out the major projects of 7 areas such as the diffusion of gender equality education for entire citizen, gender-impact analysis and evaluation, preparation of public facilities guidelines, representative city project discovery by the operation of (provisional name) Business Promotion Group, the composition and operation of citizen participation group, expansion of women' representation in the public office, promotion of department index for the control tower role of the women policy department in the preparation stage, and was re-designated as women-friendly city in 2018 recognized its performance.

Survey: To investigate the demand for the policy to build Dangjin City as women-friendly city, the questionnaire survey and FGI were performed at the same time.

1. Questionnaire Survey of Citizen of Dangjin city:

Design of Questionnaire Survey: Out of the 166,000 citizens of Dangjin, Chungnam, 800 citizens (about 0.5%) were taken as sampling frame and through the quota sampling frame by gender, age and area, total 782 questionnaires (final effective ratio 97.8%) were collected and utilized for analysis. The questionnaire survey period was from November 12, 2018 to November 20, 2018, and the method that the questionnaires are given to the persons in charge of local communities after explaining enough on the questionnaire and the allotment table and collected 3 ~ 7 days later was used. For the analysis of the demand of the citizen of Dangjin for the women-friendly policy, the frequency analysis, cross analysis, t-test, F-test, etc. were performed.

2. Results of Questionnaire Survey: The case that the citizen knows that Dangjin City is the women-friendly city was 50%, the half, and the satisfaction of the women-friendly city perceived by citizen of Dangjin was 2.83 points out of 6 points, lower than the median value.

In addition, in the results of analyzing the settlement satisfaction according to cognition if Dangjin City is the women-friendly city, in case of recognizing the women-

friendly city, the settlement satisfaction was high [Table 1]. Therefore, the fact that the cognition on the women-friendly city increases the settlement satisfaction of Dangjin City is the aspect showing how important leaping to women-friendly city again is. The fact that although Dangjin City was designated as women-friendly city in 2010 and currently re-designated as the 2nd stage city as of 2018, that the cognition level was 50% revealed the problem in promoting the policy. Therefore, it implies that to leap as a women-friendly city, the active publicity on the related city policy is required [Table 1].

Table 1. Difference in residence satisfaction according to whether they are affinity for Women Friendly City policies in Dangjin

Whether or not		Frequency	Means	S/D	t
Residence satisfaction	Know	392	3.30	.794	3.200**
	Don't know	390	3.10	.899	

***p<.001

However, in the results of analyzing the importance and the satisfaction on the 5 major areas of the women-friendly city, it was shown that the problem in the local community safety improvement area was distinguished. That is, it showed the clear difference as the importance was ranked as first priority but the satisfaction was ranked as priority No. 5 [Table 2]. Therefore, for Dangjin City to leap as women-friendly city, it needs to concentrate the city policy on the local community safety area.

Table 2. Importance and Satisfaction of Women's Friendly City Policy

All fields	Importance		Satisfaction	
	Means	S/D	Means	S/D
Gender equality policies and institutions	3.86	1.024	2.91	.867
Women's Economic and Social Participation	3.97	.971	2.95	.880
Community Safety for Women	4.10	.982	2.86	.897
Creating a family-friendly environment	4.06	1.103	2.92	.909
Women-friendly local culture and conditions	3.90	.976	2.90	.899

In addition, for the obstructive factor for Dangjin city to leap to the women-friendly city again, the lack of cognition on 'women-friendly city' was the priority No. 1 and 'Lack of women-friendly city policy and the system' was the priority No. 2, and 'insufficient women-

friendly city environment' was priority No. 3 [Table 3]. Therefore, the intensive effort is required for these 3 factors.

Table 3. Obstacles to re-establishing of Women Friendly City in Dangjin

All fields	Frequency	%
Lack of awareness of Women Friendly City	361	18.5
Lack of collaboration among departments	191	9.8
Lack of Women Friendly City policies and institutions	278	14.3
Lack of women friendly urban environment	245	12.6
Lack of facilities related to women	219	11.2
Lack of publicity	197	10.1
Lack of citizen participation	205	10.5
Lack of programs	137	7.0
Women's lack of municipal participation	117	6.0

FGI:

- 1. FGI Design:** To draw the current task and improvement plan for Dangjin City to leap to women-friendly city again, FGI was performed. FGI was performed with 22 experts from 3 groups composed of the women-friendly citizen participation group, the expert group of the academic circle, the civil servant group. Focus Group Interview was carried out approximately 2 hours by 1 interviewer and 1 assistant per group for 2 days, November 8 and 15, 2018. They were asked about the current tasks and the solutions for Dangjin City to leap to the women-friendly city again, and 1 hour and 30 minutes to 2 hours were taken per team.
- 2. FGI Result:** In the results of extracting the meaningful sentences related to the cognition of the citizen of Dangjin and the obstructive factors on the women-friendly city and contemplating repeatedly through the semantic conditioning of them and the topic bundling, 19 sub-topics and 5 essential topic were extracted. The essential topics were analyzed as 5 topics of the lack of women-friendly infrastructures, lack of safety environment, unstability of job for women and lack of socialization conditions of childbirth and care, provider-centered education program, lack of women-friendly cognition improvement project, and their specific contents are as shown in Table 4.

Table 4. FGI results for re-establishing into women friendly city

Essential theme	Sub-theme	Derived Improvement
Lack of woman friendly infrastructure	Lack of establishment of private governance	Women-Friendly City Ordinance Amended
	Weakness of administrative organization in charge of women friendly affairs	Reorganization of female family administrative organization
	Lack of cultural facilities for women	Securing cultural space for women and families
	Lack of publicity	Dangjin City Hall homepage upgraded
	Inadequate bus routes for women	Reflected in Dangjin City bus line reorganization project
	Lack of opportunity for women and minority policy participation	Women’s policy group including women and minority groups, strengthening the role of civic participation groups, etc.
Lack of safety environment	Lack of inadequate local safety system	Establish systematic public facility guidelines
	Designing road traffic centered on cars and administrative administration centered on civil servants	
Instability of women’s job and lack of socialization for birth and care	Lack of adequate job training and job training for women	Development of Dangjin-type Female Jobs and Personalized Business Start-up Education
	Lack of competence of female entrepreneurship lecturer	Strengthening the capacity of women educators - Connecting with Saemaul Lifelong Education Department
	Care for child cuts off career and limits participation in education	Institutional linkage to solve education and caring problems Introduction of Dangjin-type women-friendly certification system
Provider-centered education program	Lack of customized programs for women’s needs and situations	Gain diversity of programs using gender equality fund
	Lack of training programs to tackle minority classes	
	Lack of educational program considering time and space	Space-based Delivery Course
	Lack of information and sharing of programs offered by private institutions	Dangjin homepage upgrading
Lack of Women Friendly City recognition improvement projects’	Lack of solidarity among women	Expansion of education on civic consciousness that considers rights and responsibilities together
	Duality and personality of women	
	Lack of awareness of woman-friendliness of decision-maker male officials	Including women-friendly education in gender equality awareness education, expanding female senior officials
	Lack of gender equality education in private institutions and businesses	Gender Equality Education in Lifelong Education Instructor Education Introduced Dangjin-type female-family-family certification system

Conclusion

Dangjin City’s Vision and Road Map for Women-friendly City for New Leap: This study, which has a purpose of reestablishing the direction of the women-friendly city in Korea through the case analysis of Dangjin City’s women-friendly city, established the vision and goal for its leap based on the implications of Dangjin City’s women-friendly city building policy demand investigation drawn from the analysis of Dangjin City’s women-friendly city building process,

the questionnaire survey with the citizen of Dangjin, FGI with the women-friendly citizen participation group, the expert group of academic circle and civil servant group.

Dangjin City’s vision to leap to the women-friendly city was established as ‘Because woman is happy, your family is happy, your Dangjin’. For this vision, 4 major goals of ‘Diffusion of citizen’s feeling on the women-friendly city’, ‘Building safety city to live comfortably’, ‘Building the human-oriented employment environment’, ‘Inter-regional shared growth without alienation’ were

established. The establishment of such policy direction reflected the regional characteristics based on the policy of Ministry of Gender Equality and Family, and made the Dangjin City and the national policy linked organically.

The tasks to achieve the goals were proposed as a road map to be implemented more stably and feasibly. Year of 2019, which is the first stage, is the period of 'forming foundation'. This stage is the period of forming the foundation to leap to the women-friendly city again and builds the cognition and prepares the backbone of the women friendliness in Dangjin City through 14 tasks such as 'Revision of ordinance of women-friendly city', 'Reorganization of women-friendly administrative system', 'Development of public facilities guideline', 'Development of Dangjin type women and family-friendly certification system', 'Building and operation of the care governance', etc. The year 2020, which is the 2nd stage, is the period of 'settlement'. The 2nd stage stabilizes the Dangjin City's promotion of women-friendly policy through 8 tasks of Expansion of female civil servant proportion, 'Activation of Dangjin type employment project', 'Issuance of Dangjin female job training card', 'Building women-friendly traffic environment system', 'Dangjin type substitute worker support project', 'Installation and operation of care class', etc. based on the foundation built in the 1st stage. From 2021 to 2022, which is the 3rd stage, is the completion period. In the 3rd period, Dangjin is leaped to the women-friendly city without blind spot through the tasks of 'Building the women and family town', 'Expansion and operation of children's play facilities within family park' and 'Village academy for women' and 'Building female community space in 14 villages'.

The women-friendly city in Korea is provided by law as realizing the equal participation by female and male, women's competence reinforcement and the care and safety, and the most women-friendly cities are promoting same types of policies. However, the assessment if such policies reflect the operational status, rapidly changing regional characteristics and the changes of cognition in the citizen is passive

The case of Dangjin's building the women-friendly city will be the good example showing the difficulties in managing the policy started in the state that the regional characteristics were not reflected, the cognition of citizen were insufficient and the effort of overcoming them for the first time in the county. Currently, most of

the local governments are making efforts to be selected in the many projects designated and supported by central government. However, most of local governments are focusing on the proclamatory designation rather than on the improvement of regional characteristics and the cognition of local residents. It would be observed through the case of Dangjin City that the unilateral promotion by public sector is hard to achieve the policy promotion effect for the local resident. Therefore, for the women-friendly city in Korea, it requires the policy direction to establish the policy reflected with regional characteristics and step-by-step and feasible policy sharing with the local resident.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Effectiveness of Video Recording and Self-Evaluation for Skill Training in Undergraduate Nursing Education

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Abstract

Background/Objectives: In present nursing education, educators worked to apply new educational strategies that made use of technological development. Evidence emerged for the effectiveness of video-recording and self-evaluating to motivate students' self-directed learning.

Method/Statistical Analysis: This study evaluated the effectiveness of a skill-training program using video recording and self-evaluation. A quasi-experimental design was used such that 43 students were allocated into experimental (n = 22) and control groups (n = 21). Prior to the intervention, confidence to practice and problem-solving ability were assessed and actual performance of each core nursing skill added to the post experimental evaluation. For statistical data analysis, paired t-test, independent t-test, X2-test/Fisher's exact test and Mann-Whitney U test were conducted. SPSS was used and statistical significance was determined at the $p < .05$ level.

Findings: Comparing posttest scores, study results showed statistically significantly better performance in nursing skills ($p < .001$) and confidence to practice ($t = 2.95, p = .003$) in the experimental group. The change of scores in the experimental group on confidence to practice statistically significantly improved in the experimental group compared to changed scores in the control group. No statistically significant difference emerged in problem-solving ability.

Improvements/Applications: Based on the study findings, video recording and self-evaluation provided effective training on core nursing skills. However, caution is needed as no clear evidence emerged for problem solving, which is a critical element in nursing education. Thus, we recommend the use of these strategies as a supplement to clinical placement. Future interventions need to provide additional strategies with robust study designs using randomized controlled trials.

Keywords: *Nursing students, Core nursing skills, Performance, Self-confidence, Problem-solving.*

Introduction

In undergraduate nursing education, researchers have identified limitations in the clinical practice of nursing students, due to safety issues for students and

patients^[1]. At present, clinical practice largely depends on the observation that students lack direct practice of nursing skills. Nevertheless, a growing need exists for verification of practical capability in nursing students before graduation^[2].

Nursing is a discipline based on practice and the integration of theory and practice in buoying nursing skill is a crucial part of the nursing curriculum^[1]. Adequate programs must guarantee students obtain knowledge and skills. Nursing students desires more opportunities for real-world training rather than classroom-based

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theoretical lectures^[3]. Nursing educators have tried to satisfy students' desires; however, nursing education is working to support rapid increases in the number of nursing students in Korea.

For the performance evaluation of nursing students, the Korean Accreditation Board of Nursing Evaluation^[4] has developed 20 core nursing skills that are essential for students to achieve to the standard. Traditionally, education to attain these nursing skills involves theoretical lecture and demonstration. Additionally, given the importance of repetitive practice, educators developed strategies for effective training. To encourage practice of nursing skills, most schools offer students chances to self-practice what they have learned and incorporated active learning as a requirement educators expect from individual students^[5].

The training of students for nursing skills requires tremendous effort. Previous studies identified that technologies could ease the burden of educators^[6]. Rapid changes in science and technology enable educators to revise the curriculum by adapting technology development^[6]. Previous reviews revealed the effectiveness of skill-training education using video recording^[7-8]. Students have an opportunity to closely observe their own performance, using video recording in skill practice. Along with video recording, students self-evaluation provides a means for educators to resolve issues in nursing education, such as the high student-faculty ratio.

However, without a proper evaluation process, the effectiveness of video recording cannot be guaranteed. Previous study identified the effectiveness of video recordings based on self-assessment; that is, students review their own performance using video and a checklist; this detailed evaluation ensures fast and precise correction^[9]. Moreover, students can be motivated during the evaluation process, which is one effective strategy leading to self-regulated learning. As a self-regulated learning strategy, self-evaluation is a key factor that promotes students' commitment to learning^[10]. Strong evidence suggests the efficacy of self-evaluation, during which individuals obtain comprehensive knowledge.

Previous studies identified several variables influencing the development of professionalism in nursing students including confidence to practice and the ability to solve problems^[11]. When nursing education uses models rather than real human bodies, new nurses

often report lack of competency when practicing on actual patients. Adequate and repetitive practice with a chance to reflect on their practice would effectively improve nurses' confidence to practice skills^[12]. Having students reach a standard level in nursing skill would eventually ensure the quality of care in their future practice.

In addition to confidence, nurses should be able to provide care that is optimal to the situation and time. Knowing the priorities and urgency, nurses would produce best patient outcomes with adequate problem-solving ability. Thus current nursing-education program should be designed to incorporate content to improve confidence and the ability to solve problems.

Although evidence suggested the advantage of using video recording and self-evaluation, a scarcity of education programs used both strategies for skill training. Such sparse use may discourage nursing educators from actively replicating the use of these strategies. Thus, the present study was designed to evaluate the education program for skill practice using video recordings and self-evaluation.

Method

- 1. Design:** In this study, we used a quasi-experimental design including an intervention and comparison of groups with pre- and posttest assessment.
- 2. Implementation:** The intervention was implemented over 3-month period. The intervention group engaged in video recordings of core nursing-skill practice and self-evaluation whereas the comparison group remained in traditional training. Students in the experimental group were taught how to video record during skill training and evaluate the performance of themselves during 2 hours of open lab. These students were also encouraged to participate in a group-discussion session when they experienced difficulty in examining each other.
- 3. Participants and setting:** All undergraduate nursing students attending the 4th-year curriculum at one university located in J district in Korea were invited to participate. A convenience sample of 43 students was recruited. The intervention took place in a practice room that had all the materials to practice two core skills—intramuscular injection and suction—with supervision by a trained research assistant.

4. Instrument:

Performance Score: To evaluate the performance of nursing core skills, a researcher developed a checklist. Two research assistant with teaching experienced in fundamental nursing evaluated performance independently. The inter-rater reliability was good (ICC=.907).

The performance was evaluated for skills of intramuscular injection and suction with a maximum score of 100. Higher scores indicate better performance of individual participants.

Confidence to Practice: To evaluate the confidence to practice, a numerical rating scale (NRS) was used. Study participants rated their level of confidence on a scale scoring between 10 (not confident at all) and 100 (very confident).

Problem Solving: We used a measurement developed by Woo^[13] to evaluate the problem-solving ability

of study participants. A total of 25 items consist of discovery of problems (5 items), running problem solutions (5 items), designing problem solutions (5 items), and reviewing problem solving (5 items). Higher scores indicate better capability to engage in the process of solving problems. The Cronbach's alpha for this measurement was .90^[13].

5. Data Collection: To compare groups in terms of students' scores on performance, confidence to practice, and problem solving, we collected data for confidence to practice and problem solving before and after they had skill training using video recording and self-evaluation in the intervention group and traditional training in the control group. We obtained only the posttest data for the performance score of participants. We conducted the pretest before the first day of open lab and the posttest 2 weeks later. One researcher (initial) who was blinded, evaluated the video recording to examine individual students' performances [Figure 1].

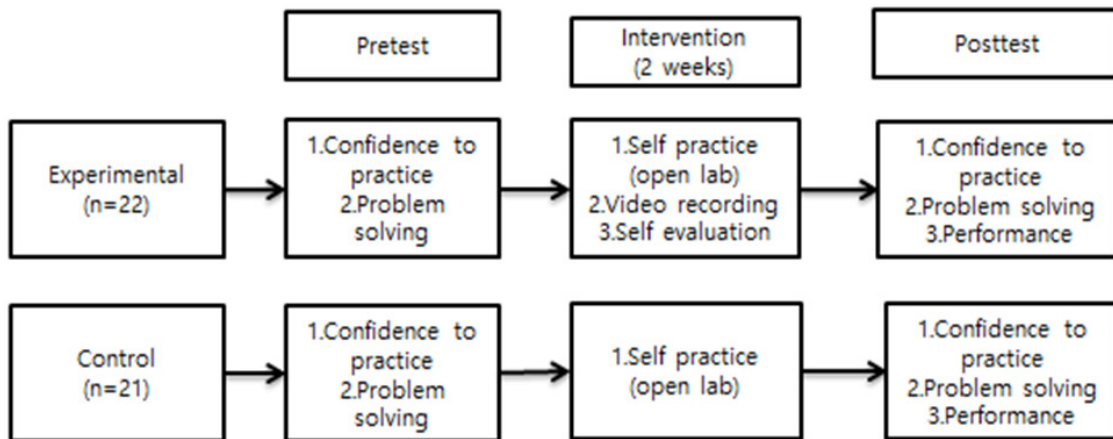


Figure 1. Research design

6. Statistical Analysis: We used SPSS, χ^2 -test/ Fisher's exact test, and the Mann-Whitney U test for statistical analysis. Statistical significance was determined at the $p < .05$ level.

Result

The sample includes 22 students in the experimental group and 21 students in the control group with a mean age of 22.95 and 22.99 years, respectively. The majority of both groups showed good satisfaction in nursing major (77.3% and 76.2%) and fair to good self-expression (90.9% and 90.5%). The homogeneity test between the experimental and control groups showed no statistical

significance between groups in general characteristics and baseline scores of study variables [Table 1].

A statistically significant difference emerged between the experimental and control group in performance scores in both skills ($p < .001$) and confidence to practice ($p = .003$). No statistically significant difference arose for confidence to practice and problem solving between the experimental and control groups (see Table 2).

The experimental group showed greater score increases for confidence to practice and problem solving. Comparing changed score between groups, increased scores of confidence to practice were statistically significant [Table 3].

Table 1. Homogeneity test for general characteristics between experimental and control group (N=43)

Characteristics	Exp. (n = 22)				Cont. (n = 21)				χ^2 or t	p
	n	%	M	SD	n	%	M	SD		
Satisfaction with nursing										
Good	17	77.3			16	76.2			0.10	1.000
Fair	5	22.7			5	23.8				
Self-expression										
Good	7	31.8			7	33.3			0.50*	1.000
Fair	13	59.1			12	57.1				
Poor	2	9.1			2	9.5				
Age (yr)			22.95	1.59			22.99	1.68	-0.16	.900
Confidence to practice			6.35	0.96			6.40	1.00	-0.53	.503
Problem solving			3.80	0.34			3.78	0.36	0.49	.519
Academic credits of fundamental nursing			4.20	5.99			4.24	6.25	-0.79	.429

Table 2. Comparisons of post-test outcome variables between experimental and control groups (N=43)

Characteristics	Exp. (n = 22)		Cont. (n = 21)		t or z	p
	M	SD	M	SD		
Performance Score						
IM injection	85.16	6.98	76.95	7.01	7.69	< .001
Suction	85.33	5.77	77.99	6.09	7.42	< .001

Exp: Experimental group, Cont.: Control group, * Mann-Whitney U test IM: Intramuscular

Table 3. Comparisons of changed scores between experimental and control groups (N=43)

Characteristics	Group	Pretest		Posttest		Difference		z	p
		M	SD	M	SD	M	SD		
Confidence to Practice	Exp. (n = 22)	6.35	0.96	7.32	0.91	0.97	1.13	3.52	.001
	Cont. (n = 21)	6.40	1.00	6.69	0.98	0.29	1.11		
Problem Solving	Exp. (n = 22)	3.80	0.34	3.90	0.39	0.10	0.51	0.56	.584
	Cont. (n = 21)	3.78	0.36	3.80	0.41	0.02	0.551		

Discussion

The present study evaluated the effects of using video recording and self-evaluation to assist nursing students to attain core skills in nursing education. The implications of the strategies of self-directed learning and technology are that students are able to view their performance and figure out what they should work to improve. Findings demonstrated statistically significant effects on performance and confidence to practice in nursing students using video recording and self-evaluation.

The performance scores for the experimental group were statistically significantly higher than those of the control group. According to the classification by the Korean Accreditation Board of Nursing Evaluation^[4], intramuscular injection and suction ranked moderate and high, respectively, in levels of difficulty. Thus, findings from this study indicated broad applicability of the present intervention across all 20 core nursing skills. However, appropriate caution should be exercised before a conclusion can be drawn on the effectiveness of video recording and self-evaluation. Supervision and timely feedback from qualified educators should be arranged first to ensure the acquisition of students

accurate nursing skills^[14].

Compared with the control group, the intervention group showed statistically significant improvement in confidence to practice after 2 weeks. Similar results emerged in a previous study using review of video tapes for self-performance of foley-catheterization skills^[15]. In that study, students reported enhanced self-awareness, thereby motivating them to practice more. Video recording and self-evaluation are strategies that could motivate students, leading to self-regulated learning^[16]. Moreover, viewing their own performance with self-evaluation, students better analyzed what they did wrong and where they need to improve.

Unlike performance and confidence, problem solving showed no statistically significant difference between the experimental and control groups. Problem solving is an essential ability in which nursing students achieve capacity to plan and provide safe and quality nursing care^[17]. Previous studies conducting simulation-based learning using standardized patients showed statistically significant improvement in students' ability to solve problems^[18]. Facing a real person in a complex clinical situation, students more actively engage in learning, achieving greater problem-solving ability. In addition, the short period of intervention showed the ability to think critically and engage actively, both skills necessary to effectively solve problems. Considering the present results, additional strategies may necessary. We suggest future studies investigate the effects of interventions with complex designs that focus on problem-solving skills.

This study was not without limitations. Using quasi-experimental design, convenience sampling may influence the results, because randomized controlled trials (RCTs) are the gold standard in evidence-based nursing practice. In addition, although we included a performance assessment by an expert to draw more reliable evidence than self-reported results alone, the blinding of the assessor could not be ensured, which could also affect the results of study. We suggest that well-designed RCTs in future studies may to provide more conclusive results.

Conclusion

A quasi-experimental design was used to identify an effective skill-training program using video recording and self-evaluation. Study results partially showed that students in the experimental group achieved better

performance scores and more confidence to practice. Caution is needed in the application of these strategies when considering replacing traditional training to help students attain nursing skills. These strategies can be an effective supplement to theoretical lectures and clinical placement. We suggest future researchers and educators implement interventions incorporating additional strategies with robust RCT designs.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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The Effects of Depression and Anxiety on Psychological Well-being of College Students: Focusing on the Emotional Perception Clarity

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Abstract

Background/Objectives: This study focuses on the psychological problems of college students, which are rapidly deteriorating in recent years, and examines how depression and anxiety affect the psychological well-being and examines the mediating effects on emotional perception clarity. It was done to improve the quality of life by solving them.

Method/Statistical Analysis: 317 data were collected for this study. The research method used factor analysis and covariance structure analysis.

Findings: Anxiety level of college students did not have a significant effect on emotional clarity. Second, the level of depression in college students had a significant effect on emotional clarity. Third, the emotional perception clarity of college students had a significant effect on psychological well-being. Fourth, anxiety levels did not have a significant effect on psychological well-being. Fifth, the depression level of college students had a significant effect on psychological well-being. Sixth, the mediating effect of emotional perception clarity on the causal relationship between depression level and psychological well-being of college students was found to be partial mediating effect.

Improvements/Applications: Based on the results of this study, online self-diagnosis service expansion is required for college students to be aware of their psychological emotional problems, and practical help and training are required to control negative emotional experiences by clearly recognizing emotions. This will provide a foundation for college students to increase their psychological well-being by increasing their ability to respond appropriately to changing circumstances.

Keywords: *Depression, anxiety, stress, psychological well-being, emotion perception clarity.*

Introduction

Recently, unlike other age groups, the psychological and emotional problems of young people in their 20s are rapidly deteriorating through medical information and statistics. In the context of the social structure and

problems that are common among the twenties, young people in their 20s focus on college entrance exams, and do not fully consider their areas of interest or aptitude. In this process, they may experience emotional symptoms such as anxiety and depression and may cause problems with their adaptation. In particular, since college students are in the transitional period from adolescence to adulthood, they can experience physical, social, and mental changes and face social dysfunction on life stress. College students are experiencing a variety of stresses from passive lifestyles to autonomous lifestyles, self-identification, independence from parents, diverse learning, and uncertainty in the future. It can be said that they are exposed to various psychological emotional

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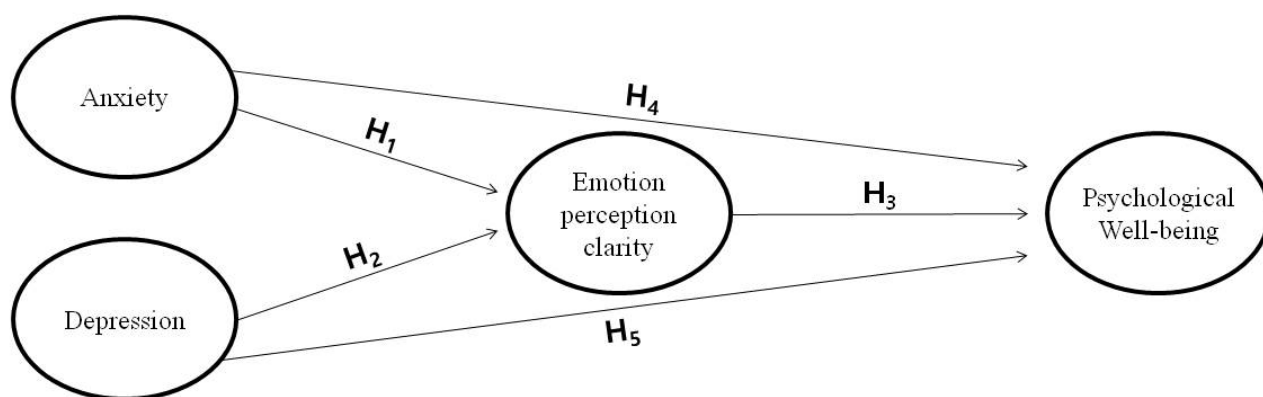
problems in the process of adjusting to the environment and lifestyle. In addition, social anxiety and stress cause mental health to suffer from threats and disconnection of social health.

Everyone wants to be happy, and most people make happiness the most important goal of their lives and look for ways to be happier. It is no exception for college students to live a better life as a basic need for humans. Personal well-being such as life satisfaction and happiness is very important for college students entering adulthood through desirable development and growth. Various factors affecting these psychological well-being have been reported, but social relations have been consistently explained as important factors for the development of adolescents. It is an important task to accumulate emotional and psychological resources through relationships with others and to achieve successful self-reliance through adulthood.

Emotions play an important role in our lives and are closely linked to our stress and mental health experiences. In particular, adolescence experiences emotional instability more frequently than other periods, and emotional development and processing is very important because it lacks consistency. The stress of everyday life can lead to negative emotions such as depression, anxiety and anger due to academic problems, friendships, conflicts with parents, and career problems^[1]. Clear perception of emotions is an important factor in controlling and managing emotions and responding appropriately to the environment. In particular, emotional awareness clarity means the ability to clearly understand and organize one's emotional state

[2]. When an individual understands and recognizes his emotions more clearly, he or she can respond to the emotions he or she experiences, as well as express his or her emotions more appropriately to others. In addition, the clearer the emotional perception, the less social anxiety and neurosis, the higher the satisfaction of life and the higher the self-regulation^[3,4,5]. Taken together, these findings suggest that recognizing emotions clearly is a positive psychological mechanism that can help us to understand and organize our emotions and to help them effectively experience situations and emotional responses. The purpose of this study is to examine how the anxiety and depression of college students affect psychological well-being, a representative mechanism of individual psychological health, through the mediating effect of emotional awareness clarity.

The hypothesis of this study is as follows. First, college students' anxiety level will have a negative effect on emotional awareness clarity. Second, the depression level of college students will have a negative effect on emotional clarity. Third, the level of emotional awareness clarity of college students will have a positive effect on psychological well-being. Fourth, college students' anxiety levels will negatively affect psychological well-being. Fifth, the level of depression of college students will negatively affect psychological well-being. Sixth, anxiety levels of college students will affect psychological well-being by mediating emotional awareness clarity. Seventh, depression level of college students will affect psychological well-being by mediating emotional clarity. For this, set up the research model as figure. 1.



H₆ : anxiety → emotion perception clarity → Psychological well-being

H₇ : depression → emotion perception clarity → Psychological well-being

Figure 1. Research Model

Method

A total of 320 subjects were randomly selected, including four and two year college students. The data used in the analysis for this study 317 except for the insincere response and non-response.

The measuring tools used in this study are depression, anxiety, clarity of emotion recognition, psychological well-being scales. Measured using the depression scale developed by Radloff and revised by Cho Myung-jae and Kim Gye-hee^[6,7]. It consists of four sub-variables: depression, positive emotions, interpersonal relationships, and physical deterioration. In this study, the reliability test of depression scale was Cronbach's $\alpha = .919$.

In order to measure anxiety, the state-trait anxiety inventory (STAI), developed by Spielberger and revised and validated by Han Duk-woong, Lee Chang-ho and Jeon-gyeok-gu was used. STAI is divided into characteristic anxiety and state anxiety, but in this study, only state anxiety was used for analysis^[8,9]. As a result of reliability test of state anxiety test, Cronbach's $\alpha = .919$ was confirmed.

To measure the level of stable emotional awareness, used the Trait Meta-Mood Scale (TMMS) developed by Salovey et al. and revised by Lee Su-jeong and Lee Hoon-gu^[10,11]. It consists of items that evaluate attention to emotion, clarity of emotion recognition, and emotional control expectations. In this study, only the items measuring emotional clarity were used. It is a five-point scale, and the higher the score, the more clearly you are aware of your emotions. Reliability test results in this study Cronbach's $\alpha = .852$.

To analyze the psychological well-being of adolescents, we analyzed the satisfaction level of the Korean Children and Youth Panel Survey (KCYPs) using the Life Satisfaction' question^[12]. The higher the score of each item, the higher the satisfaction of life. In this study, the Cronbach's $\alpha = .786$, except for one item that had a significant effect on the internal fit.

This study examined the effects of college students' anxiety and depression levels on psychological well-being, and additionally identified the mediating effects of emotional recognition clarity variables. We attempted to establish a causality research model with independent anxiety and depression as an independent variable, emotional awareness clarity as a mediating variable, and psychological well-being as a dependent variable. For this purpose, covariate structure analysis was performed using AMOS 21.0. In addition, confirmatory factor analysis was used to confirm the validity of the measures used in this study, and Cronbach's α was used to determine the reliability.

Results and Discussion

Research Model Verification: Prior to the verification of the research model, indices commonly used in existing causal studies were used to verify the suitability of the research model for the model. First, χ^2 verification was conducted to confirm the suitability of the research model. RMR, GFI, AGFI, and RMSEA were used as absolute conformity indices, and NFI, CFI, and TLI were used as incremental conformance indices.

As a result of the verification, GFI = .831 AGFI = .790 and NFI = .832 of the goodness-of-fit index of the research model did not meet the acceptance criteria. Therefore, this study improved oneness of the research model by removing one item of psychological well-being identified as an observation variable of measurement error with a large correction index. This study adopts the modified model extracted through the modification process as the final model to derive the final model for hypothesis testing (RMR = .30, RMSEA = .052, GFI = .917, AGFI = .891, NFI) = .921, TLI = .955, CFI = .962). Although the AGFI goodness-of-fit index value did not meet the criteria, it was judged that this study model was not a problem considering that it was difficult to satisfy the goodness-of-fit index in the structural equation model and that there was no absolute criterion for accepting the model.

Table 1. Research model and Final Model Fit Indices

Models	χ^2	df	p	RMR	RMSEA	GFI	AGFI	NFI	CFI	TLI
Research Model	692.605	204	.000	.04	.087	.831	.790	.832	.874	.858
Finalized Model	294.326	160	.000	.30	.052	.917	.891	.921	.962	.955
Acceptance Level	-	-	>.05	<.05	<.08	=.90	=.90	=.90	=.90	=.90

Research Hypothesis Testing: Based on the results of the final model analysis, the results of the hypothesis testing proposed in this study are in Fig.2, Table 2. The hypothesis test results of this study are as follows. Hypothesis 1 showed that “anxiety level of college students will have a negative effect on emotional clarity” ($t = 1.032, p > .05$).

Hypothesis 2 showed that “depression level of college students will have a negative effect on emotional clarity” ($t = -2.809, p < .01$). As a result, the higher the level of depression, the lower the clarity of emotional awareness.

Hypothesis 3, “The level of emotional awareness clarity of college students will have a positive effect on psychological well-being” was found to be significant ($t = -2.300, p < .05$). Therefore, college students with high emotional clarity showed higher psychological well-being.

Hypothesis 4, “The level of anxiety of college students will have a negative effect on psychological well-being” showed no significant results ($t = .900, p > .05$).

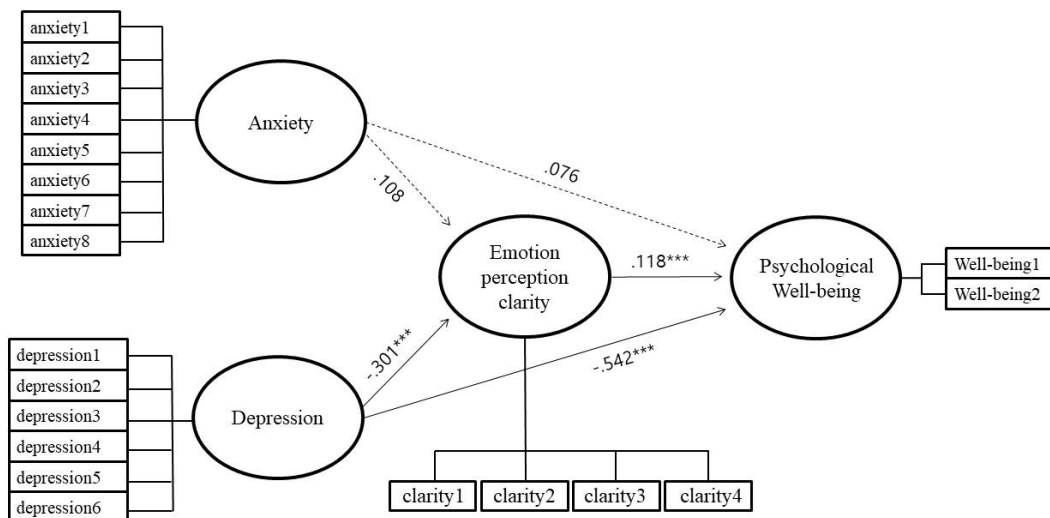
Hypothesis 5: “Depression level of college students will have a negative effect on psychological well-being” showed significant results ($t = -5.831, p < .001$). Therefore, more college students with higher levels of depression had lower psychological well-being.

Hypothesis 6 “The mediating effect of emotional awareness clarity in the causal relationship between depression level of college students and psychological well-being was found to be partial mediating effect ($t = -.301, p < .001$).

Hypothesis 7 “As a result of verifying the mediating effect of emotional awareness clarity in the causal relationship between the anxiety level of college students and the psychological well-being, there was no significant effect ($t = .108, p > .05$).

Table 2. Results of hypothesis tests

Path	Estimate	S.E.	C.R	P	Result
Emotional perception clarity ← Anxiety	.108	.105	1.032	.302	Rejected
Emotional perception clarity ← Depression	-.301	.107	-2.809	***	Accepted
Psychological well-being ← Emotional perception clarity	.118	.051	2.300	***	Accepted
Psychological well-being ← Anxiety	.076	.084	.900	.368	Rejected
Psychological well-being ← Depression	-.542	.093	-5.831	***	Accepted
Depression -->Emotional perception clarity -->Psychological well-being	-.301 ***				Accepted
Anxiety-->Emotional perception clarity -->Psychological well-being	.108				Rejected



“Solid lines()” show accepted hypothesis. “Dotted lines()” show rejected hypothesis.

Figure 2. Revised Model

Conclusion

This study examined the effects of college students' anxiety and depression levels on psychological well-being, and additionally identified the mediating effects of emotional recognition clarity variables.

The hypothesis test results of this study are as follows.

First, as a result of testing hypothesis 1 that "anxiety level of college students will adversely affect emotional clarity", no significant result was found ($t = 1.032$, $p > .05$). It is interpreted that the degree of anxiety that college students pay attention to as a stress experienced by academics, future and career problems does not affect emotional problems.

Second, the hypothesis that proved that "depression level of college students will have a negative effect on emotional clarity" showed a significant result ($t = -2.809$, $p < .01$). The higher the level of depression, the lower the emotional clarity of college students. Consistent with the findings that depression affects adaptation problems caused by stress in psychiatry.

Third, as a result of testing Hypothesis 3, "the level of emotional cognition clarity of college students will have a positive effect on psychological well-being" ($t = -2.300$, $p < .05$). Therefore, college students with high emotional clarity showed higher psychological well-being. Those who clearly recognize and define their emotions are consistent with research findings that they experience more happiness and are more emotionally adaptive than those who do not.

Fourth, the hypothesis 4, which proved that "anxiety level of college students will have a negative effect on psychological well-being", showed no significant result ($t = .900$, $p > .05$).

Fifth, the result of testing hypothesis 5 that "depression level of college students will have a negative effect on psychological well-being" showed a significant result ($t = -5.831$, $p < .001$). Therefore, more college students with higher levels of depression had lower psychological well-being.

Sixth, "The result of hypothesis 6, which verified the mediating effect of emotional awareness clarity in the causal relationship between depression level of college students and psychological well-being, showed partial mediating effect.

Based on the mediating effect of emotional awareness clarity by setting anxiety and depression as independent variables as psychological and emotional factors that affect the psychological well-being of college students, the more psychological well-being they perceive when they experience stress, the more psychological well-being. The higher the depression, the lower the emotional clarity and the lower the psychological well-being.

Anxiety in daily life did not affect psychological well-being, but depressive variables were found to have a significant effect, suggesting the need for emotional control training for college students who complain of depression.

Emotional regulation is an important factor in determining individual well-being, and an emotional mode of control is important for psychopathology and is an important factor in understanding human function and health and in determining successful function. The ability to control one's emotions at this time is very important, as college students going into adulthood experience emotional instability and thereby experience various problems.

The implications of this study are as follows.

First, as a result of examining the factors affecting the psychological well-being of college students, the higher the depression, the lower the psychological well-being. This is consistent with the findings of previous studies that the more depressed, the more maladaptive emotional control strategies are used and the lower the psychological well-being. Therefore, in order for university students to recognize their psychological and emotional problems correctly, the online self-diagnosis service is being expanded to help students adapt to their social life. Training to change your mind will be effective through the practice of mediating your feelings.

Second, the effect of emotional clarity on psychological well-being was found to be significant. This means that when college students experience a stressful event, they first select an adaptive emotional control style and increase their psychological well-being when they clearly recognize their emotions. Therefore, for the mental health management and maintenance of college students, practical help and training will be needed to know their emotions correctly and express them to have adaptive emotions.

The limitations of this study and suggestions for further research are as follows.

This study has a limitation that the study subjects were limited to college students, so the effect of emotional awareness clarity could not be studied in all age groups. In the future, it is necessary to make efforts to generalize the research results by conducting research on a more comprehensive age group. In addition, this study has a limitation that only the anxiety and depression variables are considered as psycho-emotional variables affecting psychological well-being. In the future, it is also necessary to establish a comprehensive research model that considers more diverse variables.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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A Comparative Study on Life Satisfaction on the Disabled Elderly and the Disabled Middle Aged

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Abstract

Background/Objectives: The purpose of this study is to provide a specific welfare service suitable for each generation by conducting a comparative analysis of the factors affecting the lives of the disabled.

Method/Statistical Analysis: This study analyzed the data of 2017 which is the 12th data of the Korea Welfare Panel conducted by the Korea Institute for Health and Social Affairs. As related variables, gender, education level, household income, and work ability were selected as demographic factors, and the relationship with life satisfaction was identified through social support, depression, health status satisfaction, and family life satisfaction.

Findings: As a result of comparison of social support, depression, health status satisfaction, and overall life satisfaction by generation, the middle-aged turned out to perceive higher only in health satisfaction variable. And as a result of the factors that influence the overall life satisfaction of the middle-aged and the elderly, first, for the middle-aged, household income and working ability affect overall life satisfaction in the first model, which only used demographic variables. Social support, depression, health satisfaction, and family life satisfaction in the second model, which added four variables, all four variables were found to influence overall life satisfaction. For the elderly, the first model, which only included socio-demographic variables, showed that household income and working ability were overall life. In addition to the elderly, gender also affects overall life satisfaction. Social support, depression, health satisfaction, and family life satisfaction in the second model, which added four variables, all four variables, were found to affect overall life satisfaction, and gender and household income were still influential factors.

Improvements/Applications: Social support perception, depression, health satisfaction, and family life satisfaction turned out to have a great influence. An approach providing multi-dimensional resources encompassing individual, family, emotional and social factors is required.

Keywords: *The disabled elderly, The disabled middle-aged, Life satisfaction, Social support, Depression, Korea Welfare Panel.*

Introduction

Satisfaction, which is the evidence that an individual is living happily in his or her society, is the ultimate

goal of the human being and the greatest concern^[1]. However, persons with disabilities are generally placed in alienation and isolation, subject to prejudice and discrimination. This kind of discrimination against persons with disabilities is a factor in lowering life satisfaction^[2]. The need for a life-cycle approach to disability research lies in that people with disabilities, like non-disabled people, are recognized as members of the community who perform different developmental tasks for each age group, while at the same time focusing on overall life experiences. In the context of life-cycle

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perspective, the social context such as changes in individual, economic, and social resources can affect the individual's life. The assessment of how policies to support the disabled contribute to the ultimate goal of improving the quality of life for the disabled can be seen through studies of life satisfaction decisions for the disabled, whose scope is limited^[3].

The concept of life satisfaction is expressed by ^[4], who develop the Life Satisfaction Index of the elderly, from the activities that make up their daily lives, the positive self- image, the optimistic attitude and feelings. It was defined as maintenance^[5]. Since life satisfaction is a complex concept that combines subjective aspects of interpreting each individual's objective situation and the situation, there are a growing number of studies^[6] that analyze factors that affect the life satisfaction of people with disabilities and comprehensively understand life satisfaction.

In particular, aging and disability are social issues that require social intervention because they reduce the living satisfaction of older people and cause family conflicts by increasing the support burden of families^[7]. Studies in the field of disability welfare first began in foreign countries, focusing on the living satisfaction of spinal cord-impaired and brain-impaired people^[8,9,10]. These studies compared the living satisfaction of the disabled with that of the non-disabled, or compared the factors related to the living satisfaction of the disabled. In Korea,^[11] compared the living satisfaction of the disabled and the non-disabled,^[12] examined the factors affecting the living satisfaction of those who live in metropolitan cities and those with brain lesions. The results of the preceding study show that factors related to life satisfaction of the elderly with disabilities are relevant not only to the general characteristics and life cycle factors, disability and health characteristics, but also to the social characteristics ^{[12][13]}.

In the United States, a survey is conducted annually by the National Organization on Disability to examine the differences in living conditions between people with and without disabilities. In Korea, disability surveys are conducted every five years. In Korea and the United States, the results of the ^[13] are very suggestive, with few studies dealing with the quality of life of people with and without disabilities. As a result of the analysis of the overall quality of life and the sub-areas of the scales, non-disabled people were high in satisfaction, autonomy, community participation, and accessibility.

No significant difference was found only in the material satisfaction zone. This means that overall life satisfaction is clearly higher for people with disabilities than people with disabilities, and there is less opportunity to determine free time or choose daily activities. It also means that they have low opportunities to participate in the community, such as leisure, and low access. Some studies on depression in Korea were conducted^[14,15]. Domestic studies mainly studied the depressive factors of the disabled aged 65 and over. However, it is necessary to take into account that the recent study on the elderly with disabilities has been conducted for the disabled in their 40s and 50s, which are relatively early ages^[16].

There is a need to reduce depression according to the life cycle of Korean disabled. Rather than understanding middle age and old age, mental health promotion efforts for people with disabilities are needed. Depression level tended to increase with age^[17]. Depression levels tended to decrease somewhat compared to those in their 40s, but increased rapidly after age 65. Depression prevention and reduction strategies are needed throughout the life cycle, but it can be seen that the efforts to prevent depression are particularly urgent for older people with disabilities.

Therefore, in this research, we want to examine the influence on satisfaction including social factors such as emotional factor like depression and social support perception as well as demographic factors. In addition, the comparison between the middle-aged and the elderly can be a very important basic data for the customized life-cycle approach for the disabled by providing information on the factors that affect life satisfaction among the generations as well as the current status analysis of each generation.

Method

This study analyzed the data of 2017 which is the 12th data of the Korea Welfare Panel conducted by the Korea Institute for Health and Social Affairs. Penal data total 6,581 households, 12,790 people. Among them, 1,459 were disabled, while 1,291 were middle-aged and elderly.

In order to find out the difference between generations of the disabled elderly and the disabled middle-aged, this research classified the middle-aged as those who are 45-64 years of age and the elderly aged 65 and over.

As related variables, gender, education level, household income, and work ability were selected as demographic factors, and the relationship with life satisfaction was identified through social support, depression, health status satisfaction, and family life satisfaction.

Result and Discussion

1. General Demographic Variables of the Disabled Elderly and the Disabled Middle-Aged: As a result of analysis of the demographic variables of the research subjects, there were 386 disabled middle-aged and 905 disabled elderly. As shown in [Table 1], of the former, 237 subjects were

men and 149 subjects were women. Of the latter, 433 subjects were men and 472 subjects were women respectively. As for education level, most of the middle-aged were high school graduates whereas most of the elderly were elementary school graduates. As for household income, in the case of the middle-aged, the most had more than 50 million won whereas in the case of the elderly, the most had 15 million won or less. As for work ability, most of the middle-aged and the elderly perceived that they were able to work. 66.8 percent of middle-aged people said they were able to work, while 47.1 percent of older people said they were.

Table 1. General Demographic Variables of the Disabled Elderly and the Disabled Middle-Aged

Variable	Division	Middle-Aged (N=386)		Elderly-Aged (N=905)	
		N	%	N	%
Sex	Male	237	61.4	433	47.8
	Female	149	38.6	472	52.2
Education level	Not education	15	3.9	210	23.2
	Elementary School	94	24.4	394	43.5
	middle School	74	19.2	144	15.9
	high school	141	36.5	117	12.9
	College	19	4.9	4	.4
	University	37	9.6	29	3.2
Household income	Graduate school	6	1.6	7	.8
	Less than 15 million won	83	21.5	381	42.1
	15 million ~ 20 million won	48	12.4	162	17.9
	20 million won ~ 30 million won	72	18.7	172	19.0
	30 million won ~ 50 million won	77	19.9	107	11.8
Work ability Perception	More than 50 million won	106	27.5	83	9.2
	Possible to work	258	66.8	426	47.1
	Only simple work	56	14.5	154	17.0
	Weak working hours (housework only)	50	13.0	262	29.0
	No ability to work (do not even do housework)	22	5.7	63	7.0

2. Comparison of Social Support Perception, Depression, and Satisfaction by Generation: As a result of comparison of social support, depression, health status satisfaction, and overall life satisfaction by generation as shown in [Table 2], the middle-aged turned out to perceive higher only in health satisfaction variable. There was no significant difference between the elderly and the elderly in social support, depression, family life satisfaction, and overall life satisfaction.

Only the health satisfaction score was 2.81 points for the middle-aged and significantly higher than the 2.41 points for the elderly.

The fact that middle-aged people did not show significantly higher scores in other satisfactions than the elderly in other than health satisfaction means that intensive and detailed studies on the various satisfactions of life for middle-aged people are needed.

Table 2. Comparison of social support, depression and satisfaction by generation

Variable	Middle-Aged		Elderly-Aged		t
	M	SD	M	SD	
Social support	31.91	7.99	31.53	7.36	.80
Depression	21.48	21.63	20.01	16.02	1.15
Health status satisfaction	2.81	.93	2.41	.88	6.74***
Family life satisfaction.	3.66	.74	3.72	.68	-1.19
Life satisfaction	3.33	.72	3.36	.68	-.552

*p<.05 **p<.01 ***p<.001

3. Factors Affecting Overall Life Satisfaction:

[Table 3] and [Table 4] show the factors that influence the overall life satisfaction of the middle aged and the elderly. First, for the middle aged, household income ($\beta = .30, p <.001$) and working ability ($\beta = -.15, p <.01$) affect overall life satisfaction in the first model, which only used demographic variables ($F = 9.45, p <.001$). Social support, depression, health satisfaction, and family life satisfaction in the second model, which added four variables, all four variables were found to influence overall life satisfaction ($F = 27.18, p <.001$). Higher social support ($\beta = .16, p <.01$), lower depression ($\beta = -.26, p <.001$), and higher satisfaction with health status ($\beta = 0.23, p <.001$), the higher the family life satisfaction ($\beta = 0.23, p <.001$), the higher the overall life satisfaction of the middle aged. For the elderly, the first model, which only included socio-demographic variables, showed that household income ($\beta = .19, p <.001$) and working ability

($\beta = -.21, p <.001$), as in the case of middle-aged people, were overall life. In addition to the elderly, gender ($\beta = -.08, P <.05$) also affects overall life satisfaction ($F = 14.13, p <.001$). In other words, female perceived that their overall life satisfaction was higher than male, their household income was high, and their ability to work increased their overall life satisfaction. Social Support, Depression, Health Satisfaction, and Family Life Satisfaction in the second model, which added four variables, all four variables, like the middle-aged, were found to affect overall life satisfaction, and gender ($\beta = -.08, P <.05$) and household income ($\beta = .07, P <.05$) were still influential factors ($F = 50.02, P <.001$). Higher social support ($\beta = .14, P <.001$), lower depression ($\beta = -.24, P <.001$), higher health status satisfaction ($\beta = .24, P <.001$), the higher the family life satisfaction ($\beta = 0.26, P <.001$), the higher the overall satisfaction with life.

Table 3. Factors affecting overall life Satisfaction (Middle-aged)

Variable	Middle-aged (N=730)			
	Model 1		Model 2	
	B	β	B	β
Sex (Female = 0)	-0.09	-0.06	-0.08	-0.06
Education	-0.05	-0.09	-0.04	-0.08
Household income	0.14	0.30***	0.04	0.09
Work ability perception	-0.14	-0.15**	0.03	0.03
Social support			0.02	0.16**
Depression			-0.03	-0.26***
Health status satisfaction			0.18	0.23***
Family life satisfaction			0.22	0.23***
constant	3.75		2.25	
F	9.45***		27.18***	
R2	.12		.43	

*p<.05 **p<.01 ***p<.001

Table 4. Factors affecting overall life Satisfaction (Elderly-aged)

Variable	Elderly-aged (N=1,652)			
	Model1		Model2	
	B	β	B	β
Sex (Female = 0)	-0.11	-0.08*	-0.11	-0.08*
Education	0.02	0.04	0.01	0.01
Household income	0.10	0.19***	0.04	0.07*
Work ability perception	-0.16	-0.21***	-0.01	-0.01
Social support			0.01	0.14***
Depression			-0.03	-0.24***
Health status satisfaction			0.19	0.24***
Family life satisfaction			0.26	0.26***
Constant	2.85		1.76	
F	14.13***		50.02***	
R2	.08		.38	

*p<.05 **p<.01 ***p<.001

Conclusion

As a result of this research, variables affecting overall satisfaction in both the middle-aged and the elderly, social support perception, depression, health satisfaction, and family life satisfaction turned out to have a great influence, suggesting that, as a method to enhance life satisfaction for the disabled, it is clear that an approach providing multi-dimensional resources encompassing individual, family, emotional and social factors is required. In particular, the study on the living satisfaction of the disabled in the middle-aged is very insufficient, and the government urgently needs to take measures to improve the quality of life, including the elderly as well as the middle-aged, as the quality of life has recently been reduced due to the deterioration of economic life caused by the early retirement of the middle-aged.

In particular, in terms of life satisfaction for people with disabilities, despite the social difficulties in life compared to non-disabled people, satisfaction surveys are conducted only for people with disabilities.

As a result, the tasks in the field of quality of life research for the disabled are different from the unified perspectives, including comparison of non-disabled and disabled, inclusion and recognition of social discrimination of the disabled, and differences in life satisfaction and the findings of influence factors. You need to approach it.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Evaluation of Chest Compression Quality and Appropriateness in the Pediatric Cardiopulmonary Resuscitation

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Abstract

Background/Objective: This study aimed to verify the quality and the appropriateness of pediatric CPR chest compressions according to 2015 Korean Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care.

Method/Statistical Analysis: The participants of this study were 64 EMT and nursing students who were qualified as BLS providers. Four sets of 5 CPR cycles were performed with one hand and two hands at the ratio of chest compression (30 times) to respiration (2 times), and fatigue was confirmed by NRS (numeral rating scale). Collected data were analyzed using frequency, descriptive statistics, paired t-test, and repeated measure ANOVA by SPSS 22.0.

Findings: While the total number of chest compressions (629.6 times vs. 618.3 times, $p=.016$) and hands-off time (6.6 sec vs. 6.9 sec, $p=.006$) were effective for one-handed chest compression, average pressure depth (42.2mm vs. 43.8mm, $p<.001$), sufficient chest compression depth rate (83.0% vs. 89.1%, $p=.038$) and fatigue (7.0 points vs. 6.2 points, $p=.040$) were more effective in two-handed chest compressions. In addition, there were significant differences in the average chest compression depth over time ($p=.003$) and the total elapsed time ($p=.332$), but no significant difference in inappropriate chest compression.

Improvements/Applications: Performing pediatric CPR according to the 2015 Guidelines for Pediatric Cardiopulmonary resuscitation is acceptable, but it is necessary to consider two-hand chest compression more than one hand compression.

Keywords: Chest compression; children; cardiopulmonary resuscitation; depth; quality.

Introduction

Rapid cardiopulmonary resuscitation (CPR) by bystanders is one of the key factors in the survival chain to save a patient from cardiac arrest^[1]. Fast and effective cardiopulmonary resuscitation by bystanders in children, as in adults, helps the return of spontaneous

circulation and neurological recovery. In children, the difference in survival rate varies according to the cause of cardiac arrest. In the cardiac arrest due to respiratory arrest, the survival rate of neurologically normal person is about 70%, and 20-30% in the case due to ventricular fibrillation^[2]. The quality of chest compressions is an important factor in CPR. It is also important to deliver chest compressions of sufficient depth^[1]. If an infant is unresponsive and not breathing, 30 chest compressions should be performed immediately, since proper chest compressions under cardiac arrest maintain blood flow to major organs and increase the possibility of spontaneous circulatory recovery. Appropriate chest compressions in children should be delivered at a

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rate of 100-120 times per minute at a depth of at least one-third of the diameter (chest thickness) between anterior and posterior thorax, or depth of 4-5cm^[3-5]. In a preceding study, spontaneous circulatory recovery was best when chest compressions were performed at a rate of 125 times per minute^[6], while other studies reported that the best survival discharge rates were at a rate of 100-120 times per minute^[7]. Another important factor in the quality of cardiopulmonary resuscitation is the problem of incomplete recoil that can occur during chest compressions. No human studies have yet been conducted but animal testing has confirmed that the relationship between incomplete recoil and cardiac output is inversely proportional. Therefore, effective pediatric cardiopulmonary resuscitation requires the chest compression at least one-third of the depth (approximately 4-5cm), anterior and posterior diameter, of thoracic cavity with palms of one or both hands on the lower half of the sternum. Whether one hand or two hands are used, the proper depth should be maintained for each pressure applied without pressing the xiphoid process while ribs and chest being relaxed back to its normal position after each chest compression^[8-9]. Another important aspect of CPR quality is the chest compression fraction. This is the proportion of chest compressions in the total cardiopulmonary resuscitation. The higher the chest compression fraction, the less the hands-off time and the higher the chest compression fraction, the higher the survival rate^[10-11]. Yet another concern in the quality of CPR is the rescuer's fatigue which was associated with inappropriate speed, depth and chest recoil from chest compression^[12]. However, differences in the quality and the appropriateness of chest compression between one-handed or two-handed pediatric CPR have not been sufficiently demonstrated yet and required further research. Therefore, this study examined the quality and the appropriateness of chest compressions using one or two hands for pediatric CPR to provide the basic data for improving the quality of pediatric CPR in the future.

Method

This study was a single group, post-design experimental study to check the quality and the appropriateness of one- or two-handed chest compressions in pediatric CPR.

The participants of this study were those who completed Basic Life Support (BLS) provider qualification and agreed to participate among the

third and fourth-grade students in the department of emergency technology and nursing at one university in Jecheon. The number of subjects was 64 using G*Power 3.1.9 with the effect size of .30, the significance level of .05, and power of .80. 70 patients were selected in consideration of the dropout rate, and the final analysis included 64 people except dropouts.

All cardiopulmonary resuscitation procedures were assessed and recorded with the Laredal Resusci Junior QCPRTM mannequin. According to the results of previous studies evaluated to assess the quality and the appropriateness of one- or two-handed chest compressions in pediatric CPR, in single pediatric cardiopulmonary resuscitation, if a child (i.e., the mannequin) was unresponsive and not breathing, the CPR provider placed the patient on flat floor and 30 chest compressions at a rate of 100-200 times per minute, at least one-third, 4-5cm depth, of the thoracic cavity, should be delivered immediately^[4]. The chest compression time averaged 7.28 minutes after the on-site arrival time following the report to 119 emergency services while averaging 10.86 minutes from the emergency scene to the hospital^[13]. Assessment of the quality and appropriateness of chest compressions in adult CPR found changes in the average chest compression depth and appropriate compression rates over time^[14]. Based on this prior study and its theoretical basis, to evaluate the quality and the appropriateness of one- or two-handed chest compressions in pediatric CPR, 30 chest compressions and two artificial respirations were delivered in four sets (eight minutes) of five cycles using one-handed method on the first day and two-handed method on the second day. The age, height, weight, and qualification year of BLS provider were recorded as general characteristics of the subjects. The quality of chest compressions was checked for total number of chest compression, average pressure depth, sufficient chest compression depth ratio, sufficient chest compression recoil rate, average compression rate, and hands-off time. The adequacy of chest compression over time was determined by measuring the average chest compression depth with number of inappropriate chest compression, meaning that the fewer inappropriate chest compression, the more appropriate the chest compression were. The fatigue level of the subjects was assessed using with the numerical recording scale (NRS) immediately after the CPR was completed. CPR difficulty was evaluated on the scale of 0 to 10, where 10 points was the most difficult. The ratio of chest compression to artificial respiration was

30:2, but respiration was excluded from the evaluation criteria to assess the quality and the appropriateness of chest compression.

This study was conducted from May 14-17, 2019, by the researcher who has no conflict of interest in the subject. SPSS Windows 22.0 was used to analyze the collected data and the general characteristics of the subjects were presented using descriptive statistics of frequency, percentage, mean, and standard deviation. Differences between the quality of one-handed and two-handed chest compression were analyzed by paired t-tests while the appropriateness of chest compression over time being analyzed by paired t-test and repeated measurement of ANOVA.

The data were collected after obtaining approval from the Institutional Review Board (IRB) (IRB No: D*-2019-04-001-02) of D University located in Jecheon for ethical consideration of the subjects. The Researcher without conflict of interest explained to the participants about the purpose, method, expected results, and method of handling unexpected problems. The confidentiality of the study and the voluntary participation were also explained. The survey with the evaluation was conducted after receiving written consent from the subjects who agreed to participate in the research.

Result

[Table 1] shows that forty female students (62.5 percent) and 43 (67.2 percent) BLS providers certified in 2017 were included in the study. The average age, height, and weight of the participants were 20.94 (±1.75) years, 167.5(±8.43)cm, and 62.41(±0.87kg, respectively. As [Table 2] indicates, analysis of the quality of chest compressions delivered by one- and two-handed pediatric CPR showed that the total number of chest compressions (629.6 times vs. 618.3 times, one-handed vs. two-handed, respectively; p=.016) and the hands-off time (6.6sec vs. 6.9sec, one-handed vs. two-handed,

respectively; p=.006) were more effective in one-handed chest compressions. The average compression depth (42.2mm vs. 43.8mm, one-handed vs. two-handed, respectively; p<.001) was more appropriate for two-handed chest compressions. The sufficient chest compression depth rate (83.0% vs. 89.1%, one-handed vs. two-handed, respectively; p=.038) and fatigue score(7.0 points vs. 6.2 points, one-handed vs. two-handed, respectively; p=.040) were better in two-handed chest compression. However, there was no significant difference between sufficient chest compression recoil rate (98.2% vs. 96.0%, one-handed vs. two-handed, respectively; p=.079) and average compression rates (108.9 times vs. 108.8 times, one-handed vs. two-handed, respectively; p=.924).

Table 1. Analysis of the frequency of the subject’s common matters (n=64)

Variable	Category	N (%)	Mean±SD
Gender	Male	24(37.5)	
	Female	40(62.5)	
Age	19~20	11(17.2)	20.94±1.75
	21-25	51(79.7)	
	26 or higher	2(3.1)	
Weight	40~50kg	6(9.4)	62.41±10.87
	51~60kg	22(34.4)	
	61~70kg	18(28.1)	
	71~80kg	11(17.2)	
	81~90kg	6(9.4)	
Height	140~150cm	1(1.6)	167.5±8.43
	151~160cm	9(14.1)	
	161~170cm	29(45.3)	
	171~180cm	20(31.3)	
	181~190cm	5(7.8)	
BLS provider certified	2017	7(10.9)	
	2018	43(67.2)	
	2019	14(21.9)	

Table 2. Chest compressions quality (n=64)

Variable	One-hand	Two-hands	t	p
Total number of chest compressions (n)	629.6±47.88	618.3±42.90	2.476	.016
Mean chest compression depth (mm)	42.2±0.30	43.8±0.24	-4.149	<.001
Sufficient chest compression rate(%)	83.0±21.73	89.1±15.17	-2.114	.038
Sufficient chest compression recoil rate (%)	98.2±8.02	96.0±6.82	1.786	.079
Mean chest compression speed	108.9±8.16	108.8±7.68	0.095	.924
Hands off time (sec)	6.6±1.14	6.9±1.10	-2.832	.006
Fatigue (NRS)	7.0±1.88	6.2±2.43	1.879	.040

In the appropriateness of chest compressions, the mean depth of chest compression (2min: 43.3mm vs. 44.3mm, $p=.007$; 4min: 42.5mm vs. 44.1mm, $p<.001$; 6min: 42.6mm vs. 44.2mm, $p=.001$; 8min: 42.7mm vs. 44.4mm) differed statistically over time ($p=.003$) and with the total time elapsed ($p=.043$). Inadequate chest compressions (2min: 11.8 times vs. 11.7 times, $p=$

.954; 4min: 15.6 times vs. 10.5 times, $p=.051$; 6min: 16.4 times vs. 9.9 times, $p=.028$; 8min: 15.8 times vs. 12.6 times, one-handed vs. two-handed, respectively; $p=.324$) did not differ significantly over time ($p=.332$) and with the total time elapsed ($p=.280$), but the degree of appropriateness was high for two-handed chest compression [Table 3] [Figure 1].

Table 3. Appropriateness of chest compression (n=64)

Variable		One hand compression	Two hands compression	t	p	F	p
Mean chest compression depth	(2 min)	43.3±2.50	44.3±2.37	-2.80	.007	-3.042	.003
	(4 min)	42.5±3.10	44.1±2.63	-4.02	<.001		
	(6 min)	42.6±3.53	44.2±2.51	-3.35	.001		
	(8 min)	42.7±3.94	44.4±2.86	-3.14	.003		
Inappropriate number of chest compression	(2 min)	11.8±14.39	11.7±14.47	.058	.954	0.993	.332
	(4 min)	15.6±20.89	10.5±16.94	1.98	.051		
	(6 min)	16.4±20.93	9.9±17.16	2.24	.028		
	(8 min)	15.8±21.54	12.6±19.09	.993	.324		

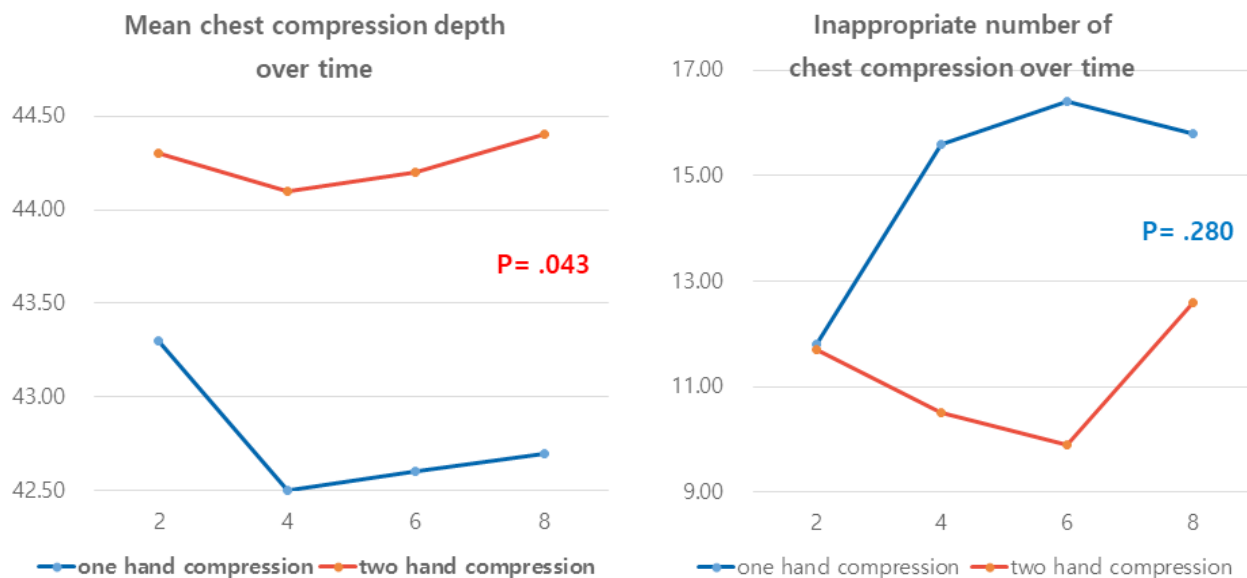


Figure 1. Assessment of adequacy of chest compressions over time (n=64)

Discussion

This study was conducted to evaluate the quality and the appropriateness of one- or two-handed chest compressions in pediatric CPR to provide the basic data for effective pediatric cardiopulmonary resuscitation. In the aspect of quality of chest compression in pediatric CPR, the total number of chest compression and the hands-off time were more effective for one-handed chest compression. The average compression depth was

more appropriate for two-handed chest compression, as was the sufficient chest compression depth rate. However, there was no significant difference between the compression recoil rate and the average compression rate between one- and two-handed CPR. These results support recommendations in the 2015 Guidelines for Pediatric Cardiopulmonary Resuscitation that suggest the use of one- or two-handed chest compression. However, the fatigue rate was higher when only one

hand was used compared to chest compression with two hands. This agrees with the results of previous study that suggested that the quality of chest compression decreased due to higher fatigue rates in adult CPR when only chest compression was delivered, compared to standard CPR [14]. The quality of chest compression is the most important factor in effective CPR, emphasizing the importance of chest compression of sufficient depth [1]. Therefore, the quality of chest compression may decrease as fatigue increases in pediatric CPR, so it is necessary to consider two-handed CPR.

The mean chest compression depth was within 4-5cm, as suggested in the 2015 Guidelines. Two-handed chest compression was more effective than one-handed compression as shown different significantly over time and over total time elapsed. However, there was no statistically significant difference over time and over total time elapsed in inappropriate chest compression rate, but there were more improper chest compressions in one-handed chest compression than in two-handed chest compression. The results were attributed to higher fatigue scores in one-handed chest compression provider than in two-handed chest compression provider, resulting in the increase in inappropriate chest compression. In addition, inappropriate chest compression is the measure of the quality of chest compression, indicating that the two-handed method was more appropriate. Furthermore, there is no previous study comparing the appropriateness of one- or two-handed chest compression in pediatric CPR, so no study can compare directly with this study. Thus, additional studies on two-handed chest compression are needed.

Conclusion

This study was aimed to assess the quality and the appropriateness of chest compression in pediatric CPR according to 2015 Korean Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Evaluation of the quality of chest compression in pediatric CPR showed that the total number of chest compression and the hands-off time were more effective in the one-handed method, but the average compression depth applied was more appropriate in the two-handed method. Furthermore, the ratio of sufficient chest compression depths and the fatigue were significantly higher for two-handed chest compression. In the appropriateness of chest compression, the average chest compression depth was significantly improved over time and over the total time elapsed in two-handed chest

compressions, but there was no significant difference in inadequate chest compression. Based on these results, this study is meaningful to provide the basic data for improving the quality of the 2015 Korean Guidelines by evaluating the quality and the appropriateness of one- or two-handed chest compression in pediatric cardiopulmonary resuscitation. In addition, one- or two-handed chest compression method in the 2015 Guidelines may be used in pediatric cardiopulmonary resuscitation, but it is necessary to perform chest compression with two hands rather than one hand, suggesting follow-up studies in various ages and groups. Furthermore, since children have the high possibility of cardiac arrest due to respiratory problems, further studies are needed to assess the quality and the appropriateness of one- or two-handed chest compression, including respiration.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Factors Influencing Internet Game Addiction in Middle School Students

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Abstract

Background/Objectives: The purpose of this study is to analyze the factors affecting internet game addiction in middle school students.

Method/Statistical Analysis: The survey was conducted among 304 middle school students in G metropolitan city of Korea. The data were analyzed using frequency and percentage, mean and standard deviation, t-test, ANOVA, and hierarchical regression analysis.

Findings: The results for the degree of middle school students' internet game addiction showed that 67.1% were average users, 23.4% were potential risk users, and 9.5% were high risk users. The variables affecting internet game addiction were found to be anxiety, ego-resilience and gender. These three variables explained 15.9% of the internet game addiction in middle school students.

Improvements/Applications: To prevent middle school students from being addicted to internet games, intervention strategies that focus on male students for reduction of anxiety and strengthening of ego-resilience are needed.

Keywords: *Internet gaming, Addiction, Anxiety, Ego-resilience, Middle school students.*

Introduction

In the modern society, most of the information are collected from the internet and thus using the internet has become an essential means in all living areas. In particular, Korea emphasized the importance of building high-speed information infrastructures and informatization education at the national level. As a result, 91.5% of the citizens over the age of 3 use the internet, and among them teenagers takes 99.9% of the total internet use. Communication was the primary

purpose of internet use (94.5%) followed by data and information acquisition (93.7%) and leisure activity (92.5%), whereas leisure activity took the highest portion (99.5%) among teenagers^[1]. Game, one of the teenagers most common leisure activities, has been continuously increasing with the development of internet and smart devices. A study in 2017 reported that 67.2% of the people in the age of 10~65 were using internet games, and the ratio of game users was highest in teenagers at 91.1%^[2]. However, it has also been noted that various problems in academic achievement, family relationship, social relationship, and physical and mental health could occur as the result of game addiction when games were excessively used^[3-4]. For instance, a shocking incident occurred that a middle school student addicted to game murdered her mother who forced to stop playing computer games and killed herself^[5]. There exists another case in which a middle school student who was addicted to internet games killed his brother in order to experience murder^[6].

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To address the problems of game addiction, it is necessary to pay attention to the precedent variables affecting game addiction. For parental variables, previous studies reported that the lack of communication between parents and children as well as breaking of family could affect game addiction^[7-8]. Psychological variables such as neurosis, anxiety, depression, self-efficacy, self-esteem, impulsivity, and aggressiveness are also known to affect game addiction^[9-11]. Among the psychological variables, anxiety was identified one of the most important variables explaining game addiction. Prior studies for anxiety have shown that both temporary and time-varying state anxiety and relatively unchanging characteristic anxiety affected online game addiction^[9]. However, although it was known that anxiety could be caused by game addiction^[4], whether anxiety is a leading factor of game addiction or not is not sufficiently researched yet.

In addition, strengthening ego-resilience was known to be important for an effective intervention on internet addiction or overuse because ego-resilience is an adaptive ability to control the individual’s emotional ability and change the situation^[11]. It was further reported that strengthening ego-resilience was the most comprehensive and effective remedy to smartphone addiction^[10]. Thus, ego-resilience has received much attention recently and studies have been reported on the relationship between ego-resilience and internet addiction or smartphone addiction.

In this study, the factors affecting internet game addiction were investigated, including anxiety and ego-resilience, in order to provide the basic data necessary for the development of internet game addiction prevention program of middle school students. The relationship of internet game addiction to the general characteristics of the subjects was determined. Then, the degrees of internet game addiction, anxiety, and ego-resilience of the subjects were analyzed. Lastly, the factors influencing the subject’s internet game addiction were identified.

Method

1. **Measures:** Ego-resilience was measured using the tool developed by Block and Kremen (1996)^[12] and revised by Yoo and Shim(2002)^[13]. The Likert 4-point scale was adopted with scores ranging from the minimum of 14 to the maximum of 56 for which a higher score implied that the individuals had a higher ability to re-establish self-control after experiencing a stress event. The reliability of the tool as determined by Cronbach’s α was .76 at the time of development and .75 at the time of this study.

Anxiety was measured using the Spielberger’s (1973) Trait Anxiety Inventory for Children (TAIC) translated by Kim and Shin(1978)^[14]. The Likert 3-point scale(range 20-60) was adopted. The reliability of the tool as determined by Cronbach’s α was .85 in Kim and Shin’s study and .90 in this study.

Internet game addiction was measured using a scale developed by the Korean National Information Society Agency (2006)^[15]. The scale consisted of 20 items which were asking about current gaming behavior rather than self-recognition of game addiction, and score was evaluated using a 4-point scale with respect to frequency. The reliability of the tool as determined by Cronbach’s α was .89 at time of its development and .94 in the present study.

2. **Data Collection:** The survey was carried out at two middle schools in G city. The purpose of the study was first explained to the principals and teachers and the questionnaires were completed by students who agreed to participate. Specifically, a pre-trained research assistant explained the purpose and method of the study, distributed the questionnaires to students, and requested the students to complete the questionnaires immediately. The questionnaire was completed with anonymity and the students were informed that the questionnaires were to be used only for the purpose of present study.

Table 1: Internet game addiction with respect to general characteristics of the subjects

	Variables	n(%)	M±SD	t or F	p
Gender	Male	150(49.3)	31.65±11.57	2.983	.003
	Female	154(50.7)	28.00± 9.62		
Class year	1st	91(29.9)	30.35±12.17	1.779	.171
	2nd	107(35.2)	30.88±10.11		
	3rd	106(34.9)	28.24±10.02		

	Variables	n(%)	M±SD	t or F	p
Communication with parents	Difficult	10(3.3)	29.80±12.12	.289	.749
	Normal	122(40.1)	29.23±10.08		
	Comfortable	172(56.6)	30.20±11.19		
Satisfaction with school life	Satisfied	208(68.4)	29.30± 9.98	1.372	.255
	Average	86(28.3)	30.40±11.16		
	Dissatisfied	10(3.3)	34.60± 19.97		
School grade	High	70(23.0)	29.68± 9.92	.246	.782
	Middle	189(62.2)	29.60± 0.45		
	Low	45(14.8)	30.84±13.26		
Economic status	High	29(9.5)	28.13± 9.88	.720	.488
	Middle	259(85.2)	29.84±10.76		
	Low	16(5.3)	32.12±12.43		
Parents living together	Both parents	277(91.1)	29.53±10.68	-1.39	.165
	Other	37(8.9)	32.55±11.48		

3. Data Analysis: The collected data were analyzed using SPSS Ver. 20.0. General characteristics of the subjects, ego-resilience, anxiety, and internet game addiction level were analyzed by frequency, percentage, means and standard deviation. The degree of internet game addiction with respect to general characteristics of the subjects were analyzed using the t/F test. Hierarchical regression analysis was used to find the cause of internet game addiction. The analyses were performed in two steps. First, the effects of general characteristics on the degree of internet game addiction were analyzed (Model 1). Then, the analysis was repeated after adding psychological factors to the general characteristics (Model 2).

Results

1. General Characteristics: Among general characteristics, gender ($p = .003$) was the primary factor revealing statistically significant difference in internet game addiction level. Especially, male students showed a higher degree of internet game addiction [Table 1].

2. Internet game addiction, ego-resilience and anxiety: The analyses of the subject's ego-resilience,

anxiety and internet game addiction showed that the ego-resilience score was 40.57 ± 6.05 , anxiety was 32.66 ± 7.63 , and internet game addiction was 29.81 ± 10.77 . The results for anxiety level of the students revealed that slightly high 13.2%, fairly high 6.3%, and very high 4.6%. Also, the analysis of the subjects' internet game addiction showed that the ratio under potential risk was 23.4% and high risk was 9.5% [Table 2].

Table 2. Internet game addiction, ego-resilience and anxiety

Variables	n(%)	M±SD
Ego-resilience		40.57±6.05
Anxiety		32.66±7.63
Normal	231(76.0)	
Slightly high	40(13.2)	
Fairly high	19(6.3)	
Very high	14(4.6)	
Internet game addiction		29.81±10.77
Normal	204(67.1)	
Potential risk	71(23.4)	
High risk	29(9.5)	

Table 3: Factors influencing internet game addiction

	Variables	B	SE	β	t	p	Tolerance	VIF
Model 1	(constant)	23.654	6.370		3.714	.000		
	Gender	-3.769	1.215	-0.175	-3.102	.002	0.998	1.002
	Class year	-0.953	.765	-0.071	-1.246	.214	0.975	1.026
	Communication with parents	1.613	1.165	0.084	1.385	.167	0.863	1.159
	Satisfaction with school life	1.852	1.180	0.093	1.569	.118	0.903	1.108
	School grade	0.099	1.018	0.006	0.097	.923	0.957	1.045
	Economic status	2.166	1.688	0.077	1.283	.200	0.884	1.131
	Parents living together	2.547	2.196	0.067	1.16	.247	0.943	1.060
		R2 =.058, Adj R2 =.035, F=2.581(p=.013)						
Model 2	(constant)	30.782	7.946		3.874	.000		
	Gender	-4.292	1.144	-0.200	-3.75	.000	0.980	1.020
	Class year	-1.099	.718	-0.082	-1.531	.127	0.964	1.038
	Communication with parents	1.79	1.089	0.093	1.643	.101	0.859	1.163
	Satisfaction with school life	0.523	1.119	0.026	0.467	.641	0.875	1.143
	School grade	-0.274	.952	-0.016	-0.288	.774	0.954	1.049
	Economic status	2.224	1.579	0.079	1.408	.160	0.880	1.136
	Parents living together	2.329	2.056	0.062	1.133	.258	0.938	1.066
	Anxiety	0.345	.080	0.244	4.314	.000	0.865	1.157
	Ego-resilience	-0.373	.099	-0.209	-3.766	.000	0.897	1.114
		R2 =.184, Adj R2 =.159, F=22.76(p<.001)						

3. Factors influencing internet game addiction:

The results of hierarchical regression analysis to determine the variables effective in predicting internet game addiction are summarized in Table 3. In the first step analysis in which only the general characteristics were utilized as the independent variables, gender appeared as the influencing factor, explaining 3.5% (F = 2.581, p = .013, R² = .058) of internet game addiction, such that male students were -3.769 (B = -3.769) higher than female students. As the next step, when the analysis was repeated after including psychological factors (anxiety and ego-resilience) as well as the general characteristics, the variables affecting internet game addiction were found to be anxiety (β = .244, p = .002) ego-resilience (β = -.209, p <.001) and gender (β = -.200, p <.001). These three variables explained 15.9% of the internet game addiction in middle school students (F = 22.76, p<.001). Since the variation inflation factor (VIF) was found to be 1.00-1.99, tolerance limit to be 0.50-0.99, and the Durbin-Watson value to be 2.089, there was no problem of multi-collinearity.

Discussion

This study was performed to find the degree of internet game addiction of middle school students and to identify the factors that influence internet game addiction. The internet game addiction level of the subjects were found that 23.4% were potential risk users, and 9.5% were high risk users. A survey carried out in 2009 using the same tool among 6,499 middle and high school students reported that only 7.1% were potential risk users and 5.6% were high risk users^[16]. Accordingly, it is understood that the results of the present study signify that adolescents' game addiction problem became more serious than the past. According to previous studies, internet game addiction causes deterioration of family and friend relationship, maladjustment of school life, health and mental problems such as impulsiveness, aggression, depression, and violence^[4,9,10]. Therefore, to preempt problems caused by game addiction, it is necessary to correctly diagnose the current state of internet game addiction among adolescents and prepare appropriate mediation alternatives.

Through hierarchical regression analysis, the variables that affect internet game addiction in middle school students were confirmed to be gender, anxiety and ego-resilience. Male students had significantly higher scores of internet game addiction than female students. This result is consistent with the previous results of a survey in 674 Korean secondary school students in which male students were 2.22 times higher in the risk of internet game addiction than female students^[17]. A recent study also reported that the game utilization rate of teenage male students was 94.9%, whereas that of teenage female students was 88.6%^[2]. Thus, for the prevention of internet game addition in middle school students, the priority should be placed on male students.

The conversation with parents and cohabitation did not show a difference in the degree of internet game addiction, which agrees with the results of previous studies in which dysfunctional communication with parents did not show a difference between high-risk users and general users^[16,18]. However, there also exists studies that reported a direct influence of the quality of family relationships on game addiction^[19], implying the necessity of further investigation for the relationship between parental variables and internet game addiction.

Besides gender, anxiety appeared to be a significant factor affecting internet game addiction. This finding was consistent with the result of a survey of university students in the United Kingdom^[9]. The subjects' anxiety score in this study was 32.66 points for which the anxiety level of 76.0% was normal, 13.2% was slightly high, 6.3% was fairly high, and 4.6% was very high. The average anxiety score from a survey of elementary school students in grades 4, 5, and 6 in 2016 was 27.91, implying that the anxiety level of middle school students is higher^[20]. Ego-resilience also appeared to be a variable affecting internet game addiction. The score for ego-resilience was 40.57 which was higher than the ego-resilience of 38.03 reported in a previous study^[13]. Although the relationship between ego-resilience and internet game addiction was little investigated previously, there exist studies that reported that ego-resilience of middle school students had a statistically significant negative influence on the dependence of mobile phones^[11] or ego-resilience of college students influenced internet addiction^[10]. Thus, it is considered that further research on the relationship between ego-resilience and internet game addiction is necessary.

Conclusion

In this study, it was found that about two-thirds of the middle school students had problems with internet game addiction. These findings suggest that it is necessary to mediate the strategies to reduce middle school students' anxiety and strengthen their ego-resilience in order to prevent middle school students' addiction to internet games.

The increase of game addiction among teenagers and related problems have emerged as a social issue recently but research for this issue is not sufficient. This study was conducted to address the factors affecting internet game addiction among middle school students. Although the survey was carried out among the middle school students in one area only, the results from this study are considered to be meaningful in understanding and elucidating the factors related to internet game addiction. Further study is necessary to develop an effective program to prevent internet game addiction of middle school students.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Factors Influencing on-line Game Addiction of Children

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Abstract

Background/Objectives: The purpose of this study was to investigate factors contributing to on-line game addiction in 3rd, 4th, 5th, 6th graders living in 2 cities of Korea.

Method/Statistical Analysis: This study applied cross-sectional research design with a structured questionnaire. The subjects were 381 elementary school students in Korea. Data were collected after describing the purpose and contents to the students and were analyzed using SPSS 25.0 program.

Findings: The relative influence toward the children's ego-resilience was shown in the order of importance as follows; trait anxiety, gender, internet time of use, perceived home atmosphere, and satisfaction with school life.

Improvements/Applications: From the study, on-line game addiction appeared to be influenced by multiple factors such as gender, perceived atmosphere, satisfaction of school life, Internet time of use and trait anxiety and These variables should be considered when developing nursing interventions for online game addiction.

Keywords: Children, Anxiety, Resilience, Game, Addiction.

Introduction

In modern society, the Internet is now an indispensable medium for information acquisition, communication, entertainment, and so on. In particular, Korea has the world's best high-speed Internet communication network ^[1], which creates conditions for anyone to receive internet service conveniently. Also digital games tend to draw more and more time, money and energy from game players, and as a result, they can have negative life consequences such as game addiction again^[2].

Online game addiction is known to cause problems for game users, such as obsessive use, real-life cognitive

impairment, resistance, and daily disorders represented by poor academic performance and attention-intensive difficulties. In particular, online game addiction among teenagers is emerging as a research topic that should be paid more attention to.

The reason is that the internet use rate of Korean teenagers is close to 100% and the game population is mostly teenagers.

Now games interfere with the many hours that many children have to spend on growth and development, and affect the lifestyles of them. The impact of these online games on teenagers, especially children, may be more serious than the facts that appear in the results of various studies^[3].

Drawing the attention of both parents and schools is the time it takes to play online games in the daily lives of children and teens. Most existing data claim that the average amount of time a player takes to play online games is about 25 hours a week^[4].

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Often on the psychological aspect, the paradigm of Internet game addiction is related to the amount of time. Many heavy gamers actually show symptoms of other behavioral addictions, including similar interpersonal and social risks-excessive enthusiasm for games^[5].

Some researchers see the reason why children and teens play computer games is that they prefer computer games to friends, care for virtual friendships, prefer behavior, overcome loneliness, and avoid problems. And they find that there was a negative meaningful relationship among game addiction, ego-resilience of their children, and participation in social activities with their parents^[6].

Resilience is defined as the process of adjusting when a child is exposed to adverse conditions and is conceptualized in terms of protective factors related to risk^[7]. A study showed that groups with high resilience were adaptable to school life and did not show good psychopathic symptoms than those with low resilience^[8]. Through resilience, children can get positive results despite adversity, so it is important to recognize protection factors such as resilience that help them overcome adversity^[9].

In summary, there is evidence that online game addiction during childhood, when growth and development are required, can be compromised in relation to a child’s home and school life as a whole. Therefore, it is necessary to gain insight into how family factors, school life-related factors, anxiety, and ego-resilience affect online-game addiction. The purpose of the study was to analyze relevant variables to gain insight into the causes and potential protection strategies of children’s online game addiction.

Method

Study design and sample: This study is a research study applying a cross-sectional design using a structured questionnaire. The investigator visited three elementary schools located in South Korea, to explain the purpose of the study to students and teachers. They obtained written consent from 400 voluntary participants, who then received completed questionnaires. The self-reported questionnaire took an average of 17 minutes.

The questionnaire was managed with the help of teachers in the classroom under the same environmental conditions as the test. The researchers collected each questionnaire as soon as the children completed it. 381

copies were analyzed using SPSS Win program except 19 copies of which were not completely filled in or duplicated.

Instruments: Online-game addiction was measured using a scale developed by the Korean National Information Society Agency (2006)^[10]. The scale consisted of statements about current gaming behavior rather on self-recognition of game addiction. The questionnaire contained 20 items and each item was scored using a 4-point scale with respect to frequency. The reliability of this as determined by Cronbach’s α was 0.89 at time of its development and 0.94 in the present study.

Ego-resilience was assessed using a scale developed by Block J. and Kremen, AM^[11] and composed of 14 questions with the self-reported 4-point scale. The higher the score, the stronger level of the ego-resilience.

Trait Anxiety was measured by Spielberger’s Trait Anxiety Inventory for Children(TAIC)^[12].

Results and Discussion

Table 1: On-line game addiction according to general characteristics of children(N=381)

	Variables	n(%)
Gender	Boy	172(45.1)
	Girl	209(54.9)
Class year	3rd	95(24.9)
	4th	91(23.9)
	5th	92(24.1)
	6th	1036(27.0)
Perceived home atmosphere	Not harmonious	5(1.3)
	Ordinary	58(15.2)
	Harmonious	146(38.3)
	Very harmonious	172(45.1)
Communication with parents	Difficult	8(2.1)
	Normal	105(27.6)
	Comfortable	268(70.3)
Satisfaction with school life	Satisfied	299(78.5)
	Average	76(19.9)
	Dissatisfied	6(1.6)
School score	High	126(33.1)
	Middle	228(59.8)
	Low	27(7.1)
Economic status	High	114(29.9)
	Middle	251(65.9)
	Low	16(4.2)

	Variables	n(%)
Parents	Both parents	341(89.5)
	Other	40(10.5)
Internet time of use	1hr↓	210(55.1)
	1-2 hr	71(18.6)
	2-3 hr	44(11.5)
	More than 4 hr	56(14.7)

General characteristics of the children: The questionnaire included items related to gender, class year, perceived atmosphere, communication with parents, satisfaction with school life, school score, economic status, parents and internet using time. 55.1% of children used the Internet for less than an hour a week [Table 1].

Characteristics of On-line game addiction, ego-resilience and anxiety of children.

The average score of on-line game addiction was 28.66 and anxiety averaged 31.53. According to a 2015 survey on Internet addiction, the risk group for Internet addiction was 6.9 percent (2,621 people) of all Internet users (3-59 years old), down 0.1 percent from the previous year's 7.0 percent).

Given that these results are assessed to have slightly higher levels of trait anxiety with a score of 39 or higher, the level of trait anxiety among children studied is not considered to be on average worrisome.

The average score of ego-resilience was 38.79 as seen in Table 2.

Table 2: On-line game addiction, anxiety, and ego-resilience of children (n=381)

Variables	M	SD	Min	Max
On-line game addiction	28.66	10.16	20.00	70.00
Anxiety	31.53	7.29	20.00	54.00
Ego-resilience	38.79	5.67	13.00	52.00

Correlations between Online game addiction and other variables: Table 3 exhibits the relationship between online game addiction and other variables. Boys were more likely to be addicted to online games than girls. The more harmonious the perceived atmosphere games. the more comfortable the communication with parents and the more satisfied with school life,the less likely it was to become addicted to online game.

The lower the level of schooling, the lower economic level, the absence of both parents, the longer internet

time of use, the higher the level of anxiety and the lower the level of schooling were associated with higher online game addiction.

Teenagers' Internet addiction is a social and environmental factors, such as nuclear families, the increase of working couples, the education environment based on admissions and the absence of play culture. Young (1998)^[13] also said that the relevant factors of youth Internet addiction are the environmental characteristics of the family, the environmental factors of school, and the behavior of personal problems.

This can be seen as somewhat similar to the correlation results of this study, and is consistent with studies showing that boys are more addicted to online games than girls in gender characteristics^[14].

Table 3: Correlations between On-line game addiction & other variables (n=381)

Variables	On-line Game Addiction
Sex	-.179**
Grade	-.012
Perceived home atmosphere	-.316**
Communication with parents	-.284**
Satisfaction with school life	.304**
School score	.232**
Economic status	.214**
Parents	-.097
Internet time of use	.214**
Anxiety	.373**
Ego-resilience	-.303**

* p< .01 . ** p<.001

Factors Influencing ego-resilience of children: Table 4 shows hierarchical multiple regression analysis to identify the factors affecting the ego-resilience of subjects. Gender children's perceived atmosphere, satisfaction with school life, internet time of use, anxiety explained 54.6% of the online game addiction. The most important factors affecting the online game addiction of children were followed by anxiety ($\beta = .194$), gender($\beta = -.179$), internet time of use ($\beta = .178$), perceived atmosphere ($\beta = -.117$), satisfaction with school life ($\beta = .116$).

These results are similar to those of this study, which gender is a one of major factors in online game addiction. In this study, the less harmonious the home atmosphere was perceived to be, the higher the degree

of online game addiction, and these results were similar to the result preceding study^[15].

A study show that parent-related variables have not affected online game addiction, and that parental attachment has played no role in alleviating online game addiction, which differs from the results of this study^[16].

Among the factors related to school life, the lower the satisfaction level of school life, the higher the score of online game addiction, which is in line with a study by Park and Kim (2005)^[17], who claim that online games are a virtual place to solve stress caused by school life or grades. There is also a similarity to the argument that lack of leisure in life undermines life satisfaction and is linked to online game addiction^[18].

Therefore, it is very important to provide opportunities for offline leisure activities and to spread various cultural activities that can be experienced in order

Time spent on the Internet has been linked to online game addiction, similar to a 2014 study on Internet addiction. According to the results, the average daily Internet use time for teenagers was 138.6 minutes per week, compared with 189.1 minutes for those at risk of addiction and 225.1 minutes for those at high risk ^[19].

Online game playing time was an important predictor of game addiction, supporting many aforementioned research results. These studies explain that a key factor in increasing online game addiction is the time and duration of the day, and that teenagers who spend more time playing games are more likely to be trapped in the world of virtual online games^[20].

When considering the relationship between anxiety and online game addiction, this study found that trait anxiety is a major variable of online game addiction, similar to the results of a study of elementary school students^[21] that online games are related to anxiety, family relationships, etc

The negative experience during the growth period was shown to raise the level of anxiety and have indirect effects as well as direct effects on the risk of online game addiction, confirming the need to approach psychological and mental health issues of negative experience and anxiety for teenagers.

The relationship between anxiety and online game addiction is similar to other research, which was reviewed through prior research. The study identified the effects of anxiety associated with negative growing experiences on Internet addiction^[22].

Until now, research on the relevance of children's online game addiction to resilience has been very insufficient, making it difficult to compare other results on par with the results of this study.

Resilience did not appear to be a significant influence on online game addiction in this study, and these results differ from previous studies showing a negative correlation between resilience and smartphone addiction.

These results are somewhat different from existing literature that children with low levels of resilience often experience negative emotions and do not achieve successful adaptation by expressing undifferentiated behaviors due to their inability to exercise flexible self-control. Behaviors due to their inability to exercise flexible self-control^[23].

It is speculated that the online game addiction level of the study is not likely to be serious, and that this may not have highlighted the variable of resilience.

Rather than diagnosing game addiction as a problem for young children, it is reasonable to assess the possibility and trend of developing game addiction in the future.

Table 4: Factors influencing On-line game addiction (n=381)

	Variables	B	SE	β	t	p	VIF	Tolerance
M O D E L 1	Gender	-3.699	.922	-.181	-4.013	.000	.974	1.027
	Perceived home atmosphere	-2.239	.687	-.168	-3.259	.001	.747	1.339
	Communication with parents	-2.003	1.030	-.100	-1.944	.053	.746	1.340
	Satisfaction with school life	3.471	1.059	.156	3.278	.001	.874	1.145
	School score	2.017	.841	.115	2.397	.017	.867	1.154
	Economic status	1.254	.954	.065	1.314	.190	.819	1.222
	School score	1.893	.421	.207	4.493	.000	.935	1.070
R2 =.508, Adj R2 =.245035, F=18.58 (p<.001)								
M O D E L 2	Gender	-3.648	.903	-.179	-4.042	.000	.966	1.035
	Perceived atmosphere	-1.552	.698	-.117	-2.223	.027	.687	1.456
	Communication with parents	-1.137	1.028	-.057	-1.106	.269	.713	1.403
	Satisfaction with school life	2.579	1.056	.116	2.442	.015	.835	1.198
	School score	1.410	.840	.080	1.680	.094	.827	1.209
	Economic status	.998	.937	.052	1.066	.287	.807	1.239
	School score	1.624	.416	.178	3.907	.000	.914	1.094
	Internet time of use	.270	.069	.194	3.889	.000	.760	1.315
	Anxiety	-.163	.089	-.091	-1.829	.068	.761	1.315
	Ego-Resilience							
R2 =.546, Adj R2 =.281, F=10.54(p<.001)								

Conclusion

This study can be meaningful in that it has taken a comprehensive approach to the general characteristics of children, the home environment, the school environment, and psychological factors as an influence on online game addiction. The most important factor influencing resilience of children was trait anxiety followed in order by gender, internet time of use, perceived home atmosphere, and satisfaction with school life. These variables accounted for 28.1% of the children's resilience.

Based on the risk factors of online game addiction among children shown in the above research, it is believed that the development of preventive nursing intervention programs and treatment programs for the problem of online game addiction in children that may increase due to the information age can be carried out.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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A Study on the Factors Affecting Depression of the Disabled People in Korea

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Abstract

Background/Objectives: The purpose of research is to construct a living environment and provide appropriate welfare resources to reduce the depression by identifying the factors affecting the depression of the disabled people.

Method/Statistical Analysis: This research analyzed the data of 2017 which is the 12th data of the Korea Welfare Panel conducted by the Korea Institute for Health and Social Affairs. In order to identify the factors affecting the depression of the disabled, this research analyzed the difference of depression according to demographic factors. In addition, the factors affecting depression were surveyed through the regression analysis of the SPSS statistics program.

Findings: The high scores of people with disabilities on depression indicate that access to mental health is essential in the areas of disability support, which suggests that life cycle management should be carried out through all subjects regardless of their socio-demographic variables. The result of a hierarchical regression analysis through demographic variables, satisfaction, and social support variable is as follows. First, in the area of demographic variables, male more than female, the lower is household income and the higher is one's work ability, depression turned out to be high. Next, the result of analysis showed significant results in all variables excluding all ages and education level. When all variables are included, male more than female, the lower is one's household income, the more one has work ability, depression was high, and the lower is one's health satisfaction, residential satisfaction, family life satisfaction, and social support, depression turned out to be low, suggesting that individual, family, and social resource environment are important explanatory factors in the perception of depression for the disabled.

Improvements/Applications: It is clear that, as a method to reduce depression of the disabled, a comprehensive and environmental approach is necessary which encompasses familial, psychological, and social dimensions.

Keywords: *Disabled person, Satisfaction, Social support, Depression, Korea Welfare Panel.*

Introduction

In the study of life satisfaction of people with disabilities, we have focused on physical health in

the past, but recently there is an increasing interest in psychological aspects^[1]. One of the psychological problems of people with disabilities is depression, and when depression progresses, it causes the satisfaction of life to be reduced to the extent that it requires professional treatment^[2,3].

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Personal factors and social environmental factors such as deterioration of physical function experienced by disabled people, child problems, economic problems, loss of close people, and changes in life events are likely to increase depression^[4]. In this vulnerable situation,

people with disabilities often meet with their families^[5] and have social relations, showing that depression decreases^[4].

Mental health is one of the essential requirements for reaching spiritual, physical and social well-being, the ultimate goal of social welfare. Especially, depression and schizophrenia are representative mental health issues that require prevention and treatment given the frequency of occurrence and the outcome of the disease^[6].

Fortunately, a variety of preventive programs have been provided in Korea, focusing on large and regional mental health centers, since the mid-2000s, as the national level of prevention has been strengthened in line with the global trend of mental health policies. The main contents of the Center's project consist of raising awareness of mental health problems for the general or high-risk groups of local residents and conducting various knowledge education and screening tests for early detection^[7,8].

Depression is a common symptom that can be experienced, but it can be exposed to a variety of risks if it becomes severe. Specifically, severe depression can impair psycho-social functioning^[9] and cause 7.8 times greater risk of suicidal thoughts than non-depressants^[10].

According to^[11], the ratio of the disabled to experience depression was 24.5 percent, about twice as high as the 10.3 percent of the non-disabled.

Differences in depression can be described as inequality due to socioeconomic perspectives other than biological ones, which are also applicable to differences in the experience of depression for the disabled and non-disabled^[12]. The socioeconomic view is that the social and economic status of an individual, such as the level of education, income level, and professional status, creates differences between individuals^[13].

When thinking about policies for the disabled, pay attention first the target is aging disabled people who have lived with disabilities for a long time. Priority is given to developing policy support measures to address the aging issues of people with developmental disabilities, including intellectual and autistic persons, who are using the welfare facilities for the disabled. Expansion of available service facilities is required^[14].

The elderly population need social attention to experience the double risk of disability and aging. As older people age, their health risks increase. Older people with disabilities are more likely to experience premature aging than non-disabled people^[15]. In other words, people with disabilities experience changes due to aging in addition to previous disorders, which lead to health risks.

The main thing is that these health risks are not natural and can be prevented and managed. In terms of their rights, they should seek social alternatives to recognize and support the healthy retirement of disabled seniors.

The guarantee of the right to health of the elderly must include not only physical but also mental health. Compared to the discussion of the physical health of the elderly, the interest in mental health is limited.

In particular, depression of the elderly is a very important problem that threatens the quality of life.

Older people with disabilities are two to three times more likely to experience depression than non-disabled older people^[16]. The prevalence of depression in older people is associated with a variety of factors including age, health, function, and social role^[17].

People with disabilities are more vulnerable to depression because they receive more social discrimination and exclusion than non-disabled people. In addition, people with disabilities have a negative perspective on themselves by internalizing social exclusion, non-acceptance, and prejudice. It is very likely that these points will soon appear depressed^[18].

This research aims to provide basic data to related social welfare systems and practice areas by examining factors affecting depression as one of the factors that can lower the depression of the disabled and increase the satisfaction of life.

The study on the effect on depression, which is a major threat to the healthy lives of people with disabilities, can contribute to the implementation of specific projects, such as the creation of policy alternatives that can enhance the life satisfaction of people with disabilities, as well as programs implemented by institutions for the disabled.

Method

This research analyzed the data of 2017 which is the 12th data of the Korea Welfare Panel conducted by the Korea Institute for Health and Social Affairs. of 6581 households which include 12,790 persons, only 1,459 persons who are disabled were selected as subjects of this analysis.

In order to identify the factors affecting the depression of the disabled, this research analyzed the difference of depression according to gender, education level, age, household income, and working ability as demographic factors. In addition, the factors affecting depression due to health satisfaction, residential satisfaction, family life satisfaction and social support were surveyed through the regression analysis of the SPSS statistics program.

Result and Discussion

- 1. Depression differences by demographic variables:** Shown in [Table 1], gender was 784 males, slightly more than 675 females. The educational level was

the highest with 511 graduates (35%). The highest age group was in the 70s with 477 persons (32.7%). The highest household income was 478 people (32.8%) with less than 15 million won per year. 782 (53.6%) of the respondents answered that they were able to work, and 222 (15.2%) answered that only simple work was possible. There were 333 (22.8%) simple workers who could only do household work, and 103 (7.1%) responded that they had no working ability at all. The statistics for each section showed only significant differences in the work ability factors.

As a result of demographic variables of the research subject, the factors affecting depression of the disabled was the variable of work ability and degree. In the case of work ability or simple work ability, the degree of depression turned out to be significantly lower than weak simple work or no work ability. In the end, it can be seen that the ability and degree of work ability in the case of the disabled have a great influence on the depression.

Table 1. Depression differences by demographic variables

Variable	Division	N	%	M	t/F
Sex	Male	784	53.7	21.13	-.22
	Female	675	46.3	20.89	
Education level	Not attending school	3	.2	-	1.70
	unschooled	230	15.8	23.83	
	Elementary School	511	35.0	20.26	
	Middle School	231	15.8	18.11	
	High school	340	23.3	22.39	
	College	51	3.5	20.96	
	University	77	5.3	21.49	
	Graduate school	16	1.1	15.92	
Age	Under the age of 10	8	.5	-	1.70
	Teenage	22	1.5	-	
	20s	30	2.1	23.64	
	30s	49	3.4	32.39	
	40s	127	8.7	23.98	
	50s	183	12.5	23.22	
	60s	284	19.5	18.78	
	70s	477	32.7	18.72	
	Over 80s	279	19.1	22.68	
Household income	Less than 15 million won	478	32.8	20.83	.07
	15 million ~ 20 million won	226	15.5	21.44	
	20 million won ~ 30 million won	276	18.9	21.09	
	30 million won ~ 50 million won	230	15.8	20.59	
	More than 50 million won	249	17.1	21.32	

Variable	Division	N	%	M	t/F
Work ability perception	under the age of 14	19	1.3	-	45.94*** a,b<c<d
	Possible to work ^a	782	53.6	17.67	
	Only simple work ^b	222	15.2	20.89	
	Weak working hours (housework only) ^c	333	22.8	26.26	
	No ability to work (do not even do housework) ^d	103	7.1	50.11	

*p<.05 **p<.01 ***p<.001

2. General characteristics of the variables: [Table 2] shows the general characteristics of the main factors such as health satisfaction, housing environment satisfaction, family relationship satisfaction, social support, and depression. The average of health satisfaction was 3.32 for the disabled and 2.57 for the disabled, which was significantly higher in the non-disabled. The satisfaction level of living environment was 3.62 for the disabled and 3.54 for the disabled. The satisfaction level of family

relations was higher for the non-disabled people with 3.90 and 3.71 for the disabled, and the social support was 3.74 and 3.49 for the disabled. Depression was 25.75 for the disabled and 30.25 for the disabled.

The high scores of people with disabilities on depression indicate that access to mental health is essential in the areas of disability support, which suggests that life cycle management should be carried out through all subjects regardless of their socio-demographic variables.

Table 2. General characteristics comparison

Variable	Non-disabled		Disabled		t
	M	SD	M	SD	
Health satisfaction	3.32	.94	2.57	.94	26.33***
Housing environment satisfaction	3.62	.74	3.54	.74	3.67***
Family relationship satisfaction	3.90	.64	3.71	.70	9.05***
Social support	3.74	.62	3.49	.73	11.55***
Depression	25.75	8.11	30.25	10.49	-14.34***

*p<.05 **p<.01 ***p<.001

3. Factors Affecting Depression of the Disabled:

The result of a hierarchical regression analysis through demographic variables, satisfaction, and social support variable, is as shown in [Table 3].

First, in the area of demographic variables, male more than female ($\beta=.01, p<.01$), the lower is household income ($\beta=-.20, p<.001$) and the higher is one's work ability ($\beta=.30, p<.001$), depression turned out to be high ($F=50.03***$). Next, when the factors were analyzed adding satisfaction and social support to demographic variables, the result of analysis showed significant results in all variables excluding all ages and education level ($F=63.62***$).

When all variables are included, male more than female ($\beta=.02, p<.001$), the lower is one's household income ($\beta=-.09, p<.01$), the more one has work ability ($\beta=.19, p<.001$), depression was high, and the lower is one's health satisfaction ($\beta=-.26, p<.001$), residential satisfaction ($\beta=-.07, p<.01$), family life satisfaction ($\beta=-.20, p<.001$), and social support ($\beta=-.10, p<.001$), depression turned out to be low, suggesting that individual, family, and social resource environment are important explanatory factors in the perception of depression for the disabled.

Table 3: Factors Affecting Depression of the Disabled

Variable	Model 1		Model 2	
	B	β	B	β
Sex (F=0)	0.00	0.01**	0.01	0.02***
Age	-1.06	-0.09	-1.19	-0.10
Education level	0.13	0.03	0.22	0.05
Household income	-0.77	-0.20***	-0.37	-0.09**
Work ability	1.99	0.30***	1.27	0.19***
Health satisfaction			-1.59	-0.26***
Residential satisfaction			-0.57	-0.07**
Family life satisfaction			-1.68	-0.20***
Social support			-0.08	-0.10***
Constant	15.27		29.61	
F	50.03***		63.62***	
R2	.18		.34	

*. p<.05 **p<.01 ***p<.001

Conclusion

The results of this research showed that, in addition to demographic variables, health satisfaction, residential satisfaction, family life satisfaction, and social support variable have a great influence on the depression of the disabled. From this, it is clear that, as a method to reduce depression of the disabled, a comprehensive and environmental approach is necessary which encompasses familial, psychological, and social dimensions. In particular, when investigating the depression of the disabled, it should be interpreted and constituted in consideration of the prior environmental differences due to social discrimination and exclusion, not just the comparison with the figures with the non-disabled.

Future research to apply and understand the environment of persons with disabilities suggests the use of qualitative research method. Rather than merely conducting a case study, a research method that understands, applies and interprets the environment and culture in which people with disabilities live, and creates alternatives would be desirable.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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A Study on the Status and Improvement of Physical & Mental Health for Middle-aged People

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Abstract

Background/Objectives: The purpose is to find out utilization and necessity of public support related to the physical and mental health experienced by the middle-aged and elderly people.

Method/Statistical Analysis: In distribution of 28 cities and 3 Guns of Gyeonggi-Do, 8,653 subjects are middle-aged people between 50 to 64 years old, and 6,547 subjects are the group under 49 years old and 11,953 subjects are the group over 65 years old. This study examined the differences in physical and mental health characteristics of the middle-aged and comparative groups through χ^2 validation and one-way ANOVA analysis by SPSS 21.0 program.

Findings: The middle-aged showed relatively low level of difficulty than the group over 65 years old in all areas of physical health problems, physical health care difficulty, mental health problems, and mental health care difficulty. However, it showed a significantly higher level of difficulty than the group under 49 years old. The 6,731 people (77.8%) had no intention of using the social services provided to alleviate physical health problems, and 266 people (3.1%) are currently using related services. Among those who are willing to use the service, 1,135 people (13.1%) did not know the related service, the next highest rate, and 377 (4.4%) who knew the service but did not apply, 114 people (1.3%) applied for the application but could not use it. In the analysis of social service use to alleviate the difficulties of mental health, 7,165 (82.8%) of the middle-aged group had no intention of using it.

Improvements/Applications: The results showed that the physical and mental difficulties experienced by the elderly and the level of difficulty were lower than normal, but higher than those under the age of 49.

Keywords: Physical Health, Mental Health, Middle-aged people, Old age, Family Social Work Service.

Introduction

In Korea, middle-aged people face various social problems such as job insecurity, poverty, child rearing, housing, and preparation for retirement^[1], and the number of suicides is increasing in the 30s to 50s^[2], but related research is very insufficient^[3]. The middle

age group is the age group that is the foundation of our society^[4]. Therefore, their health and well-being can be a subject of social policy importance.

Recent longitudinal studies show that older age health, dependence, and quality of life are significantly affected by middle-aged lifestyles^[5-6]. In the West, men and women were sampled together to explore gender differences and factors of mental health and lifestyle^[7-8]. It was centered on women. In the early stages, studies were divided according to traditional stereotypes based on gender roles as well as gender separation^[9-10]. This study was initiated to identify the level of physical and mental health experienced by middle-aged people and to propose basic support measures based on it. This

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will help prepare for happy old age as well as the corresponding middle-aged, and could contribute to providing basic data in Korea’s insufficient middle-aged mental health sector.

Method

This study well reflects the characteristics related to physical and mental health of middle-aged and elderly in Gyeonggi-Do reflecting the population and its distribution of 28 cities and 3 Guns of Gyeonggi-Do. Among 27,153 subjects, 8,653 subjects are middle-aged people between 50 to 64 years old, and 6,547 subjects are the group under 49 years old and 11,953 subjects are the group over 65 years old. In order to examine the physical and mental health status and related characteristics of the middle aged and elderly, we investigated situations such as degree in physical and mental functions and difficulties in physical and mental health related to daily life, difficulty in in the choice of hospital or clinic, lack of health care support system, the need for support, the need for support for physical and mental health care, and the use of social security for physical and mental health support. For each item, physical and mental questions were classified into the difficulty of health problems, the difficulty of health care, the necessity of health care, and the use of health insurance.

This study examined the physical and mental health characteristics of the middle-aged and comparative groups, and conducted a technical analysis to identify the actual use and needs of related services. In addition, this study examined the differences in physical and mental health characteristics of the middle-aged and comparative groups through X^2 validation and one-way ANOVA analysis. SPSS 21.0 was used for statistical analysis of the study data.

Result

Participants’ Characteristics: As for the general characteristics of the research subjects, the middle-aged people between 50 to 64 years old showed a low level of male, 3,514 persons (40.6%) compared with female, 5,139 persons (59.4%) in [Table 1]. In the case of education, 6,260 (72.3%) were middle or high school graduates, and 1,914 (22.1%) were higher than college graduates and 476 persons (5.5%) were lower than elementary school graduates.

In the general characteristics of the subjects, the proportion of women was relatively higher than that of

group under 49 years old and the group over 65 years old. In the case of education, the level of education was higher than that of group over 65 years old with 6,398 (53.5%) elementary school graduates or lower but lower than the group under 49 years old with 4,445 (67.9%) college graduates or higher.

Table 1: Participants’ Characteristics

Variable		N	%	
Gender	≤ 49	Male	2,298	35.1
		Female	4,249	64.9
	50-64	Male	3,514	40.6
		Female	5,139	59.4
	≥ 65	Male	4,139	34.6
		Female	7,814	65.4
Age	≤ 49	20-29	395	6.0
		30-39	2,286	34.9
		40-49	3,866	59.0
	50-64	50-59	5,456	63.1
		60-64	3,197	36.9
	≥65	≥ 65	11,953	100.0
Education Level	≤ 49	Elementary	62	0.9
		Middle/High	2,040	31.2
		>University	4,445	67.9
	50-64	Elementary	479	5.5
		Middle/High	6,260	72.3
		>University	1,914	22.1
	≥ 65	Elementary	6,389	53.5
		Middle/High	5,135	43.0
		>University	429	3.6

Comparison of Physical and Mental Health by Generation: [Table 2] shows the characteristics of the middle-aged and comparative groups through physical and mental health characteristics experienced by age group.

In the middle aged, the average level of physical difficulty was 1.85($SD=1.356$), which was lower than usual considering the response category. The comparison group was 49 years old and under, with an average of 1.46($SD=1.054$) and a group of 65 and older with an average of 2.35($SD=1.563$). The number of physical health management difficulties was 1.69($SD=1.241$) for middle-aged group, 1.40($SD=.962$) for those under 49 years old, and 2.04($SD=1.453$) for those over 65 years old. The level of difficulty in mental health was 1.62($SD=1.164$) in the middle-aged group, 1.39($SD=.954$) in the under 49 group,

and 1.88(*SD*=1.301) in the 65-year-old group. In the difficulty of mental health management, the middle-aged group had an average of 1.52(*SD*=1.060), the under 49 group had 1.34(*SD*=.861), and the over 65 group had an average of 1.70(*SD*=1.198).

The middle-aged showed relatively low level of difficulty than the group over 65 years old in all areas of physical health problems, physical health care difficulty, mental health problems, and mental health care difficulty. However, it showed a significantly higher level of difficulty than the group under 49 years old.

Table 2: Comparison of physical and mental health by generation

Variable	≤ 49		50-64		≥ 65		F
	M	SD	M	SD	M	SD	
Physical health problem	1.46	1.054	1.85	1.356	2.35	1.563	898.236***
Physical health care difficulty	1.40	.962	1.69	1.241	2.04	1.453	551.100***
Mental health problem	1.39	.954	1.62	1.164	1.88	1.301	366.816***
Mental health care difficulty	1.34	.861	1.52	1.060	1.70	1.198	249.042***

***: p<.001

Current Usage Status of Social Services for Physical and Mental Health: In order to alleviate the physical and mental health difficulties experienced by the elderly, the use of socially provided services was checked in [Tables 3 and 4]. First of all, 6,731 people (77.8%) had no intention of using the social services provided to alleviate physical health problems, and 266 people (3.1%) are currently using related services

Among those who are willing to use the service, 1,135 people (13.1%) did not know the related service,

the next highest rate, and 377(4.4%) who knew the service but did not apply, 114 people (1.3%) applied for the application but could not use it. The highest rate was found to be unwilling to use in all groups, including the elderly. However, the older group showed higher intention to use the service to management their physical and mental healthcare. And also there is a high intention to use but do not know the service. The distribution of social service usage to alleviate physical health difficulties by age group showed a statistically significant difference ($F = 948.961, p < .001$)

Table 3: Current Usage Status of Social Security Services for Physical Health by generation

Variable	≤ 49		50-64		≥ 65		F
	N	%	N	%	N	%	
No Intention to Use	5,636	86.10	6,731	77.80	7,949	66.50	948.961***
Service not known	600	9.20	1,135	13.10	2,489	20.80	
Service recognized but failed to apply	171	2.60	377	4.40	838	7.00	
Applied but can't be used	33	.50	114	1.30	215	1.80	
Experience in use, currently not available	4	.10	30	.30	36	.30	
Service in use	103	1.60	266	3.10	426	3.60	

***: p<.001

In the analysis of social service use to alleviate the difficulties of mental health, 7,165(82.8%) of the middle-aged group had no intention of using it. In addition, 107 people(1.2%) were using related services, which was lower than physical health related services.

Even though they were willing to use mental health-related services, 1,091(12.6%) of them did not know the service, and 225(2.6%) of them knew the service but did not apply for it. The middle-aged group showed a lower rate than the 65-year-old or older group, but compared to

the 49-year-old or younger group, they were willing to use the service but did not know the service. There were statistically significant differences in the distribution of

social service usage by age group to alleviate mental health difficulties ($F = 282.746, p < .001$).

Table 4: Current Usage Status of Social Security Services for Mental Health by generation

Variable	≤ 49		50-64		≥ 65		F
	N	%	N	%	N	%	
No Intention to Use	5,753	87.90	7,165	82.80	9,355	78.30	282.746***
Service not known	615	9.40	1,091	12.60	1,919	16.10	
Service recognized but failed to apply	98	1.50	225	2.60	424	3.50	
Applied but can't be used	24	.40	57	.70	83	.70	
Experience in use, currently not available	4	.10	8	.10	22	.20	
Service in use	53	.80	107	1.20	150	1.30	

***: $p < .001$

Need for Support of Physical and Mental Health by Generation: The results of analyzing the need for physical and mental health support and physical and mental health support are presented in [Table 5]. For the elderly, 1,594(18.4%) were aware of the need for physical health support, and 1,225(14.2%) indicated the need for

mental health support. In other words, the elderly had a higher recognition of the need for physical health rather than mental health. 1,422 respondents(16.4%) said they needed physical health care support, compared with 1,123 respondents (13.0%).

Table 5: Comparison of Need for Support of Physical and Mental Health by Generation

Variable	≤ 49		50-64		≥ 65		X ²
	Yes	No	Yes	No	Yes	No	
Support for Physical health problem	729 (11.1)	5,818 (88.9)	1,594 (18.4)	7,059 (81.6)	3,413 (28.6)	8,540 (71.4)	825.976***
Support for Physical health care	665 (10.2)	5,882 (89.8)	1,422 (16.4)	7,231 (83.6)	2,932 (24.5)	9,021 (75.5)	615.331***
Support for Mental health problem	614 (9.4)	5,933 (90.6)	1,225 (14.2)	7,428 (85.8)	2,249 (18.8)	9,704 (81.2)	302.587***
Support for Mental health care	577 (8.8)	5,970 (91.2)	1,123 (13.0)	7,530 (87.0)	2,003 (16.8)	9,950 (83.2)	231.349***

***: $p < .001$

In addition, this study examined the differences in perceptions among middle-aged and other age groups regarding physical and mental health care support. The results of the analysis showed that the elderly have physical health support ($X^2=825.976, p < .001$), mental health support ($X^2=302.587, p < .001$), physical health

care support ($X^2=615.331, p < .001$), and mental health care. All elements of support ($X^2 = 231.349, p < .001$) were found to recognize the need compared to those under 49 years of age. However, they were perceived to be lower than those aged 65 or older.

Conclusion

The purpose of this study was to investigate the physical and mental difficulties of middle-aged people, their current use of social services, and their desire for services. In addition, the purpose of this study was to compare the current status of middle-aged group by each element with those under 49 years of age and those over 65 years of age, and to explore the characteristics of the physical and mental health of the elderly and future development directions.

The results showed that the physical and mental difficulties experienced by the elderly and the level of difficulty they experienced were lower than normal, but higher than those under the age of 49. This will make it very difficult in the future to be equal to the group aged 65 and over. However, the intention to use related services was still low. In addition, there were many cases where they did not know about the related services or even applied. In terms of service usage, the level of awareness of the service was lower than the age group of 49 and younger. Also, the elderly thought that the support for physical and mental health was very much needed compared to the group under 49 years old. Based on the research results, in order to alleviate the physical and mental difficulties of the elderly and to support the health care, an objective plan for the health verification of the elderly is needed. The physical and mental levels of the elderly identified through this study are the subjective opinions of the subjects, and there is no objective confirmation of the physical and mental health status.

In middle-aged and older age, physical and mental problems are often caused by deterioration of physical function, burden of social activities and relationship difficulties. For these middle-aged people, an objective judgment must first be made about their health level, and policies should be in place for health insurance, preventive services, and diagnosis through local agencies.

Secondly, middle-aged group often did not know or could not apply for the service even though they were willing to use it. In order to overcome the current situation, it is necessary to strengthen public relations at various levels of services and related institutions to support the physical and mental health of the elderly. In addition, it is necessary to find ways to increase the ease of application and access to services.

While older adults feel less physical and mental health difficulties than older people, but prevention is very important because they will be increasingly more intense as they aged. Especially that is important because the sooner they encounter social services, the faster they can adapt.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Skin Care Behaviors for Wellaging in Male Adults

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Abstract

Background/Objectives: The purpose of this study was to examine the skin care behaviors of male adults for wellaging in an effort to improve their quality of life through various skin care behaviors in pursuit of healthy life and to seek ways of vitalizing the beauty industry for men from diverse angles.

Method/Statistical Analysis: The collected data were analyzed by SPSS(statistical package for the social science) 23.0 version for Windows. To find out the adult men's degree of skin and beauty care for wellaging, χ^2 (chi-square) test, frequency analysis, one-way ANOVA and t-test were carried out.

Findings: The largest number of the men possessed oily skin. As a result of analyzing their skin care for wellaging, many didn't apply face packs for wellaging, and the men who were unmarried and who spent average 200 thousand won or more on appearance management on a monthly basis applied face packs more often for wellaging than the other men. The men who were in their 30s, who were unmarried and whose monthly mean appearance management spending was larger massaged their faces or got massages more frequently for wellaging than the others. Although men are said to be interested as well in skin beauty along with social development, the findings of the study show that they weren't yet exposed a lot to skin care, and how to make skin care more accessible to them should be considered.

Improvements/Applications: This study investigated the beauty care behaviors of the selected men for wellaging and is expected to be utilized as basic data on the vitalization of the beauty industry and the beauty market for men.

Keywords: *Adult male, Well-aging, Beauty Care, Skin Care, Well-being.*

Introduction

In the midst of "wellbeing" cultural trend geared toward healthy life and of material affluence, modern people have mounting interest in the skin for the growing pathological reasons of skin lesions caused by all sorts of stress and for psychosocial reasons as they want to display their healthy beauty with confidence in the era characterized by self-expression, and the need

for systematic ways of skin care is accentuated^[1]. In addition, it is a time where people invest in themselves both inside and out to grow old in a healthy, natural and beautiful manner, and wellaging is gradually being entrenched as a major cultural trend in society.

"Wellbeing" refers to accepting aging as a natural phenomenon and taking good care of the body and the mind in hopes of advancing in age in a beautiful and healthy way^[2]. Now, not only women but also men are interested a lot in both of wellbeing and wellaging, which are respectively to eat and live well for a better quality of life and to grow old wisely and healthily.

Skin conditions may depend on internal factors such as physical health, nutrition, life style, the release of hormones and internal organs, and on external factors

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as well like season, climate, environments and incorrect skin care^[3]. Various things can be cited as the causes for men’s skin damages.

First, the stratum corneum of the shave zone where there appear moustache and beard is removed more than needed by repetitive daily shaving^[4], and skin damages and external stimuli trigger skin troubles, which might make people vulnerable to skin diseases such as dermatitis and folliculitis. So correct shaving, hydration and skin soothing are all necessary^[5]. Second, there are frequent chances of drinking in social activities like gatherings and staff dinners. After drinking, moisture is evaporated from the body and skin for the purpose of alcoholysis, which results in making the skin bad and dry, and skin dryness sometimes leads to the phenomenon of skin keratinization^[5]. At the time of alcoholysis, acetaldehyde is generated, which is a component that has strong medical reaction and is highly responsive, and it expedites angiectasia, which brings about temporary changes like getting red in the face and getting hot and is eventually followed by skin dryness ^[4].

Third, smoking also results in skin damages. Reactive oxygen that is generated by smoking destroys cells and causes protein oxidation by reacting with protein, and the amount of betacarotin that plays the role of neutralizing reactive oxygen in the body is diminished, which contributes to accelerating skin aging^[4].

The purpose of this study was to examine beauty care behaviors that men of different age groups showed for their present and future skin and wellaging, as beauty care makes it possible for them to build confidence by taking care of their appearance in modern society that pursues healthy life. This study was intended to afford information that is about the shifts of the beauty industry and could be useful for the vitalization of the skin care industry and men’s beauty care.

Method

The Subjects and Data Collection: A self-administered survey was conducted on the adult men in North Gyeongsang Province from October 8 through November 10, 2018, after the purpose of this study was explained. Out of the collected 250 questionnaires, 243 answer sheets were analyzed as the final data.

Measurement Items: The questionnaire method was used to gather the data, and the questionnaire items that were used as the measuring instrument largely dealt

with general characteristics and skin care behaviors for wellaging. They were prepared by modifying an inventory used in an earlier study(Jung, 2013)^[6].

The Instrument: The reliability of the instrument was tested. As shown in Table 1, the Cronbach alpha coefficient of it was 0.93 in terms of beauty care for wellaging, which was a reliable level.

Table 1. Survey reliability

Classification	Number of questions	Cronbach’s a
beauty care for wellaging	15	0.93

Data Analysis: The collected data were analyzed by SPSS(statistical package for the social science) 23.0 version for Windows. To find out the skin care behaviors of the male adults for wellaging, χ^2 (chi-square) test, frequency analysis, one-way ANOVA and t-test were carried out.

Result and Discussion

The General characteristics of the subjects: As for occupation, office job and profession were most common with 27.6 percent, followed by production/technical post with 26.7, sales/service job/self-employment with 24.3, students with 12.8 and others with 8.6 percent.

By monthly mean spending on appearance management, less than 100 thousand won was most dominant with 69.5 percent, followed by 100 to less than 200 thousand won with 13.2, 200 to less than 300 thousand won with 9.1, and 300 thousand won or more with 8.2 percent.

The Skin Care of the Male Adults for Wellaging

Skin Type: The men whose skin type was oily made up the largest group with 27.2 percent, followed by dry skin with 24.7, combination skin with 23.5, sensitive skin with 11.9, normal skin with 9.9 and aged skin with 2.9 percent.

By age, oily and combination types were more dominant in the men in their 30s than the other age groups, and dry skin was more common in the men in their 50s than the other age groups. Normal skin was more common in the older men ($\chi^2=38.55$, $p<.01$). Kim(2011)’s study found that 42.44 percent suffered from skin troubles related to skin dryness and sebum, and Song(2015)’s study found that the use of functional products increased in the men in their 30s and over, and

that the subjects used products for combination skin and hoped to use these products when they were asked what they hoped to use among products tailored to specific skin types. This study also found that oily skin and combination skin were common in the men who were in their 30s.

Thus, the men whose skin type was oily made up the greatest group, and oily skin was more common in the men who were in their 30s, who were production and technical workers and who were married than in the other men.

The Skin Care of the Male Adults for Wellaging:

Wellaging by Massage: How often the adult men massaged themselves or got massages was analyzed.

As shown in Table 3, the men who didn't do that for wellaging represented 77.4 percent that was the majority, and the second biggest frequency was once or more per two weeks with 10.3, once a week with 7.4 and twice or more a week with 4.9 percent. Heo(2013)'s study found that the rate of using skin care clinics and that of not using them respectively stood at 10.3 and 89.7 percent. Thus, most of them didn't use skin care clinics, and it corresponded with the finding of this study that more men didn't do that.

Thus, the majority of the men didn't massage themselves or got massages for wellaging, and the men who were in their 30s, who were unmarried and whose monthly mean appearance management spending was larger did that more frequently for wellaging.

Table 2. Skin Type

Classification		Dry skin	Oil skin	Combination skin	Sensitive skin	Normal skin	Geroderma	Total	χ^2 (df)	p
Age	In one's 20s	18 (25.7)	18 (25.7)	19 (27.1)	12 (17.1)	2 (2.9)	1 (1.4)	70 (100.0)	38.55** (15)	0.001
	In one's 30s	15 (21.4)	26 (37.1)	23 (32.9)	2 (2.9)	4 (5.7)	0 (0.0)	70 (100.0)		
	In one's 40s	11 (20.8)	15 (28.3)	6 (11.3)	9 (17.0)	9 (17.0)	3 (5.7)	53 (100.0)		
	In one's 50s	16 (32.0)	7 (14.0)	9 (18.0)	6 (12.0)	9 (18.0)	3 (6.0)	50 (100.0)		
Academic credential	High school or lower	18 (25.4)	14 (19.7)	16 (22.5)	11 (15.5)	7 (9.9)	5 (7.0)	71 (100.0)	13.08 (10)	0.219
	Technical college	18 (26.1)	22 (31.9)	13 (18.8)	10 (14.5)	5 (7.2)	1 (1.4)	69 (100.0)		
	University or higher	24 (23.3)	30 (29.1)	28 (27.2)	8 (7.8)	12 (11.7)	1 (1.0)	103 (100.0)		
Occupation	Sales/service job/ self-employment	15 (25.4)	13 (22.0)	13 (22.0)	10 (16.9)	6 (10.2)	2 (3.4)	59 (100.0)	42.92** (20)	0.002
	Office job/profession	10 (14.9)	20 (29.9)	21 (31.3)	9 (13.4)	6 (9.0)	1 (1.5)	67 (100.0)		
	Student	11 (35.5)	7 (22.6)	8 (25.8)	4 (12.9)	1 (3.2)	0 (0.0)	31 (100.0)		
	Production/ technical post	19 (29.2)	24 (36.9)	13 (20.0)	4 (6.2)	4 (6.2)	1 (1.5)	65 (100.0)		
	Others	5 (23.8)	2 (9.5)	2 (9.5)	2 (9.5)	7 (33.3)	3 (14.3)	21 (100.0)		

Classification		Dry skin	Oil skin	Combination skin	Sensitive skin	Normal skin	Geroderma	Total	χ^2 (df)	p
Monthly mean income	Less than a million won	9 (27.3)	7 (21.2)	10 (30.3)	3 (9.1)	3 (9.1)	1 (3.0)	33 (100.0)	26.97 (20)	0.136
	1 to 1.99 million won	8 (22.2)	9 (25.0)	10 (27.8)	3 (8.3)	5 (13.9)	1 (2.8)	36 (100.0)		
	2 to 2.99 million won	22 (24.4)	28 (31.1)	26 (28.9)	8 (8.9)	2 (2.2)	4 (4.4)	90 (100.0)		
	3 to 3.99 million won	13 (34.2)	9 (23.7)	4 (10.5)	5 (13.2)	6 (15.8)	1 (2.6)	38 (100.0)		
	4 million won or more	25 (21.4)	35 (29.9)	33 (28.2)	17 (14.5)	6 (5.1)	1 (0.9)	46 (100.0)		
Marital status	Unmarried	35 (27.8)	31 (24.6)	24 (19.0)	12 (9.5)	18 (14.3)	6 (4.8)	117 (100.0)	13.45* (5)	0.020
	Married	8 (17.4)	13 (28.3)	7 (15.2)	10 (21.7)	8 (17.4)	0 (0.0)	126 (100.0)		
Monthly mean appearance management spending	Less than 100 thousand won	44 (26.0)	49 (29.0)	35 (20.7)	17 (10.1)	19 (11.2)	5 (3.0)	169 (100.0)	16.88 (10)	0.077
	100 to less than 200 thousand won	9 (28.1)	6 (18.8)	12 (37.5)	1 (3.1)	3 (9.4)	1 (3.1)	32 (100.0)		
	200 thousand won or more	7 (16.7)	11 (26.2)	10 (23.8)	11 (26.2)	2 (4.8)	1 (2.4)	42 (100.0)		
Total		60 (24.7)	66 (27.2)	57 (23.5)	29 (11.9)	24 (9.9)	7 (2.9)	243 (100.0)		

* p<.05, ** p<.01

Table 3. Wellaging by Massage

Total		Twice or more a week	Once a week	Once or less a week	Zero	Total	χ^2	p
Age	In one's 20s	5 (7.1)	11 (15.7)	11 (15.7)	43 (61.4)	70 (100.0)	26.59** (9)	0.002
	In one's 30s	6 (8.6)	2 (2.9)	8 (11.4)	54 (77.1)	70 (100.0)		
	In one's 40s	1 (1.9)	4 (7.5)	5 (9.4)	43 (81.1)	53 (100.0)		
	In one's 50s	0 (0.0)	1 (2.0)	1 (2.0)	48 (96.0)	50 (100.0)		
Academic credential	High school or lower	7 (9.9)	4 (5.6)	7 (9.9)	53 (74.6)	71 (100.0)	7.86 (6)	0.248
	Technical college	1 (1.4)	8 (11.6)	7 (10.1)	53 (76.8)	69 (100.0)		
	University or higher	4 (3.9)	6 (5.8)	11 (10.7)	82 (79.6)	103 (100.0)		
Occupation	Sales/service job/self-employment	4 (6.8)	7 (11.9)	7 (11.9)	41 (69.5)	59 (100.0)	15.83 (12)	0.199
	Office job/profession	6 (9.0)	5 (7.5)	9 (13.4)	47 (70.1)	67 (100.0)		
	Student	1 (3.2)	4 (12.9)	1 (3.2)	25 (80.6)	31 (100.0)		
	Production/technical post	1 (1.5)	1 (1.5)	6 (9.2)	57 (87.7)	65 (100.0)		
	Others	0 (0.0)	1 (4.8)	2 (9.5)	18 (85.7)	21 (100.0)		

Total		Twice or more a week	Once a week	Once or less a week	Zero	Total	χ^2	p
Monthly mean income	Less than a million won	1 (3.0)	4 (12.1)	1 (3.0)	27 (81.8)	33 (100.0)	7.14 (12)	0.849
	1 to 1.99 million won	2 (5.6)	1 (2.8)	4 (11.1)	29 (80.6)	36 (100.0)		
	2 to 2.99 million won	5 (5.6)	7 (7.8)	12 (13.3)	66 (73.3)	90 (100.0)		
	3 to 3.99 million won	1 (2.6)	4 (10.5)	4 (10.5)	29 (76.3)	38 (100.0)		
	4 million won or more	3 (6.5)	2 (4.3)	4 (8.7)	37 (80.4)	46 (100.0)		
Marital status	Unmarried	9 (7.7)	12 (10.3)	16 (13.7)	80 (68.4)	117 (100.0)	10.81* (3)	0.013
	Married	3 (2.4)	6 (4.8)	9 (7.1)	108 (85.7)	126 (100.0)		
Monthly mean appearance management spending	Less than 100 thousand won	4 (2.4)	11 (6.5)	13 (7.7)	141 (83.4)	169 (100.0)	19.19** (6)	0.004
	100 to less than 200 thousand won	2 (6.3)	2 (6.3)	4 (12.5)	24 (75.0)	32 (100.0)		
	200 thousand won or more	6 (14.3)	5 (11.9)	8 (19.0)	23 (54.8)	42 (100.0)		
Total		12 (4.9)	18 (7.4)	25 (10.3)	188 (77.4)	243 (100.0)		

* p<.05, ** p<.01

Conclusion

In this study, a survey was conducted on the male adults in North Gyeongsang Province to find out their skin care behaviors for wellaging, and 243 collected questionnaires were analyzed as the final data.

The men who were interested in appearance due to interpersonal relationships that social activities entail were analyzed in relation to wellaging which is a social trend to manage oneself inside and out to lead a healthy life. The findings of the study were as follows:

As for the skin type of the adult men, many that accounted for 27.2 percent were in possession of oily skin, and the second most common type was oily, followed by combination, sensitive, normal and aged types. By age, oily and combination types were common in the men who were in their 30s, and dry skin was dominant in the men who were in their 50s. Normal skin was common in the older men ($\chi^2=38.55$, $p<.01$). By occupation, combination type was dominant in the men who engaged in office work and professions, and dry skin was common in the men who were students. Oily skin was common in the men who were in production and

technical posts ($\chi^2=42.92$, $p<.01$). Oily and combination types were dominant in the unmarried men, and oily, sensitive and normal types were dominant in the married ones ($\chi^2=13.45$, $p<.05$).

The men who didn't massage themselves or got massages for wellaging accounted for 77.4 percent that was the majority, and the second most common frequency was once or more per two weeks, once a week and twice or more a week.

By age, the men in their 20s did that once or more per two weeks for wellaging, compared to the other men, and the older men didn't do that ($\chi^2=26.59$, $p<.01$). The unmarried men did that twice or more a week for wellaging, compared to the married ones, and the married men didn't do that, compared to the unmarried ones ($\chi^2=10.81$, $p<.05$). By monthly mean appearance management spending, the men who spent a lot on appearance management did that twice or more a week for wellaging, and the men who spent a small sum of money didn't do that ($\chi^2=19.19$, $p<.01$).

Since the men from a limited region were investigated in this study, the findings might not be

generalizable, and it's needed to examine more regions and more people of diverse age groups. In the future, a follow-up study should be implemented to make up for the limitations of the study.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Relationship between Body Image, Growth Mindset, Grit, and Successful Aging in Korean Elderly: Moderated Mediation Effect of Hope

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Abstract

Background/Objectives: This study examines the moderated mediation effect of hope on the relationship between body image, growth mindset, grit, and successful aging in 422 elderly people in Korea.

Method/Statistical Analysis: Descriptive statistics analysis, reliability analysis, correlation analysis, and moderated mediation effect analysis were done using SPSS Win.25.0 and PROCESS macro version 3.4.

Findings: First, there was a statistically significant positive correlation between body image, growth mindset, hope, grit, and successful aging. Second, hope moderated the mediating effect of growth mindset and grit in the relationship between body image and successful aging.

Improvements/Applications: This result shows that the body image of the elderly in Korean society influences successful aging through growth mindset and grit. It will be a way to increase successful aging.

Keywords: Elder, Body image, Growth mindset, Grit, Hope, Successful aging, Moderated Mediation, PROCESS macro. Forward head posture, Dynamic neuromuscular stabilization exercises, McKenzie exercise, Neck stabilization exercise, Spinal structure.

Introduction

Aging is an indispensable phenomenon that no human being can avoid. Recently, research on “successful aging” has been actively conducted because of the efforts of scholars to escape from the negative view of aging. Successful aging refers to the process of continual growth and maturity in the second half of life, focusing on “well-growing”^[1]. In other words, the weakening of human function and health is usual in aging. Successful aging is a more positive concept than is “usual aging”^[2].

Social and psychological variables are closely related to successful aging. Studies have shown that they are more associated with successful aging than are demographic, physical health, or cognitive function variables^[3]. Therefore it is worth noting the relationship between social and psychological variables and successful aging. Among psychological factors, hope, grit, and growth mindset are in the spotlight.

Hope is the driving force of life, and people with high hopes maintain a challenging and positive psychological state by focusing on success rather than failure^[4]. The hope of the elderly decreases negative sentiment^[5], finds more alternatives when faced with difficulties^[6], and constructively believes that this will work well. Thinking^[7]. Grit is also known as a predictor of success^[8]. Grit in older people also contributes to successful aging^[9]. Finally, the growth mindset is the belief that human intelligence (IQ) can change with learning and effort^[10], which is also very closely related

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to success. In this context, cognitive and physical function deteriorates with age, but it is predicted that successful aging will differ according to one's psychological state.

Another variable to consider in relation to successful aging is body image, which is a feeling and attitude related to the subjective evaluation of one's body and includes all emotional, evaluative, and behavioral aspects^[11]. Appearance is an important part of the reason for shrinking in the elderly, and older people are aware of the importance of appearance, and more active management is, the more can negative emotions, such as depression or atrophy from aging, be alleviated and the vitality of life can be improved^[12]. There is a direct study that body image affects successful aging^[13], but the number is very low, which points to the need for research. The results of studies related to external image, appearance management, and appearance satisfaction, which are used as a concept similar to body image, show that external image is a major determinant of psychological and social health, and negative external image also affects emotional health^[14]. In addition, life satisfaction, self-esteem, and happiness of those who had good appearance management and appearance

satisfaction was higher than that of those who did not^[15,16].

Existing studies can be found on the relationship between body image, grit, growth mindset, hope, and successful aging, but most of them are limited to individually identifying the relationship between variables or similar concepts. Therefore, empirical research is needed to comprehensively verify the relationship between variables in one model and, in particular, to investigate when and how each variable manifests.

Therefore, this study aimed to provide a new model for successful aging of the elderly by verifying the moderated mediation effect of hope in the relationship among body image, growth mindset, grit, and successful aging in Korean elderly people.

Research Method

Research Model: The main analysis method of this study is the moderated mediation effect analysis of model 91 of PROCESS macro ver.3.4. The concept of the research model is shown in [Figure 1].

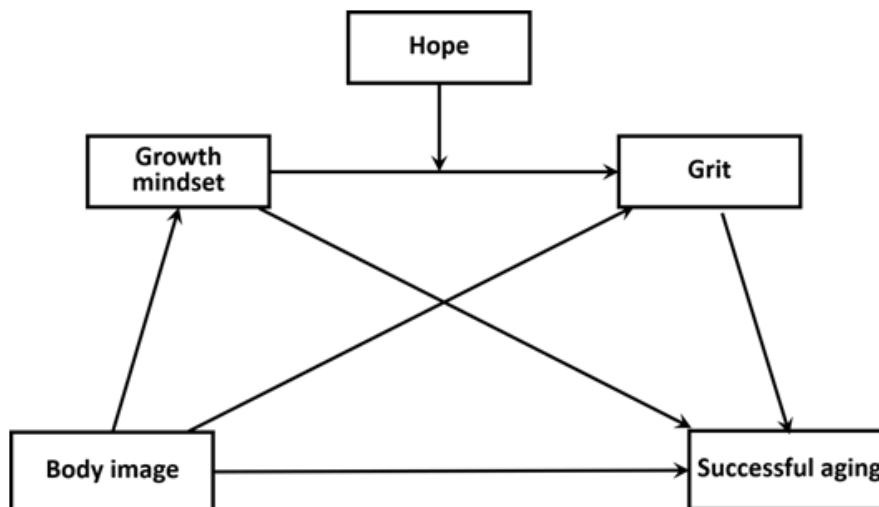


Figure 1. Conceptual Research Model

Survey subject and data collection method: The subjects of the survey were 422 elderly people in D and S city in Chungcheongnam-do, selected by taking into consideration the convenience of the survey. The subjects were 38.8% men and 61.2% women; and 31.3% were between 66 and 70, 27.5% between 71 to 75, and 17.3% for ages under 65. Of them, 52.5% resided in

small and medium cities (cities and counties), 32.9% in rural areas (eup and myeong), and 14.6% in metropolitan cities (metropolitan cities).

Research Tools:

Body Image: We used the body-image scale developed by Cash^[17] and used by Cho and Go^[18], and

Lee^[19]. The 19 items were adjusted to fit the subjects and measured. The reliability by Cronbach’s α was .832.

Growth Mindset: We used the growth-mindset scale developed by Dweck^[20] and translated by Lee et al.^[21]. It consists of 8 items and includes beliefs about changes in intelligence and personality. In this study, the growth mindset’s reliability, Cronbach’s α , was .613.

Successful Aging: The successful-aging questions, produced by Lee^[22] based on Paek and Choi’s^[23], were used. It consists of 17 items and includes such subareas as healthy and smooth family relationships, stable living and use of remaining capacity, and purposeful living. The reliability of successful aging in this study was a Cronbach’s α of .957.

Hope: We used the Korean version of the Hope Scale (K-DHS), which was developed by Snyder et al.^[24], revised and validated by Choi et al.^[25]. It consisted of four agency-thinking items that measured whether a goal was set and four pathways-thinking items that measured how to reach the goal. In this study, Cronbach’s α was .892.

Grit: We used the grit scale developed by Duckworth and Quinn^[26]. It consists of 8 items and includes two subareas of passionate attention and persistence. The grit reliability in this study was .699.

Data Analysis: SPSS Win. 25.0 was used for descriptive statistics analysis, reliability analysis, and average comparison analysis. The moderated mediation effect was analyzed using SPSS PROCESS macro 3.4. To verify this, a bootstrap method was applied.

Results and Discussion

Correlation and descriptive statistics: Pearson’s correlation analysis showed a statistically significant positive correlations between the main variables. The results are shown in [Table 1]. The correlation coefficient between growth mindset and grit was the highest at .455, and the correlation coefficient between the successful aging and body image was the lowest at .189.

This is supported by the claim that demographic and physical health and cognitive function variables are associated with successful aging, but that psychological variables are more related to successful aging^[3].

Table 1. Correlation and Descriptive Statistics

	Body image	Successful aging	Growth mindset	Grit	Hope
Body Image	1				
Successful Aging	.189**	1			
Growth Mindset	.207**	.247**	1		
Grit	.205**	.235**	.455**	1	
Hope	.392**	.424**	.375**	.336**	1
M	3.27	4.20	3.34	3.54	3.42
SD	0.45	0.63	0.49	0.49	0.60

** $p < .01$

Model Verification:

Verification of multiple mediating effects: To verify the moderated mediation effects of hope in the relationships between body image, growth mindset, grit, and successful aging of Korean elderly, we analyzed model number 91 of the PROCESS macro for SPSS. The values of the hope and growth mindset variables were centered before the analysis. The analysis results are shown in [Figure 2], [Table 2].

First, in the mediation model, the body image had a significant positive effect on the growth mindset (.2269, $p < .001$) and the growth mindset had a significant positive effect on the grit (.3551, $p < .001$). Hope also had a significant positive effect on the grit (.1696, $p < .001$), and the interaction term of the growth mindset and hope had a significant effect on the grit (.1704, $p < .01$).

The conditional effect of the hope variable, which is a moderating variable, is significant if hope is lower than average, average, or higher than average, the interaction term between growth mindset and hope was found to

affect grit. The Johnson-Neyman method, which is a floodlight method, was used to identify in which area the conditional effect according to the moderating variable value was significant. Identifying the significance area of the conditional effect of the interaction between growth mindset and hope according to the hope value showed that hope moderated the relationship between growth mindset and grit in the region where the hope value was greater than -1.1098. The proportion of this effect was significant at 96.6% with a hope value of over -1.1098. Second, in the model in which successful aging was the dependent variable, body image had a significant positive effect on successful aging (.1806, $p < .01$), growth mindset also had a positive influence on successful aging (.2030, $p < .01$), and grit had a significant positive effect on successful aging (.1778, $p < .01$).

Third, when investigating the conditional and unconditional indirect effects on the relationship between body image and successful aging, the path from body image to successful aging through growth mindset

(.0461, .0127 ~ .1085) is significant, because there was no 0 at the 95.0% confidence interval. However, the path from body image to successful aging via grit (.0107, -.0090 ~ .0338) was not significant, because there was 0 at the 95.0% confidence interval.

The conditional indirect effect (body image → growth mindset → grit → successful aging) in the relationship between body image and successful aging is significant at all three conditional values of hope. Thus, the moderated mediation effect of hope on the mediation effect of growth mindset and grit in the relationship between body image and the successful aging was verified.

Although it is meaningful to analyze the results by each path, this study is intended to empirically grasp the role and relationship of variables in social phenomena. Therefore, it may be desirable to discuss all the results of the study, which show that the hope of the elderly reduces negative emotions^[5] and does agency thinking with the belief that this will work^[7]. It is in sync with studies that the grit of the elderly contributes to successful aging^[9].

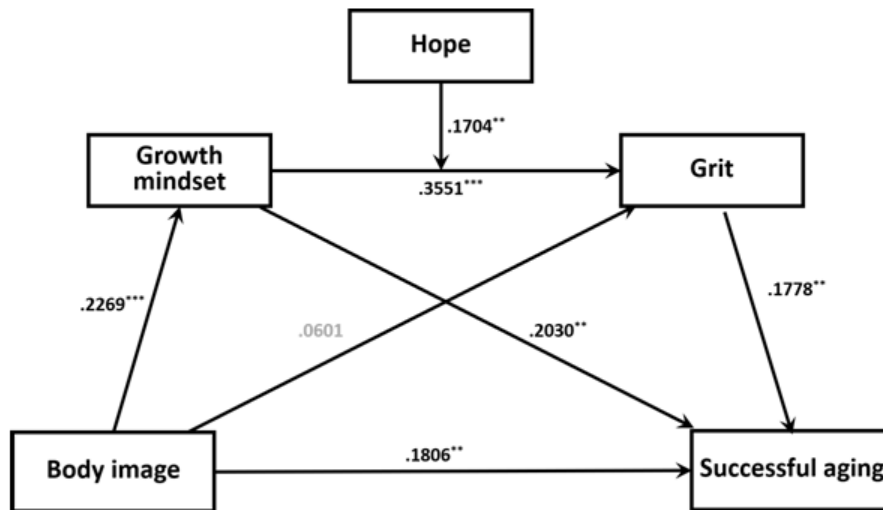


Figure 2. Effect size for each path

Table 2. Moderated mediation analysis of hope in relation to body image, growth mindset, grit and successful aging

Mediating variable model 1 (DV: Growth mindset)						
Variables	β	SE	t value	p	LLCI*	ULCI**
Constant	-.7424	.1732	-4.2851	.0000	-1.0829	-.4019
Body image	.2269	.0525	4.3253	.0000	.1238	.3300
Mediating variable model 2 (DV: Grit)						
Variables	β	SE	t value	p	LLCI*	ULCI**

Constant	3.3212	.1642	20.2315	.0000	2.9985	3.6438
Body image	.0601	.0498	1.2071	.2281	-.0378	.1580
Growth mindset	.3551	.0454	7.8219	.0000	.2659	.4443
Hope	.1696	.0410	4.1329	.0000	.0889	.2502
Growth mindset X Hope	.1704	.0587	2.9029	.0039	.0550	.2858
Test of highest order unconditional interaction:						
R ² -change	R²	F	p			
Growth mindset X Hope	.0150	8.4267	.0039			
Conditional effects of growth mindset at values of hope:						
Hope	Effect	se	t	p	LLCI*	ULCI**
-.5958	.2536	.0611	4.1531	.0000	.1336	.3736
.0000	.3551	.0454	7.8219	.0000	.2659	.4443
.5958	.4566	.0533	8.5673	.0000	.3518	.5614
Significance area of conditional effect of growth mindset at values of hope:						
Hope	Effect	se	t	p	LLCI*	ULCI**
-2.4235	-.0579	.1552	-.3727	.7095	-.3630	.2473
-1.2235	.1466	.0902	1.6261	.1047	-.0306	.3238
-1.1098	.1660	.0844	1.9657	.0500	.0000	.3320
-1.0235	.1807	.0802	2.2530	.0248	.0230	.3383
1.3765	.5896	.0870	6.7792	.0000	.4187	.7606
1.5765	.6237	.0972	6.4157	.0000	.4326	.8148
Dependent variable model (DV: Successful aging)						
Variables	β	SE	t value	p	LLCI*	ULCI**
Constant	2.9844	.3083	9.6811	.0000	2.3785	3.5904
Body image	.1806	.0676	2.6731	.0078	.0478	.3135
Growth mindset	.2030	.0676	3.0026	.0028	.0701	.3359
Grit	.1778	.0686	2.5903	.0099	.0429	.3127
Direct effect of X on Y						
Effect	se	t	p	LLCI*	ULCI**	
.1806	.0676	2.6731	.0078	.0478	.3135	
Conditional and unconditional indirect effects of X on Y						
Paths			Effect	Boot SE	LLCI*	ULCI**
Body image → Growth mindset → Successful aging			.0461	.0248	.0127	.1085
Body image → Grit → Successful aging			.0107	.0107	-.0090	.0338
Body image → Growth mindset → Grit → Successful aging	Hope	Effect	SE	LLCI*	ULCI**	
		-.5958	.0102	.0053	.0021	.0229
		.0000	.0143	.0064	.0033	.0286
		.5958	.0184	.0083	.0041	.0367

*LLCI = boot the lower bound of the indirect effect within the 95% confidence interval, **ULCI=boot the upper bound of the indirect effect within the 95% confidence interval

Conclusion

This study was conducted to verify the moderated mediation effect of hope in the relationship between body image, growth mindset, grit, and successful aging in Korean elderly people.

First, Pearson correlation analysis showed a statistically significant positive correlation between body image, growth mindset, hope, grit, and successful aging.

Second, analyzing the moderated mediation effects showed that hope moderated the relationship between

growth mindset and grit in the relationship between body image and successful aging. In other words, hope moderated the mediating effects of growth mindset and grit in the relationship between body image and successful aging.

Suggestions for follow-up studies are as follows.

First, although scholars' interest in growth mindsets, grit, and hope is growing, studies on the role of these variables are still inadequate. In particular, it is necessary to identify the various roles of these variables in various subjects.

Second, this study revealed that growth mindset, grit, and hope are mediators in the relationship between body image and successful aging in the elderly. This is remarkable, in that it verified the effective variables for the successful aging of the elderly in Korean society, where the population of the elderly is increasing at the fastest speed in the world. This should be followed by the development and application of programs to promote the growth mindset, grit, and hope of the elderly.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Effects of Various Deadlifts on the Muscle Activity of the Trunk and Lower Extremity

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Abstract

Background/Objectives: The purpose of this study is to identify changes in the muscle activity of the trunk and lower extremity during deadlift with various equipments (Kettlebell, Barbell, and Trap bar).

Method/Statistical Analysis: 29 people were selected to measure the muscle activity of the elector spinae, gluteus maximus, rectus femoris and rectus abdominis. One-way ANOVA with repeated measurements was conducted to determine the difference in muscle activity in various deadlift. The Bonferroni correction was used as a post-test to check the difference in muscle activity between the various interventions, and the significance level was set to 0.05. Statistical programs used SPSS Version 22.0 (Statistics Package for the Social Science).

Findings: There were significant differences in elector spinae, gluteus maximus, and rectus during the various deadlift. The rectus femoris showed higher muscle activity in trapbar deadlift than barbell deadlift and kettlebell deadlift. The elector spinae showed higher muscle activity barbell deadlift than kettlebell deadlift. The gluteus maximus showed higher muscle activity in barbell deadlift and kettlebell deadlift than deadlift.

Improvements/Applications: This study suggests that muscle activity vary depending on the barbell during deadlift.

Keywords: Barbell deadlift, Elector spinae, Gluteus maximus, Kettlebell deadlift, Trapbar deadlift.

Introduction

In modern society, due to the development of scientific civilization, many people use computer for a long time [1], and according to the National Health and Nutrition Survey, there are fewer people practicing moderate or higher physical activity [2]. Decreased physical activity may be a factor that causes musculoskeletal disorders such as back pain, osteoporosis, and osteoarthritis [3].

Therefore, it is necessary to exercise for the purpose of preventing muscle degradation and preventing musculoskeletal disorders, and a lot of weight training is selected as such means [4].

Weight training is a resistance exercise that uses barbells and dumbbells in general, and is an effective and stable exercise that can improve muscle strength and endurance by properly activating the body muscles [5]. In addition, it is effective in reducing body fat, which helps prevent disease and improve obesity, and improves motor control by improving muscle coordination and balance [4,6].

The most popular sports among weight training are squat, lunge and deadlift [7]. Deadlift is an exercise that lifts weights on the floor, It is a good resistance exercise that strengthening the erector spine (ES), gluteus

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maximus (GM), Rectus femoris (RF), Hamstring, Lattismusdolsi, etc. [8,9]. Deadlift, in particular, is frequently referred to for the improvement of gluteal amnesia caused by increased sedentary lifestyles, Gluteal amnesia causes problems with hip joint lose of function, pain, and problem on hip extension movement [10]. In general, ES and GM are used as the main muscles at the hip joint extention, GM lose of function causes dysfunction in the back and knee joints [11]. Therefore, the deadlift exercise is essential for modern people who have a lot of sedentary lifestyles to prevent dysfunction of back and lower extremity [8].

Deadlifts is use in a variety of method at sports and clinical rehabilitation field. The deadlift types include romanian deadlift, sumo deadlift, conventional deadlift, kettlebell deadlift, trapbar deadlift etc. Conventional deadlift is the most representative deadlift, a hip hinge movement with the foot at shoulder width, holding the barbell, keeping the back unbending, and chest protraction while maintaining the neutral posture of the spine [12]. The Romanian Deadlift is a 45 degrees bend angle of the knee joint, descending along the thigh while holding a barbell, and maintain the lumbar curve and returning in reverse order [13]. In Sumo Deadlift, the upper extremity in the starting position is the same as the Conventional Deadlift movement, but the lower extremity is extended to about twice the width of the shoulders, descending along the thigh and the hip joint angle is bent at about 90 degrees and returned [13]. Weight training has been reported to differ in muscle activity according to posture even in the same exercise. Kwon and Kim (2018) compared GM muscle activations at 60% intensity when their respective exercises of the conventional deadlift, the romanian deadlift and the bent over row, which reported that GM muscular activity was high in the conventional deadlift compared to the romanian deadlift and the bent over row [12]. This is due to the difference in the joint angle between conventional deadlift and romanian deadlift, conventional deadlift knee joint 90 degrees flextion and romanian deadlift knee joint 45 degrees flextion, the conventional deadlift's GM seems to have high muscle activity. In the study of Yu (2004), a comparison of the muscle activity ratios of the vastus medialis and vastus lateralis muscles during squats (general squat, hip joint adduction 20 degrees + toe out 20 degrees) according to the subject's posture [14]. It was reported that the muscle activity ratio of vastus medialis and vastus lateralis was increased in the squats hip joint adduction 20 degrees + toe out 20 degrees. This suggests

that hip joint adduction is important for effective vastus medialis training and that selective muscle activity is possible on the exercise posture.

As can be seen in the preceding study, the study on comparison of muscle activity according to various deadlift method has been actively conducted. However, the study of apply various equipment to the deadlift is still insufficient. Therefore, this study is based on the kettlebell, barbell, and trap bar that are used mainly during deadlift; this is a comparative analysis of muscle activity of ES, GM, RF, RA. Therefore, the hypothesis of this study is that there would be a difference in muscle activity of both ES, both GM, both RF and both RA on the equipment used during deadlift.

Method

BTS Free EMG 1000 (BTS Bioengineering, Milano, Italy) was used to measure muscle activity of the trunk and lower extremity muscles during deadlift.

Barbell (BANSUK SPORT, KOREA) and plate (KU SPORTS, KOREA) were used to perform the barbell deadlift and to determine 50% of the initial 1RM. The length of the barbell is 1400mm long to match the length of the trap bar. The bar weighs 13 kg. The internal diameter was 50.4mm international standard size. The weight of the plate varied from 0.5kg to 15kg.

The trap bar (BADYSTREET, KOREA) was used to trap bar deadlift. The trap bar is 1400 mm long and weighs 14 kg. The trap bar, also called hexa bar, is a hexagon and must be used inside the bar. Thus, the trap bar is said to prevent the injury by matching the center of gravity and the center of mass. The kettlebell is mainly used for kettlebell swing, but also used to the kettlebell deadlift. The weight of the kettle bell was limited, but it was carried out with various weight kettlebells to meet 50% of 1RM. The 10RM load method of the 1RM test method, which is recommended by the National Strength and Conditioning Association (Anderson et al, 2018), was used. All deadlift were standardized on both feet by measuring the shoulder width before exercise and marking the shoulder width with tape on the floor. Each subject was asked to position their feet in shoulder width and then to get ready and the gaze to look straight ahead. Each deadlift was practiced several times before the measurement to familiarize the movement with three measurements. The ascending, descending and holding sections were kept for 5 seconds, and the data from 2 to 4 seconds, 6 to 9 seconds, and 11 to 14 seconds

were analyzed except for the data of 1 and 5 seconds for each of the 15 seconds measured. Enough rest time was provided to prevent fatigue between measurements, and the experimenter performed the movement after the sign of start [19].

Statistical program used SPSS Version 22.0 (Statistical Package for the Social Science). To compare differences in muscle activity (RA, RF, ES, GM) between various deadlift (Barbell deadlift, Kettlebell deadlift, Trapbar deadlift), Statistical method used one-way ANOVA with repeated measure, the post-test performed the Bonferroni test.

Results and Discussion

The results are shown in table 1-3

Table 1. Ascending

Amount of activation	Barbell deadlift	Kettlebell deadlift	Trap bar deadlift	F	P
LRA	9.88±12.07	5.27±2.54	7.316±4.58	2.981	.076
RRA	17.12±22.01	7.15±4.96	10.08±6.18	6.176	.009
LRF	45.75±19.61	41.80±21.32	52.21±22.69	3.144	.059
RRF	37.06±17.01	34.71±19.49	41.89±19.49	3.217	.055
LES	51.05±18.56	42.53±12.86	53.91±37.88	4.807	.021a
RES	52.46±16.86	44.42±12.66	44.97±16.02	5.895	.006 a,b
LGM	29.63±12.12	27.06±16.60	26.80±11.38	2.471	.113
RGM	26.33±10.31	22.98±7.71	28.21±16.45	3.039	.073

*p<.05, a: There is a significant difference between Barbell deadlift and Kettlebell deadlift., b: There is a significant difference between Barbell deadlift and Trap bar deadlift., c: There is a significant difference between Kettlebell deadlift and Trap bar deadlift.

Table 2. Holding

Amount of activation	Barbell deadlift	Kettlebell deadlift	Trap bar deadlift	F	P
LRA	3.97±1.85	5.08±4.04	3.86±1.90	1.706	.210
RRA	6.28±5.50	5.46±4.69	5.11±4.39	1.827	.189
LRF	5.22±5.04	6.22±6.77	4.31±4.33	1.473	.244
RRF	5.22±5.04	6.22±6.77	4.31±4.33	1.473	.244
LES	20.79±9.79	22.44±10.83	13.63±7.74	7.783	.003 b,c
RES	22.27±9.01	24.58±8.46	14.26±6.10	19.375	.000 b,c
LGM	10.97±8.14	13.20±9.79	7.28±7.27	11.757	.001 b,c
RGM	9.96±5.33	13.02±7.34	7.44±5.08	16.173	.000 a,b,c

*p<.05

Table 3. Descending

Amount of activation	Barbell deadlift	Kettlebell deadlift	Trap bar deadlift	F	P
LRA	7.89±13.50	4.83±2.48	7.085±9.63	.943	.408
RRA	11.29±13.52	5.32±2.30	5.65±2.78	2.075	.155
LRF	35.96±20.69	39.83±22.68	46.85±21.71	3.748	.044 ^b
RRF	28.62±15.40	31.81±17.67	42.12±22.52	8.463	.001 b,c
LES	48.29±17.46	37.31±13.94	47.81±26.61	10.385	.001 ^a
RES	46.36±13.96	37.17±14.56	39.23±13.28	13.472	.000 a,b
LGM	13.27±4.59	17.84±19.87	14.63±7.10	1.199	.325
RGM	14.00±8.10	13.00±6.06	22.56±23.71	2.203	.139

*p<.05

Discussion

The purpose of this study was to compare muscle activity of RA, RF, ES, and GM on both sides of barbell deadlift, kettlebell deadlift, and trap bar deadlift. Existing exercises were mainly trained in the abdominal and trunk deep muscles, but recently, the studies emphasize the importance of the lower extremity muscles and hip muscles for trunk stability and injury prevention^[15]. Fredericson and Moore (2005) reported that weak hip muscles increase anterior shearing forces in the lumbar spine to instability in the trunk, in order to strengthen hip muscles, deadlift exercise is effective for strengthening trunk and hip muscles. Because deadlift uses local muscle for trunk stability, among which activates gluteus medius^[16]. Therefore, this study aimed to suggest effective exercise method by comparing muscle activity of trunk and lower extremity muscle during barbell deadlift, kettlebell deadlift, and trapbar deadlift.

In this study, there was a significant difference between LRF and RRF in comparison with barbell deadlift, kettlebell deadlift and trapbar deadlift ($P < 0.05$). In the descending section, LRF increased muscle activity at trapbar deadlift compared to barbell deadlift ($P < 0.05$). In the descending section, RRF increased muscle activity in trapbar deadlift compared to barbell deadlift and muscle activity in trapbar deadlift compared to kettlebell deadlift ($P < 0.05$). This result is thought to be due to increased angle of hip and knee joint during trap bar deadlift compared to barbell deadlift. According to Jang (2015), RF muscle activity increased due to the increase of the external moment arm as the knee joint angle increased during the squat^[17]. In addition, other studies reported that the muscle activity of the muscles around the knee increases because the external moment arm increases as the knee bending angle increases during the closed chain exercise^[18]. In this study, we also believe that RF muscle activity was high due to increased knee angle during trapbar deadlift when compared to barbell deadlift and kettlebell deadlift.

In this study, the muscle activity of ES in both sides during the barbell deadlift, kettlebell deadlift, and trapbar deadlift was significantly increased muscle activity at barbell deadlift compared to that of kettlebell deadlift in the ascending section and the descending section ($P < 0.05$). This may be because the center of gravity of the barbell deadlift exercise was relatively ahead of kettlebell deadlift. In previous studies, moving the center of mass forward increased the external moment arm,

which increased the muscle activity of the lowback^[19,20]. In this study, trapbar deadlift muscle activity was significantly decreased in the holding section compared to kettlebell deadlift and barbell deadlift ($P < 0.05$). In a study comparing barbell deadlift and trapped deadlift, barbell deadlift increased lumbar moment due to its center of mass, which increased the muscle activity of ES^[21]. In addition, Camara's study more used hamstrings and lower backs in barbell deadlift. And trapbar deadlift shows higher peak force, peak velocity, and peak power for barbell deadlift. In our study, barbell deadlift muscle activity was high in ascending section and descending section. In the holding section, trapbar deadlift both ES had the lowest muscle activity, similar to the above study. This is thought to reduce the moment of lumbar by spreading the load evenly across all joints, allowing the center of mass to be closer to the center of gravity with the horizontal distance from the ankle as the measurement point. Therefore, in the case of injured or painful person in lumbar, it is considered safer to do trapbar deadlift when performing deadlift.

In this study, muscle activity of both GM was significantly higher in barbell deadlift and kettlebell deadlift than in trapped deadlift in holding section ($p < 0.05$). This result may be because the length-tension relationship of GM muscle is higher in barbell deadlift and kettlebell deadlift than trapbar deadlift. Therefore, barbell deadlift and kettlebell deadlift training may be helpful to strengthen the hip muscles.

Conclusion

This study investigated the muscle activity of ES, GM, RF, RA during deadlift exercise under various deadlift (barbell deadlift, trapbar deadlift, kettlebell deadlift). This study suggests that muscle activity vary depending on the barbell during deadlift. Further research will be needed to study motion analysis by using various barbells during deadlift exercise.

Ethical Clearance: Not required

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Factors Influencing Nursing Performance of Clinical Nurses: Focusing Communication Competency and Job Satisfaction

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Abstract

Background/Objectives: The purpose of this study was to identify factors influencing nursing performance of clinical nurses.

Method/Statistical Analysis: The participants were 187 clinical nurses. Data were collected from December, 2017 by questionnaire survey. Data analysis was done by using descriptive statistics, t-test, ANOVA, multiple logistic regression with the SPSS 23.0 program.

Findings: This study shows significant variables of age, marital status, education level, working pattern, position, salary, career of participants. The factors influencing with nursing performance were age, salary, communication competency and job satisfaction have a 52.0% explanatory power for the nursing performance of clinical nurses.

Improvements/Applications: This study confirmed that communication competency and job satisfaction were identified to improve nursing performance. Therefore we should develop programs in order to increase communication competency and job satisfaction.

Keywords: Nurse, Nursing performance, Communication competency, Job satisfaction.

Introduction

With the rapid development of modern society, the medical environment becomes more complicated and the hospital organization requires high-quality nursing with high level of expertise in various aspects^[1]. The change caused the Nurses are considered highly essential medical personnel as they take care of patients for 24 hours^[2] and nursing performance, which refers to nurses' fulfilment of their role in nursing organization with expertise, is the key requirement for improved

quality of care^[3]. It is possible to induce the development and synchronization of nurses through evaluation of nursing performance to grasp the ability of nurses^[4]. In this regard, poorer performance of nurses can lower individual work productivity, loss of motivation, indifference to the nursing subject, unkindness, and cause patient safety issues, thereby making it difficult to provide high quality care and hampering development of nursing profession^[5]. As such, in order to find ways to enhance nursing performance, there should be continuous research on what affects it^[6]. In terms of variables related to nursing performance, one of the previous studies which examined 92 hospice nurses in the U.S, found that communication competency affects nursing performance^[7] and another observed communication competency is one of the biggest factors of nursing performance^[3]. A number of studies stress principles of communication during nursing education

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or on the ground as an important element of effective nursing service, yet there has been little practical support to promote interactive skills among nurses within the health care system^[8]. However, an effective communication of nurses can boost nursing performance by establishing a cooperative relationship with other medical staff and maximize job satisfaction of nurses^[9]. Job satisfaction means a pleasant and positive emotional state that occurs when evaluating job experience with the attitude of having about one's work^[10]. In fact, a content analysis study on nurses' job satisfaction^[11] suggested that main factors of job satisfaction include a work environment that allows nurses to perform care services easily, as well as nurses' interpersonal relationship. If nurses are not satisfied with their job, they cannot perform their work effectively and make progress as professionals. Moreover, lower job satisfaction may end up undermining quality of patient care as it's also linked to organizational productivity^[12]. Since patient care and treatment is the top priority at the clinical settings, it's vital to figure out what influences nursing performance. Positive interpersonal relationships and communication are the factors that increase job satisfaction. In the end, the efficiency of nursing work is improved and the performance and development of the organization is promoted^[13]. As such, this study attempts to investigate the effect of clinical nurses' communication competency and job satisfaction on their nursing performance, thereby providing baseline data for measures to improve nursing performance of clinical nurses.

Method

Research Design: This study is descriptive survey research aimed at exploring clinical nurses' communication competency, job satisfaction and nursing performance, and investigating factors influencing nursing performance.

Participants and data collection: This study collected data from 191 clinical nurses working at a general hospital from December, 2017, who were informed of the purpose of this study and gave consent to participation, and ultimately data from 187.

Communication Competency: To measure the participants' individual communication competency, this study used the Global Interpersonal Communication Competence Scale (GICC), which was originally developed by^[14] and complemented by^[15]. In terms of

the tool's reliability^[15] found Cronbach's alpha to be .72, whereas that in this study stood at .81.

Job Satisfaction: For job satisfaction, this study adopted the Job Descriptive Index (JDI) whose validity has been widely proved. The Research Institute at University of Minnesota suggested 100 detailed factors of job satisfaction, after excluding demographic factors and were later modified and complemented by^[16]. While Cronbach's alpha in^[16] was .89, that in this study turned out to be .88.

Nursing performance: To measure nursing performance, nursing performance measuring tool, developed by^[17]. While^[17] generated Cronbach's alpha of .92, Cronbach's alpha calculated in this study was .90.

Data Analysis: The collected data were analyzed using SPSS 23.0. The participants' communication competency, job satisfaction and nursing performance were examined by t-test, ANOVA, Scheffe's test and multiple logistic regression.

Result

Communication competency, job satisfaction and nursing performance according to general characteristics of participants: It was found that position (p=.002) and monthly income (p=.039) made significant difference in communication competency while job satisfaction was significantly affected by marital status (p=.049) and position (p=.007). In addition, age (p<.001), marital status (p<.001), education (p=.003), working pattern (p=.001), monthly income (p<.001) and career (p<.001) had significant impact on nursing performance[Table 1].

Communication competency, job satisfaction and nursing performance perceived by participants: On average, clinical nurses recorded 3.41±0.44 for communication competency, 3.35±0.43 for job satisfaction and 3.56±0.48 for nursing performance on a five-point scale [Table 2].

Table 2. Communication Competency, Job Satisfaction and Nursing Performance

Variables	M±SD
Communication Competency	3.41±0.44
Job Satisfaction	3.35±0.43
Nursing Performance	3.56±0.48

M = Mean; SD = Standard Deviation

Table 1. Difference in Variables according to General Characteristics

Characteristics	Categories	n(%) or M±SD	Communication Competency		Job Satisfaction		Nursing Performance	
			M±SD	t or F (p)	M±SD	t or F (p)	M±SD	t or F (p)
Age (Yr)		32.24±7.11						
	≤25	30(16.0)	3.33±0.40	0.99 (.399)	3.25±0.39	2.64 (.051)	3.23±0.39	14.34 (<.001)
	26-30	64(34.2)	3.37±0.46		3.26±0.42		3.43±0.40	
	31-35	40(21.4)	3.45±0.50		3.44±0.48		3.66±0.40	
≥36	53(28.3)	3.47±0.40	3.43±0.43		3.81±0.50			
Gender	Male	13(7.0)	3.42±0.43	0.43 (.966)	3.35±0.40	0.43 (.966)	3.39±0.37	-1.27 (.206)
	Female	174(93.0)	3.41±0.44		3.35±0.44		3.57±0.48	
Religion	Protestant	49(26.2)	3.42±0.41	0.11 (.956)	3.35±0.43	0.21 (.893)	3.69±0.49	2.37 (.072)
	Catholic	16(8.6)	3.46±0.35		3.40±0.43		3.61±0.47	
	Buddhist	24(12.8)	3.39±0.53		3.37±0.52		3.56±0.57	
	None	98(52.4)	3.40±0.45		3.33±0.42		3.48±0.43	
Marital status	Unmarried	112(59.9)	3.39±0.47	-0.89 (.375)	3.30±0.43	-1.98 (.049)	3.45±0.47	-3.85 (<.001)
	Married	75(40.1)	3.45±0.39		3.42±0.43		3.71±0.45	
Education level	Junior college ^a	67(35.8)	3.38±0.47	2.03 (.135)	3.32±0.41	0.71 (.495)	3.53±0.46	5.98 (.003) a,b<c
	Bachelor ^b	112(59.9)	3.41±0.42		3.35±0.46		3.53±0.46	
	≥Master ^c	8(4.3)	3.71±0.42		3.52±0.33		4.11±0.53	
Working pattern	3shifts	116(62.0)	3.39±0.46	-0.66 (.510)	3.30±0.43	-1.77 (.079)	3.46±0.42	-3.51 (.001)
	Day fixation	71(38.0)	3.44±0.40		3.42±0.43		3.71±0.52	
Position	Nurse ^a	148(79.1)	3.36±0.44	6.22 (.002) a<c	3.30±0.42	5.10 (.007) a<c	3.44±0.42	26.37 (<.001) a<b, a<c
	Charge nurse ^b	17(9.1)	3.56±0.35		3.53±0.47		3.91±0.40	
	Head nurse/manager ^c	22(11.8)	3.67±0.36		3.55±0.43		4.05±0.46	
Salary (10,000 won)	<300	156(83.4)	3.38±0.45	-2.08 (.039)	3.33±0.43	-1.44 (.151)	3.48±0.44	-5.52 (<.001)
	≥300	31(16.6)	3.56±0.38		3.45±0.47		3.96±0.44	
Working ward	Internal medicine	37(19.8)	3.47±0.46	0.31 (.873)	3.42±0.43	1.75 (.141)	3.57±0.50	1.44 (.223)
	Surgical	93(49.7)	3.39±0.42		3.27±0.42		3.49±0.45	
	ICU, ER	21(11.2)	3.43±0.51		3.36±0.51		3.58±0.54	
	OR	14(7.5)	3.44±0.36		3.55±0.41		3.72±0.47	
	Others	22(11.8)	3.35±0.48		3.38±0.39		3.70±0.47	
Career (Yr)		6.39±6.18		1.13 (.345)		1.78 (.134)		9.28 (<.001) a,b,c<e, a<d
	<1 ^a	31(16.6)	3.32±0.46		3.28±0.41		3.29±0.38	
	1-2 ^b	43(23.0)	3.36±0.42		3.27±0.44		3.43±0.39	
	3-4 ^c	17(9.1)	3.34±0.44		3.23±0.38		3.38±0.32	
	5-9 ^d	41(21.9)	3.46±0.47		3.39±0.44		3.61±0.48	
	≥10 ^e	55(29.4)	3.49±0.42		3.45±0.44		3.81±0.49	

M= Mean; SD= Standard Deviation, ICU= Intensive Care Unit; ER= Emergency Room; OR= Operation Room

Factors affecting participants' nursing performance: Analysis results of factors that influenced the participants' nursing performance are presented in [Table 3]. Multiple logistic regression with general characteristics of the participants taken into

consideration showed that age (p=.004), monthly income (p=.023), communication competency (p<.001), and job satisfaction (p<.001) were factors that could affect nursing performance, and the four factors explained 52.0% of nursing performance.

Table 3. Factors Influencing Nursing Performance

Variables	B	SE	β	t	p
Constant	.69	.29		2.40	.017
Age	.02	.01	.28	2.96	.004
Salary (1= \geq 300)*	.18	.08	.14	2.29	.023
Communication Competency	.33	.06	.30	5.28	<.001
Job Satisfaction	.33	.06	.30	5.23	<.001
R ² =.549, Adj R ² =.520, F=19.34, p<.001					

Discussion

In terms of communication competency, participants of this study scored an average of 3.41 out of 5, similar to the results of previous studies of [19]. It is also in line with the results of [20] that compared doctors and nurses in terms of communication competency and found that the former group recorded a higher score of 3.42 on average. The clinical nurses examined and those doctors showed similar scores for communication competency, which are higher than those of ordinary nurses, but this is because clinical nurses perceived their communication competency a little higher. As for communication competency according to general characteristics, the participants exhibited significant difference depending on their position and monthly income, which corresponds to the results of previous literature. For example, [18] found that higher position led to greater communication competency and [19], too, discovered charge nurses or those at a higher position recorded higher scores for communication competency than ordinary nurses. Taken altogether, these results indicate it's not easy to enhance communication competency and repetitive training and diverse work experiences can contribute to improvement of the competency. Returning to what this study found, while only position and monthly income made significant differences, older age and longer career also led to greater communication competency. It means there should be an intervention program for young and less experienced nurses as their perception of communication competency was low.

The participants of this study marked 3.35 out of 5 on average for job satisfaction, which is higher than 3.12 of [20] or 3.07 of [21]. Also, this study found that position at work was one of the significant variables to job satisfaction, which is in line with the results of [21]. As nurses become older and build more career, they get to learn more skills and know-hows through various experiences and, by working with those newly

acquired skills, not only patients but also the nurses themselves feel greater satisfaction with their work. Unfortunately, nurses at a number of hospitals are currently suffering chronic fatigue caused by labor shortage and heavy workload and facing much conflict in a bureaucratic organizational culture. The consequent reduction in job satisfaction makes it extremely difficult to improve nursing performance. Nevertheless, nursing organizations must introduce a system for better nursing performance where nurses can build capabilities and expertise so that they can become more satisfied with their work and enhance performance.

The participants in this study scored an average of 3.56 out of 5 for nursing performance, supported by [22]. Meanwhile, in terms of nursing performance according to general characteristics, this study observed significant difference made by several variables, including age, marital status, education, working pattern, position, monthly income and total career, which also corresponds to the findings of [22, 23]. From these results, it can be inferred that nurses has greater confidence and expertise as they get older, build more career, get more education and have higher position, thereby showing greater performance with their work. In addition, married participants recorded higher scores for nursing performance than the unmarried ones, and it seems attributable to social stability and confidence that married people experience thanks to emotional support and psychological peace they get from family even though they need to juggle work and family. Therefore, creating a working environment where nurses can get additional education and maintain their career can be suggested as another measure to boost nurses' job satisfaction and nursing performance.

As for correlations among clinical nurses' communication competency, job satisfaction and nursing performance as well as factors influencing them, this study found that the greater communication competency and job satisfaction the nurses had, the higher nursing performance they showed. When general characteristics of the participants were considered, communication competency and job satisfaction were the biggest influencing factors of nursing performance of clinical nurses, followed by age and monthly income. These results are supported by previous papers of [3], which reported communication competency and job satisfaction can affect nursing performance, respectively. As hospitals get larger in size and departmentalized further, nurses are required to carry

out more than conventional jobs. They now have to help patients recover from illnesses and maintain and improve health, plan and manage care services and educate families of patients and consult with them. This is why communication competency is emphasized for nurses. More importantly, nurses are the ones that form the most direct and sustainable relationship with medical consumers, or patients, and, thus, can determine how the consumers perceive medical services they get. In this sense, communication competency of nurses can make considerable influence not only on the efficiency, but also on the performance of hospital.

Conclusion

It found that communication competency and job satisfaction can make effect on nursing performance. Based on these findings, various intervention programs must be developed to improve nurses' job satisfaction and boost their nursing performance so that they could provide comprehensive care as professional nurses. Furthermore, a training program should be provided for nurses to learn how to communicate in a clear and effective manner, and organizations must introduce a measure to promote horizontal and open communication for greater job satisfaction among nurses. As this study utilized measuring tools of communication competency, job satisfaction and nursing performance of nurses who are providing regular patient care at hospital, there is a need for a standardized measuring instrument with high reliability and validity for nurses who are working at a special department. Considering that appropriate education, training in communication competency and better working conditions can boost job satisfaction, the results of this study can serve as baseline data for development of strategies to enhance nursing performance of clinical nurses.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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The Effects of Domestic Abuse Experience and Stress on Depression of Adolescents: The Moderated Mediation Effect of Teacher Relations

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Abstract

Background/Objectives: The purpose of this study was to investigate the moderated mediation effect of teacher relations on the mediating effect of stress on the relationship between domestic abuse experience and depression in adolescents.

Method/Statistical Analysis: To this end, approximately 860 middle and high school students from D city in Korea participated in the study survey. Collected data were analyzed using mean comparison analysis, reliability analysis, correlation analysis, and moderated mediation effect analysis.

Findings: First, as a result of the difference test of depression according to general characteristics, there were significant differences according to gender, school grade, income level, and parent-teacher relationship. Second, as a result of the correlation analysis, there was a positive correlation between domestic abuse experience, stress, and depression, However, the teacher relationship negatively correlated with other variables. Third, stress was found to mediate between domestic abuse experience and depression. Fourth, teacher relationship was found to control between stress and depression. Fifth, teacher relations showed moderated mediation effects, on mediating effects of stress in the relationship between domestic abuse experience and depression.

Improvements/Applications: Based on these findings, we discuss approaches to alleviating stress and reducing depression caused by domestic abuse experience.

Keywords: *Domestic abuse experience, Stress, Depression, Teacher relation, Moderated Mediation Effect.*

Introduction

Domestic abuse is the act of perpetrating at home, emotional, physical, abandonment, or neglect^[1]. This behavior is a serious deterrent to healthy growth during adolescent development. Additionally, domestic abuse does not end once and continue, and instead tends to

escalate in frequency and intensity. A total of 11,715 adolescents who experienced abuse in 2015 accounted for 49.1% of the youth who experienced abuse more than once weekly^[2]. Students who experience long-term abuse have problems psychologically, mentally, and physically. Personal factors can lead to a negative ego and psychological maladjustment such as stress, depression, and anxiety.

There are various causes of adolescent stress, such as peer harassment, teacher relations, and academic burden. However, among them, domestic abuse experience increases adolescent stress^[3]. Students who experience abuse are more likely to accept the stress of daily life than those who do not, and have difficulty adjusting to

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school life. Abuse experiences can lead to extreme post-traumatic stress disorder, making the abused individual vulnerable to the stress experienced during growth. In other words, students who have been hurt by domestic abuse experience cannot cope with stress appropriately, and stress beyond control level becomes psychologically negative.

There is no accurate data on the prevalence of depression in adolescents. However, data published by the World Health Organization (WHO) reported that the prevalence of depression in adolescents was approximately 4-8% per year^[4]. Adolescents who experience depression experience a significant amount of time to recover from depression, and depression during adolescence prevails through adulthood. Additionally, according to the Adolescent Health Behavior Survey reported by the Centers for Disease Control and Prevention (CDC), high school students experienced higher levels of depression and hopelessness than middle school students^[5]. It seems that the higher the grades, the more persistent the symptoms of depression due to psychological pressure or accumulated stress. A number of previous studies analyzing factors of adolescent depression showed that factors such as family conflict, parental abuse, and neglect had significant effect on depression^[6].

Depression caused by stress in adolescents also has a negative effect on interpersonal relationships, such as peer and teacher relationships, which can lead to maladjustment in school life^[7]. In adolescence, students develop social skills through school life, and they experience satisfaction in school life through good interpersonal relationships. However, an emotionally depressed student can promote interpersonal conflict and discord within the school. Additionally, students who have experienced domestic abuse experience difficulty adapting to teacher relations because of adult rejection^[8]. Every student wants to be recognized by the teacher at school and expects to be treated fairly. Students who are treated properly by teachers and have good teacher relationships reduce their negative emotions and depression symptoms at school^[9].

Thus, the purpose of this study was to identify the moderated mediation effect of teacher relations on the mediating effect of stress between domestic abuse experience and depression.

This study established the following research questions:

First, what is the difference in the depression depending on students' personal characteristics?

Second, what is the correlation among the main variables?

Third, does the stress mediate in the relationship between the domestic abuse experience and depression?

Fourth, does the teacher relationship moderate the relationship between the stress and depression?

Fifth, does the teacher relationship moderate the mediating effect of stress in the relationship between the domestic abuse experience and depression?

Method

Research Model: The research model of this study is shown in [Figure 1]. Stress mediates in the relationship between domestic abuse experience and depression, and teacher relations have moderated mediation effects in the path in which stress affects depression.

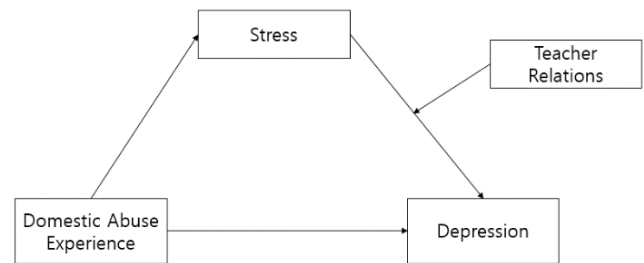


Figure 1. Research model

Research Subjects: The survey was conducted on approximately 900 middle and high school students from D city in Korea. The survey was conducted February-April 2019, and a total of 860 copies were finally used, except for questionnaires that were answered unfaithfully.

The gender distribution of the study subjects was 398 male students (46.3%) and 462 female students (53.7%). The distribution of school grades was similar with 421 middle school students (49.0%) and high school students 439 (51.0%). Looking at the income form of the parents, the dual-earner earned 568 (66.0%) and the single-earner earned 292 (34.0%). Additionally, their income level was 106 low (12.4%), 'normal' 465 (54.1%), and 'high' 289 (33.6%). Conversely, the relationship between parents

and teachers was 291 (33.8%) for poor, 424 (49.3%) for ‘normal’, and 145 (16.9%) for ‘good’.

Research Tools:

Domestic Abuse Experience: Domestic abuse experience was measured using the family violence experience used by Bae Mi-hee^[10]. This scale was designed to measure the degree of domestic violence such as verbal violence, emotional violence, mild physical violence, and severe physical violence experienced by parents. Each question is a total of 5-point Likert scales, ranging from 1 point (not at all) to 5 points (at all times). The higher the score, the higher the experience of domestic abuse.

Stress: We used the stress scale which was used by Lee et al. ^[11] based on the BEPSI-K (Brief Encounter Psychosocial Instrument-Korean). A total of five questions, each of which is a 5-point Likert scale, ranging from 1 point of ‘not at all’ to 5 points of ‘very so’. The higher the score, the higher the stress. In this study, the reliability Cronbach’s α value was .881.

Depression: We used the depression scale which was used by Choi^[12] for the subscale of SCL-90. It consists of a total of 10 questions, and is 5-point Likert

scale, ranging from 1 point at ‘not at all’ to 5 points at ‘very yes’. The higher the score, the higher the depression tendency. Cronbach’s α for the reliability was .926.

Teacher Relations: The teacher relations used measures related to teacher relations among the subscales of school adaptation used by Kim^[13]. It is composed of five questions, and it is a 5-point Likert scale from 1 point at ‘not at all’ to 5 points at ‘very yes’. The higher scores mean higher teacher relationships. The reliability of this scale, Cronbach’s α , was .831.

General Characteristics: The gender, school grade, marital income form, income level, and parent-teacher relationship of the study subjects were examined.

Data Analysis: For this study, we analyzed using SPSS Win 23.0 and SPSS PROCESS Macro 3.1. The t-test and ANOVA were used to analyze the difference in depression according to the general characteristics of the study subjects. The post-test was performed with Duncan/Dunnet T3. Additionally, correlation analysis was conducted to identify the correlations among the major variables used in this study. Regression analysis was performed using model 14 of SPSS PROCESS macro proposed by Hayes^[14] to identify mediating effect, moderating effect, and moderated mediation effect.

Result and Discussion

Table 1. Depression according to general characteristics

Characteristics		Depression			
		Frequency	Mean (Standard Deviation)	T-value/F (Duncan)	
Gender	Male	398	2.19(.85)	-6.109***	
	Female	462	2.54(.85)		
School level	Middle school	421	2.24(.88)	-4.754***	
	High school	438	2.52(.82)		
Double-income status	Yes	567	2.39(.83)	.754	
	No	292	2.35(.92)		
Income level	Bad	289	2.65(.89)	8.720***	A
	Middle	464	2.39(.83)		B
	Good	106	2.25(.83)		B
Parent-Teacher relationship	Bad	291	2.55(.86)	11.041***	A
	Middle	423	2.33(.83)		B
	Good	145	2.17(.90)		C

***: p<0.001

Depression according to general characteristics of subjects: [Table 1] shows the difference in depression according to the general characteristics of middle and high school students. According to the gender of the students, female students showed higher depression than male students ($t = -6.109, p < .001$). These results are consistent with the results of several previous studies^[15-16]. However, contrary to another study^[17], there was no consistent results in depression depending on gender. According to the school level, high school students showed higher depression than middle school students ($t = -4.754, p < .001$). These results can be explained by the burden and stress on schooling in higher grades. Additionally, depending on the income level, depression was highest in the order of ‘bad’, ‘medium’ and ‘good’ ($F = 8.720, p < .001$). Meanwhile, depending on the parent-teacher relationship, students’ depression was highest in the order of ‘bad’, ‘medium’ and ‘good’ ($F = 11.041, p < .001$).

Correlation of key variables: [Table 2] presents the results of the correlation analysis among the major variables. The results showed a positive correlation between domestic abuse experience, stress and depression, and stress and depression. Conversely, teacher relations showed a negative correlation with domestic abuse experience and depression. Among them, stress and depression ($r = .717, p < .01$) showed the highest correlation, followed by depression and teacher relationship ($r = -.255, p < .01$), and domestic abuse experience and depression ($r = .238, p < .01$) in order.

Table 2. Correlation coefficients among major variables

	1.	2.	3.	4.
Domestic abuse experience	1			
Stress	.188**	1		
Depression	.238**	.717**	1	
Teacher relations	-.129**	-.062	-.255**	1
Average	1.33	2.85	2.38	3.47
Standard Deviation	.55	.98	.86	.76

The moderated mediating effects of teacher relations between domestic abuse experience and depression of students: The moderated mediation effect of teacher relation on the mediating effect of stress in the relationship between domestic abuse experience and depression of students was analyzed using Model 14 of the SPSS PROCESS Macro 3.1^[14]. The results are shown in [Table 3].

The results showed that domestic abuse experience had significant positive effect on stress ($\beta = .3404, p < .001$), and stress had significant positive effect on depression ($\beta = .6050, p < .001$). Additionally, domestic abuse experience had significant positive effect on depression ($\beta = .1322, p < .001$). The fact that domestic abuse experience has significant effect on stress and that stress has significant effect on depression indicates that stress plays a mediating role between students’ domestic abuse experience and depression.

Table 3. Moderate mediation effect of teacher relations between domestic abuse experience and depression

Variables	Effect	SE	t-value	p
Mediating variable model (Dependent variable: Stress)				
Constant	-.4515	.0872	-5.1786	.0000
Domestic abuse experience → Stress	.3404	.0608	5.6012	.0000
Dependence variable model (Dependent variable: Depression)				
Constant	2.2015	.0522	42.1868	.0000
Domestic abuse experience → Depression	.1322	.0365	3.6214	.0003
Stress → Depression	.6050	.0201	30.0995	.0000
Teacher relations → Depression	-.2288	.0258	-8.8664	.0000
Stress × Teacher relations → Depression	-.0529	.0238	-2.2201	.0267

Conversely, the interaction terms of stress and teacher relationship had significant effect on depression ($\beta = -.0529, p < .05$). In other words, domestic abuse experience has a relationship that domestic abuse

experience increases depression via stress, which means that the effect of stress as a mediator on depression as a dependent variable depends on the relationship of teacher as a moderating variable.

The Johnson-Neyman method was used to analyze the significance region for the range of moderating variable. As a result, the effect of stress on depression was significant in all areas of teacher relations. This means that the higher the teacher relationship, the less stress on depression.

The shape according to the moderating effect of teacher relations was identified in the graph and presented in [Figure 2]. The depression level by stress was higher in order from the low to middle, and high groups of teacher relations. In other words, the better the teacher relationship in the effect of stress on depression, the lower the depression.

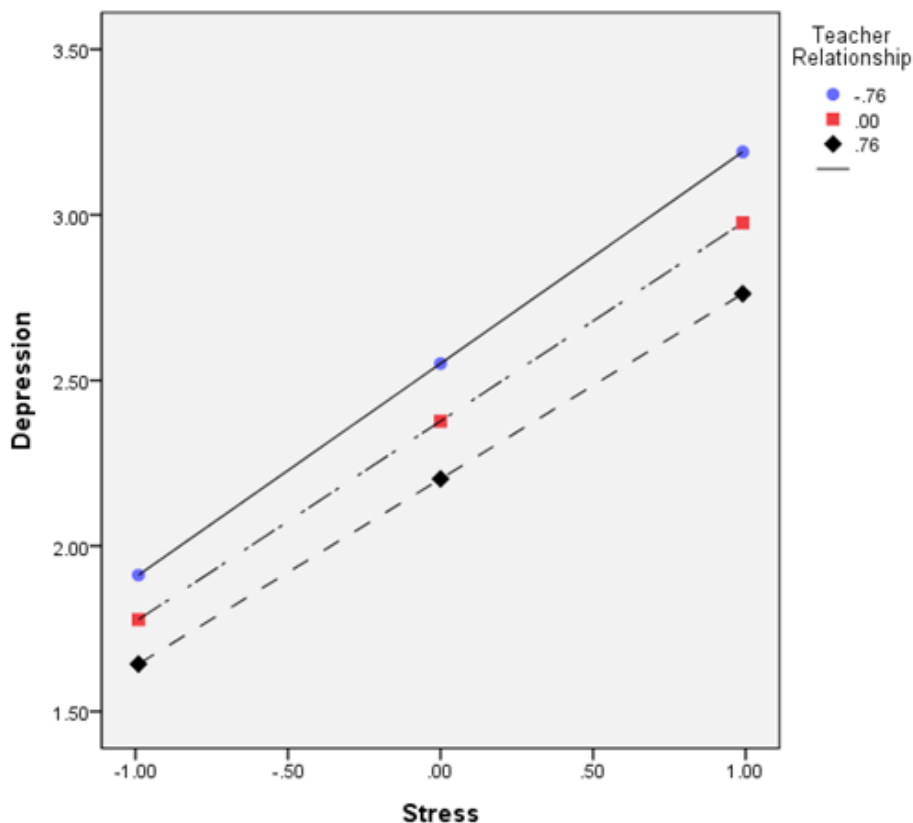


Figure 2. The moderating effect of teacher relationship in the relationship between stress and depression

Table 4. Testing moderated mediation effects of teacher relations between domestic abuse experience and depression

Conditional indirect effect	β	Boot Se	LLCI*	ULCI**
M-1SD (-.7613)	.2197	.0377	.1467	.2927
M (.0000)	.2060	.0356	.1369	.2750
M+1SD (.7613)	.1923	.0350	.1252	.2624

*LLCI=The lower limit of the indirect effect within the 95% confidence interval, **ULCI=The higher limit of the indirect effect within the 95% confidence interval

Finally, the conditional indirect effects of the domestic abuse experience, an independent variable, on the dependent variable, depression, are presented in

[Table 4]. The conditional indirect effects of stress on depression was significant in the range of -.7613 (M - 1SD) to .7613 (M + 1SD) of teacher relations.

Conclusion

The limitations of this study and suggestions for further research are as follow. First, this study examined the mediating effect of stress and moderated mediation effect of teacher relations on the effects of domestic abuse experience on depression in middle and high school students. However, domestic abuse experience tends to persist after the first experience in childhood and must be studied in lower grades. This will be the basis for solving fundamental problems in the early stages of domestic abuse. Second, the difference of depression according to

general characteristics was compared. In this study, the higher the grade, the higher the depression. However, in the upper grades, the study on if teacher-adaptation had significant effect on depression in the upper grades could not be analyzed in depth. Thus, further research is needed to determine if teacher relations by school level can control depression. Third, this study collected and analyzed few students. Thus, there is a limit to generalizing the results of this study for all students. There is a need for national sampling in the future, and regional comparative studies must be conducted.

In a series of preceding studies, most of the studies on the effects of domestic abuse experience on students' depression and stress were conducted. However, this study is meaningful in analyzing the effect of teacher relations on these relationships based on these previous studies. Thus, this study should find different ways to deal with stress according to students' situation. Additionally, a system for active communication and improving relations between students and teachers should be established to cope with stress flexibly and to reduce student depression.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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The Effect of Workers' Smartphone Addiction on Depression: Dual Mediation of Growth Mindset and Impulsiveness

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Abstract

Background/Objectives: This study was performed to investigate the dual mediating effects of growth mindset and impulsiveness between smartphone addiction and depression of workers.

Method/Statistical Analysis: The major subjects of this study were 286 employees of 20 work-places in Seoul, Daejeon, Chungnam province, and Chungbuk areas. The collected data were analyzed using t-test, ANOVA, correlation analysis, dual mediation effect analysis by SPSS PC+ Win. 25 and SPSS PROCESS macro 3.4.

Findings: First, there was no significant difference in depression according to the general characteristics of the subjects. Second, the growth mindset had a negative correlation with impulsiveness and depression. And Impulsiveness had a positive correlation with depression. Third, mediating effect analysis revealed that there was a dual mediation effect of growth mindset and impulsiveness between smartphone addiction and depression of workers.

Improvements/Applications: Based on these findings, growth mindset is expected to act as a major defensive factor. And, we discussed ways to reduce depression caused by smartphone addiction.

Keywords: *Smartphone addiction, Growth mindset, Impulsiveness, Depression, Workers, Mediating effect.*

Introduction

Smartphone addiction generally means a situation in which the increase in usage cannot be controlled because of the excessive immersion in the smartphone^[1]. Such smartphone addiction has the same context as the existing internet addiction, from which it differs because smartphones can run various applications, such as the internet and games, in any place, at any time^[2]. These smartphone addictions can cause a variety of problems. In summary, previous studies discussed physical, psychological, and social problems in personal terms.

First of all, the physical problems include Turtleneck Syndrome and Wrist Tunnel Syndrome caused by prolonged use of smartphones; dry-eye syndrome and spinal curvature were also found to be frequent. In particular, for workers, smartphone addiction worsens their vision, decreases physical fitness, and interferes with their work life because of lack of sleep^[3]. Psychologically, it can cause mental illnesses, such as psychological anxiety, obsessive compulsive disorder, depression, and social avoidance^[4]. In particular, if you do not have your smartphone, it may be difficult to concentrate on work or daily life, and hearing problems with ringing may occur. Socially, it has been reported to deteriorate interpersonal relationships^[5]. The SNS function of smartphones has made it possible to connect with more people than the members of the society one belongs to. As a result, smartphone users can connect with various open and diverse people and feel accustomed to communicating in a virtual environment.

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As a result, their communication with their family and friends has decreased, and more and more people cannot adapt to their relationships, which harms the level of mutual relations with others, social stability, autonomy, and social development^[6-7].

This study was carried out with an interest in depression and impulsiveness, which are psychological problems among smartphone dysfunctions. According to previous studies, the relationship between smartphone addiction and depression appears to be very close. Lee said that the higher smartphone addiction, the higher the depression^[8]. Sung further said that such depression affects their unhappiness and falls into lethargy^[9].

On the other hand, smartphone addiction affects impulsiveness. Park said that impulsiveness was the most significant in the difference between the smartphone addiction group and the non-addictive group^[10]. In addition, when the smartphone is used addictively, people do not control their own desire to use it, and in wanting to have a relationship with others, there is a tendency to satisfy the desire immediately^[11].

Recently, growth mindset is a variable that is frequently studied as a defensive mechanism against impulsiveness and depression. Dweck calls “mindset” a belief in one’s intelligence or ability^[12]. He divided mindset into a fixed mindset, which means an unchanging attitude, and a growth mindset, which means that skills can be developed. People with a growth mindset excel in many areas, including goal orientation, achievement standards, thinking about effort, challenges, and frustration^[13]. Recently, various empirical studies have found that growth mindset has a very positive effect on negative psychological problems, such as anxiety and depression. Thus, one can assume that growth mindset will reduce impulsiveness and depression from smartphone addiction.

These previous studies found that impulsiveness mediates between workers’ smartphone addiction and depression. However, a growth mindset acts as a defense against impulsiveness. Overall, therefore, growth mindset and impulsiveness will both mediate between smartphone addiction and depression. However, most of the studies conducted so far focused on the research that identified the negative effects of smartphones.

Therefore, this study set the smartphone addiction of workers as the independent variable, depression as a dependent variable, and explored whether a

worker’s growth mindset and impulsiveness play a dual mediation role. In order to achieve this goal, the research questions are as follows. First, what is the difference in depression according to the general characteristics of workers? Second, what is the role of growth mindset and impulsiveness between smartphone addiction and depression?

Method

Research Model: Based on previous studies conducted to date, the research model shown in [Figure 1] was set up. In other words, a dual mediation model of growth mindset and impulsiveness was established in the relationship between smartphone addiction and depression.

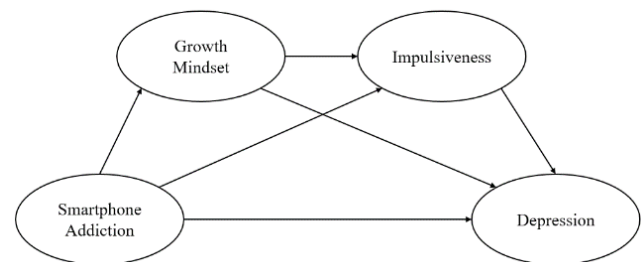


Figure 1. Research model

Research Subjects: For the study areas, 20 workplaces in Seoul, Daejeon, Chungnam, and Chungbuk were selected, and 286 workers were selected from the workplaces. The genders were 234 males (82.4%) and 50 females (17.6%). The most common age group was in the thirties, with 128 (44.8%), followed by 77 in the 40s (26.9%), 48 in the 20s (16.8%), and 30 in the 50s (10.5%). In terms of marital status, there were 174 married people (61.3%), 110 unmarried people (38.7%). Finally, the monthly salary distribution was 110 persons (35.2%) with 3 million won, 97 persons (34.2%) with 2 million won, 43 persons (15.1%) with more than 4 million won, and 34 (12.0%) with less than 2 million won.

Research Tools:

Smartphone Addiction: The measurement was done using an adult smartphone addiction self-diagnosis scale developed by the Korean Information Technology Intelligence Agency^[14]. This scale is composed of sub-domains of daily living disorders, virtual world orientation, withdrawal, and tolerance, but they are summed up in this study. The smartphone addiction scale is a 5-point Likert scale and consists of 15 questions. Each

item is given a score from “not at all” to “very much” with a score of 5, with questions 4, 10, and 15 being reverse scored. A higher score means more smartphone addiction. In this study, the overall reliability was found to be Cronbach’s $\alpha = .854$, indicating a reliable level.

Growth Mindset: We used the scale developed by Carol Dweck^[15] and translated by Lee^[16]. The growth mindset is a tool for measuring how close an individual is to a fixed mindset or a growth mindset. It is divided into subfactors of intelligence and personality. It consists of 8 questions, and each sub-factor consists of 2 positive questions and 2 negative questions about intelligence, and 2 positive questions and 2 negative questions about personality. In this study, each sub-factor was summed up without any distinction of subfactors, and the range of questions was measured on a five-point Likert scale ranging from one point of “not at all” to five points of “very ”. Negative questions were scored in reverse. The higher the total score, the higher the growth mindset. The reliability of this scale Cronbach’s α is .813 and is judged to be reliable.

Impulsiveness: We used the Barratt Impulsiveness Scale (BIS) developed by Barratt^[17] and used by Yang^[18]. It consists of 5 questions that adapt the scale of smartphone addiction to the purpose of this study. The questions were measured on a five-point Likert scale, ranging from one point of “not at all” to five points of “very much”. The higher the total score, the higher the

impulsiveness. In this study, Cronbach’s α was .870, which was judged to be reliable.

Depression: We used five questions selected by Yang^[18] based on the development and validation of Bae^[19]. The questions consist of a total of five Likert scales, ranging from one point of “not at all” to five points of “very much”. The higher the total score, the higher the depression. In this study, the Cronbach’s α of this scale was .795.

Other Variables: The gender, age, marital status, and salary of workers were examined.

Data Analysis: We did data analysis using SPSS PC + Win. Ver. 24.0. Frequency analysis, reliability analysis, t-test, ANOVA, and correlation analysis were done using the SPSS PC + Win. 25. In addition, dual-mediation effect and bootstrapping were assessed using the SPSS PROCESS macro 3.4.

Result and Discussion

Depression According to General Characteristics:

There was no significant difference in depression according to the general characteristics of the subjects, as is presented in Table 1. Specifically, gender ($t = -1.553, p = .122$), age range ($F = .200, p = .896$), marital status ($t = -1.475, p = .141$), or salary ($F = .641, p = .589$) did not show a significant difference.

Table 1. Depression according to general characteristics; N = 286

		Frequency	Depression	
			M (SD)	t value/F (Duncan)
Gender	Male	234	2.552(.755)	-1.553(p=.122)
	Female	50	2.733(.723)	
Age range	Twenties	48	2.591(.722)	.200(p=.896)
	Thirties	128	2.561(.730)	
	Forties	77	2.639(.713)	
	More than fifty	30	2.546(.709)	
Marital status	Married	174	2.532(.772)	-1.475(p=.141)
	Single	110	2.666(.705)	
Month salary	Less than 2 million	34	2.719(.710)	.641(p=.589)
	2 and 3 million	97	2.552(.701)	
	3 and 4 million	110	2.604(.720)	
	More than 4 million	43	2.497(.711)	

***: $p < 0.001$

Correlation of key variables: The results of correlation analysis of the major variables are presented in Table 2. Smartphone addiction was negatively correlated with growth mindset and positively correlated with impulsiveness and depression. The growth mindset had a negative correlation with impulsiveness and depression. Impulsiveness had a positive correlation with depression. Impulsiveness and depression together showed the highest correlation ($r = .573, p < .01$), followed by smartphone addiction and depression ($r = .512, p < .01$), and smartphone addiction and impulsiveness ($r = .487, p < .01$).

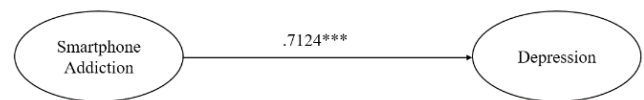
Table 2. Correlation coefficients between major variables

	1.	2.	3.	4.
Smartphone addiction	1			
Growth mindset	-.345**	1		
Impulsiveness	.487**	-.339**	1	
Depression	.512**	-.311**	.573**	1
M	2.67	3.26	2.76	2.58
SD	.53	.60	.63	.74

** : $p < 0.01$

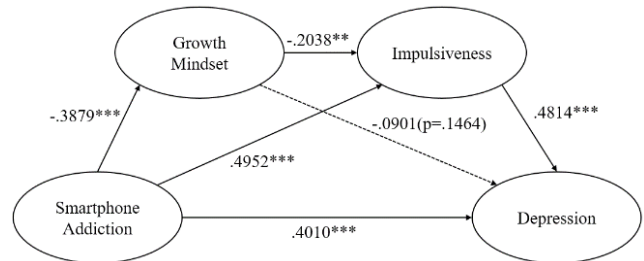
These results are mostly consistent with previous studies^[10,12-13]. In other words, the more severe the smartphone addiction, the more negative the depression and the higher the impulsiveness. Growth mindset had a negative effect on depression. This is sufficiently predictable at the common-sense level and has been found in recent studies^[13]. Therefore, in order to reduce the depression of workers, it is necessary to devise a way to suppress smartphone addiction. However, the reality is that smartphone addiction is difficult to suppress, because smartphone use is difficult to suppress.

Effects by Path: [Figure 2] shows the magnitude of the overall effect of workers' smartphone addiction on depression. In [Figure 3], the coefficients for each path are presented to verify the double mediating effect. Verifying the coefficients for each path showed that all of them were statistically significant, except for the influence of growth mindset on depression ($-.0901, p = .1464$). Smartphone addiction had a negative effect on growth mindset ($-.3879, p < .001$) and a positive effect on impulsiveness ($.4952, p < .001$) and depression ($.4010, p < .001$). Growth mindset had a negative effect on impulsiveness ($-.2038, p < .01$), and impulsiveness had a positive effect on depression ($.4814, p < .001$).



***: $p < 0.001$

Figure 2. The total effect of smartphone addiction on depression



** : $p < 0.01$, ***: $p < 0.001$

Figure 3. The dual mediating effect of growth mindset and impulsiveness

Table 3. Dual mediating effect of growth mindset and impulsiveness

Classification	Mediating effects		
	B	S.E.	BC 95% CI
smartphone addiction → growth mindset → depression	.0350	.0273	-.0120 ~ .0957
smartphone addiction → impulsiveness → depression	.2384	.0530	.1374 ~ .3474
smartphone addiction → growth mindset → impulsiveness → depression	.0381	.0199	.0091 ~ .0858
Total Indirect Effect	.3114	.0584	.2011 ~ .4294

Dual mediation effect verification: 15,000 bootstrapping was done to verify the dual mediation effect, and the confidence interval was set to 95%. As shown in Table 3, the total indirect or mediation effect was .3114 (.2011 ~ .4294), which was significant, because there was no 0 in the 95.0% confidence interval. In addition, the verification of the simple mediation effect of growth mindset between smartphone addiction and depression was .0350 ($-.0120 \sim .0957$), which was not significant, because there was a 0 in the 95.0% confidence interval. However, the simple mediation effect of impulsiveness between smartphone addiction and depression was .2384 (.1374 ~ .3474), which was significant, because there was no 0 in the 95.0% confidence interval. In addition, the dual mediation effect of growth mindset and impulsiveness between smartphone addiction and depression was .0381 (.0091 ~

.0858), which was significant, because there was no 0 in the 95.0% confidence interval. Therefore, there is a dual mediation effect of growth mindset and impulsiveness between smartphone addiction and depression of workers.

These results indicate that growth mindset can play a positive role in both the impulsiveness and the depression that are caused by smartphone addiction. In other words, growth mindset can lower the impulsiveness and depression caused by smartphone addiction. Therefore, the policies about the smartphone addiction of workers need to be dualized. First of all, training to decrease the use of the smartphone itself is needed. However, this requires a strong will of the trainees and is likely to have a partial effect, because the reality is not so high. Therefore, the second solution is to minimize the damage even if a worker is addicted to smartphones. Therefore, in this study, growth mindset has been found to play such a role. Accordingly, it is necessary to prepare an education program to increase growth mindset in the workplace.

Conclusion

This study investigated the dual mediating effects of growth mindset and impulsiveness between workers' smartphone addiction and depression. As a result, growth mindset and impulsiveness were found to indicate serial dual mediation. Based on these findings, we discussed ways to reduce depression caused by smartphone addiction.

Suggestions about the limitations of this study are as follows. First, this study was conducted in Seoul, Daejeon, Chungnam, and Chungbuk and thus has regional limitations. Therefore, it is unreasonable to generalize the results of this study to national phenomena. In the future, national sampling will be needed. Second, we set growth mindset as a parameter that acts as a defensive factor. However, there are many variables that play this role. Later we will need to uncover further variables.

On the other hand, the research on the growth mindset conducted to date has been limited to the academic achievement of adolescents, but recently, research on adults has been actively conducted. In this study, the growth mindset may have a significant role in the positive role of adults.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Perceived Health Status, Psychological Well-Being and Health Promotion Behavior of College Students

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Abstract

Background/Objectives: This study is descriptive research aimed at determining the association with perceived health status and psychological well-being affecting health promotion behavior and at providing basic data that could help develop programs for health care and healthy lifestyle of college students in early adulthood.

Method/Statistical Analysis: The data were collected from 194 students at colleges in B City from March 5 to 22, 2019. The collected data were analyzed through t-test, ANOVA, Pearson's correlation analysis using an SPSS/WIN 23.0 program.

Findings: The respondents scored an average of 2.38 out of 5 for perceived health status. They scored an average of 2.27 out of 5 for psychological well-being and 2.57 out of 5 for health promotion behavior. Perceived health status was significantly positively correlated with psychological well-being ($r=.617$, $p<.001$) and health promotion behavior ($r=.516$, $p<.001$). Psychological well-being was significantly positively correlated with health promotion behavior ($r=.667$, $p<.001$). Perceived grade, household financial status and smoking and alcohol intake status made significant differences and psychological well-being differed significantly by religion, grade, major satisfaction and residence type. Health promotion behavior differed significantly by major, gender, household financial status and academic achievement.

Improvements/Applications: It is necessary to develop customized programs that can help college students feel and improve psychological well-being with the objective of promoting health promotion behavior in pursuit of health care and healthy lifestyle.

Keywords: College student, early adulthood, perceived health status, health promotion behavior, psychological well-being.

Introduction

As greater attention is paid to health in the rapidly changing and developing society and emphasis is placed on its importance, there is a shift from the concept of

quantitative treatment to the qualitative concept of health maintenance and promotion. In modern society based on the development of medical technology, in particular, conventional infectious, poisonous and acute diseases are almost controlled, whereas chronic diseases, such as cancer or circulatory diseases, which occur due to long-term lifestyle become major health problems. Such a change leads to the efforts to protect and promote health through public health education, disease prevention, nutritional improvement and healthy life practice rather than to treat disease as before [1]. Health promotion behavior is determined by psychological and subject factors, such as personal beliefs, values and motives

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and it is more reliable to determine the level of health promotion behavior by using self-rated perceived health status rather than clinical conditions^[2,3]. College students are in the healthiest period in their whole life, as measured by the conventional health index; however, many of them live away from their parents and family and may choose health-threatening acts, such as smoking, alcohol intake and irregular eating habits, in making the primary decision as to their own health. However, college students are in the critical period to form health-related habits for adulthood and health care in this period is important, affecting health in remaining life^[4]. The factors affecting health promotion behavior included health perception, self-esteem, self-efficacy and social support^[5,6] and body image, emotional status, stress and peer relationship satisfaction^[7]. However, college students have relatively low mortality or morbidity and are in a favorable position to have better health status by correcting wrong lifestyle and by controlling stress and the efforts to help make their health promotion behavior habitual on the basis of good knowledge about health are very important to prevent chronic diseases expected in adulthood^[8]. Psychological well-being is a concept of how positively individuals function against challenges and is a very important variable for college students with a developmental task of forming and establishing identity^[9]. To confirm that psychological well-being is an important factor for health promotion behavior, research has been conducted in nurses, nursing students and shift workers, but little research has been conducted in general college students^[10,11]. This study aimed to determine the level of association among perceived health status, psychological well-being and health promotion behavior in college students and provide basic data that could help develop health care and healthy lifestyle practice programs for college students.

Method

This study is descriptive research aimed at determining the association among perceived health status, psychological well-being and health promotion behavior in college students.

Convenience sampling was performed from March 5 to 22, 2019 among those students at two colleges in B City who understood the purpose of this study and consented to participation. For data collection, self-administered questionnaires were distributed and collected immediately after they were completed. It took 10 to 15 minutes to complete the questionnaire.

The minimum sample size was found to be 120 persons when a G Power 3.1.0 program based on Cohen's (1988) statistical method was used with significance level .05, effect size .30 and testability .95. Taking the insufficient number of responses into account, data were collected from 200 persons; 194 questionnaires were finally analyzed, with the exception of 7 copies having poor or no responses

The collected data were statistically processed by using an SPSS/WIN 23.0 Program in following specific way: For the respondents' general characteristics, perceived health status, psychological well-being and health promotion behavior, the real number, percentage and the mean and standard deviation were estimated. For perceived health status, psychological well-being and health promotion behavior by the respondents' general characteristics, t-test and ANOVA were performed, along with Scheffe's method as post-hoc test. Person correlation coefficient was estimated to determine correlation between perceived health status, psychological well-being and health promotion behavior.

Health perception was measured by using the tool which had been developed and adapted by Ware (1976) and translated by Lee^[12]. This tool had a total of 12 items--6 positive ones and 6 negative ones--which covered concerns about present, past and future health; the positive items were scored 5 totally agree and 1 totally disagree and the negative ones were scored backward. The total scores ranged from 12 to 60, with a higher score meaning a higher level of perceived health status; Cronbach's $\alpha=.92$ in this study.

Psychological well-being was measured by using the tool applied by Jeong^[13]. This tool had a total of 16 items in two areas--8 concerning the changes of the self and the world and 8 concerning the changes in the view of life and in the interpersonal relationships--in the five-point likert scale whose scores ranged from 1 totally disagree to 5 totally agree, with a higher score meaning a higher level of psychological well-being. For its reliability, Chronbach's $\alpha=.91$ in this study

Health promotion behavior was measured by using the health-related behavior inventory developed by Lee^[14], which was composed of 57 items: 33 concerning behavior and 24 concerning awareness. It had a five-point likert scale whose scores ranged from 1 not at all to 5 all the time and whose total scores ranged from 27 to 135, with a higher score meaning a higher likelihood to do

health-related behavior. For its reliability, Chronbach’s α was .79 at the time of its development and .89 in this study

Result and Discussion

Differences in perceived health status, psychological well-being and health promotion behavior by respondents’ general characteristics:

The variation in perceived health status, psychological well-being and health promotion behavior by the general characteristics is as presented in Table 1. Perceived health status differed significantly by grade, household financial status and smoking and alcohol intake status. For perceived health status, freshmen and sophomores scored higher than seniors; non-smokers and non-drinkers scored higher; and students whose household financial status was at high levels scored higher than those whose household financial status was at low levels. This result was similar to the findings from the research in college students [15]. Because higher graders feel poorer health status due to the increased

burden of employment and graduation, it is necessary to develop differentiated education concerning this issue. Psychological well-being differed significantly by religion, grade, academic satisfaction and residence type. Those having no religion, higher graders, those less satisfied with their major and self-boarding students had lower levels of psychological well-being. This result demonstrates that young adults may rely on their family and need assistance from supporters, such as religion. Health promotion behavior differed significantly by major, gender, household financial status and academic achievement. For health promotion behavior, nursing students scored lowest and the male students scored higher than the female ones. The merchants’ group scored high for health promotion behavior in terms of household financial status and academic achievement. This result is consistent with the findings that nursing students had a heavier burden of academic work and practice than the students at other departments [16] and that the higher academic achievement, the higher score for health promotion behavior [17].

Table 1. Differences in perceived health status, psychological well-being and health related behavior by respondents’ general characteristics

Characteristics		n(%)	Perveived health status		Psychological well-being		Health related behavior	
			M±SD	t or F(p)	M±SD	t or F(p)	M±SD	t or F(p)
Age	18~20	19(9.8)	3.53±0.41	0.47 (.755)	2.84±0.27	0.22 (.926)	2.43±0.34	0.36 (.839)
	21~25	170(87.6)	3.38±0.31		2.86±0.26		2.32±0.33	
	≥26	5(2.6)	3.43±0.31		2.74±0.40		2.26±0.37	
Grade	1 st year ^a	45(23.1)	3.38±0.32	0.981 (.001)	2.82±0.26	3.62(.023) c<a	2.82±0.28	1.75 (.177)
	2 nd year ^b	98(50.6)	3.46±0.29		2.82±0.31		2.34±0.33	
	3 rd year ^c	30(15.5)	3.40±0.34		2.82±0.29		2.28±0.36	
	Grade 4 ^d	21(10.8)	3.35±0.33		2.85±0.26		2.27±0.39	
Sex	Male	60(30.9)	3.48±0.36	1.13 (.343)	2.82±0.28	0.57 (.568)	2.43±0.28	2.20(.029)
	Female	134(69)	3.38±0.34		2.80±0.33		2.27±0.31	
Religion	None	62(32.0)	3.39±0.37	0.28 (.597)	2.89±0.33	4.39(.005) A<b,c	2.24±0.36	1.48 (.222)
	Buddhist	33(17.0)	3.41±0.34		2.82±0.21		2.26±0.40	
	Catholic	19(9.8)	3.42±0.34		2.82±0.28		2.30±0.34	
	Christian	80(41.2)	3.38±0.34		2.81±0.31		2.57±0.16	
Household financial status	High ^a	64(33)	3.69±0.03	3.45 (.034) a, c>b	2.87±0.23	1.12 (.347)	2.41±0.31	5.97 (.003) a>b=c
	Middle ^b	98(50.5)	3.45±0.34		2.89±0.25		2.33±0.35	
	Low ^c	32(16.49)	3.38±0.34		2.76±0.20		2.23±0.36	
Type of residence	With family ^a	107(55.1)	3.69±0.03	0.84 (.474)	2.82±0.26	10.15 (<.001) b=c<a	2.32±0.32	0.47 (.755)
	Dormitory ^b	23(11.9)	3.45±0.34		2.82±0.29		2.32±0.35	
	Alone or other ^c	64(33.0)	3.34±0.36		2.82±0.28		2.21±0.32	
Smoking	Yes	30(15.46)	2.79±0.25	11.74 (.001)	2.92±0.28	0.01 (.946)	2.34±0.29	0.20 (.946)
	No	164(84.54)	2.83±0.25		2.69±0.26		2.32±0.31	

Characteristics		n(%)	Perceived health status		Psychological well-being		Health related behavior	
			M±SD	t or F(p)	M±SD	t or F(p)	M±SD	t or F(p)
Alcohol	Yes	74(38)	2.74±0.40	0.00	2.79±0.28	0.28	2.82±0.28	1.13
	No	120(61.86)	2.83±0.30	(.000)	2.77±0.22	(.597)	2.36±0.33	(.326)
Major	Nursing ^a	98(50.51)	2.72±0.26	0.45 (.715)	2.84±0.31	1.09 (.356)	2.37±0.33	2.96 (.034) d<a, c<b
	Mechanical ^b	48(24.74)	2.80±0.26		2.79±0.25		2.34±0.29	
	Chemical ^c	39(20.10)	2.83±0.25		2.83±0.25		2.29±0.34	
	Etc. ^d	9(4.6)	2.91±0.04		2.84±0.30		2.30±0.34	
Major satisfaction	High ^a	68(35.05)	3.71±0.342.88 (.059)	1.15 (.320)	3.71±0.34	6.69 (.002) a>b=c	2.26±0.38	0.31 (.872)
	Middle ^b	89(45.88)	3.68±0.39		3.50±0.32		2.31±0.32	
	Low ^c	37(19.07)	3.48±0.32		3.39±0.37		2.31±0.34	
Academic achievement	High ^a	56(28.87)	2.83±0.30	0.38 (.767)	3.59±0.30	2.67 (.072)	2.27±0.31	5.97 (.003) a>b=c
	Middle ^b	85(43.81)	2.79±0.34		3.44±0.32		2.36±0.33	
	Low ^c	53(27.31)	2.74±0.40		3.43±0.31		2.28±0.37	

Table 2. Degree of perceived health status, psychological well-being and health promoting behavior

	M±SD
Perceived Health Status	42.8±0.52
Psychological Well-being	2.27±0.28
Health Promoting Behavior	2.57±0.41

Respondents’ perceived health status, psychological well-being and health promotion behavior: The respondents’ perceived health status, psychological well-being and health promotion behavior are as presented in Table 2. The respondents scored an average of 42.8 out of 60 for perceived health status. This is lower than an average of 3.37 out of 5 in nursing students [18] and 4.42 in general students [19] and implies that college students have recently had poor perception of their health status due to various types of stress. They scored an average of 2.27 out of 5 for psychological well-being, which was similar to the findings from the research in college students; college students in early adulthood commonly scored lower for psychological well-being than the middle aged or other occupation groups, demonstrating instability characteristic of early

adulthood. They scored an average of 2.57 out of 5 for health promotion behavior. This result is also consistent with the findings from other studies [20]: college students are passive about health promotion behavior practice, fail to be psychologically stable and fail to be well aware of the importance of practice for health.

Correlation among perceived health status, psychological well-being and health promotion behavior: The correlation among psychological well-being, perceived health status and health promotion behavior is as presented in Table 3. Psychological well-being was significantly positively correlated with perceived health status ($r=.617, p<.000$) and health promotion behavior ($r=.516, p<.000$), significant positive correlation was found between perceived health status and health promotion behavior ($r=.667, p<.001$). As this study and Min [21] found that perceived health status was more strongly correlated with health promotion behavior, it has been confirmed that psychological well-being promotion is an important factor in improving health promotion behavior among college students. It is necessary to develop programs focusing on psychological well-being promotion for college students.

Table 3. Correlation among perceived health status, psychological well-being and health promotion behavior

	Perceived health status	Psychological well-being	Health promotion behavior
Perceived health status	1		
Psychological well-being	.617(.000)	1	
Health promotion behavior	.516(.000)	.667(.000)	1

Conclusion

This study is descriptive research aimed at determining the level of association among perceived health status, psychological well-being and health promotion behavior in college students and at providing basic data that could help improve health promotion behavior for college students in early adulthood. This study found that psychological well-being was correlated with perceived health status and health promotion behavior. This is an unstable period during which people can be very passive about the act of health care, have poor awareness of disease and unhealthiness and show a lower level of psychological well-being. It is therefore necessary to provide college students in early adulthood with opportunities to participate continuously in health promotion practice education, taking their characteristics into account and to develop customized programs so that they can have a will to participate in the education.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Risk Analysis of Metabolic Syndrome Affecting Osteoarthritis: Focused on the 6th Korean National Health and Nutrition Survey

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Abstract

Background/Objectives: With the rapid economic development and changes in living conditions in south Korea, the frequency of chronic diseases has been gradually increasing due to westernized eating habits and decreased physical activities. This study is a descriptive secondary analysis designed to provide basic data necessary to maintain healthy life for patients of osteoarthritis patients by analysing the risk of metabolic syndrome affecting osteoarthritis in Koreans.

Method/Statistical Analysis: Secondary analysis was conducted on the 6th KNHANESraw data provided by the Korean Ministry of Health and Welfare. A total of 4,571 adults aged 19 or older who received both health and medical examinations were selected for analysis.

Findings: 10.8% of total subjects were identified to have osteoarthritis. Logistic regression analyses after adjusting age, sex, education levels, smoking and drinking revealed that the odds ratio of osteoarthritis increased depending on waist circumference of the persons reviewed in the study (OR 1.474, 95% CI=1.121-1.938) in the metabolic syndrome components.

Improvements/Applications: In conclusion, this study showed the waist circumference only of other components of metabolic syndrome was significantly related to osteoarthritis in Korean adults. Therefore, this study suggested that intensive management of obesity including abdominal obesity be useful to prevent risks of osteoarthritis.

Keywords: *Metabolic syndrome, Osteoarthritis, Korean National Health and Nutrition Examination Survey, KNHANES.*

Introduction

Recently, the frequency of chronic diseases in south Korea has been gradually increasing due to rapid economic development and changes in living conditions, as well as westernized eating habits and

decreased physical activities. Accordingly, various chronic diseases are leading the main causes of death, in the order of malignant neoplasms (cancer), heart disease, cerebrovascular disease, diabetes, chronic lower respiratory disease and hypertension^[1]. The concept of metabolic syndrome emerged when it was announced that several risk factors for cardiovascular disease among these chronic diseases could increase the incidence of cardiovascular disease if they existed together in one person. It is known that the major risk factors of cardiovascular disease, such as abdominal obesity, hypertension, hyperglycemia and hyperlipidemia, occur simultaneously in clusters, especially insulin resistance,

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which is a common denominator, is known as the major etiology. The mechanism of outbreak of metabolic syndrome has not yet come to light, but it is caused by the interaction of environmental factors, including genetic factors and inappropriate eating habits. Genetic factors are difficult to control, but metabolic syndrome can be prevented by improving environmental factors^[2]. In advanced countries, about a quarter of the population has metabolic syndrome, the overall prevalence rate of metabolic syndrome in south Korea ranged from 20.1% in 1998 to 23.2% in 2012. In addition, the prevalence rate of metabolic syndrome, that is adjusted for age in the population of total adults, has been steadily increasing to 31.3%^[3-4]. It is also known that if the condition is not improved with metabolic syndrome, the risk of developing to cardiovascular disease is 2 times higher and the risk of developing to diabetes is 4 to 6 times higher^[5].

Meanwhile, osteoarthritis is the most general joint disease in adults, accompanied by extreme pain and severely impairing physical and functional disorders and degrading quality of life. In addition, osteoarthritis is a very heavy economic loss and health-related economic burden in that it is the second highest in medical expenses after hypertension^[6]. The prevalence rate of osteoarthritis in Koreans aged 50 and over was 12.5% between 2010 and 2013. By age, the 50s accounted for 4.7% and the 60s accounted for 14%^[4]. The proportion of the elderly population in Korea has been increased from 7.2% in 2000 to 13.1% in 2015 and 14.3% in 2018 due to the development of medical technology and improved living standards and is expected to go into a super-aged society at 2026 with 20% in^[7]. With this aging phenomenon, the prevalence rate of osteoarthritis is expected to continue to increase.

Both osteoarthritis and metabolic syndrome are chronic diseases and due to the characteristics of a rapidly aging society, the prevalence rate has continued to increase, affecting individuals or countries gradually with social and economic ways. In addition, cardiovascular disease and osteoarthritis, which are related to metabolic syndrome, are common risk factors for age and obesity and several epidemiological and biological studies show that similar inflammatory patterns in metabolic syndrome-related cytokine environments as osteoarthritis is no longer only degenerative. Recently, studies on the association of metabolic syndrome and osteoarthritis has been conducted in United Kingdom and the United States, a study conducted in Japan

has been reported that the increase in the number of components of metabolic syndrome and the prevalence rate of knee arthritis have been associated^[8]. In other words, studies on metabolic syndrome and osteoarthritis have been conducted internationally, but there are few studies regarding this subject in Korea.

Therefore, the purpose of this study is to provide basic data for maintaining healthy life of osteoarthritis patients by analysing the risk of metabolic syndrome affecting osteoarthritis in Koreans and identifying the association between metabolic syndrome and osteoarthritis.

Method

Study Design: This study is a secondary analysis study using raw data in 2014, the second year of the 6th KNHANES of the Ministry of Health and Welfare in Korea and is a descriptive research to determine the risk of metabolic syndrome affecting osteoarthritis in Koreans.

Research subject and data collection: The data of this study was analysed by receiving raw data on the KNHANES. Of the 7,550 persons surveyed in the study, 5,979 adults aged 19 or older received both health surveys and medical check-ups. Of these, 4,571 persons (1,927 males and 2,644 females) were subject to analysis, excluding those who had metabolic syndrome components and missing values of osteoarthritis.

Research Variable: The health survey questions in the KNHANES data were used such as monthly average income, education and economic activities, smoking, drinking and physical activities and the examination result was used for the analysis of physical measurements, blood pressure and blood. The demographic characteristics of the subjects were categorized by gender, age, marital status, education level and income level. The classification according to health behaviour was used by smoking, drinking, moderate physical activity days, weekly walking days, body mass index and stress perception rate, etc. The variables of osteoarthritis classified according to the subject's answers in health questionnaire. It is that those who answered with no osteoarthritis in the questionnaire were divided into 'group without osteoarthritis' and those who answered with osteoarthritis in the questionnaire were divided into 'group with osteoarthritis'. The diagnosis of metabolic syndrome was based on the diagnostic criteria of NCEP ATP III. The waist circumference was provided by the

Korean Society for Obesity [9], which is suitable for Koreans. A case of having three or more risk factors of blood pressure, waist circumference, blood sugar, HDL-cholesterol, or triglycerides as a component of metabolic syndrome is defined as metabolic syndrome.

Data analysis method: Statistical analysis was conducted using the IBM SPSS 23 program and statistical significance test level was $p < 0.05$. The risk of osteoarthritis according to metabolic syndrome components and metabolic syndrome was analysed by logistic regression.

Result

General, physical and psychological factors:

In this study, the prevalence rate of osteoarthritis was 10.8% of the total subjects. The prevalence rate of osteoarthritis by gender was 4.5% for male and 15.4% for female, which was higher for female than for male ($p < .001$). The prevalence rate of osteoarthritis by age was 0.4% under 40s, 1.7% in 40s, 9.8% in 50s, 22.1% in 60s and 29.6% in 70s and older ($p < .001$). The prevalence rate of osteoarthritis according to the marital status was 12.7% in married group, which was higher than 0.4% in unmarried group ($p < .001$). The prevalence rate of osteoarthritis according to education level was elementary school undergraduates, 28.9%, elementary school graduates, 13.7%, high school graduates, 5.3%, university graduates, 2.7% that is the higher the educational background was low of the prevalence rate of osteoarthritis ($p < .001$).

The prevalence rate of osteoarthritis according to the classification of the fourth-tier income level was 23.0% for the low class, 10.9% for the middle-low class, 8.2% for the middle-upper class and 5.8% for the upper class, with a lower rate of osteoarthritis as income increases ($p < .001$).

As a result of analysing the difference in osteoarthritis prevalence rate according to health behaviour, the rate of osteoarthritis prevalence was 13.8% in non-smoking groups, 7.4% in the past smoking groups and 3.1% in the current smoking group and lower in current smoking group ($p < .001$). 15.1% in non-drinking groups, 7.7% in moderate drinking groups and 6.2% in severe drinking groups. The higher the frequency of drinking, the lower the prevalence of osteoarthritis ($p < .001$). The prevalence rate of osteoarthritis due to moderate physical activity was higher in the group who did not exercise 6.0%, less than 3 days a week, 5.6% and 11.6% more than 3 days

a week ($p < .001$). The prevalence rate of osteoarthritis according to the number of days of walking per week was in the group who did not walk per week, 12.9%, 8.2% for less than 3 days a week and 10.6% for more than 3 days a week ($p = .013$). The prevalence rate of osteoarthritis according to BMI was 8.8% under 25.0(normal) and 15.1% over 25.0(obesity). The prevalence rate of osteoarthritis according to the stress perception rate was 10.6% with low stress and 10.2% with high stress, so there was no difference between the two groups.

Effects of metabolic syndrome affecting osteoarthritis:

The risk of metabolic syndrome affecting osteoarthritis is as shown in [Table 1]. In metabolic syndrome, the risk of osteoarthritis was 2.318times higher, in fasting glucose was 1.497 times higher, in HDL cholesterol was 1.721 times higher and in triglycerides 1.746 was higher in the abnormal group than in the normal group [Table 2].

Table 1. Odds ratio of osteoarthritis according to metabolic syndrome (N=4571)

Metabolic syndrome	Osteoarthritis	
	Odds ratio	95% CI
Abnormal(Ref. Normal)	2.318	1.913-2.808

Table 2. Odds ratio of osteoarthritis according to components of metabolic syndrome (N=4571)

Variables	Osteoarthritis	
	Odds ratio	95% CI
BP	2.376	1.966-2.871
WC	2.215	1.822-2.692
FPG	1.497	1.237-1.811
HDL-Cholesterol	1.721	1.417-2.089
TG	1.746	1.447-2.108

BP: Blood pressure, WC: Waist circumference, FPG: Fasting plasma glucose, TG: Triglycerides

Risk of osteoarthritis by metabolic syndrome:

The risk factors of osteoarthritis tested by multivariate analysis with statistically significant variables extracted from multivariate analysis are shown in [Table 3]. The risk of osteoarthritis in gender was 5.772 times higher for female (95% CI=3.548-9.392) compared to male. The risk of osteoarthritis in age was 2.792 times in 40s (95% CI=1.019-7.651), 50's 14.869 times (95% CI=6.026-36.687), 60's 37.514 times (95% CI=15.097-93.214), over 70's 45.620 times (95% CI=17.895-116.297), the older the age, the greater the risk of osteoarthritis. At the education level compared to the elementary graduates,

the risk of osteoarthritis was 0.632 times (95% CI=0.442-0.904) for high school graduates and 0.537 times (95% CI=0.334-0.849) for university graduates and 0.747 times (95% CI=0.515-1.086) for middle school graduates but not statistically significant.

The risk of osteoarthritis of metabolic syndrome was 1.167 times higher in the abnormal group than in the normal group, but it was not statistically significant.

Table 3. Risk of osteoarthritis according to metabolic syndrome (N=4571)

Variables	Osteoarthritis	
	Odds ratio	95% CI
Women(Ref. Men)	5.772	3.548-9.392
Age (Ref. ≤39)		
40~49	2.792	1.019-7.651
50~59	14.869	6.026-36.687
60~69	37.514	15.097-93.214
≥70	45.620	17.895-116.297
Married (Ref. Unmarried)	2.400	0.700-8.227
Education level (Ref.<Elementary)		
Middle school	0.747	0.515-1.086
High school	0.632	0.442-0.904
>University	0.537	0.340-0.849
Income level (Ref. Low)		
Middle low	1.062	0.752-1.500
Middle high	1.499	1.034-2.173
High	1.004	0.660-1.528
Smoking (Ref. No smoker)		
Past smoker	1.622	0.994-2.647
Current smoker	0.992	0.578-1.700
Drinking (Ref. No drinker)		
Moderate drinker	0.759	0.569-1.012
Heavy drinker	0.864	0.590-1.267
Metabolic syndrome (Ref. Normal)	1.167	0.901-1.513

Discussion

The prevalence rate of osteoarthritis in this study was 10.8%, that female was higher than that of males and increased with age. This is consistent with a study on osteoarthritis in Korea [9], which appears to be higher than that of men as women grow older due to a decrease in female hormones after menopause. The prevalence rate of osteoarthritis caused by health behavioural factors was higher in non-smoking and non-drinking groups and the results were consistent with preceding studies [6,10-11]. This appears to be due to the high number

of osteoarthritis in women who have a high proportion of non-smokers and non-drinkers.

The body mass index showed a higher risk of osteoarthritis in cases higher than 25.0 than BMI below 25.0, which was consistent with preceding studies [2,12] that increased BMI raises the risk of osteoarthritis in the knee [13] and the U.S. NHANES reported that higher BMI increases the risk of knee osteoarthritis [13]. Only the waist circumference showed statistically significant results as an influence variable for osteoarthritis among metabolic syndrome components and these results were consistent with existing studies [13-14]. Previous studies have shown that obesity is associated with the development of osteoarthritis. However, In Korea, there are many cases of light and severe obesity and abdominal obesity compared to Westerners. It means despite low waist circumference and low BMI, risk factors for other chronic diseases as a high aspect seems to be increased [14].

In addition, according to the 5th Annual Report of the KNHANES [15], abdominal obesity was 18.3% in people aged 19 to 64 and 46.1% in people aged 65 or older, while BMI measures 24.1% in adults aged 19 to 64 and 37.8% in people aged 65 or older. In other words, in adults under 64 years of age, obesity by BMI is higher than abdominal obesity, while in people over 65 it is more likely to be abdominal obesity is higher than BMI [14]. The study also found that the prevalence rate of abdominal obesity is 21.2% for those under 65 years old and 34.2% for those over 65 years old, with the prevalence rate of osteoarthritis rising much higher. Therefore, it is necessary to control obesity including abdominal obesity and education should be strengthened to prevent and improve osteoarthritis in the future. In addition, as the number of risk factors of metabolic syndrome components increased, the risk of osteoarthritis increased and common risk variables among upper combinations were blood pressure and waist circumference, which would also be necessary to control the combination for each component.

Conclusion

This study is a descriptive secondary analysis designed to examine the association between metabolic syndrome and osteoarthritis in adults by analysing the raw data of 4,571 adults from the 6th KNHANES in south Korea.

In metabolic syndrome, the risk of osteoarthritis was

2.318 times higher, in fasting glucose was 1.497 times higher, in HDL-cholesterol was 1.721 times higher and in triglycerides 1.746 was higher in the abnormal group than in the normal group.

In conclusion, the importance of abdominal obesity control should be emphasized considering the relation with osteoarthritis of metabolic syndrome. In addition, since metabolic syndrome and osteoarthritis are multifactorial diseases and more risk factors for metabolic syndrome components cause to increase the risk of osteoarthritis, it is necessary to control each component as well.

This study is a secondary study that extracts and re-analyzes part of the master's thesis by Kim ^[16].

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Source of Funding: Self

Conflict of Interest: Nil

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The Effects of Critical Thinking Disposition, Perception of Others and Empathy on Communication Competency among Students Majoring in Nursing

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Abstract

Background/Objectives: This study seeks to identify correlations among critical thinking, perception of others and communication competency among nursing school students

Method/Statistical Analysis: Survey respondents were 1st, 2nd, 3rd and 4th year students majoring in nursing at three universities of Chung Nam and Chung Buk who understood the objectives of the study and who gave their consent on participation.

Findings: The critical thinking of subjects scored 3.27(1~5), their perception of others scored 3.35(1~5), empathy scored 3.15(1~5) and communication skills was 3.34(1~5). Variables affecting respondents' communication competency were critical thinking disposition 27.5% ($\beta=0.42$, $p<0.001$), peer relationships 7.8% ($\beta=0.27$, $p<0.001$) and perception of others 6.2% ($\beta=0.27$, $p<0.001$) with a total explanatory power of 41.5%. The study found out that, among those independent variables, critical thinking disposition has the greatest effect on communication competency.

Improvements/Applications: Based on these findings, it seems necessary to develop curriculums and programs that include strategies for smooth communication competency and improved critical thinking among nursing school students.

Keywords: Nursing school students, critical thinking, communication competency, empathy, perception of others.

Introduction

Communication competence is the ability to clearly express one's opinion, or clearly describe one's point of view when the other person's opinion is different from one's own opinion [1]. To nursing school students who have to satisfy nursing demands of

patients in the relationship with patients and people with different professions, it is very important to improve communication competence from college days [2].

Critical thinking is the process where one judges on what to rely on among given contents. As critical thinking ability in nursing process allows nurses to make decisions based on reasons, it is very important in clinical practices [3].

To improve communication competence, the process in which one can correctly perceive the other person and have empathy with the person is needed [4]. The higher one has ability to perceive the other person, the more one can focus on the other person in communication process and the more correctly one can get the information about

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the other person [5]. Consequently, perception of others can be considered as an element affecting communication competence of nursing school students.

Empathy is the ability to see the situation with the view of the other person and communicate by understanding the other person's emotion without criticism [6]. Empathy is the ability to communicate with the other person by accurately expressing the internal meaning of emotion the other person cannot express [7]. In nursing, empathy is an important means to form treatment relations with patients and induce cooperation with persons in other professions and strategy to provide effective nursing [8].

Previous researches have suggested variables related with communication competence among nursing school students as follows: one's opinion [9], self respect [9, 10], emotional intelligence, empathic ability [10, 11], grade [11], stress from clinical training [10], perception of oneself and the other person [12] and critical thinking disposition [2]. But, there are not enough researches examining relationship among critical thinking disposition, perception of others and empathic ability. Accordingly, this research intends to examine critical thinking disposition, perception of others and empathic ability and factors affecting communication competence and provide basic sources to develop strategies to improve communication competence.

Materials and Method

- 1. Design:** This research is a descriptive survey research to examine the effect of critical thinking disposition, perception of others and empathic capacity on communication competence among nursing school students.
- 2. Subjects:** This research did a survey to students in nursing departments in 3 universities located in Chungcheongnamdo and Chungcheongbukdo. Those students are from freshmen to senior students. They understood the purpose of this research and agreed to participate in this survey. They signed the agreement on participating in this survey and, they filled out structured questionnaire. The size of samples was calculated with the help of G*Power program. The program demonstrated that the minimum number of respondents needed to do multiple regression analysis using about 7 variables, middle size effect .15, significance level 0.5 and test power .95 is 153. Thus, this research

did survey to 200 respondents and, 197 copies of the questionnaire were used for analysis, excluding 3 copies which were not answered properly.

3. Tools:

Communication Competency: To measure communication competence, this research used Global Interpersonal Communication Competence (GICC) scale developed by Huh Gyeong-ho [13]. The reliability of the tool when Huh developed the scale was Cronbach's $\alpha = 72$. In this research, Cronbach's α was .85.

Critical thinking disposition: To measure critical thinking disposition, this research used the tool developed by Gwon In-soo et al. [13]. The reliability of the tool when they developed the scale was Cronbach's $\alpha = .89$. In this research, Cronbach's α was .88.

Perception of others: To measure perception of others, this research used the tool developed by EunHyeok-gi to test perception of others among Korean adolescents [14]. The reliability of the tool when they developed the scale was Cronbach's $\alpha = .85$ and, in this research, Cronbach's α was .89.

Empathy: To measure empathic capacity, this research used Interpersonal Reactivity Index (IRI) developed by Davis [15] and translated into Korean by Gang Il, et al. The reliability of the tool when Davis developed the scale was Cronbach's $\alpha = .89$. In this research, Cronbach's α was .88.

- 4. Data analysis:** Collected data were analyzed using SPSS 21.0 statistical program. The characteristics of respondents were measured by frequency distributions. Critical thinking disposition, perception of others, empathy and communication competence were analyzed by means and standard deviation. The relationship between general characteristics of nursing school students and their communication skill was analyzed by t-test and ANOVA. Scheffe-test was used for ex-post analysis. The relationships among critical thinking disposition, perception of others and communication competence were analyzed by Pearson's correlation coefficient. To examine variables affecting communication competence of respondents, this study did stepwise multiple regression analysis.

- 5. Ethical Consideration:** To respondents of the survey, this research explained the purpose of the survey and explained that they could stop answering

questions during the survey. The questionnaire was distributed only to students who agreed to and would voluntarily participate in the survey.

Results and Discussion

General characteristics of subjects: The average age of respondents was 21.7 years old and proportion of females was 82.9%. The distribution of students per school year was as follows: Freshmen 30.0%, seniors 25.2%, sophomores 23.3% and juniors 21.4%. To the

questions on motive of choosing nursing as major, 45.2% of respondents answered that they could find jobs easily after graduation, followed by 31.0% who said that their high school scores allowed them to apply for the nursing department and who said their aptitude fit nursing. In satisfaction with major, 41.9% of them said they were “satisfied” and 34.3% said “So so”. In relationship with friends, 48.1% said they had good relationship and 30.0% said “So so”. (See Table 1.)

Table 1. General characteristics of respondents

Characteristics	Classification	N (%)	M±SD
Age			21.73±2.43
Gender	Male	36(17.1)	
	Female	174(82.9)	
Religion	Yes	50(23.8)	
	No	160(76.2)	
Grade	Freshman	63(30.0)	
	Sophomore	49(23.3)	
	Junior	45(21.4)	
	Senior	53(25.2)	
Motive to choose nursing as major	Considering high school scores	9(4.3)	
	Aptitude and hobby fit nursing	65(31.0)	
	Easy to find jobs after graduation	95(45.2)	
	Recommended by parents or teachers	35(16.7)	
	Others	6(2.9)	
Satisfaction with major	Not satisfied at all	6(2.9)	
	Not satisfied	20(9.5)	
	So so	72(34.3)	
	Satisfied	88(41.9)	
	Very satisfied	24(11.4)	
Relationship with riends	Very bad	2(1.0)	
	Bad	2(1.0)	
	So so	6.3(30.0)	
	Good	101(48.1)	
	Very good	42(20.0)	

Differences in communication competency depending on general Characteristics: In the relationship between general characteristics of respondents and communication competency, gender (t=-1.75, p=.081), religion (t=-1.208,p=.205), school year (F=.18, p=.905), motive to choose nursing as major (F=1.06, p=.376) did not have any statistically

meaningful differences. But relationship with friends (F=4.58, p=.001) and satisfaction with major (F=2.87, p=.024) did have statistically meaningful differences. Scheffe ex-post test showed that good and very good relationship with friends significantly boosts communication competency (See Table 2.).

Table 2. Difference in communication competency depending on general Characteristics

Characteristics	Classification	M±SD	t or F	p
sex	Male	3.23±.42	-1.75	.081
	Female	3.36±.41		
Religion	Yes	3.28±.36	-1.20	.228
	No	3.36±.43		
Grade	Freshman	3.35±.38	.18	.905
	Sophomore	3.35±.39		
	Junior	3.36±.52		
	Senior	3.30±.39		
Relationship with friends	Very bad	3.40±.18	4.58 d,e>c	.001
	Bad	3.20±.28		
	So so	3.16±.31		
	Good	3.42±.37		
	Very good	3.43±.58		
Motive to choose nursing as major	Considering high school scores	3.35±.46	1.06	.376
	Aptitude and hobby fit nursing	3.40±.40		
	Easy to find jobs after graduation	3.29±.42		
	Recommended by parents or teachers	3.35±.43		
	Others	3.55±.30		
Satisfaction with major	Not satisfied at all	3.00±.32	2.87	.024
	Not satisfied	3.19±.35		
	So so	3.31±.39		
	Satisfied	3.39±.42		
	Very satisfied	3.48±.47		

Correlations among critical thinking disposition, perception of others, empathy and communication competency: Critical thinking disposition and communication competency are significantly correlated

($r=.528$, $p<.001$) and empathy and communication competency are significantly correlated ($r=.416$, $p<.001$) and perception of others and communication competency are significantly correlated ($r=.452$, $p<.001$)[Table 3].

Table 3. Correlations among critical thinking disposition, perception of others, empathy and communication competency

	Critical thinking disposition	Percept-ion of others	Empathy	Communi-cation Compete-ncy
Critical thinking disposition	1			
Perception of others	.394** ($<.001$)	1		
Empathy	.571** ($<.001$)	.478** ($<.001$)	1	
Communicat-ion Competency	.528** ($<.001$)	.452** ($<.001$)	.416** ($<.001$)	1

Variables affecting communication competency: To examine relative influences of critical thinking disposition, perception of others and empathy on communication competency, this research did multiple

regression analysis using 5 independent variables: 2 general characteristics variables which were found to be statistically significant—relationship with friends and satisfaction with major - and above 3 variables

- critical thinking disposition, perception of others and empathy. The analysis showed that the following three variables had 41.5% explanatory power in total: critical thinking disposition 27.5% ($\beta=.421, p<.001$), relationship with friends 7.8% ($\beta=.272, p<.001$) and perception of others 6.2% ($\beta=.276, p<.001$).

Before conducting multiple regression analysis,

this research did multicollinearity test and found that tolerance limits are .843~.998, above 0.1 and Variance Inflation Factor, (VIF) was 1.002~1.186, below 10. Thus, multicollinearity was not the problem. And independency of standard residuals test showed that Durbin-Watson statistics was 2.057, near 2. Thus, there was no problem [Table 4].

Table 4. Variables affecting communication competency

Variable	B	β	SE	t	p	Adj R2	F	p
Constant	.560		2.45	2.28	.024		50.38	<.001
Critical thinking Dispositi-on	.573	.421	.078	7.30	<.001	27.5		
Relationship with friends	.245	.272	.048	5.14	<.001	35.3		
Perception of others	.221	.276	.046	4.78	<.001	41.5		

Discussion

This research intended to examine critical thinking disposition, perception of others and empathy and variables affecting communication competency among nursing school students and provide basic sources for making and implementing educational programs in the future.

Among general characteristics of respondents, relationship with friends and satisfaction with major make significant differences in communication competency. In the relationship between relationship with friends and communication competency, 'good' and 'very good' relations with friends improve communication competency of respondents compared with 'so so' relations with friends. It means that good relations with friends have positive effect on communication competency. In the same context, satisfaction with major boosts communication competency. Such findings are consistent with findings of Lee & Chung [16], Kwak et al. [10] and Ji [8]. The results seem to be caused by the facts that positive perception on major affects attitudes on professional jobs as well as knowledge area through theoretical education and training education.

There were positive correlations among critical thinking disposition, perception of others, empathy and communication competency. It supports the findings of other researches that the higher critical thinking disposition is [16, 17], the higher empathy is [10, 18], the higher perception of others is [12, 19, 20], the higher communication competency is. Communication

competency is an essential capacity nurses should be equipped with and the basic capacity nursing school students should be equipped with. As it will ultimately improve clinical performance ability of nurses, it is necessary to cultivate communication competency through various learning method in the courses related with communication in the curriculum.

As variables predicting communication competency, critical thinking disposition, relationship with friends and perception of others had explanatory power of 41.5%. While Kwak et al. [10], Jeong et al. [18] found out that empathy affects communication competency, this research did not find such a relationship between the two variables. In the previous research, critical thinking disposition affects communication competency and lets nurses make decisions focusing on foundation basis [21].

If critical thinking disposition is internal to individuals, it is necessary to lead nurses to take care of patients by suggesting rational and reasonable knowledge as basis toward examining the problem of the objects more specifically and minimizing conflicts with the objects [17]. Considering that improvement of critical thinking disposition is the basic premise to improve communication competency, a core capacity of nurses, it is very important to make efforts to cultivate such capacity in nursing education [16]. Consequently, it is necessary to change educational environment or teaching method of nursing education toward improvement of critical thinking disposition [21].

Good relationship with friends was shown to improve communication competency. As there is no previous research dealing with the relationship between the two variables, repetitive researches on it are required. Perception of others means to pay attention to attitudes, action, or feature of others and think of internal thinking and emotion of others [20]. Perception of others is an important element of communication competency. The more attentive one is to others, the higher one is likely to communicate well with others [22]. It seems necessary to do continuous researches on communication competency in the future.

Conclusion

This research is a descriptive survey research to examine the effects of critical thinking disposition, perception of others and empathy on communication competency among nursing school students. The analysis found out that those variables like critical thinking disposition, relationship with friends and perception of others have effects on communication competency. This research is significant in that it suggests a direction in educational programs and implementation of them on communication competency. The findings of this research can be used as basic sources in searching for effective learning strategies to cultivate communication competency and apply and evaluate them. Based on such findings, this research suggests that we need researches on concrete practical ways to improve communication competency among nursing school students.

Ethical Clearance: Not required

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Changes in the Health-related Quality of Life among Korean Adults: Data Comparison between 2007 and 2017

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Abstract

Background/Objectives: The purpose of this study was to analyze and compare changes in Koreans' health-related quality of life between 2007 and 2017.

Method/Statistical Analysis: A secondary analysis was conducted using raw data from 3,854 adults over 20 years old using the Korean National Health and Nutritional Examination Survey (KNHANES) statistics for 2007 and 2017.

Findings: In 2007 the health-related quality of life (EQ-5D) among respondents was 0.97 and it was 0.98 in 2017, which indicated that there were not significant changes in this area. However, among other EQ-5D items, particularly with regard to anxiety and depression, there was a significant decrease noted in 2017 compared to 2007. In addition, socio-economic factors such as level of education and marital status affected health-related quality of life.

Improvements/Applications: It is necessary to develop and manage policies that take into consideration factors affecting people's health-related quality of life.

Keywords: *Quality of life, HR-QoL, EQ-5D, Korean, KNHANE.*

Introduction

As medicine and technology have developed, the world's elderly population has also grown dramatically. This growth in the elderly population has also tended to increase morbidity rates through chronic illness and medical costs. Promoting health-related quality of life (below HR-QoL) is one of the most important tasks of the government, as health and happiness in life is more important than living longer. The Korean government has also tried to establish a fundamental model for various public health and well-being services to improve people's health-related quality of life. HR-QOL is an

individual's or a group's perceived physical and mental health over time. The Korea Centers for Disease Control and Prevention website provides general information about health-related quality of life, such as HR-QOL surveillance and its role in public health practice. The site also lists HR-QOL trend data by state and demographics using our online HR-QOL data application^[1].

HR-QOL is an individual's perceived physical, mental and social health based on their individual's experiences, faith, expectations and level of awareness. The importance of the HR-QoL has gradually increased because it is an independent factor that affects various medical situations such as death and hospitalizations^[2,3].

The survey used the HR-QoL questionnaire from the Korean National Health and Nutritional Examination Survey (KNHANES) and it contained 5 sections, so called Euro QoL-5 dimensions (EQ-5D) asking about current health conditions^[4]. Past research indicated that health related quality of life was closely related to

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socio-economic factors including education and income. This study focused on Koreans' HR-QoL from 2007 to 2017 with the goal of examining and investigating demographic factors that affect HR-QoL over time and to examine factors that need to be considered when implementing public health and well-being service models.

Method

This study performed a secondary analysis of the Korean National Health and Nutritional Examination Survey (KNHANES) data for 2007 to 2017.

The total number of subjects who participated in the Korean National Health and Nutritional Examination Survey (KNHANES) for 2007 were 4,594 and 8,127 in 2017. Of those subjects, 3,854 were included in the study because they were over 20 year old (1,286 in 2007 and 2,568 in 2017), answered all of the study variables and denied having an illness.

This study used the health related survey questionnaire from the Korean National Health and Nutritional Examination Survey (KNHANES). Demographic variables included sex, age, residential area, education level, marital status, household composition, household income level and occupation. Variables associated with physical and mental health included subjectively perceived health condition, activity confinement, perceived usual stress level, depression (in the past 2 weeks), suicidal ideation (in the past year) and body mass index(BMI).

The EQ-5D was used to measure HR-QoL. The EQ-5D is a standardized instrument that measures HR-

QoL and it is composed of 5 items/areas. The EQ-5D index was obtained by applying a weighted value to the measured score of each question. The score variation was 0 through 1 and higher scores indicated a better quality of life [5].

The study analysis was conducted by following usage guidelines of the Korean National Health and Nutritional Examination Survey (KNHANES) suggested by KNHANES. The raw materials of KNHANES were used for complex sample design.

The differences of EQ-5D index score of Korean adults between 2007 and 2017 were determined by using the complex sample Chi-square test. The socio-economic factors affecting the health-related quality of life of Korean adults in 2007 and 2017 were determined by using the complex sample general linear model (CSGLM) respectively. SPSS version 19.0 (SPSS Inc. Chicago, IL, USA) was used to measure the data and significance level was below 0.05.

Result and Discussion

Changes in Korean Adults' HR-QoL: [Table 1] presents changes in Korean adults' HR-QoL. In the past ten years, there were no significant differences in Korean adults' HR-QoL as the EQ-5D index indicated 0.97 for 2007 and 0.98 for 2017 (Wald F=2.39, p=0.123).

In EQ-5D, the only category to show a significant difference between 2007 and 2017 was anxiety/depression. This data indicates that the category of anxiety and depression had improved in 2017 compared to 2007 ($\chi^2=19.18$, p<0.001).

Table 1. EQ-5D index score of Korean adults

Categories	2007 (n=1286)		2017 (n=2568)		χ^2	p
	Value (%) ^a	SE (%) ^a	Value (%) ^a	SE (%) ^a		
EQ-5D: mobility						
1	96.4	0.50	96.1	0.40	0.74	0.473
2	3.6	0.50	3.8	0.40		
3	-	-	0.1	0.10		
EQ-5D: self-care						
1	99.3	0.20	98.9	0.20	1.24	0.288
2	0.7	0.20	1.1	0.20		
3	-	-	-	-		

Categories	2007 (n=1286)		2017 (n=2568)		χ^2	p
	Value (%) ^a	SE (%) ^a	Value (%) ^a	SE (%) ^a		
EQ-5D: usual activities						
1	98.2	0.30	98.0	0.40	0.79	0.450
2	1.8	0.30	1.8	0.40		
3	-	-	0.1	0.10		
EQ-5D: pain/discomfort						
1	85.5	1.10	85.7	0.70	0.34	0.699
2	14.0	1.10	13.9	0.70		
3	0.5	0.20	0.4	0.10		
EQ-5D: anxiety/depression						
1	90.8	0.90	95.8	0.40	19.18	<0.001
2	9.0	0.90	4.1	0.40		
3	0.2	0.10	0.1	0.10		
EQ-5D index (M±SE)	0.97±0.002		0.98±0.001		Wald F=2.39	0.123

Value= Estimated value, SE= Standard error, a=Weighted value, EQ-5D: European quality of life-5 dimensions used as a measure of health-related quality of life (HR-QoL)., 1=Performed well, 2=Performed with a few difficulties, 3=Performed badly

HR-QoL comparison in socio-demographic characteristics between 2007 and 2017: According to the study's results regarding the HR-QoL related to socio-demographic characteristics, females, subjects in their 40s and those subjects who lived in urban and countryside areas showed significant differences.

Among women, the HR-QoL was significantly different for females in 2007 and women in 2017 (F=8.27, p=0.004). Significant differences were also noted among subjects in their 40s, where 95% CI of the HR-QoL was 0.97~0.98 in 2007 and 0.98~0.99 in 2017 (F=8.11, p=0.005). Among study subjects who lived in urban areas, 95% CI of their HR-QoL was 0.96~0.98 in 2007 and 0.98~0.98 in 2017, thus indicating that there was a significant difference (F=4.17, p=0.042). That is, compared to 2007, in 2017 the HR-QoL of women in their 40s and who lived in an urban areas had improved.

Factors affecting Korean adults' HR-QoL in 2007:

[Table 2] presents the factors affecting Korean adults' HR-QoL in 2007.

As the subject's age range for 2007 was converted into covariates, sex was the main factor that affected the HR-QoL for Korean adults in 2007. The EQ-5D

index score for Korean men in 2007 was higher than women and this indicated that the HR-QoL of Korean men in 2007 was also higher than that of women (Wald F=17.38, p<0.001). By exploring the HR-QoL according to subjects' educational level, scores for those with an elementary school or below education level were lower than for the subjects who were college students or graduates (95% CI= -0.055~-0.004, p=0.023).

As the study subjects aged, their HR-QoL lowered by 0.001 each year (Wald F =12.09, p=0.001).

The explanation power for socio-demographic variables among the HR-QoL of Korean adults in 2007 was 11.2% (Wald F=4.34, p<0.001).

The Oh's study^[6] about factors affecting the HR-QoL by age group (such as young age group, middle age group and elderly age group,) noted that the women's HR-QoL was low and both genders showed more differences in elderly age group. This study also noted that walking was one of the factors that affected the HR-QoL, thus emphasizing its importance. Factors affecting the HR-QoL played a more influential role for the middle and elderly age groups than young age group. Consequently, it is important to study factors negatively affecting the HR-QoL beginning at a young age.

Table 2. HR-QoL by the socio-demographic characteristics of Koreans in 2007 (N=1286)

Categories	95% CI Lower limit	95% CI Upper limit	p	Wald F	p
(constant)	0.979	1.025	<0.001	7153.18	<0.001
Sex					
Male	0.008	0.022	<0.001	17.38	<0.001
Female ^a	.	.	.	.	.
Residential area					
Seoul	-0.011	0.006	0.618		
Urban area	-0.012	0.004	0.307	0.54	0.583
Provincial area ^a	.	.	.	.	.
Education					
≤Elementary	-0.055	-0.004	0.023		
Middle	-0.029	0.005	0.173	1.98	0.118
High	-0.009	0.006	0.685		
≥University ^a	.	.	.	.	.
Marital status					
Married	-0.008	0.011	0.725	0.12	0.725
Others ^a	.	.	.	.	.
Household composition					
1	-0.020	0.019	0.989		
2~3	-0.017	0.018	0.977	0.02	0.994
4~5	-0.015	0.017	0.882		
≥6 ^a	.	.	.	.	.
Household income level					
Lower class	-0.026	0.001	0.062		
Lower-Middle	-0.009	0.006	0.722	1.28	0.282
Upper-Middle	-0.010	0.005	0.505		
Upper class ^a	.	.	.	.	.
Occupation*					
A	-0.005	0.012	0.441		
B	-0.017	0.008	0.501		
C	-0.004	0.019	0.212		
D	-0.020	0.023	0.892	1.08	0.371
E	-0.011	0.018	0.653		
F	-0.001	0.025	0.061		
G ^a	.	.	.	.	.
Age	-0.001	<0.001	0.001	12.09	0.001

Model summary: $R^2=0.112$, Wald $F=4.34$, $p<0.001$, 95% CI=95% Confidence Interval, a =Reference category, Occupation*: A=Managers, B=Clerical workers, C=Service and sales workers, D=Farm and fishery skilled workers, E=Technicians, machine operations and assembly line workers, F=Simple labor workers, G=Unemployed

Factors affecting Korean adults' HRQoL in 2017:

[Table 3] presents the factors affecting Korean adults' HR-QoL in 2017.

As subject's age among Korean adults in 2017 was converted into covariates, educational level (Wald $F=3.02$, $p=0.030$) and marital status (Wald $F=4.82$, $p=0.029$) were the main factors that affected the HR-QoL for Korean adults in 2017.

Those with an elementary school education level had lower quality of life compared to college graduates or those with a higher education level (95% CI= -0.037 ~-0.006, $p=0.007$). Related to marital status, the study subjects who were married indicated having a higher quality of life compared to the group of others (95% CI= 0.001 ~0.016, $p=0.029$).

Household income was not a significant factor affecting the total HR-QoL (Wald $F=2.47$, $p=0.062$),

but it indicated partially significant differences. The study subjects in the low income household group had a lower HR-QoL compared to those in the higher income household group (95% CI= -0.043 ~-0.007, p=0.008). This matched Kraus and Tan’s study results [7], which indicated that socio-economic status influences not only physical and mental health, but also social mobility.

Like the 2007 results, as the study subjects got one year older, their HR-QoL lowered by 0.001 in 2017 (Wald F =14.96, p<0.001).

The explanation power for the socio-demographic variables in the HR-QoL among Korean adults in 2017 was 6.7% (Wald F=3.69, p<0.001).

While numerous studies[8-9] indicated that several factors (younger age, male gender, higher level of education, higher annual household income, status of employment and marital status) affected the HR-QoL individually, this study’s results indicated that education level and socio-economic factors were more closely related to the HR-QoL.

Kim and Park’s research[10] supported this study’s findings that educational attainment was one of variables affecting the subjects’ HR-QoL. Both studies found that higher educational attainment correlated with quality of life and HR-QoL. Socio-economic status and subjective social class affected not only health related quality of life, but also overall quality of life. According to Robert et al.[11], an increased life span and economic growth has improved the HR-QoL in all age groups of subjects, but this change was hidden by an average score among the population and it is therefore important to focus on health differences by economic status for each age group.

Consequently, socio-economic status and level of education are important variables that should be considered when developing a program related to improving the health related quality of life. It is especially important to take into consideration that subjects with a lower socio-economic status might show different results in health related quality of life and overall quality of life.

Table 3.HR-QoLby the socio-demographic characteristics of Korea in 2017 (N=2568)

Categories	95% CI Lower limit	95% CI Upper limit	p	Wald F	p
(constant)	0.973	1.022	<0.001	11868.49	<0.001
Sex					
Male	-0.001	0.009	0.123	2.39	0.123
Female ^a	.	.	.		
Residential area					
Seoul	-0.005	0.007	0.754	1.13	0.324
Urban area	-0.001	0.009	0.144		
Provincial area ^a	.	.	.		
Education					
≤Elementary	-0.037	-0.006	0.007	3.02	0.030
Middle	-0.029	0.004	0.138		
High	-0.008	0.003	0.329		
≥University ^a	.	.	.		
Marital status					
Married	0.001	0.016	0.029	4.82	0.029
Others ^a	.	.	.		
Household size					
1	-0.010	0.035	0.277	1.06	0.364
2~3	-0.017	0.024	0.745		
4~5	-0.016	0.026	0.668		
≥6 ^a	.	.	.		

Categories	95% CI Lower limit	95% CI Upper limit	p	Wald F	p
Household income					
Lower class	-0.043	-0.007	0.008	2.47	0.062
Lower-Middle	-0.010	0.003	0.275		
Upper-Middle	-0.006	0.004	0.613		
Upper class ^a	.	.	.		
Occupation*					
A	-0.008	0.005	0.639	0.80	0.565
B	-0.003	0.008	0.300		
C	-0.009	0.007	0.769		
D	-0.011	0.025	0.434		
E	-0.003	0.015	0.193		
F	-0.012	0.014	0.904		
G ^a	.	.	.		
Age	-0.001	<0.001	<0.001	14.96	<0.001

Model summary: $R^2=0.067$, Wald $F=3.69$, $p<0.001$, 95% CI=95% Confidence Interval, a =Reference category, Occupation*: A=Managers, B=Clerical workers, C=Service and sales workers, D=Farm and fishery skilled workers, E=Technicians, machine operations and assembly line workers, F=Simple labor workers, G=Unemployed

Conclusion

In 2007 and 2017, the health related quality of life among Korean adults did not show any significant differences. However, a couple of socio-demographic factors affected the HR-QoL in 2007 and 2017. In 2007, men showed a higher HR-QoL compared to women, but there was no significant difference in 2017 and it indicated that sex did not affect the HR-QoL. In 2007, the level of education had some effect on the HR-QoL. In 2017, the level of education and marital status affected the HR-QoL of Korean adults and household income had some effect on the HR-QoL. In 2017, the study results indicated that educational attainment, marital status and economic factors played more significant roles in determining the HR-QoL.

In spite of the government's promotion of health-related policies, social economic status including income, education and assets continues to affect its citizens overall health and quality of life. It is necessary to understand health-related quality of life by considering socio-economic factors by age group when examining fundamental policies. When developing a program, it is equally important to consider the impact of a person's economic status on their health condition in order to improve their health-related quality of life.

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Conflict of Interest: Nil

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Effects of VR-based Rehabilitation Video for Visual Vertigo on Autonomic Nervous System and Subjective Immersion and Interest in the Elderly

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Abstract

Background/Objectives: Many elderly people experience visual vertigo. VR will provide optokinetic stimulation to help reduce visual vertigo. This study is to investigate the rehabilitative effects of VR-based rehabilitation video.

Method/Statistical Analysis: The subjects of this study were 51 elderly people. The rehabilitation video was produced on the basis of traditional visual vertigo rehabilitation video. After watching the rehabilitation video, all subjects were measured for autonomic nervous system activity, heart rate and asked to write a questionnaire on subjective commitment and interest composed of 5 points scale. The collected data were subjected to independent t-test for comparison between groups.

Findings: In subjects who experienced visual vertigo, VR video group showed higher value in sympathetic nervous system activity and parasympathetic nervous system activity after visualization of rehabilitation video than general video group and, subjective immersion and interest showed the same results. In subjects who nonexperienced visual vertigo, on the other hand, VR video group showed higher value than general video group only in subjective immersion and interest after visualization of rehabilitation video. Based on the results of this study, the 360 degree VR rehabilitation video seems to have better therapeutic effect on visual vertigo than the existing video.

Improvements/Applications: Therefore, the convergent use of VR in the vestibular rehabilitation area improved the rehabilitation effect. Future research will increase the participation of active rehabilitation through the development of VR rehabilitation contents and programs.

Keywords: VR, Rehabilitation video, Visual vertigo, Autonomic nervous system, Immersion.

Introduction

Vertigo is one of the common symptoms in life. In particular, it is a high frequency in the elderly population and is a major factor in visiting hospitals^[1]. Vertigo is problematic in itself but has difficulty in performing daily

activities or affects falls^[2]. Data released by the KCDC (Korea Centers for Disease Control & Prevention) reports that falls are a serious threat to the health of the elderly and can result in death or permanent disability^[3]. Therefore, it is necessary to understand and manage the vertigo of the elderly to avoid this problem.

Vertigo can be caused by an imbalance in the vestibular, visual and proprioception systems that are involved in the equilibrium function. In addition, if one of these functions is lost, the other organ system will compensate. However, in older people, degenerative changes occur in all organ systems, making them more

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difficult to compensate for in other organ systems^[4]. Among the symptoms of vertigo, elderly people may feel dizzy due to visual stimulation, such as passing between grocery stands or looking at the escalator stairs. This is called visual vertigo^[5]. If people often feel dizzy after seeing moving objects in their daily activities, the elderly will be more likely to be exposed to falls. It is necessary to devise ways to alleviate the symptoms of visual vertigo.

Visual vertigo is deeply related to vestibular-ocular reflex^[6]. The eye is reflexively placed in the optimal position according to the eye movement according to the head movement and further the eye movement according to the body movement or alignment. However, elderly people may have errors in eye movements as their functions decrease as they age. This error causes vestibular problems such as vertigo and we must find ways to deal with these systematic problems.

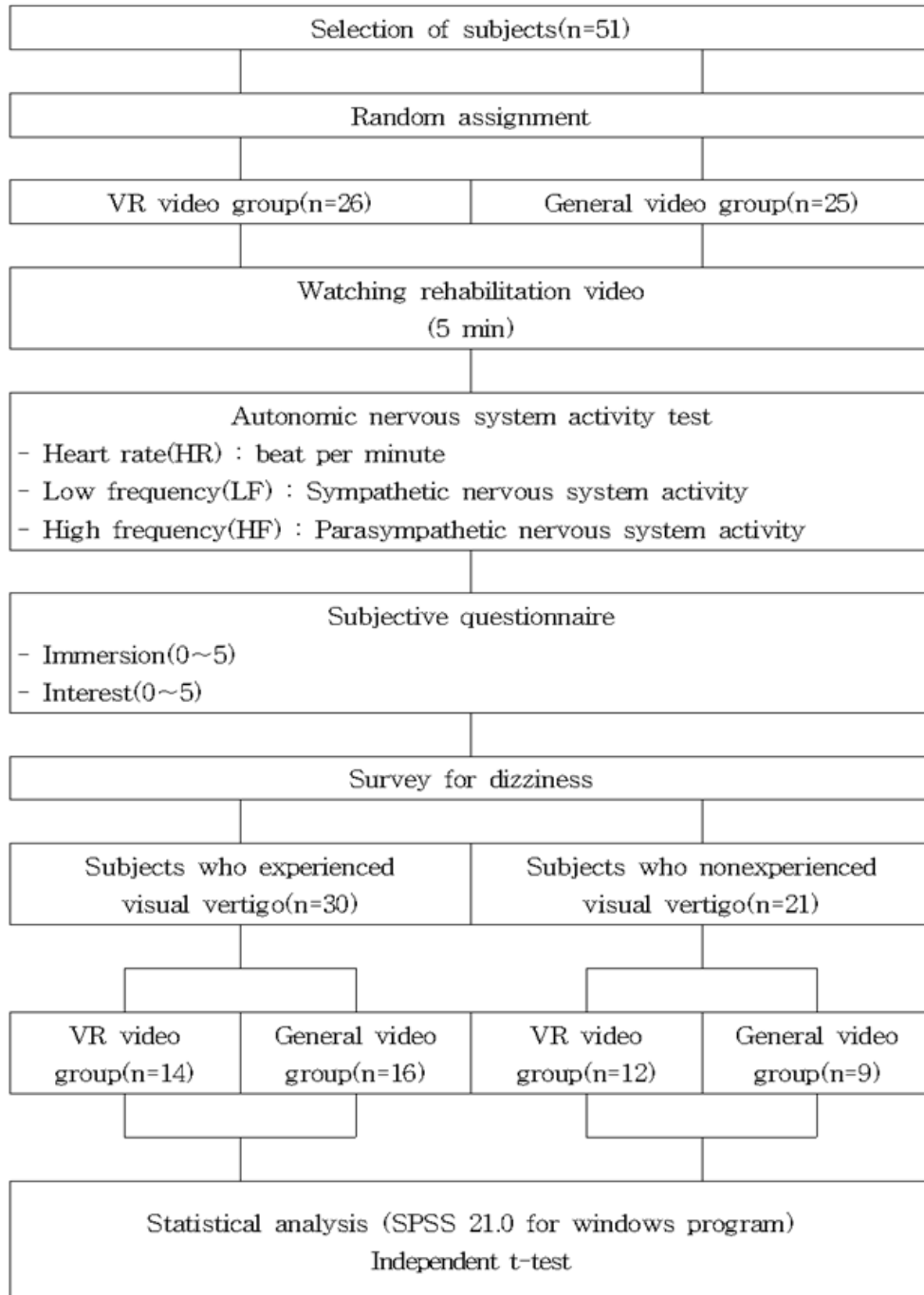


Figure 1. Schematic diagram of study design

Vestibular rehabilitation is implemented as a way to solve problems in the vestibular system. In general, the mechanism of vestibular rehabilitation is explained by mechanisms through compensation, adaptation and substitution^[7]. Compensation uses a method of inducing habituation as a recovery method through the neuroplasticity of the central nervous system and it seems to have applied this principle to previous studies.



Figure 2. Galaxy Gear360

Recently, with the development of technology, virtual reality (VR) technology is further advanced. Since the first mention of “la realite virtuelle” in the Theatre of Cuelty of French writer Antonin Artaud, virtual reality has evolved to the extent that virtual reality feels as immersed. Previous studies have reported that the application of immersive VR in VR rehabilitation enhances the effect of rehabilitation^[8-9]. From this point of view, in the vestibular rehabilitation for visual vertigo patients, it is thought that VR using 360-degree video will show more effective rehabilitation effect than conventional rehabilitation.

In a recent study, Pavlou^[10] ‘s study, published in 2009, conducted vestibular rehabilitation to stimulate optokinetic in subjects with visual vertigo, suggesting that it would be a new innovation in vestibular rehabilitation. In addition, pavlou suggested the therapeutic potential for the method of kinetic stimulation using high-tech as well as traditional therapies such as low-tech DVD. Pavlou^[11], follow-up study, published in 2012, conducted a pilot study of patients with peripheral vestibular disease using optokinetic stimulation. As a result, dynamic VR reported the results of therapeutic effects as a useful adjunct to vestibular rehabilitation programs.

Motivation in rehabilitation as well as therapeutic effects is an important factor influencing the outcome of rehabilitation. Immersive imaging will be of interest to vestibular patients and have a positive impact on rehabilitation^[12]. From a variety of perspectives, it’s still unknown how VR using 360-degree video will benefit vestibular rehabilitation.



Figure 3. Ubipulse T1

Therefore, the purpose of this study is to investigate the effects of 360-degree VR video on autonomic nervous system, subjective immersion and interest in elderly people who experience visual vertigo and to investigate the rehabilitative effect of 360-degree VR video.

Method

This study was performed on 51 elderly people over 65 years of age living in Guri city, 18 males and 33 females participated in the study. The average age of the subjects was 72.16 ± 1.78 years and the average height and weight were 157.05 ± 5.06 cm and 58.72 ± 5.06 kg. All subjects participated in the experiment after hearing and agreeing with the purpose and method of the study. This study was conducted in compliance with the Helsinki Convention and the Research Ethics Standards. The schematic diagram of the study is shown in Figure 1.

All subjects were randomly assigned to the VR video group and general video group. The rehabilitation video was produced based on the previous visual vertigo rehabilitation video, which was a roadside drive, a street walk and a grocery store corridor. In the case of VR video, images were taken using Galaxy Gear360 (Samsung, ROK) [Figure 2] and the general video was taken using Galaxy Tab 3 (Samsung, ROK). The video was applied by wearing Galaxy Gear (Samsung, ROK) products and watched the Galaxy Tab 3 (Samsung, ROK) at eye level

and placed at a proper distance in view of eyesight. Subjects in each group watched VR and general video for 5 minutes according to their assigned group. After watching the rehabilitation video, all subjects were evaluated for autonomic nervous system activity and heart rate and a questionnaire about subjective immersion and interest composed of five-point scale was prepared. Autonomic nervous system activity and heart rate were measured using the heart rate variability measuring device (ubpulse T1, Laxtha, ROK) [Figure 3]. Collected results were classified into two groups and analyzed: experienced vertigo and non experienced group.

All measured data were independent t test using SPSS 21.0 to test the comparison between groups according to 360 degree VR application. The statistical significance level was set at 0.05.

Result and Discussion

According to the results of this study, In subjects who experienced visual vertigo, VR video group showed higher value in sympathetic nervous system activity (LF, low frequency) and parasympathetic nervous system activity (HF, high frequency) after visualization of rehabilitation video than general video group and, subjective immersion and interest showed the same results [Table 1]. In subjects who nonexperienced visual vertigo, on the other hand, VR video group showed higher value than general video group only in subjective immersion and interest after visualization of rehabilitation video [Table 2]. The results of this study showed that VR video was more immersive and interesting than general video and subjects who experienced visual vertigo were more affected by autonomic nervous system after visualization of rehabilitation video.

Table 1: The changes in subjects who experienced visual vertigo after visualization of rehabilitation video

	VR video	General video
Immersion*	4.07±0.83	2.93±0.44
Interest*	4.29±0.99	2.19±1.17
Heart rate	80.57±7.57	79.94±12.92
Low frequency*	5.44±0.80	4.76±0.97
High frequency*	4.84±0.46	4.19±0.94

*:p<0.05

unit: point, point, bpm, ms², ms²

The change of autonomic nervous system in this study can be regarded as change of vestibular system by visual response. Indeed, according to Kim^[13]'s research, the vestibular system and the autonomic nervous system are closely related as the Vestibulo-Autonomic System. In particular, Kim also showed an increase in the low frequency reflecting the sympathetic nervous system activity and the high frequency reflecting the parasympathetic nervous system activity. Table 2: The changes in subjects who nonexperienced visual vertigo after visualization of rehabilitation video

	VR video	General video
Immersion*	4.07±0.83	2.93±0.44
Interest*	4.29±0.99	2.19±1.17
Heart rate	80.57±7.57	79.94±12.92
Low frequency*	5.44±0.80	4.76±0.97
High frequency*	4.84±0.46	4.19±0.94

*:p<0.05

unit: point, point, bpm, ms², ms²

system activity. The results presented in this study suggest that the visual stimulation by VR video caused the change of autonomic nervous system and that stimulation by visual vestibular reflex can be effectively applied to vestibular rehabilitation.

In addition, according to Kim^[9]'s research, VR increased the immersion, the effect of rehabilitation and thus also affected the balance. Other studies have shown the similar result and it can be seen that the rehabilitation through VR enhances the effect of rehabilitation by increasing the immersion feeling compared to the existing video media^[14-15]. Therefore VR video is expected to show more effective rehabilitation effect than conventional therapeutic general video.

Miled^[16]'s study also provided rehabilitation that provided interesting visual stimuli and reported that interesting stimuli increased the effectiveness of rehabilitation. In this study, the subjective interest score was higher in VR video. Many other studies are also aimed to make interest in using VR games^[17-18]. In this respect, VR video is more interesting, so it will enhance the effect of rehabilitation in vestibular rehabilitation. In a recent Riches^[19]'s study, VR rehabilitation was performed using Computer graphic (CG), patients were evaluated and mediated. In this CG environment, it is expected that the therapeutic effect, immersion and interest will be higher through active participation rather than passive rehabilitation. But we are facing the

limitation of VR content shortage. Future research will verify the effects of VR rehabilitation using CG along with content development.

Conclusion

Based on the results of this study, the 360-degree VR rehabilitation video would be more effective than the previously used rehabilitation video for visual vertigo. Therefore, the converging use of VR in vestibular rehabilitation has enhanced the rehabilitation effect. Future research will increase the participation of active rehabilitation through the development of VR rehabilitation contents and programs.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Factors Affecting Health-related Quality of Life for Subjects with Breast Cancer

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Abstract

Background/Objectives: The purpose of this study was to compare the health-related quality of life between subjects in good health and subjects with breast cancer.

Method/Statistical Analysis: A secondary analysis was performed with data from 255 adults using raw data from the Korean National Examination Survey (KNHANES) conducted from 2010 to 2017.

Findings: Subjects with breast cancer displayed a poor level of health awareness and high activity confinement. The EQ-5D index scores between subjects in good health and subjects with breast cancer did not show any significant differences. However, factors affecting health related quality of life for subjects with breast cancer and subjects in good health were different. Household income, perceived health status and activity confinement were the strongest factors affecting the health related quality of life among subjects with breast cancer while residential area, level of education, household composition, perceived health status, activity confinement and BMI were significant for subjects in good health.

Improvements/Applications: The results of the study will be instrumental in giving insights on health-related quality of life for patients with breast cancer and establishing nursing strategies to promote their HR-QoL.

Keywords: *Breast cancer, Quality of life, HR-QoL, EQ-5D, KNHANE*

Introduction

As the frequency of breast cancer occurrences and patients' survival rate have been increasing recently, people are more interested in the quality of life of the patients with breast cancer. It has been necessary to promote the patients' quality of life during their medical treatments in order to receive the best outcomes [1-3].

Most breast cancer patients finish their medical treatments, including chemo therapy and radiation therapy, one year after first being diagnosed [4]. Of particular interest was that 58% of the breast cancer patients were diagnosed before age 49, thus indicating

that Korean breast cancer patients are generally younger than their European counterparts [5]. The growth of young breast cancer patients was primarily related to their family history, but because they are young, they are often better able to survive treatment and thus their life is prolonged. Accordingly, it is important to pay attention to their quality of life. After medical treatments, the majority of breast cancer survivors were still struggling with activities of daily living and their quality of life continued to be decreased [6]. Breast cancer survivors who survived 5 years or more were still afraid of cancer recurrence and continued to experience side effects long after treatments which negatively impacted their quality of life in addition to experiencing long-term psychological barriers and physical discomfort [7].

This study noted that the subjects with breast cancer were in need of not only medical treatments, but also of enhancing their quality of life and for that reason, the quality of life was included as an important index that

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can be used to evaluate the effectiveness of the cancer treatments [8].

This study examined factors that affect health-related quality of life (below HR-QOL) of the subjects with breast cancer by comparing them with the healthy subjects and aims to provide basic materials that can guide the promotion of HR-QoL among breast cancer patients.

Method

This study was a secondary analysis of data collected by the KNHANES from 2010 and 2017. Subjects were selected two groups (subjects with breast cancer and healthy subjects) according to study criteria.

The total number of female participants in the KNHANES from 2010 to 2017 was 35,301. Among them, 113 participants were breast cancer patients with an age range from 31 to 80. An additional 142 healthy subjects aged over 30 were used as a comparison group. Participants who were receiving treatments for other types of cancer were excluded for this study.

This study used the health-related survey questionnaire from the KNHANES. Socio-demographic characteristics included age, residential area, education level, marital status, household composition, household income level and occupation.

Variables associated with physical and mental health included perceived health condition, activity confinement, perceived usual stress level and body mass index (BMI).

The EQ-5D was used to measure HR-QoL. The EQ-5D is a standardized instrument that measures HR-QoL and it is composed of 5 items/areas. The EQ-5D index was obtained by applying a weighted value to the measured score of each question. The score variation was 0 through 1 and higher scores indicated a better quality of life [9].

The study analysis was conducted by following usage guidelines of the Korea Centers for Disease Control and Prevention suggested by the KNHANES. The raw materials of KNHANES were used for complex sample design. Complex sample Chi-square test was to compare the differences of EQ-5D on socio-demographic variables and health related variables between the health subjects and the subjects with breast cancer. The complex sample general linear model (CSGLM) was

used to examine the factors that affect health-related quality of life (HR-QOL) of health participants and participants with breast cancer.

SPSS version 19.0 (SPSS Inc. Chicago, IL, USA) was used to measure the data and significance level was below 0.05.

Result and Discussion

1. Socio-demographic characteristics comparison between healthy female subjects and subjects with breast cancer

Among demographic characteristics [Table 1], significant differences were noted between the healthy subjects and the subjects with breast cancer according to their age ($\chi^2=4.06, p=0.003$) and occupation ($\chi^2=5.50, p<0.001$). The results show a spike in the percentage of subjects with breast cancer in their 40s (compared to those in their 30s) and a drop in the percentage of breast cancer patients in their 60s and 70s. The occupation of the subjects with breast cancer was also significant as it showed that those with breast cancer were more likely to be in clerical positions or be unemployed compared to healthy subjects.

Table 1. Socio-demographic factors of study participants (N=255)

Categories	Healthy Subjects (n=142)		Subjects with breast cancer (n=113)		χ^2	p
	Value	SE	Value	SE		
	(%) ^a	(%) ^a	(%) ^a	(%) ^a		
Age (years)						
30~39	6.4	2.60	10.1	3.30	4.06	0.003
40~49	15.9	3.50	32.0	4.90		
50~59	32.8	4.50	35.8	5.20		
60~69	27.4	4.20	11.1	3.00		
≥70	17.5	2.90	11.0	2.70		
Occupation*					5.50	<0.001
A	12.3	3.10	2.7	1.60		
B	3.6	1.60	11.4	4.20		
C	14.3	3.50	3.5	1.60		
D	5.4	2.10	0.7	0.60		
E	2.4	1.40	1.4	1.10		
F	10.2	3.10	3.9	2.00		
G	51.8	4.60	76.4	4.70		

Value= Estimated value, SE= Standard error, a= Weighted value

Occupation*: A=Managers, B=Clerical workers, C=Service and sales workers, D=Farm and fishery skilled workers, E=Technicians, machine operations and assembly line workers, F=Simple labor workers, G=Unemployed

2. Comparison of health-related characteristics between the healthy subjects and the subjects with breast cancer

In health-related characteristics [Table 2], perceived health status ($\chi^2=4.34$, $p=0.015$), activity confinement ($\chi^2=5.99$, $p=0.016$) and BMI ($\chi^2=4.31$, $p=0.015$) showed significant differences between the healthy subjects and the subjects with breast cancer, but not perceived usual stress level.

Beaulac et al. [10] discovered that a year after surgery, breast cancer survivors who had lymphedema and confined shoulder movement had significantly low HR-QOL in physical and functional areas. Accordingly, it is very important for breast cancer patients to make an effort to manage their physical and functional health so their quality of life is not adversely affected.

Table 2. Health related factors of study participants (N=255)

Categories	Healthy subjects (n=142)		Subjects with breast cancer (n=113)		χ^2	p
	Value (%) ^a	SE (%) ^a	Value (%) ^a	SE (%) ^a		
Perceived health status						
Good	23.3	4.00	9.4	2.40	4.34	0.015
Moderate	44.5	4.40	53.4	5.20		
Poor	32.2	4.30	37.2	5.20		
Activity confinement						
Yes	13.1	2.80	26.0	4.80	5.99	0.016
No	86.9	2.80	74.0	4.80		

BMI						
<18.5	4.6	2.30	1.3	1.00	4.31	0.015
18.5 ~<25	58.2	4.60	76.6	4.50		
≥25	37.2	4.70	22.1	4.50		

Value= Estimated value, SE= Standard error, a= Weighted value

3. Comparison in HR-QOL between the healthy subjects and the subjects with breast cancer

As shown [Table 3], the EQ-5D index score for the HR-QOL between healthy subjects and the subjects with breast cancer did not show any significant differences (Wald F=0.18, $p=0.672$). The EQ-5D index score for the healthy subjects was 0.92 and the EQ-5D index score for the subjects with breast cancer was 0.91.

In the research done by Matalqah et al. [11] and Wallwiener et al. [12], the EQ-5D index score of breast cancer patients was lower compared to healthy people, which is different from the results of this paper. According to Matalqah et al. [11], the EQ-5D index scores for breast cancer patients and healthy people in Malaysia were 0.71 and 0.87 respectively, which were lower than our EQ-5D index scores, which indicated that Korean breast cancer patients had higher health-related quality of life.

Table 3. EQ-5D index score of healthy women and women with breast cancer

Categories	Healthy women (n=142)	Women with breast cancer (n=113)	Wald F	p
	Mean±SE	Mean±SE		
EQ-5D index	0.92±0.011	0.91±0.017	0.18	0.672

EQ-5D: European quality of life-5 dimensions used as a measure of health-related quality of life (HR-QOL)

4. Factors affecting HR-QOL of women with breast cancer

[Table 4] presents the factors affecting HR-QOL of women with breast cancer.

As a result of examining the socio-economic and health-related factors that affect health-related quality of life of breast cancer patients by controlling age, the factors found to affect the HR-QOL of breast cancer patients were household income (Wald F=3.16, p=0.027), perceived health status (Wald F=4.35, p=0.015) and activity confinement (Wald F=4.81, p=0.030).

When controlling for age, the factors affecting health-related quality of life of healthy women were residential area (Wald F=11.00, p<0.001), education (Wald F=2.67, p=0.050), household composition (Wald F=5.10, p=0.002), perceived health status (Wald F=6.47, p=0.002), activity confinement (Wald F=7.09, p=0.009) and BMI (Wald F=8.08, p<0.001).

Among the subjects with breast cancer receiving medical treatments, those who perceived their health condition positively and those who had less activity confinement had higher health-related quality of life.

According to studies [13, 14], physical activity played an essential role as it reduces the side effects of treatments and disease prognosis. Consequently, it is necessary to examine the factors that affect activity confinement and to develop and apply guidelines to manage overall health. In addition, the breast cancer patients' financial situation is an important indicator of quality of life and this study noted that among subjects with breast cancer, those who had high household incomes had better health-related quality of life. Other research including Edib et al.[15] and Huang et al. [16] had similar findings which support the findings of this study. Economical allowance provides more opportunities for cancer patients to join in social activities and hobbies and minimizes stress levels created by financial struggles such as medical bills or lack of cost of living and accordingly, economical allowance

is closely related to the quality of life of participants. Thus, it is very important to eventually improve public health policies focusing on reducing the medical costs for cancer patients.

Other criteria such as residential area, education, marital status, household composition, occupation, perceived usual stress and BMI did not affect the health-related quality of life of breast cancer patients.

Social support plays a positive role in HR-QOL of cancer patients [17]. Family support is the most primary support in social supports, since as the more family members a person has, the more social support they can receive. However, it did not show any significant difference for cancer patients in this study.

In the studies of Leung et al.[18], social supports including positive and emotional cares, informational consultation and emotional support from spouses or significant others was found to be an important factor in promoting health-related quality of life. Family support is a very important element for breast cancer patients for their health-related quality of life. However, it explained that the emotional support offered by the family unit is the meaningful element rather than the number of people in the household.

Factors influencing HR-QOL of patients with breast cancer in this study were household income, perceived overall health condition and activity confinement and the explanatory power of socioeconomic and health related factors was 41.9%.

It is necessary to develop nursing management plans by considering the each patients' socio-economic and health-related characteristics to maximize their health-related quality of life instead of providing generalized treatment.

Table 4. Factors affecting health-related quality of life of breast cancer patients (N=113)

Categories	95% CI Lower limit	95% CI Upper limit	p	Wald F	p
(constant)	0.634	1.096	<0.001	263.97	<0.001
Residential area					
Seoul	-0.031	0.104	0.283	1.16	0.314
Urban area	-0.018	0.103	0.168		
Provincial area ^a	.	.	.		
Education					
≤Elementary	-0.135	0.043	0.305	1.13	0.336
Middle	-0.136	0.083	0.630		
High	-0.121	0.013	0.112		
≥University ^a	.	.	.		
Marital status					
Married	-0.091	0.125	0.760	0.09	0.760
Others ^a	.	.	.		
Household composition					
1	-0.103	0.252	0.410	1.44	0.234
2~3	-0.066	0.166	0.397		
4~5	-0.032	0.222	0.141		
≥6 ^a	.	.	.		
Household income level					
Lower class	-0.169	0.057	0.327	3.16	0.027
Lower-Middle	-0.018	0.142	0.129		
Upper-Middle	-0.117	0.040	0.330		
Upper class ^a	.	.	.		
Occupation [*]					
A	-0.140	0.077	0.565	1.75	0.114
B	-0.006	0.123	0.076		
C	-0.017	0.175	0.104		
D	-0.013	0.302	0.072		
E	-0.042	0.336	0.127		
F	-0.025	0.265	0.103		
G ^a	.	.	.		
Perceived health status					
Good	0.043	0.218	0.004	4.35	0.015
Moderate	-0.050	0.081	0.640		
Poor ^a	.	.	.		
Activity confinement					
Yes	-0.180	-0.009	0.030	4.81	0.030
No ^a	.	.	.		

Cont... Table 4. Factors affecting health-related quality of life of breast cancer patients (N=113)

Perceived usual stress					
Often	-0.199	0.048	0.230	1.53	0.209
Frequently	-0.166	0.049	0.286		
Somewhat	-0.090	0.114	0.815		
Hardly any ^a	.	.	.		
BMI					
<18.5	-0.070	0.229	0.296	0.59	0.551
18.5 ~<25	-0.061	0.081	0.782		
≥25 ^a	.	.	.		
Age (years)	-0.003	0.002	0.688	0.16	0.688

Model summary: R²=0.419, Wald F=377.83, p<0.001

95% CI=95% Confidence Interval, a =Reference category

Occupation*: A=Managers, B=Clerical workers, C=Service and sales workers, D=Farm and fishery skilled workers, E=Technicians, machine operations and assembly line workers, F=Simple laborworkers, G=Unemployed

Conclusion

Breast cancer patients’ treatment and nursing care are not just survival strategies. The direction of nursing care after the treatment should be aimed at improving the patients’ health-related quality of life.

While there were no significant differences in health-related quality of life between the healthy subjects and the subjects with breast cancer, the factors affecting health-related quality of life were different. It is important to explore alternatives in receiving cancer treatment and promoting health-related quality of life for breast cancer patients since it primarily affects those females aged below 50 in Korea.

Therefore, this study focused on providing fundamental data that can be used to manage the health-related quality of life for subjects with breast cancer by comparing factors that affect the health--related quality of life between the healthy subjects and the subjects with breast cancer.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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The Influence of Self-Efficacy, Self-Esteem, Aging Anxiety on Successful Aging in Middle-Aged Women

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Abstract

Background/Objectives: The purpose of the study was to identify factors influencing successful aging in middle-aged women.

Method/Statistical Analysis: The subjects of this study were 298 middle-aged women living in 4 cities. The data were collected through structured questionnaire and analyzed using descriptive statistics, t-test, ANOVA, Pearson correlations, Spearman correlations and multiple regression analysis with the SPSS/WIN 21.0 program.

Findings: As a result of regression analysis using self-efficacy, self-achievement and aging anxiety as independent variables, factors affecting successful aging were self-efficacy and aging anxiety. Their explanatory power is 16.8%. Aging anxiety was found to have the most significant influence on the degree of successful aging.

Improvements/Applications: This study shows that self-efficacy and aging anxiety have important effects on successful aging in middle-aged women. In addition, middle aged women learned that nursing knowledge needs to be accumulated and researched to increase self-efficacy or to reduce anxiety about aging.

Keywords: *women, successful aging, self-efficacy, aging anxiety.*

Introduction

Middle age is a transitional period between adolescence and old age, 40-60 years of age, with a decline in biological capacity but social responsibility. As life expectancy increases, the process of aging is prolonged and therefore, we must approach with an integrated concept of successful aging, including the wisdom aspect, rather than focusing only on passive responses to age-related declines ^[1]. In order to have a long and healthy old age, it is necessary to prepare in advance and the middle age in the transition of life into old age will be the most critical point ^[2]. In a study of middle-aged women, they said they were interested in the life of the old age. The higher the awareness of successful aging, the higher the degree of preparation

for retirement^[3]. Therefore, it is necessary to study the factors that influence the successful aging of the middle age. Self-efficacy is a personal belief that they can cope with the various situations they face and that they can influence the progress of things that can happen in their daily life ^[2]. It is also assumed that such factors would have a positive effect on successful aging, but few studies have reported the relevance of these factors in middle-aged women. Self-fulfillment is a personal confirmation, expectation, or belief of one's ability to perform a specific action or activity successfully. It means the satisfaction of achieving or achieving one's purpose. Self-fulfillment is a measure of satisfaction when one achieves their purpose and is used as an index to measure the level of successful aging in a study of the elderly ^[4]. Therefore, it is necessary to study the factors that influence the successful aging of the middle age. Self-efficacy is a personal belief that they can cope with the different situations they face and that they can influence the progress of what can happen in their daily life. 4 and furthermore, it is assumed that it will have a

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positive effect on successful aging, but few studies have reported the relevance of these factors in middle-aged women. Self-satisfaction is the satisfaction level when he achieved his purpose and was used as an index to measure the level of successful aging in the study of the elderly [5].

All generations are in a line of life and are expected to be essential factors for successful aging in middle-aged women. Aging anxiety expresses anxiety about an individual's aging, which refers to anxiety caused by physical, mental and social problems derived from aging. Since studies on aging anxiety have negative responses in life satisfaction [6] and self-efficacy [7-8], it is assumed to have similar effects on successful aging in middle-aged women, but few studies have reported the relevance of these factors. We think that research is necessary.

Method

This study is a descriptive research to analyze the effects of self-efficacy, self-fulfillment and aging anxiety on successful aging in middle-aged women.

The study subjects are middle-aged women living in four cities in Seoul, Suwon, Seongnam and Yongin. A total of 310 women aged 40 to 60 were able to understand and respond to the purpose of the study. A total of 298 responses collected after excluding questionnaires with missing responses.

The purpose of this study is to identify the factors affecting successful aging and to provide necessary data for the development of nursing intervention program criteria. The specific purpose is as follows. First, identify differences in successful aging according to the general characteristics of the subject. Second, the effects of self-efficacy, self-fulfillment and aging anxiety on successful aging of the subjects identified.

Rowe & Kahn defined successful aging as "a low chance of developing disease, a low risk for disease and disability, high physical and mental functioning and participation in social and productive activities." [8] Successful aging consists of physical, psychological and social aspects. Physical aging refers to a score measured by Park [9] as a single question. Higher scores on a five-point scale indicate better physical aging. Psychological aging refers to the score of self-acceptance attitude measured by Kim [10]. Their questionnaire has a total of 20 questions and the reliability coefficient in their

study was Cronbach's $\alpha = .81$. Human aging is a score measured using the five questions of Kim [11]. The higher the score, the more successful the aging of the social aspects. In their study, the reliability factor was Cronbach's $\alpha = .72$. The higher the score, the higher the successful aging and the reliability coefficient of the overall successful aging was Cronbach's $\alpha = .72$.

Self-efficacy is Belief that they believe they can successfully do what they need to achieve good results. It is a belief in their ability to cope with different situations. In this study, self-efficacy was measured using the Korean self-efficacy scale developed by Lee et al [12]. It consists of a total of 10 questions and the higher the total score on the 4-point scale, the higher the perceived self-efficacy. In their study, the reliability coefficient was Cronbach's $\alpha = .88$.

Self-fulfillment is a personal confirmation, expectation, or belief of one's ability to perform a specific action or activity successfully. It means the satisfaction of achieving or achieving one's purpose [5]. In their study, the scores were measured using twelve questions about self-fulfillment suggested by Roh [13]. The tool consists of a five-point scale, with higher scores indicating higher levels of self-fulfillment. In their study, the reliability coefficient was Cronbach's $\alpha = .85$.

Aging anxiety is a synthesis of aging and anxiety means fear of their aging process and the aging anxiety scale (AAS) developed by Lastheir and Faulkender [6] used, which Kim et al [14] has revised in Korean and it is a score measured by a tool that verified reliability and validity. In their study, the reliability coefficient was Cronbach's $\alpha = .89$.

Data collection for their study was conducted from August to September 2012, using a self-response method through a structured questionnaire. Participants' anonymity, confidentiality and research content were not used for any purpose other than the study and the survey was conducted to those who signed the written consent. The subjects read and filled out the questionnaire directly. The time required to respond to the questionnaire was about 20 to 30 minutes. Collected data were analyzed using the SPSS / WIN 21.0 program as follows. First, subjects' general characteristics, self-efficacy, self-fulfillment, aging anxiety and successful aging were analyzed using frequency and percentage, mean and standard deviation. Second, t-test and

ANOVA were used to identify the differences in successful aging according to the general characteristics of the subjects. Third, Pearson correlation analysis used for the correlation between variables. Fourth, multiple regression was conducted to understand the effects of self-efficacy, self-fulfillment and aging anxiety on successful aging.

Result and Discussion

1. General Characteristics of Subjects and Differences in Successful Aging

[Table 1] shows the difference of successful aging according to general characteristics.

Frequency analysis was performed to examine the demographic characteristics of the subjects. As for the analysis results, first of all, the total age of 298

respondents was 164 (55.0%) in their 40s, followed by 120 in 50s (40.3%) and 14 in 60s (4.7%). Educational background was 135 high school graduates (45.3%), 113 high school graduates (37.9%). The marriage status was 276 married (92.6%) and 22 (7.4%) divorced or bereaved. The most common occupations were ‘housewives’ 111 (37.2%), 74 (24.8%) ‘others’, 59 (19.8%) ‘professional jobs’, 37 (12.4%). The highest household income was 78 people (26.2%) with ‘more than 5 million won’, followed by 69 people (23.2%) under ‘300-400 million won’, 44 people (14.8%) under ‘200-300 million won’. Expected life expectancy was 183 (61.4%) among ‘80-90 years old’, followed by 58 (19.5%) under 80 ‘and 57 (19.1%)’ over 90 years old. The results of analyzing the differences in the successful aging according to the demographic characteristics of the study subjects show was no statistically significant difference in all items for successful aging.

Table 1. General Characteristics of Subjects and Differences in Successful Aging (N=298)

Variables	Categories	N(%)	Successful Aging		
			M±SD	F/t	p
Age (year)	40~49	164 (55.0)	3.98±.54	.562	.571
	50~59	120 (40.3)	3.91±.63		
	≥60	14 (4.7)	4.01±.69		
Education	≤ Middle school	27 (9.1)	3.89±.65	.396	.756
	High school	135 (45.3)	3.93±.57		
	College	113 (37.9)	3.99±.60		
	Graduate school	23 (7.7)	4.00±.50		
married status	married	276 (92.6)	3.96±.57	.540	.589
	Divorce and Bereaved	22 (7.4)	3.89±.69		
job	White collar	37 (12.4)	3.94±.54	.379	.863
	Technical job	6 (2.0)	4.09±.36		
	Business, commerce	11 (3.7)	3.76±.72		
	Housewife	111 (37.2)	3.98±.62		
	Professional	59 (19.8)	3.95±.54		
	Etc	74 (24.8)	3.94±.59		
Household income (10,000 won)	< 100	26 (8.7)	3.86±.74	.340	.888
	100 ~ <200	39 (13.1)	4.03±.51		
	200 ~ <300	44 (14.8)	3.96±.72		
	300 ~ <400	69 (23.2)	3.97±.65		
	400 ~ <500	42 (14.1)	3.90±.40		
	≥500	78 (26.2)	3.96±.50		
Life expectancy	< 80	58 (19.5)	4.01±.58	.480	.619
	80~89	183 (61.4)	3.95±.59		
	≥ 90	57 (19.1)	3.95±.58		

2. Correlations among Successful Aging, Self-Efficacy, Self-Esteem, Aging Anxiety.

The correlation between self-efficacy, self-fulfillment, aging anxiety and successful aging are as follows [Table 2].

increases and the higher the aging anxiety, the more successful aging decreases.

Table 2. Correlations among Successful Aging, Self-Efficacy, Self-Esteem, Aging Anxiety(N=298)

Variables	self-efficacy	self-fulfillment	aging anxiety
	r (p)	r (p)	r (p)
self-fulfillment	.328(<.01)	1	
aging anxiety	-.267(<.01)	.024	1
successful aging	.225(<.01)	.016	-.390(<.01)

3. Influencing Factors on Successful Aging.

The effects of self-efficacy, self-achievement and aging anxiety on successful aging are as follows [Table 3].

To analyze the factors that influence self-efficacy, self-achievement and aging anxiety on successful aging, multiple regression analysis was selected as an independent variable. In the regression analysis has about

Successful aging had the most significant negative correlation with aging anxiety ($r = -.390$) and positive correlation with self-efficacy ($r = .225$). That shows that the higher the self-efficacy, the more successful aging

16.8% explanatory power on the effects of self-efficacy, self-achievement and aging anxiety on successful aging. The significance test of regression coefficient showed that self-efficacy ($t = 2.326, p < .05$) and aging anxiety ($t = -6.345, p < .001$) had a significant effect on successful aging. The coefficient of standardization represents the relative influence of each independent variable on successful aging, with aging anxiety ($= -.353$) being the most influential, followed by self-efficacy ($= .137$). The higher the self-efficacy, the more successful aging

increases and the higher the aging anxiety, the more successful aging decreases.

Table3. Influencing Factors on Successful Aging (N=298)

Variables	B	SE	β	t	p	Tolerance	VIF
(Constant)		.321	4.255	13.245	<.001		
self-efficacy	.137	.090	.209	2.326	.021	.816	1.225
self-fulfillment	-.020	.056	-.020	-.359	.720	.879	1.138
aging anxiety	-.353	.046	-.289	-6.345	<.001	.914	1.094

$R^2 = .168$, Adj. $R^2 = .160$, $F = 19.805$, $p < .001$, Durbin-Watson = 1.929

aged women's self-efficacy. In this study, aging anxiety was the most significant variable for successful aging and self-efficacy was also a significant factor.

Discussion

The purpose of this study was to investigate the self-efficacy, self-satisfaction, aging anxiety and middle-

A middle-aged in previous study reported that elderly life experience had the effect of alleviating aging

anxiety^[15] and the relationship between depression and self-esteem in aging anxiety among middle-aged adults^[16], middle-aged adults. The results were in agreement with the results of some previous studies that reported a significant inverse correlation between aging anxiety and self-efficacy in Koreans^[17]. These results indicate that middle age is a period of loss and a transition to an opportunity for successful aging and it is fearing aging, but it is gradually trying to accept the aging process and future life. In addition, self-efficacy was identified as an important variable affecting the successful aging of middle-aged women. Many previous studies supported the results^[18-19]. This result is in line with the findings of self-efficacy which have positive effects on health promotion behavior, life satisfaction and quality of life. Therefore, self-efficacy was identified as an important variable to successfully adapt to various changes in the new transitional period of middle-aged women's life. Self-efficacy is said to have a significant impact on the choice and continuity of behavior as an expectation of efficacy, which is the belief that an individual can successfully perform the actions necessary to achieve a result. Therefore, strategies for enhancing self-efficacy should be established in health education and nursing interventions for successful aging of middle-aged women.

Conclusion

This study is a descriptive research to identify the factors of successful aging in middle-aged women. As a result of regression analysis using self-efficacy, self-achievement and aging anxiety as independent variables, factors affecting successful aging were self-efficacy and aging anxiety. Their explanatory power is 16.8%. Aging anxiety was found to have the most significant influence on the degree of successful aging. None of the general characteristics affected the successful aging. The results of this study showed that the effects of self-efficacy and aging anxiety were significant for the successful aging of middle-aged women. Through this, it was necessary to understand the aging instability of middle-aged women and to study the accumulation of nursing knowledge and the development of interventions. Therefore, for successful aging of middle-aged women, it is possible to increase self-efficacy, which is a personal belief that they can cope with various situations during their lives and to see the positive effects of adaptation and aging process. We think it is crucial to develop strategies, policies and diversified support programs. Also, it is necessary to repeat research with a broader target in

preparing a successful aging strategy.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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The Influence of Social Network and Depression on Successful Aging in the Elderly

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Abstract

Background/Objectives: The purpose of this study was to investigate the relationship between social network, depression and successful aging of elderly people and to identify the factors influencing successful aging of elderly people.

Method/Statistical Analysis: The subjects of this study were 150 elderly people aged 65 and older who live in three cities. The data were collected through structured questionnaire and analyzed using descriptive statistics, t-test, ANOVA, Pearson correlations, Spearman correlations and multiple regression analysis with the SPSS/WIN 21.0 program.

Findings: The results showed that depression was the most influential factor in successful aging of elderly people, followed by social activities, perform parental grandparent role and 74.1% explained successful aging of elderly people. Based on these results, it concluded that the role of social activities, parents and grandparents is critical and the development of related programs is necessary for the elderly to be successfully aged.

Improvements/Applications: This study showed that depression, social activities and the role of parents and grandparents were significant for the successful aging of the elderly. In particular, depression was more influential than social activities and the role of parents and grandparents. Therefore, it found that research is needed to prevent depression in the elderly.

Keywords: elderly, social network, depression, successful aging.

Introduction

According to the National Statistical Office, the average life expectancy in 2013 was 85.06 years for females and 78.51 years for males^[1]. As life expectancy increases, the process of aging must be prolonged and should be approached with an integrated concept of successful aging, including the wisdom aspect, from focusing only on passive responses to decay with age^[2]. Successful aging is the individual's awareness that he has effectively adapted to the physical and functional changes that have accumulated over a long period of time, while at the same time discovering the meaning or purpose of life^[3-4]. Previous studies have shown that

successful aging is not a final state, but a process of adaptation and that old age is not the end of everything, but the successful completion of a lifelong development process by physically, psychologically or socially developing tasks^[5].

Population aging is a recent phenomenon of social change, which is emerging as a significant cause of social problems in Korea and other countries. On the other hand, older people in 21C have stronger desire to retain resources such as economic power and health and to spend old age comfortably and disease-free than existing older people. Because of these changes and diversity, there is increasing interest in how the elderly's social network can successfully raise the level of successful aging and depression is predicted to impede the quality of life of the elderly^[6]. The purpose of this study is to divide the social network of the elderly into the role of parents and grandparents, economic activities and social

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activities and to investigate the effects of variables and depression on successful aging. A social network is a social unit composed of individual social ties [7]. As the attention of the elderly concentrated on families with frequent contact opportunities, satisfaction with their children's relationships and affection with their grandchildren influenced successful aging [8]. Also, the elderly have been shown to harm their life satisfaction as they become psychologically depressed [9] when they become economically depressed [10]. Accordingly, the study was performed assuming that the role of parents and grandparents, economic activities, social activities and depression, which are the social networks of the elderly, will affect the successful aging.

Method

This study is a descriptive research to analyze the effects of the role of parents and grandparents, economic activity, social activity and depression on the successful aging of the elderly.

The subjects of this study were 150 older people over 65 years old who could understand and respond to the study purpose of the elderly living in three cities. The purpose of this study is to identify success factors of aging and to provide primary data for developing nursing intervention program criteria. The specific purpose is as follows. First, the purpose of the study is to identify the difference in successful aging due to the general characteristics of the subject. Second, the purpose of this study is to investigate the effects of the role of parents and grandparents, economic activities, social activities and depression on successful aging.

Successful aging is a condition that is free from illness or disability, maintains proper physical and mental functioning and spends every day actively [11]. In this study, we used a successful aging scale Kim & Shin [12], which developed a scale based on the characteristics of Korean culture. Reliability factor in this study was Cronbach's $\alpha = .95$. The higher the score, the higher the successful aging. In this study, the average score of the questions used for analysis.

The role activity scale was used to measure the role performance of the elderly Song [13]. In this study, the reliability coefficient of Cronbach's $\alpha = .90$.

The economic activities of old age have positive effects such as securing stable income, contributing to social development and confirming self-use, maintaining

health, suppressing social alienation and loneliness, thus improving the level of satisfaction and success in old age [14]. The measures developed by Park & partially used in Kwak's research used [15]. In this study, the reliability coefficient was Cronbach's $\alpha = .93$

Social activity of Old age was measured based on the research of Cheong & Yi [16], which conceptualizes social activities, consisting of hobbies and volunteer activities, which are longer leisure time than other age groups. In this study, the reliability coefficient was Cronbach's $\alpha = .82$.

Depressed of the questionnaire measuring depression is a Korean-type elderly depression test tool (KGDC), which Han [17] reconstructed a total of 30 questions. The questionnaire consists of 10 questions and each question answered on a 4 level Likert scale. In this study, the Cronbach's α coefficient of .89 was relatively good.

Data collection for this study was conducted for four months from November 2014 to February 2015. The self-response method used through structured questionnaires. Collected data were analyzed using the SPSS / WIN 21.0 program as follows. First, the general characteristics of the subjects analyzed using frequency and percentage, mean and standard deviation. Second, t-test and ANOVA were used to identify the differences in successful aging according to the general characteristics of the subjects. Third, Pearson correlation analysis used for the correlation between variables. Fourth, multiple regression was conducted to investigate the effects of the subjects.

Result and Discussion

1. General Characteristics of Subjects and Differences in Successful Aging

[Table 1] shows the difference of successful aging according to general characteristics.

Frequency analysis was performed to examine the demographic characteristics of the study subjects. According to the analysis results, among the total 150 respondents, the number of women was 100 (66.7%) for women and 50 (33.3%) for men. The most common age group was 70s' with 77 people (51.3%). In the marriage, 87 (58.0%) were married (spouse survived) and 63 (42.0%) were 'married alone due to bereavement or divorce.'

In terms of education level, 52 students (34.7%) graduated from elementary school. 82 (54.7%) had a religion and 68 (45.3%) had no religion. There are 73 positives (48.6%) who answered that they are healthier than their peers. In addition, the results of analyzing

the differences in successful aging according to the demographic characteristics of the study subjects showed age ($F = 8.534, p = .000$), marital relationship ($t = 2.307, p = .022$), an education level ($F = 5.527, p = .000$), religion ($t = 3.163, p = .002$) and health ($F = 2.478, p = .047$).

Table 1. General Characteristics of Subjects and Differences in Successful Aging (N=150)

Variables	Categories	n(%)	Successful aging		
			M±SD	F/t	p
Gender	Male	50 (33.3)	3.28±0.88	1.418	.158
	Female	100 (66.7)	3.07±0.84		
Age (year)	60~69	40 (26.7)	3.37±0.79a	8.534	.000
	70~79	77 (51.3)	3.24±0.86a		
	≥ 80	33 (22.0)	2.63±0.72b		
Marital status	Married (Spouse survival)	87 (58.0)	3.28±0.83	2.307	.022
	Other(Divorce and Bereaved)	63 (42.0)	2.96±0.87		
Education	uneducated	10 (6.7)	2.61±0.91d	5.527	.000
	Elementary school	52 (34.7)	2.82±0.71cd		
	Middle school	18 (12.0)	3.29±0.70bc		
	High school	24 (16.0)	3.13±0.72cd		
	≥ College	46 (30.7)	3.96±0.67a		
Religion	Yes	82 (54.7)	3.34±0.99bc	3.163	.002
	No	68 (45.3)	3.83±0.81ab		
Health perception	Very Dissatisfied	8 (5.3)	3.34±0.88	2.478	.047
	Dissatisfied	30 (20.0)	2.91±0.77		
	Average	39 (26.0)	2.79±1.00b		
	Satisfied	47 (31.3)	3.04±1.02b		
	Very Satisfied	26 (17.3)	2.93±0.76b		

2. Correlations among Successful Aging, Perform parental grandparent role, Economic activity, Social activity, Depression.

The correlation between self-efficacy, self-esteem, depression and successful aging is as follows [Table 2].

Successful aging had the largest negative correlation with depression ($r = -.657, p < .01$), followed by social activities ($r = .556, p < .01$) and parent grandparent roles ($r = .457, p < .01$) and economic activity ($r = .301, p < .01$) were positively correlated. That shows that the higher the depression, the less successful aging and the

more successful aging increases as the role of parents, grandparents, economic and social activities increases.

Table 2. Correlations among Successful Aging, Self-Efficacy, Self-Esteem, Aging Anxiety (N=150)

Variables	Perform parental grandparent role	Economic activity	Social activity	Depression
	r (p)	r (p)	r (p)	r (p)
Economic activity	.464(<.001)	1		
Social activity	.592(<.001)	.468(<.001)	1	
Depression	-.003	-.077	-.072	1
successful aging	.457(<.001)	.301(<.001)	.556(<.001)	-.657(<.001)

3. Influencing Factors on Successful Aging.

The effects of self-efficacy, self-achievement and aging anxiety on successful aging are as follows [Table 4].

The effects of age, marital relationship, education level, religion, health and independent variables of grandparents, economic activity, social activity and depression on the successful aging according to demographic characteristics were analyzed. Multiple regression analysis was performed to confirm. It has about 74.1% accountability for the effects of role performance, economic activity, social activity and depression on successful aging. The significance test of the regression coefficient showed that the aging of the parents grandparents (t = 4.150, p <.001), social activities (t = 6.140, p <.001) and depression (t = -13.918, p <.001) was successful. It was found to have a significant effect on it. The standardization coefficient represents the relative influence of each independent variable on successful aging, which is the dependent variable. Depression (= -.645) was the most influential factor, followed by social activities (= .387) and the role of grandparents (= .243) was the most influential. The higher the depression, the less successful aging and the higher the grandparents' role and social activities, the more successful aging.

Table3. Influencing Factors on Successful Aging (N=150)

Variables	B	SE	β	t	p	Tolerance	VIF
(Constant)		.653	3.426.	5.246	<.001		
Age	.035	.008	.005	.613	.541	.552	1.813
Marital status	-.091	.083	-.157	-1.882	.062	.791	1.264
Education	.013	.027	.006	.229	.819	.533	1.875
Religion	.073	.077	.126	1.625	.106	.899	1.112
Perform parentalgrandparent role	.243	.049	.205	4.150	<.001	.536	1.865
Economic activity	-.010	.048	-.009	-.178	.859	.590	1.695
Social activity	.387	.036	.222	6.140	<.001	.462	2.166
Depression	-.645	.050	-.699	-13.918	<.001	.855	1.170

R²=.741, Adj. R²=.727, F=50.515,p<.001, Durbin-Watson=2.156

Discussion

There is increasing interest in how the elderly's social network can raise the level of successful aging and depression is predicted to be a deterrent to the quality of life of the elderly [6]. In addition, the social network reported that the elderly had a significant result on the health status [18]. The purpose of this study was to divide the social network of the elderly into the role of parents and grandparents, economic activities and social activities and to analyze the factors affecting successful aging. In this study, depression was the most significant influence variable for successful aging, followed by social activities and the role of parents grandparents.

Depression was supported by this study because it was predicted as a factor that impeded the quality of life of the elderly, although no previous study found a direct relationship between depression and successful aging [6]. In addition, the study showed that depression affects self-integration as a successful aging partly mediated by the elderly [19]. Social activity is similar to the previous study in which elderly people who participated in social activities of the elderly had higher life satisfaction than those who were not [20]. In other previous studies, the meta-analysis study on factors related to successful aging in Koreans reported that social factors such as family support, social activities, leisure activities and volunteer activities were all significant factors for successful aging [21].

Previous studies have reported that for the emotionally stable retirement life, contact frequency and scope with family and friends who can share fun and difficulty as well as reconciled family are necessary for retirement life [22]. Therefore, the results of this study supported the previous study that parent-grandparent role was a significant influence on successful aging.

Based on the preceding studies, depression, social activities and parent / grandparent roles were analyzed as important factors for the successful aging of the elderly. We need to identify, develop and maintain a social support system that enables this.

Conclusion

This study is a descriptive research to identify the factors of successful aging in the elderly. The results of this study were regression analysis using the role of parents, grandparents, economic activity, social activity and depression as independent variables. As a result,

the factors influencing successful aging were the role of parents and grandparents, social activities and depression, all with 74.1% explanatory power. Depression was the most influential factor for successful aging, followed by social activities and parent/grandparent roles. Among the general characteristics, variables affecting successful aging were age, marital relationship, education level, religion and health. The results of this study showed that depression, social activities and parent/grandparent roles were essential for the successful aging of the elderly. In particular, depression was more influential than social activities and parent/grandparent roles. It found that related studies, such as intervention development, were needed to prevent the depression of the elderly. Also, it found that various opportunities to activate the social activities of the elderly were needed. The more parents and grandparents performed, the higher the level of successful aging. Based on these results, it found that in order to improve the successful aging of the elderly, it is necessary to develop specific educational programs and mediation plans that can lower depression and enhance social activities and role of parents and grandparents.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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The Effect of Healthcare Service of Employees at a Workplace Using Mobile

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Abstract

Background/Objectives: This study was conducted to investigate the effectiveness of mobile-based healthcare program on indicators of chronic disease.

Method/Statistical Analysis: This study was conducted on 149 participants from the A company employees who had a Health Check-up at S hospital Health Screening Center (Yong-in, Korea) in 2017 then found to be exceeding the prediabetes standard (Fasting Glucose \geq 100 mg/dL). 109 participants completed the 12 weeks mobile healthcare program. The final data were analyzed from these participants. Participants are divided into two groups; General care group (HbA1c $<$ 6.4%, n=62) and intensive care group (HbA1c \geq 6.5%, n=47).

Findings: After 12 weeks, participants' average HbA1c was decreased to $0.38 \pm 0.65\%$ ($p < 0.001$). HbA1c of the intensive care group was decreased to $0.78 \pm 0.79\%$, which was more effective than the $0.08 \pm 0.25\%$ reduction of HbA1c from the general care group. In addition, with adjustment of the age, body mass index, glucose, the improvement of HbA1c of intensive care group was even more effective than another group (Odds ratio [OR]=4.385, 95% CI 1.043-18.440).

Improvements/Applications: The mobile healthcare program provided to pre-diabetes and diabetes patients was found to be effective in enhancing the indicators of chronic diseases. In particular, the program is more effective to the intensive care group than the general care group.

Keywords: Diabetes, Health Care, Mobile, Health Management Service, Employee

Introduction

Many International Organizations recognized the seriousness of chronic diseases and ask their each nations to make policies to improve it. World Health Organization (WHO) declared WHO Global Action Plan for the 'Prevention and Control of Non-Communicable Diseases (NCDs) 2013-2020 (resolution WHA66.10)' in 66th World Health Assembly then WHO set a goal to decrease the death rate by the chronic disease, such as diabetes, to 25% lower, then to make a realistic goal, WHO advised member countries to establish national

policies^[1]. In addition, during United Nations (UN) 'General Assembly on the Prevention and Control of Non-communicable Diseases' held on September 19-20, 2011, UN addressed a declaration of the high-level meeting that prevention and management of the NCDs are a basic duty of countries^[2].

According to Atlas 8th, the global number of diabetics in 2017 is expected to be 425 million and by 2025 the number is to be 629 million, which is 48% increase. In addition, one of three adults over 20 years of age in the Western Pacific countries (Korea, etc.) has diabetes and one third of deaths were due to diabetes^[3]. International Diabetes Federation (IDF) estimates that health care costs increased to \$ 732.7 billion in 2017, more than three times of \$ 232 billion in 2006^[3]. According to the 2017 Organization for Economic Cooperation

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and Development (OECD)'s Health Glance, deaths by diabetes are 700,000 people per year in OECD countries. Already 9 million adults which are 7% of the OECD population, has diabetes and the number continues to be increased and they suffer from cardiovascular diseases such as heart attacks, strokes, loss of vision, diabetic foot and kidney diseases^[4].

There needs to be a serious attention to medical situation regarding Korea's diabetes in the OECD's Health Glance^[5]. The rate of hospitalization due to diabetes was decreasing, but Korea still has 281 inpatients per 100,000 people and it is more than the double of the OECD's average, 137, so Korea is No.2, after Mexico of 292^[5]. According to Korea Center of Disease Control (KCDC), the rate of diabetes of the people older than 30 was increased by 1.8%p from 9.5% in 2005 to 11.3% in 2016^[6]. In addition, the treatment rate increased by 18.2%p from 49.0% to 67.2%. However, in 2016, only one third of diabetes patients was able to manage their blood glucose (HbA1c<6.5%)^[6].

There have been national efforts regarding diabetes management. Most of domestic diabetes-related prevention programs are driven by public health centers. In September 2007, Daegu launched a pilot project of high-risk cardiovascular risk groups (hypertension / diabetes) registration. 10 new locations were newly added from 2012^[7]. In addition, according to the general health screening project (Article 5 of Framework ACT On Health Examinations, Article 52 of National Health Insurance ACT, Article 25 of Enforcement Decree of The National Health Insurance ACT, Article 14 of Medical Care Assistance ACT), the screening targets are defined as a law and the targets are expanding^[8]. The subjects of medical examination are beneficiaries of medical benefits and health insurance and as of the end of November 2015, the number of people is about 20.8 million. The goal is to conduct primary and secondary screening for early detection of 13 diseases with a focus on cardiovascular diseases including diabetes^[9, 10].

However, the assessment level of public management was not positive. The given level by the program was high, but each individual's self-management level was low. Health centers currently does not play an effective role in the clinical information system^[11]. The need for improvements shall have many agrees, but there are limitations as a country to manage all chronic diseases^[12].

Therefore, it is necessary to have an alternative solution for efficient management of chronic diseases.

Improving diabetes requires interventions among appropriate exercise, eating habits and blood sugar management. In order to make an effective strategy, the method shall be established through location and tools which are closely connected to daily lives then the method shall be easy of use and cost efficient^[13-15]. Office is the place where the majority of employees stay and it is where they stay for the longest time outside of homes, therefore it is an important place to manage their lifestyles for the prevention and management of chronic diseases^[16]. In addition, previous studies have shown that mobile healthcare program can improve self-management in a cost-effectiveness way^[17]. Especially according to the related regulations and law, Auxiliary medical institution that are built in the workplaces, can be the legally assured institution that can support employees' management and prevention of diseases in the safest way^[18, 19].

Therefore, it is necessary to evaluate and see the effectiveness of mobile diabetes management program, which can manage diabetes anywhere and anytime, provided to the employees by Auxiliary medical institution to manage diabetes.

Method

This study was conducted in the auxiliary medical institution then provided an intervention service between the medical staff and diabetic patients through mobile health care program.

149 participants were the A company employees who received a health Check-up at S Hospital Health Screening Center in 2017 who showed indicators exceeding the prediabetes standard (Fasting glucose \geq 100 mg/dL). Among them, 40 participants were excluded due to any of the following: participants who refused to participate the program (n=33), who did not conduct post-inspection (n=7). Finally, 109 participants were enrolled in this study.

A mobile healthcare program from June to August 2018 was provided. Participants had Check-up before and after the program for measurements such as blood and blood pressure. Eating and physical habits was checked by a Google survey.

There were 4 small group training session for participants. The doctor explained purpose of the mobile healthcare program. The nurse trained blood sugar management method. The nutritionist taught how to manage eating habits. The IT specialist trained how to use mobile healthcare applications.

After the sessions, each portable Bluetooth blood glucose meter and consumables (blood needles, strips and alcohol swabs) was provided to check diabetes for 12 weeks. During the period, 3 mobile messages sent every week which is individualized health information such as participant’s blood records, eating habits and health information. There were a team for writing messages by doctors from family medicine department, nurses and dietitians.

The message provided evidence-based information, including dietary and behavioural recommendations on exercise habits. Notification of users and delivery of disease information is based on the 2019 Diabetes Guidelines of the Korean Diabetes Association^[20]. Participants were trained to check pre-prandial blood sugar, post-prandial blood sugar and fasting blood sugar daily and asked to write their physical activities, diet and medications so they could manage own records by themselves. The results were delivered to participants by the doctor within 7 days of the examination and a report containing an assessment of changes in self-care habits was sent through mobile app within 3 weeks after finishing programs.

Chronic conditions were determined on the basis of HbA1c. More than 6.5% of HbA1c was defined as diabetes^[20]. Participants were assigned into 2 groups, intensive care group (ICG) (HbA1c≥6.5%, n=47) and general care group (GCG) (HbA1c 5.7%-6.4%, n=62) based on the prior HbA1c. To the ICG, additional messages were sent.

Venous blood samples were collected in the morning (AM 8:00-9:00) after an overnight fast of more than 8 hours. Concentrations of HbA1c, fasting plasma glucose (FPG), total cholesterol (TC), triglycerides (TG), high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C) were measured.

Blood sugar level were measured by blood Glucose meter (CareSens N Premier; i-SENS, Seoul, Korea) and obesity were measured by BMI (BSM370; Biospace, Seoul, Korea)

Logistic regression analysis was performed to assess the factors of HbA1c improvement in the GCG and the ICG. The effects on HbA1c between two groups were evaluated using multivariate logistic regression analysis that corrected age and gender. Statistical analysis were performed using SPSS 25.0 (SPSS Inc., Chicago, IL, USA). A p value<0.05 was considered as statistically meaningful.

Prior to this program, participants were aware of their prediabetes status then voluntarily agreed to the program then signed the participation consent. It was informed to participants that they can discontinue the service at any time. After the service closed, the application is disabled within a month and all data will be erased.

Result and Discussion

1. General characteristics of the subjects

The general characteristics of the study subject are given in Table 1.

Table 1. General characteristics of subject (n=109)

Variable	Value
Age	
<40	14 (12.84)
40-49	38 (34.86)
≥50	38 (34.86)
Sex	
Male	105 (96.33)
Female	4 (3.67)
Height	170.31 ± 18.06
Weight	80.241 ± 10.99

Data are presented as n (%) or mean ± standard deviation.

2. Change in forward head posture

Comparisons of parameters before and after using mobile intervention service are given in Table 2. Body mass index (BMI) reduced from 26.92 to 26.47 (p<0.001). HbA1c reduced from 6.53 to 6.15 (p<0.001).

Table 2: Comparison of chronic disease parameters before and after using mobile intervention service (n=109)

Variable	Baseline	After 3 months	t	p value
BMI	26.92 ± 3.28	26.47 ± 3.26	4.281	<0.001
SBP	129.18 ± 12.74	121.68 ± 11.42	5.919	<0.001
DBP	86.07 ± 10.17	77.20 ± 8.97	8.350	<0.001
HbA1c	6.53 ± 0.90	6.15 ± 0.64	6.124	<0.001
TC	176.21 ± 38.64	168.94 ± 36.69	1.945	0.054
HDL-C	49.62 ± 12.02	46.71 ± 10.68	4.940	<0.001
LDL-C	106.13 ± 33.59	102.94 ± 33.11	0.963	0.338

BMI, body mass index; DBP, diastolic blood pressure; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; SBP, systolic blood pressure; TC, total cholesterol.

In both ICG and GCG, HbA1c were declined comparing to the baseline during the 12 weeks participation period. Related to the baseline, ICG's HbA1c change was 0.89%p (p<0.001), GCG's HbA1c reduction was 0.60%p (p<0.001).

For the BMI, ICG decreased significantly from 27 to 26.61 (p<0.001) and for GCG from 26.81 to 26.33 (p<0.001) (Table 3).

Table 3: Comparison of chronic disease parameters between intensive care group (n=47) and general care group (n=62)

		Baseline	After 3 months	t	p value
Intensive care group (n=47, 43.1%)	BMI	27.00 ± 0.57	26.61 ± 3.50	2.154	<0.001
	SBP	128.18 ± 1.79	119.36 ± 12.01	4.729	<0.001
	DBP	87.77 ± 9.35	76.28 ± 9.69	5.341	<0.001
	HbA1c	7.33 ± 0.11	6.55 ± 0.71	6.723	<0.001
	TC	170.91 ± 5.47	161.96 ± 31.39	1.430	0.116
	HDL-C	47.34 ± 1.54	45.74 ± 9.22	1.892	<0.001
	LDL-C	102.13 ± 4.84	99.96 ± 31.46	0.406	0.014
General care group (n=62, 56.9%)	BMI	26.81 ± 0.44	26.33 ± 3.07	3.986	<0.001
	SBP	129.92 ± 1.78	123.18 ± 11.19	3.900	<0.001
	DBP	86.30 ± 10.82	78.18 ± 8.45	6.392	<0.001
	HbA1c	5.93 ± 0.04	5.85 ± 0.36	2.574	<0.001
	TC	180.23 ± 4.99	174.23 ± 39.68	1.307	<0.001
	HDL-C	51.35 ± 1.63	47.44 ± 11.68	4.895	<0.001
	LDL-C	109.16 ± 4.30	105.21 ± 34.38	0.941	<0.001

BMI, body mass index; DBP, diastolic blood pressure; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; SBP, systolic blood pressure; TC, total cholesterol.

3. Logistic regression analysis

Univariate and multivariate logistic regression analyzes were performed to determine whether age and BMI influence HbA1c improvement. The dependent variable is HbA1c improvement and the independent variable is age and BMI. In the crude model, the HbA1c improvement was more effective in the ICG than the GCG (OR=5.676, 95% CI 1.972-16.333). (Table 4).

Table 4: Logistic regression analysis

	Crude	Model 1	Model 2	Model 3
General care group (HbA1c<6.5)	1.000	1.000	1.000	1.000
Intensive care group (HbA1c≥6.5)	5.676 (1.972-16.333)	5.776 (1.954-17.075)	6.501 (1.854-22.803)	4.385 (1.043-18.440)

Model 1: adjusted for age; Model 2: Model 1+body mass index; Model 3: Model 2+glucose.

Discussion

In this study, participants were divided into two groups HbA1c level: ICG (n=47) with the HbA1c level over 6.5% and GCG (n=67) with the HbA1c level below 6.5% and as a result, the ICG showed greater effect on the improvement of the intervention service.

In case of ICG, they received additional customized messages regarding risk of diabetes and its complications so this helped them to have active interests in self-management to make improvements of HbA1c. Participants verified that the effort to improve the HbA1c level was effective for the improvement of BMI and blood pressure.

Conclusion

The study provided mobile intervention service to 149 employees with prediabetes from their health screening and they voluntarily participated in the healthcare program during 12 weeks. As a result, all 109 participants showed a significant statistical decrease in their BMI, SBP, HbA1c after the service.

As result of the study, this is a proposal as follows;

Firstly, this study was during 12 weeks so more

study with longer period to verify the improvement on the indicators of cholesterol is required. This may be the opportunity to identify the improvement of cholesterol through improving HbA1c.

The study was not able to identify the association between HbA1c improvements and characteristic of participants. Therefore, more research is necessary to find which characteristic is effective on improving the HbA1c.

From this study, to satisfy with employees' interests with their health in the workplace, a company shall not stay with just providing health screening to employees but expand to provide an after-service program based on the individual's health examination evaluation result then employees' health condition could contribute to a company's cost effectiveness.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Actor and Partner Effects of Self-Efficacy and Social Support on the Colorectal Cancer Screening Behavior of Husbands and Wives: Based on the Actor-Partner Interdependence Model

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Abstract

Background/Objectives: As the healthcare behavior of husbands and wives has effects on their spouse, it would be necessary to examine the dynamic relationship of husband and wife. This study aims to verify the actor and partner effects of self-efficacy and social support of husbands and wives on their colorectal cancer(CRC) screening behavior.

Method/Statistical Analysis: This study surveyed total 249 pairs of husband and wife. The SPSS 24.0 and AMOS 24.0 were used for the data analysis.

Findings: The self-efficacy of husbands and wives showed the actor effects on the CRC screening behavior while the self-efficacy of wives showed the partner effects on the CRC screening behavior of their husbands. The social support of husbands and wives had the actor and partner effects on the CRC screening behavior.

Improvements/Applications: In order to increase the CRC screening rate, it would be necessary to encourage the husbands and wives to participate in the self-efficacy enhancement programs, to understand the level of family support and problems and also to strengthen the family support. The model verified based on the APIM in this study provided the empirical model that could show the dynamic relationship of husband and wife in relation to the CRC screening behavior in the multilateral divisions, which could be used as the theoretical basis

Keywords: *Colorectal Cancer Screening, Health Behavior, Self-Efficacy, Social Support, Actor-Partner Interdependence Model, Spouses*

Introduction

The incidence of colorectal cancer(CRC) in Korea is ranked No.1 in the world^[1]. Emphasizing the necessity of early screening to decrease the incidence of cancer or death by cancer. However, according to the national cancer screening rate in 2019, the CRC screening is about 28%, which is lower than a neighboring country, Japan(41.4%)^[2]. Meanwhile, in case of CRC, the precancerous polyps could be early detected/ treated through the early screening and the incidence of CRC could be remarkably decreased. Thus, it would be

needed to seek for the measures for the improvement of screening rate.As the factors having great effects on the CRC screening behavior, the sociodemographic characteristics, psychological characteristics and partner effects have been reported^[3]. Especially, depending on the marital status, the cases of having a spouse show the higher screening rate than the cases of having no spouse. Based on this, it would be needed to intervene in their partners to improve the cancer screening rate^[4]. Despite the limited researches on the effects of marital relationship on the CRC screening behavior, it has been reported that the healthcare behavior of husbands and wives has effects on their spouse^[5]. Also, the people in the interdependent relationship just like husband and wife, are highly possible to exchange the effects on the mutual health behavior, so that the necessity to analyze

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the data in the unit of husband and wife is emphasized^[6].

As a method to analyze the interrelation of people in the interdependent relationship such as married couple or unmarried couple, Kenny^[7]suggested the Actor-Partner Interdependent Model (APIM). In this model, the effects of actor's independent variables on the actor's dependent variables are called 'actor effects' while the effects of partner's independent variables on the actor's dependent variables are called 'partner effects'. In the marital relationship, the same environment, financial resources and social relationship are shared and this shared environment works as a variable that could be beneficial or harmful to health in accordance with the environment and health behavior of spouse.

Thus, this study aims to verify the actor and partner effects of self-efficacy and social support on the CRC screening behavior of husbands and wives, by applying the APIM to the husbands and wives of CRC screening. The results of this study could provide the empirical model that could examine the dynamic relationship of husband and wife in relation to the CRC screening behavior in the multilateral divisions, which could be also used as the basic data for the improvement of CRC screening rate.

Method

Research Design

This study is a descriptive causality research for verifying the actor and partner effects of self-efficacy and social support on the CRC screening behavior of husbands and wives of CRC screening based on the APIM.

Research Subjects

The concrete standards for the selection of subjects were first, the husbands and wives whose ages were both 50 or more, second, the husbands and wives who understood the objectives of this study and agreed on the participation in this study. As the husband and wife was the unit of analysis in this study, the husbands and wives suitable for the standards of selection were selected through the convenience sampling. After distributing the questionnaires to total 260 pairs, the questionnaires were collected from 249 pairs (249 husbands, 249 wives).

Measurement

Self-Efficacy

The self-efficacy was measured by modifying/complementing the contents of breast cancer of the Champion's Health Belief Model Scale (CHBMS) [8] into the contents of CRC screening. Composed of total ten questions, each question was measured by the 5-point scale. The higher score means the higher self-efficacy. Regarding the reliability of the tool, in the moment of development, the Cronbach's α was .87. In this study, the Cronbach's α was .90.

Social Support

The social support was measured by using the Multi-dimensional Scale of Perceived Social Support (MSPSS) developed by Zimet et al., [9]. As the MSPSS is composed of family support, peer support and special support from meaningful others, it has total 12 questions including four questions in each area, based on the 5-point scale. The higher score means the better social support. Regarding the reliability of the tool, in the moment of development, the Cronbach's α was .83. In this study, the Cronbach's α was .86.

CRC Screening Behavior

According to the Korean National Cancer Screening Guideline, this study verified the matter of conducting the fecal occult blood test at an interval of one year targeting the husbands and wives in their 50 or up and also conducting the colonoscopy or the double contrast barium test in case of abnormal findings.

Data Collection

This study was conducted after approval of the University Research Ethics Committee (2013-0041-1). This study collected data at community service centers located in Seoul and Gyeonggi-do from December 1st 2013 to March 30th 2014. In case when the husbands and wives used the organization together, they were asked to fill out each questionnaire for husband and wife and then the questionnaires were collected on the spot. In case when only one spouse of a married couple used the organization, an envelop including a research explanation and questionnaires was provided and then the spouse was asked to bring it back on the appointed day after filling them out at home. It took about ten minutes to finish the questionnaire. To analyze the couple relationship data in the unit of husband and wife, this study only used the anonymized code that could verify the husbands and wives whose personal information were not exposed.

Data Analysis

The collected data was analyzed by using the SPSS WIN 24.0 and AMOS 24.0 Program. The actor and partner effects of self-efficacy and social support on the CRC screening behavior of husbands and wives were analyzed through the path analysis while the goodness-of-fit of the model was verified through GFI, AGFI, CFI, PGFI, PNF and RMSEA.

Result and Discussion

1. General Characteristics of Husbands and Wives of CRC Screening

In the age of subjects, the husbands were 58.54 years old while the wives were 57.64 years old($t=1.54$, $p=.102$). Regarding the private insurance, the 67% of husbands and the 70% of wives had it($\chi^2=1.56$, $p=.244$). In the family history of cancer, the 55% of husbands and the 53% of wives had no history of it($\chi^2=.10$, $p=.817$).

Regarding the monthly income of family, 3million won or up was 51% while less than 3million won was 49%.

2. Differences in the Self-Efficacy, Social Support and CRC Screening Behavior of Husbands and Wives of CRC Screening

[Table 1] show that the differences in the self-efficacy, social support and CRC screening behavior of husbands and wives of CRC screening. In the self-efficacy of subjects, the husbands were 3.48 ± 0.45 and the wives were 3.74 ± 0.34 , so that the wives were statistically significantly higher than the husbands($t=2.39$, $p=.011$). Regarding the social support, the husbands were 50.36 ± 5.67 and the wives were 52.73 ± 4.58 , so that the wives were statistically significantly higher than the husbands($t=2.43$, $p=.015$). In the matter of CRC screening behavior, the 59% of husbands and the 63% of wives conducted it, which did not show significant differences($\chi^2=0.19$, $p=.186$).

Table 1. Self-Efficacy, Social Support and CRC Screening Behavior of Husbands and Wives

Variables	Husbands (n=249) n(%) or M±SD	Wives (n=249) n(%) or M±SD	t or X2	p
Self-Efficacy	3.48±0.45	3.74±0.34	2.39	.011
Social Support	50.36±5.67	52.73±4.58	2.43	.015
Behavior of CRC Screening	146(59)	158(63)	0.19	.186

CRC= Colorectal cancer.

3. Actor and Partner Effects of Self-Efficacy and Social Support on the CRC Screening Behavior of Husbands and Wives of CRC Screening

The path analysis was conducted to analyze the actor and partner effects[Figure 1].The goodness-of-fit of the model was GFI=.92, AGFI=.88, CFI=.97, PGFI=.67, PNF=.77 and RMSEA=.06, which showed the relatively fine goodness-of-fit. In this study, the actor and partner effects of husbands and wives are as follows. First, even though the self-efficacy of husbands had the actor effects on their own CRC screening behavior($\beta=.66$, $p=.012$), it had no partner effects on the CRC screening behavior of their wives($\beta=.14$, $p=.285$). Second, the social support of husbands had the actor effects on their own CRC screening behavior($\beta=.48$,

$p<.001$)and also the partner effects on the CRC screening behavior of their wives($\beta=.45$, $p=.003$). Third, the self-efficacy of wives had the actor effects on their own CRC screening behavior($\beta=.51$, $p=.021$) and also the partner effects on the CRC screening behavior of their husbands($\beta=.37$, $p=.015$). Fourth, the social support of wives had the actor effects on their own CRC screening behavior($\beta=.41$, $p=.014$) and also the partner effects on the CRC screening behavior of their husbands($\beta=.34$, $p=.005$). The social support of husbands and the self-efficacy($\beta=.36$, $p=.023$) and social support($\beta=.52$, $p<.001$)of wives were influencing each other and this model explained the CRC screening behavior of husbands and wives as 42.1% and 33.4% respectively.

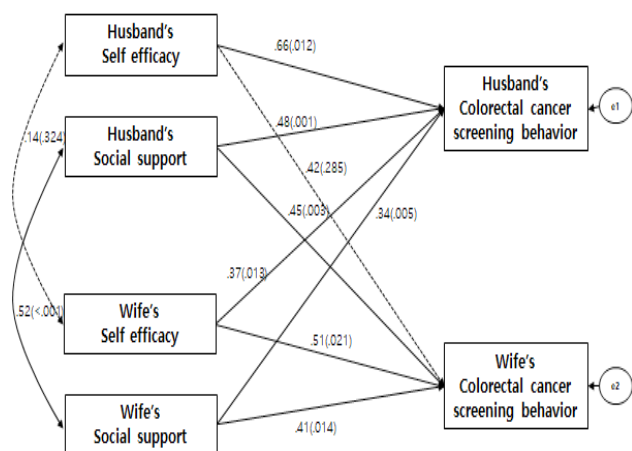


Figure 1. Actor and Partner Effects of Self-Efficacy and Social Support on the CRC Screening Behavior of Husbands and Wives

Discussion

This study aimed to verify the actor and partner effects of self-efficacy and social support on the CRC screening behavior of husbands and wives of CRC screening by applying the analysis on the couple relationship data based on the APIM. The discussions of the results of this study are as follows.

First, in the husbands and wives of CRC screening, the self-efficacy of husbands and wives had the actor effects on their own CRC screening behavior while the self-efficacy of wives had the partner effects on the CRC screening behavior of their husbands. As a belief in his/her own ability to successfully achieve a certain matter when facing a certain matter or situation, the self-efficacy is one of the factors having direct effects on the intention and behavior^[10]. According to a research by Manne et al., ^[6], the attitude and behavior of a spouse had direct effects on the intention of CRC screening behavior of the other spouse and the experience or behavior of the other spouse was considered for the decision-making of CRC screening behavior. Such results accord with the results of this study verifying that the self-efficacy of husbands and wives is interdependently working. Thus, this result supports the hypothesis of APIM explaining that the data should be collected and analyzed together. Meanwhile, in this study, the self-efficacy of wives had the partner effects on the CRC screening behavior of their husbands. This provides the information about who creates the bigger dynamics in the relationship between husband and wife. Especially, based on the study results reporting that wives are playing an important decision-making role in the health behavior of husbands and

wives^[11], women are supporting the decision-making for the health behavior of husbands and wives.

Based on the results of this study, it would be necessary to have the measures for the enhancement of self-efficacy of husbands and wives, in order to improve the CRC screening rate. Especially, the husbands and wives should be encouraged to directly participate in the intervention program helping them to control their own health to increase their self-efficacy. Also, as the self-efficacy of wives has effects on the CRC screening behavior of their husbands, it would be necessary to promote the direct motivation through the relationship adjustment and encouragement from spouse by systematically operating the programs participated by husbands and wives.

Second, in the husbands and wives of CRC screening, the social support of husbands and wives had the actor and partner effects on their own CRC screening behavior. As the important social support resources, the family, colleagues, or friends have positive effects on the early screening and health behavior for the effective prevention of cancer and also work as an element that makes it possible to conduct the behavior for the health enhancement. Especially, verifying the social support in the subjects of cancer screening is helpful for understanding the effects on health condition, health behavior and health-related decision. Moreover, the subjects in a pair based on a close relationship like husband and wife are highly possible to influence each other, so that it is important to verify their relationships. This study verified the important role of social support of husbands and wives in the voluntary preventive behavior. Therefore, when the social support of husbands and wives is high, it could have positive effects on their health behavior, which could be contributing to the decision of screening behavior. Thus, it would be needed to develop the intervention programs that could increase the social support of husbands and wives.

Bandura^[10] explained that sharing the social contexts like marriage would have effects on the mutual motivation, self-efficacy and health behavior. Therefore, in the close interdependent relationship like husband and wife, the self-efficacy and supportive relationship of spouse play an important role in the mutual decision-making. Thus, in order to improve the CRC screening rate, it would be necessary to understand the level of family support and problems through the continuous counseling with a medical team and also to provide the

intervention for strengthening the family support.

Through the discussions above, the effects of self-efficacy and social support on the enhancement of CRC screening rate of husbands and wives were verified. Such results of this study could be used as the basic data for the development of intervention programs for enhancing the CRC screening rate.

Based on the results of this study, the suggestions for the follow-up researches could be made as follows. First, it would be necessary to have the researches on the development of programs including the contents of improving the self-efficacy and social support of husbands and wives of CRC screening and the verification of effects. Second, there should be the researches including diverse variables that could have effects on the CRC screening besides the variables verified in this study.

Conclusion

This study aimed to verify the actor and partner effects of self-efficacy and social support on the CRC screening behavior of husbands and wives of CRC screening. In the results of the analysis, the self-efficacy of husbands and wives had the actor effects on the CRC screening behavior while the self-efficacy of wives had the partner effects on the CRC screening behavior of their husbands. The social support of husbands and wives had the actor and partner effects on the CRC screening behavior. Therefore, to enhance the CRC screening rate, it would be more effective to verify the social support system of husbands and wives and also to plan/carry out the programs that could improve the self-efficacy in the unit of husband and wife. The model verified on the basis of APIM in this study could become the theoretical basis for the development of programs for improving the CRC screening rate by verifying the actor and partner effects of husbands and wives of CRC screening.

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The Correlation of the Star Excursion Balance test, Star Excursion Balance Test, Visual Feedback Balance Test

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Abstract

Background/Objectives: The purpose of this study was to evaluate the relationship between Star Excursion Balance Test (SEBT), Y-Balance Test (YBT) and Visual Feedback Balance Test (VFT).

Method/Statistical Analysis: Thirty subjects were recruited for this study. To verify the usefulness of the VFT, we compared the correlation with the existing SEBT and YBT scores. Pearson Correlation Analysis was conducted to determine the difference in each balance test.

Findings: In this study, there were statistically significant correlations between reach distance and composite scores in SEBT, YBT and VFT ($p < 0.01$).

Improvements/Applications: The results suggest that VFT may be able to use dynamic test equipment. The VFT can be used for dynamic balance exercise because it can intuitively visually check balance values.

Keywords: Correlation, Dynamic balance, Star excursion balance test, Visual Feedback, Y-balance test

Introduction

In the human body, balance is the ability to maintain the center of gravity on the base of support during movement^[1]. The ability to maintain balance is an essential part of life because humans have to adjust body's posture and balance with respect to space^[2], such as when humans stand up and sit down in everyday life. A well-balanced posture protects the body from injury and helps maintain its function^[3].

Balance can be divided into static balance and dynamic balance. Static balance is the ability to keep the body's center in base of support without disturbance. Dynamic balance is the ability of the body to maintain balance as it moves and maintain the desired posture by placing the center of gravity within the base of support^[4]. Balance is a complex process that monitors the body's motion through the sensory apparatus, enters the central nervous system and then sends it back to the muscular

skeletal system to perform the response, which is an important element in everyday life. Therefore, balance test has been used in orthopedic, sports medicine^[5] and rehabilitation^[6].

Method of measuring static balance includes Romberg test and one leg standing test^[7,8] and method of measuring dynamic balance includes timed up & go test^[9], star excursion balance Test (SEBT) and Y-Balance Test (YBT)^[10,11]. Especially SEBT and YBT are widely used in clinical practice. The reason is the most common and well-established balanced assessment, because both tests do not require high interventions and techniques. In particular, SEBT and YBT are often performed in clinical practice, because they are the most common and well-established balance assessment and because they do not need to perform high-level arbitration and techniques, they are used most often in clinic^[12-14].

SEBT is a dynamic balance test tool that measures strength, flexibility and the sense of motion of the legs and is measured with eight lines drawn on the ground at intervals of 45 degrees. The test is to measure the distance reached by supporting the ground with the

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dominant legs and extending as far as possible with the non-dominant legs in the specified direction^[15,16]. SEBT was studied by many researchers, including changes in muscle activity towards the direction subjects with and without symptom.

YBT performs only three directions: anterior (AN), posterior-medial (PM) and posterior-lateral (PL). It has high inter ratorreliability (intraclass correlation coefficient (ICC) = .88 to .99) compared to the higher repeatability and less test time and is widely used in clinic^[16-18]. However, YBT can be performed when the assessor is present and have to return the box to basic position each time after the test. YBT also has the disadvantage of not receiving visual feedback during the balance test.

Several studies have been reported that visuals have affected balancing when visuals are blocked or limited. Postural fluctuations have been reported to increase by 20-70% in the absence of visual information. Visual feedback is combined with centripetal information from body sensations, contributing to postural coordination and reducing postural movements.

To address these problems, this study developed a VFT using visual feedback sensor system measurement technology. Therefore, the purpose of this study is to investigate the correlation with SEBT and YBT to determine the usability of VFT as an objective tool for the dynamic balance assessment. The purpose of this study was to evaluate the relationship between, YBT, SEBT and VFT.

Method

SEBT is a dynamic balance measurement tool that evaluates muscle strength, flexibility and proprioception. This experiment used three of the eight directions, anterior, posterolecular and posteromedial. In addition, lines in the direction of posterolecular and posteromedial were marked with tape at 135 degree points on both sides of the ground in relation to the forward direction.

Y Balance Test (Functional Movement Systems, Danville, VA, USA) is a modified dynamic balance measurement method by increasing the efficiency of SEBT, which was commonly used to measure the strength, flexibility and proprioception of the lower extremities. Unlike SEBT, YBT consists of only three directions: anterior, posteromedial and posterolateral. The YBT kit consists of a single plate with height and

PVC pipe with three directions: AM and PL PM. The pipes in the PM and PL directions are at an angle of 90 degrees and the pipes in the front and rear directions are at an angle of 135 degrees. Each pipe is marked with a distance in 5 mm so that the distance can be expressed numerically. Each pipe is marked with a distance in 5 mm so that the distance can be expressed numerically.

VFT is performed in the same method as SEBT but the length is measured through the program without the assessor. During dynamic balance test, subjects can receive visual feedback from the screen.

SEBT was measured three times in each direction after sufficient practice until the subject could perform the experiment. The measuring method is to extend the leg as much as possible for 4 seconds and return to the starting position again. The weight was supported by the dominant leg and the distance to the maximum stretched point in cm was recorded while maintaining the balance along the line of the ground with the non-dominant leg^[12]. To prevent muscle fatigue, subjects rested for 30 seconds after each measurement. If the supporting foot falls off the ground, supports the floor with an extended foot for balancing, or fails to return to the starting position after the foot is extended, it was considered a failure and remeasured. YBT was measured three times in each direction after practice until the experiment could be performed as much as possible and it was instructed to return to the starting position in four seconds with the legs stretched out as much as possible for four seconds.

YBT was measured three times in each direction after practice until the experiment could be performed as much as possible and it was instructed to return to the starting position in four seconds with the legs stretched out as much as possible for four seconds. The subject's second toe was placed on the instrument reaching direction line and the experimenters measured the distance from the center of the instrument to the predominant leg and to the maximum point in which the non-dominant leg extends from the center in three directions. To prevent muscle fatigue, subjects rested 30 seconds after each measurement. If the supporting foot falls off the ground, supports the floor with an extended foot for balancing, or fails to return to the starting position after the foot is extended, it was considered a failure and remeasured. It was also considered to be a failure if the end of the body moved while reaching the foot from an unstable support surface when the end device was kicked to reach the maximum reach distance.

VFT is a method of measuring the maximum length reached by extending the legs in each direction on a tape attached to the ground like SEBT. If the leg is extended during the measurement, the ultrasound program on the machine automatically records the distance. After practicing until the experiment could be performed as much as possible, three measurements were taken in each direction and with the hands fixed to the waist, the legs were stretched for 4 seconds as much as possible and the instruction was made to return to the starting position again at 4 seconds. The subject supports the weight with the dominant leg and balances along the line of the ground with the non-dominant leg, stretching the leg as far as possible and recording the distance to the point in cm. If the supporting foot falls off the ground, supports the floor with an extended foot to balance, or fails to return to the starting position after reaching out, it is considered a failure and remeasured.

The Pearson correlation analysis of the reach and composite scores of SEBT, YBT and VFT was performed. And the correlation coefficient (r) was used to determine the reliability between the two variables. The r values were classified as poor reliability below .69, good reliability between .70 ~ .79 fair reliability, good reliability between .80 ~ .89 and high reliability above .90 ~ .99. All statistics were processed by SPSS ver. 22.0 program (SPSS Inc, Chicago, IL, USA) was used.

Result and Discussion

1. Reach distance correlation of SEBT, YBT, VFT

The results of the reach distance correlation of SEBT, YBT and VFT are as follows [Table1-3].

Table 1. Pearson correlation of AN

AN reach distance	PEARSON Correlation Coefficient		significance probability (**p<0.01)		
	YBT	VFT		YBT	VFT
SEBT	.602**	.619**	SEBT	.000	.000
YBT		.485**	YBT		.007

Table 2. Pearson correlation of PM

PM Reach Distance	PEARSON Correlation Coefficient		Significance probability(**p<0.01)		
	YBT	VFT		YBT	VFT
SEBT	.670**	.651**	SEBT	.000	.000
YBT		.621**	YBT		.000

Table 3. Pearson correlation of PM

PL Raach Distance	PEARSON Correlation Coefficient		Significance probability(*p<0.05),(**p<0.01)		
	YBT	VFT		YBT	VFT
SEBT	.416*	.491**	SEBT	.022	.006
YBT		.600**	YBT		.000

2. Composite Score Correlation of SEBT, YBT, VFT

The results of the composite score of SEBT, YBT and VFT are as follows[Table 4-6].

Table 4. Pearson correlation of AN

AN Composite Score	PEARSON Correlation Coefficient		Significance probability (**p<0.01)		
	YBT	VFT		YBT	VFT
SEBT	.578**	.760**	SEBT	.001	.000
YBT		.636**	YBT		.000

Table 5 : Pearson correlation of PM

PM Composite Score	PEARSON Correlation Coefficient		Significance probability(**p<0.01)		
	YBT	VFT		YBT	VFT
SEBT	.639**	.749**	SEBT	.000	.000
YBT		.661**	YBT		.000

Table 6. Pearson correlation of PL

PL Composite Score	PEARSON Correlation Coefficient		Significance Probablity(**p<0.01)		
	YBT	VFT		YBT	VFT
SEBT	.669**	.787**	SEBT	.000	.000
YBT		.684**	YBT		.000

Result and Discussion

The purpose of this study is to identify the correlation between the reach distance and the composite score of the dynamic balancing test, SEBT, YBT and VFT. Dynamic balance testing is the ability of the body to maintain balance during the performance of the movement. During the movement, the body center is placed on the support surface to evaluate the performance of the movement. SEBT and YBT are dynamic balance tests performed frequently in clinical use and VFT is an instrument that can provide visual information to users during dynamic balance tests. The purpose of this study is to examine the correlation between the range of distance and composite scores of the existing clinical evaluation tools SEBT, YBT and VFT and whether the test tool can be used as an objective tool for balance evaluation.

In this study, there were statistically significant correlations between AN, PM, PL reach distance and composite scores during SEBT, YBT and VFT (p <0.01). SEBT has traditionally been widely used in clinical practice to assess dynamic balance. YBT is an instrument that is made by modifying and improving SEBT and it is measured using only three directions (AN, PM, PL) unlike SEBT that extends in eight directions. YBT consists of three pipes and a plate with height. The PVC pipe of PM and PL are located at 135° each in the AN direction and the angle between the two pipes of PM and PL is 90°. According to the study of Coughlan et al. (2012), when the reach of SEBT and YBT in each direction is compared, the reach distance of anteior directions is correlated because the reach of SEBT is longer than that of YBT^[16]. Plisky et al. (2009) reported higher in Inter-rater reliability in YBT compared to SEBT, which he claimed was because the use of standardized kits in YBT reduced errors^[18]. However, YBT has the hassle of having the tester check each record, record it on the test sheet and inform the subjects.

Our findings showed statistically significant correlation results in the reach distance and composite score reached not only in SEBT and YBT, but also in VFT. Visual information can be integrated with afferent information coming from vestibular and somatosensory to contribute to postural agitation, improving dynamic balance. Uchiyama and Demura(2008) showed that when providing visual information, pre- and post-pressure center point shifts were reduced compared to when no visual biofeedback was given^[19].

The VFT applied in this study was applied to the evaluation of dynamic balance by integrating visual feedback which is essential for the motor control factor. This is because the ability to control motion is essential for dynamic balancing capabilities and visual biofeedback is necessary for proper motor control, which changes the control of motion. VFT is a functional test performed on the ground that does not require three pipes and plates and does not change in height, unlike the YBT, which is performed on a high plate, the same conditions as in everyday life. VFT is an automated system using ultrasonic sensor system measurement technology with visual feedback, allowing the experimenter to return the boxed plate to its original position and eliminate visual errors between the subject and each time during the balance measurement. Therefore, VFT is not only suitable as testunobtrusiveequipment for dynamic balance ability, but also as a tool for balance exercise. The limitation of this study is that the VFT did not confirm inter-rater reliability. In future studies, it will be necessary to examine the inter-rater reliability during VFT.

Conclusion

This study was conducted to investigate the correlation between SEBT, YBT and VFT and to find out whether VFT can be used as a balance assessment. As arsulsts, VFT is not only suitable as testequipment for dynamic balance ability, but also as a tool for balance exercise. Further research will require study of motion analysis during VFT.

Ethical Clearance: Not required

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Conflict of Interest: Nil

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Study the Association between the Thyroid Autoimmunity Markers and Polycystic Ovary Syndrome in Euthyroid Women

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Abstract

Polycystic ovary syndrome during childbearing age is considered as one of the commonest endocrine disease in reproductive age females, with a prevalence of 4% to 15%. The clinical expression of PCOS is variable, but mostly includes anovulation or oligo-ovulation, clinical or biochemical hyperandrogenism and ovarian polycystic picture in U\S. **Objective:** To determine the levels and prevalence of thyroid antibodies in euthyroid women has PCOS.

Patients and method: A case control study carried in the Infertility clinic of the Babylon Teaching Hospital for maternity and children in Al-Hila city, Babylon governorate, /Iraq in the period from October 1, 2018 to the end of Nov. 2019. **Results:** the current study found a highly statistically significant association between the studied group among the BMI ($P<0.001$), while no significant association between the studied groups regarding the age ($P>0.05$). Eighty percent of the patients (PCOS) group, and 20% in control group presented with family history with thyroid disease. Anti-TG were negative in (85.72%) of the PCOS group patients, 8.57% of the patients with borderline positive and only (5.71%) were positive (>110 IU/ml). TSH level in PCOS group (2.3 ± 0.5) were increase with significant association than that in control group (2.1 ± 0.8), highly significant increase were found in Anti-TPO, Anti-TG, free testosterone and LH in PCOS group than that in control group ($P<0.001$).

Conclusion: There is increased risk of thyroid disease with increase in thyroid Autoimmunity Markers in PCOS patients.

Keyword: PCOS, Anti-TPO, Anti-TG, Thyroid Autoimmunity Markers,

Introduction

Polycystic ovary syndrome during childbearing age is considered as one of the commonest endocrine disease in ladies, with a prevalence of 4% to 15% of the female population of childbearing age being estimated ⁽¹⁾.

The clinical expression of PCOS is variable, but mostly includes absence of ovulation or oligo-ovulation, clinical or biochemical hyperandrogenism and ovarian polycystic picture in U\S ⁽²⁾. Variability in phenotypic expression continues to be a reason for investigation and

should be considered at the time of the clinical approach ⁽³⁾.

The prevalence of thyroid pathology in patients who has PCOS remains a matter of debate. Several studies have shown a relationship between PCOS and the existence of hypothyroidism and autoimmune thyroid disease AITD ⁽⁴⁾. The AITD in PCOS is proposed to be related to genetic factors that also contribute to the pathophysiology of this syndrome, suggesting that autoimmune mechanisms are involved in the pathogenesis of PCOS ⁽⁵⁾.

While insulin resistance (IR) seems to be a fundamental event to initiate or perpetuate the most important pathological conditions of this syndrome, it is associated in obese patients with an increase in adipokines - cytokines and other inflammatory markers

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such as, tumor necrosis factor α (TNF α) and IL-6^(6,7). Moreover, its related to a defect in auto phosphorylation receptor, and phosphorylation of signaling molecules coupled to the insulin receptor independently of obesity and body mass index (BMI))⁽⁸⁾. Structural changes of the thyroid gland have been determined in different states of insulin resistance in relation to thyroid nodular disease⁽⁹⁾.

The effects described for insulin resistance establish phenomena of selectivity, maintaining the mitogenic pathways that involve this hormone as a vital factor of cellular growth and generation. The effect of insulin resistant on the thyroid gland recently has been evaluated, and demonstrating that patients with this condition have a greater thyroid mass, as well as a higher prevalence of thyroid nodules, and even recently has been related to early stages of thyroid carcinogenesis. In view of the overexpression of insulin receptors and insulin-like growth factors type 1 and 2 (IGF-1 and 2), with high structural homology and the existence of hybrid tetramers, in cell cultures of thyroid tumors, which They have also been isolated in granulosa and ovarian cells from PCOS patients^(9,10).

One of the common autoimmune disorders in childbearing women (5% to 20%) is the autoimmune thyroid diseases (AITD)⁽¹¹⁾. Previous studies have stated a relation between thyroid autoimmunity in pregnant women and adverse gestational outcomes like preterm labor and recurrent miscarriages⁽¹²⁾; moreover, recently many studies have described that there is an association with PCOS⁽¹³⁾.

Aim of the study: To determine the levels and prevalence of thyroid antibodies in euthyroid ladies with PCOS.

Patients and method:

A case control study carried in the in the Infertility clinic of the Babylon Teaching Hospital for maternity and children in Al-Hila city, Babylon governorate, / Iraq in the period from October 1, 2018 to the end of Nov. 2019. For this study, each patient presented with hypertrichosis and menstrual disturbance with in the age in between 18-40 years who visited the infertility clinic at same period. For determining of PCOS we depend on The Rotterdam Classification in the case of: (1) menstrual disorders such as amenorrhea (no menses for the last six months), oligomenorrhea (cycles of >35 days), (2) clinical and / or biochemical hyperandrogenism, (3) U\ S

pictures show PCO (more than 12 follicles, 2-9 mm in size).

The presence of 2 of these 3 criteria was necessary to determine poly cystic ovarian syndrome when all other diagnoses, such as congenital adrenal hyperplasia, androgen secreting tumors, Cushing's syndrome, and hyperprolactinemia, were excluded⁽¹⁴⁾. Clinical hyper-androgenism (hypertrichosis) with Ferriman-Galway score more than (7) and / or acne and/or androgenic(male) pattern of alopecia⁽¹⁵⁾. Biochemical hyperandrogenemia was determined by increased testosterone. The proportion of luteinizing hormone to follicle stimulating hormone more than two found to be high. To detect the presence of cystic ovaries, ultrasound performed on the transabdominal pelvis. Other causes of hyperandrogenism excluded by 17-OH progesterone stimulated with adrenocorticotropin, a test for dexamethasone suppression, and / or urinary cortisol excretion for 24 hours. Ladies with similar age group who visited the infertility clinics with complains not related to poly cystic ovarian syndrome or thyroid problems, with normal menstruation enrolled as controls (N=35).

Medical history taken in detail, developed physical examination, Age, BMI were recorded.

Laboratory parameters measurement:

Five cc of venous blood samples were collected in the morning from each participants using clot activator tube during menstrual cycle (2-5th days of MC). By using centrifuge the separation of serum were done after standardized time needed and then put in a special refrigerator to frozen at temperature below -80°C to do further analysis. The following serum measurements were achieved: TSH, free thyroxin level (FT4 and FT3), anti-thyroid peroxidase antibody (anti-TPO), anti-thyroglobulin antibody (anti-TG), fasting blood glucose, fasting insulin, LH, FSH, free testosterone.

As we measured the blood glucose in mg/dL so we use can calculate the HOMA-IR (mIU/L) as follow:

Fasting insulin mIU/L multiply by fasting glucose mg/dL divided by (405).

Insulin resistance readings range:

- Normal (less than 3)
- Borderline (3-5)

- Severe IR (more than 5)

Statistical Analysis

Data entered by the researcher by use of computerized statistical software; Statistical Package of the Social Sciences (SPSS) version 23. Descriptive statistics are presented in the form (mean ± standard deviation). One-way ANOVA analysis was used to compare more than two means. In all statistical analyzes,

the significance level (p-value) was set at ≤ 0.05 and the result was presented in tables and / or graphs.

Results

Seventy participants enrolled in the current study with response rate of 100%. Table 1 show that the BMI in PCOS group were highly significant than BMI in healthy control group (P<0.001). The age in case group were less than that in control group but with no statistically difference were found (P>0.05)

Domains	PCOS group (No=35)	Control group (No=35)	P value
Age (year)	27.2±6.7	28.3±7.2	NS
BMI	29.4±3.1	27.7±3.6	<0.001

As shown in figure 1, 80% of the patients in case group (PCOS) and 20% in control group presented with family history with thyroid disease.

Figure 1: family history of thyroid disease in the studied group (case and control)

Anti-TG-IgG were negative in (85.72%) of the PCOS group patients, 8.57% of the patients with borderline positive and only (5.71%) were positive (>110 IU/ml)

Domain	No.	%	
Anti-TG IgG	Positive (> 110 IU/ml)	2	5.71
	Borderline positive (90 - 110 IU/ml)	3	8.57
	Negative (< 90 IU/ml)	30	85.72
	No.	%	
Anti-TPO IgG	Positive (> 55 IU/ml)	4	11.42
	Borderline positive (45 - 55 IU/ml)	4	11.42
	Negative (< 45 IU/ml)	27	77.16

Table 3 revealed that TSH level in PCOS group (2.3 ± 0.5) were increase with significant association than that in control group (2.1 ± 0.8), highly significant increase were found in FBG, Fasting insulin, HOMA-IR, Anti-TPO, Anti-TG, free testosterone and LH in poly cystic ovary group than that in healthy group (P<0.001), while difference between FT4, and FSH was not significant.

Table 3: The relation of many domains and the studied groups

Domain	PCOS group	Control healthy group	P-value
FBG(mg/dL)	108.57±11.27	98.68±15.1	<0.001
Insulin(IU/ml)	22.7±3.4	17.20±5.3	<0.001
HOMA-IR (mIU/L)	6.08±2.51	4.19±1.81	<0.001
TSH µIU/ml	2.3 ± 0.5	2.1 ± 0.8	0.03
FT4 nmol/L	78.23± 21.4	76.9 ± 22.2	NS
Anti-TPO IU/ml	46.5 ± 16.9	32.9 ± 10.2	<0.001
Anti-TG IU/ml	92.3±23.4	34.8±6.20	<0.001
Free testosterone	0.98 ± 0.44	0.36 ± 0.14	<0.001
LH	9.7 ± 6.5	5.4 ± 2.8	<0.001
FSH	6.4 ± 4.2	6.8 ± 1.5	NS

Discussion

One of the most common connection between PCOS and thyroid disease is the increase level of insulin resistance and BMI⁽¹⁶⁾. The current study revealed that there is increase in BMI of the PCOS group, which is very common in women with this disease. As mentioned by Lim S et al, this prevalence was between 54–68% of cases⁽¹⁷⁾. Moreover, many studies were in agreement with current study. Nevertheless, it is not in agreement with Duntas L et al, and with Harpsoe M et al, when they concludes that there is no association between thyroid autoimmunity and BMI^(18,19).

Prevalence of thyroid disorders (Td) in women With the PCOS, this is still a matter of debate. Different studies demonstrated a link between PCOS and attendance hypothyroidism and antithyroid antibodies⁽²⁰⁾.

In a retrospective study of 197 women With PCOS, reported a high prevalence of subclinical hypothyroidism and thyroid autoimmunity, with frequencies of 26.3 and 20.3%, respectively

Ganie and colleagues reported a significantly higher prevalence of PCOS in euthyroid adolescents with

chronic lymphocytic thyroiditis (CLT) compared to healthy controls (46.8 vs. 4.3%)⁽²¹⁾.

In addition, a recent meta-analysis study indicates that the occurrence of autoimmune thyroiditis and Plasma TSH levels in patients with poly cystic ovarian syndrome was significantly higher than those of healthy group⁽¹⁵⁾.

While in the current study we found that positive anti TPO were found in 11.42% of the patients with PCOS, this is less than (37.8%) that found in a study carried by Ozdemir D et al, in Turkey⁽²²⁾. Moreover, it is less than that found by Indian study done by Sinah U et al, when positive anti-TPO were found in 22.5% of the PCOS patients included his study⁽¹⁵⁾. This may be due to differences in sample size collection and different in cutoff value of the markers used in the studies.

The current study show that LH/FSH were increase >2 times in 24% of the PCOS patients and < 2 times in 76%, while in Banaszewska B et al, study they revealed that the raised was in 45.4% in LH/FSH ratio and the raised was 64% in Anlakash A et al^(23,24).

The mean serum of anti TPO in PCOS group was significantly elevated than that in healthy group ($p < 0.001$), also the anti-TG serum levels were higher increase in PCOS group than that in control group. In agreement with Syrian study regarding the anti-TPO but this study that carried by Al-Saab R et al, mentioned that serum level of anti-TG were more elevated in PCOS group than that in control healthy group but with no significant association ⁽²⁵⁾. In addition to that, Kachuei et al, in Iranian study were in agreement with Al-Saab R et al finding ⁽¹³⁾.

Conclusion

There is increased risk of thyroid disease with increase in thyroid Autoimmunity Markers in PCOS patients.

No Conflicts of Interest

Self-funding Source: Ethical clearance: from the Ministry of health and Environment/ scientific committee

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The Effect of Slow Stroke Back Massage, Cold-compress and Warm-compress on Superokside Dismutase and Malondialdehyde Levels in Primary Dysmenorrhoea

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Abstract

During dysmenorrhea occurred inflammation and endothelial dysfunction with lipid peroxidation sign and it was an indication of oxidative stress. Several previous studies have showed in dysmenorrhoea there was an increase of MDA levels and a decrease of SOD plasma. The aim of this study was to determine the effect of Slow Stroke Back Massage (SSBM), cold-compress and warm-compress on Superokside Dismutase and Malondialdehyde levels in Primary Dysmenorrhoea. This study used a Quasy Experiment design with approach a Post Test Only Control Group Design. The population in this study was all female students in Health Science Faculty of Unipdu Jombang who experienced dysmenorrhoea, a total sample in this study was 50 respondents and they were divided into 4 groups. The instruments in this study were included: thermometer for measured the temperature, and a Spectrophotometer which consists of NBT (Nitro Blue Tetrazolium) method for measured SOD level, Thiobarbituric Acid (TBA) method for measured MDA level. The data were analyzed by using the Kruskal-Wallis test and Post Hoc Test with $\alpha \leq 0.05$. The results of this study showed that there were disfferences of SOD level in SSBM, warm-compress compared to control and there were no differences in SOD levels between cold-compress with the control. There were significant differences of MDA levels in all treatment groups and control.

Keywords: *Slow Stroke Back Massage, Cold-compress, Warm-compress, Superokside Dismutase Malondialdehyd*

Introduction

Primary dysmenorrhea is a complaint of lower abdominal pain during menstruation among young women without pelvic pathology⁽¹⁻³⁾. Cramping pain of menstruation occur ≥ 2 days and accompanied some symptoms such as nausea, diarrhea, headaches and bloating⁽⁴⁻⁷⁾.

The incidence of primary dysmenorrhea was estimated at 60%-88% occurred young women⁽⁷⁻⁸⁾. Dysmenorrhoea give an impacts for personal health and social. A study mentioned that about 600 million of work hours and the economic losses of around 2 billion dollars per year in the United States⁽⁹⁾. Studies in

Korea showed that about 83%-94% of female students complained of cramps during menstruation⁽¹⁰⁻¹¹⁾. The menstrual cramps defined as colic pain before or during menstruation in the pelvis, lower back, or upper legs that last for 48-72 hours⁽¹²⁾.

In primary dysmenorrhea has an increase of endometrial secretion, PGF2 α and leukotriene levels during menstruation so it makes an increasing of uterine tone and pain⁽¹³⁾. Also occurred an inflammation and endothel dysfunction characterized by lipid peroxidation which is an indication of oxidative stress⁽¹⁴⁻¹⁵⁾. Lipid peroxidation can be identified by an increasing of malondialdehyde (MDA) levels⁽¹⁶⁾. On healthy conditions, oxidative stress and free radical are balanced in the cellular system. Oxidative stress occurs because of an imbalance between pro-oxidants and antioxidants⁽¹⁷⁾. It men has an increase on concentration of reactive oxygen species (ROS) and or reactive nitrogen species (RNS) and has a decrease in defense of

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antioxidant mechanisms⁽¹⁸⁻²²⁾. Some of ROS are needed for the development of normal cell function with the condition on the oxidation of each molecule returning to the reduced status⁽²³⁾. Excessive ROS can defeat the body's natural antioxidant defending system⁽¹⁷⁾, induce lipid peroxidation and the damage of DNA and cell membranes^(18,24-25). One of endogenous antioxidant is superoxide dismutase (SOD). Several previous studies said that in dysmenorrhoea process will increases MDA⁽²⁶⁻²⁸⁾ and decreases in plasma SOD⁽²⁹⁾.

Nonsteroidal anti-inflammatory drugs (NSAIDs) consumption can reduce menstrual pain by inhibiting the cyclooxygenation enzyme especially in acute phase and reducing prostaglandin F2 levels in menstrual fluids⁽³⁰⁻³¹⁾. Eventhough this drug is beneficial but it also has side effect such as dyspepsia, nausea, breast tension, bleeding between two menstrual cycles, visual and hearing disorders and abnormal results of kidney and liver function⁽³²⁻³⁷⁾, so effective and efficient interventions are needed for patients who experienced primary disminorhea. These efforts can be giving a SSBM, cold-compresses and warm-compress. Massage can reduce the production of NF- κ B, inflammatory cytokines and TNF- α ⁽³⁸⁾. Cold-compress can reduce prostaglandins and it maked strengthen the sensitivity of pain and other subcutaneous at the site of injury by inhibiting the inflammatory process by reducing blood flow and giving analgesic effects by slowing the speed of nerve delivery so the pain impulses are late or less to reach the brain⁽³⁹⁾. Warm-compress can increase the circulation on pelvic area. Previous studies said that local heat intervention was effectives as ibuprofen⁽⁴⁰⁾ and paracetamol⁽⁴¹⁾. However, the study about the impact of SSBM, cold-compresses and warm-compresses on SOD and MDA level are limited so the researchers are interested to conduct this research with the aim of this study was to determined the effect of SSBM, cold-compresses and warm-compresses on SOD and MDA in Primary Dysmenorrhoea.

Method

This research used Post-Test Only with Control Group Design. The population were all female students in Faculty of Health Sciences Unipdu who experienced dysmenorrhoea. Sample size was 50 respondents, divided into 4 groups, it were SSBM (n=13), cold-compress (n=12), warm-compress (n=13), control (n=12). The sampling technique was purposive sampling. Inclusion criteria were 1) primary dysmenorrhoea; 2) pain

intensity: moderate to severe, 3) have not received anti-pain medicine; 3) Cooperative. Exclusion criteria were 1) experienced secondary dysmenorrhoea; 2) refused in the middle of intervention. The instruments were: thermometer and a Spectrophotometer which consists of NBT for measured SOD level, TBA for measured MDA level. The data were analyzed by using the Kruskal-Wallis test.

Findings

Table 1. The differences of SOD level after giving intervention

Group	Median (Min-Max) pg/ml	p
SSBM	1099 (1069.2-1190.8)	0.001
Cold-compress	1061 (1029.2-1187.5)	
Warm-compress	1081 (1035.8-1215.8)	
Control	1034 (900.8-1135.8)	

Kruskal-Wallis test

Table 2. The differences of SOD level after giving intervention

Group	p
SSBM vs Cold-compress	0.005
SSBM vs Warm-compress	0.068
SSBM vs Control-group	0.001
Cold-compress vs warm-compress	0.205
Cold-compress vs control	0.106
Warm-compress vs control	0.007

Post Hoc Mann-Whitney test

The Kruskal-Wallis test obtained p=0.001 (there was significant differences of SOD levels between the two groups). The Mann-Whitney Post Hoc Test showed that there were significant differences of SOD in SSBM vs. Cold-compress, SSBM vs. Control and Warm-compress vs control.

Table 3. The differences of MDA level after giving intervention

Group	Median (Min-Max) pg/ml	p
SSBM	164.17 (142.5-194.2)	0.000
Cold-compress	100.83 (52.5-127.5)	
Warm-compress	72.5 (40.8-114.2)	
Control	286.67 (234.2-347.5)	

Kruskal-Wallis test

Table 4. The differences of MDA level after giving intervention

Group	P
SSBM vs Cold-compress	0.000
SSBM vs Warm-compress	0.000
SSBM vs Control	0.000
Cold-compress vs Warm-compress	0.014
Cold-compress vs control	0.000
Warm-compress vs control	0.000

Post Hoc Mann-Whitney test

The Kruskal-Wallis test showed there were significant differences in MDA between each the 2-groups.

Discussion

The pain of primary dysmenorrhea can spread to the lower back and thighs and occurred 2-3 days⁽⁴²⁾. Primary dysmenorrhea occurs due to an increasing of endometrial prostaglandin production so it makes uterine hypercontractility and increasing uterine basal pressure followed by the decreasing of blood flow in large or small blood vessels in uterus and in the end giving impacts like ischemia and pain⁽⁴³⁻⁴⁴⁾. Endometrial ischaemia can activates phospholipase A2 so it will hydrolyze acylgliserolipids and producing free fatty acids, especially arachidonic acid which is metabolized by the enzyme lipoxigenase, cyclooxygenase, and cytochrome P450 to eicosanoid formation and activated the release of ROS⁽⁴⁵⁻⁴⁶⁾. Excessive ROS can defeat the defense of body's natural antioxidant system⁽¹⁷⁾ so in primary dysmenorrhoea there is an increase of MDA levels and a decrease of SOD levels.

The results of this study showed that SOD level among intervention group was higher than control group. SSBM and warm-compress were effected the increases of SOD level in primary dysmenorrhoea and statistically there is no differences of SOD level between cold-compress group and control group, however the maximum value of SOD levels in cold-compress group was higher than control group. SSBM, cold-compress and warm-compress were effected to reducing MDA level in primary dysmenorrhea.

SSBM give impact on an increase of SOD level and a decrease of MDA level, this occurs because the mechanical pressure of the massage will encourages on increasing blood circulation by increasing arteriolar

pressure⁽⁴⁷⁻⁴⁸⁾. The massage on the neck and shoulders are increase peripheral blood flow and it can detected by using infrared thermography⁽⁴⁹⁾. The increasing of blood circulation can improve the oxygenation in tissues and also improves ischemia and reduce the production of free radicals and the uptake of the antioxidant SOD. Ischemia in uterine endometrial cells and muscles is a condition of reperfusion ischemia which generates a lot of oxygen free radicals which is it gives an impact on the uptake of SOD⁽²⁹⁾.

The results showed that there were no differences of SOD level in cold-compress and control, and there were differences of MDA level in cold-compress and control. Although, there was no differences of SOD level in cold-compress and control, the maximum of SOD was higher than control. Cold-compress works by reducing the inflammatory process, reducing edema and reducing local pain⁽⁵⁰⁾. The decreasing of MDA, possibly due in cold-compress work by reducing the inflammatory process so the prostaglandin products also decrease, and in the end also decreasing uterine contractility, and oxygenation in endometrial tissue will improves.

SOD and MDA after given a warm-compress also given an impacts where there was an increase of SOD and a decrease of MDA. A warm-compress given an impacts on blood flow of pelvic region increases because the effects of vasodilation⁽⁵¹⁾. The changes mechanism in SOD and MDA levels after given of warm-compress intervention was same as the SSBM intervention. Hot hip-bath intervention for 10 minutes every day in 7 days before menstruation was effected to reducing menstruation pain among women with primary dysmenorrhea. This happens because the hot hip bath can increase blood flow in myometrium, which is it can clear prostaglandins and in the end it will reducing cramps and pain⁽⁵²⁾.

Conclusion

1. The SSBM, warm-compress were effected to increasing of SOD levels in primary dysmenorrhoea
2. The SSBM, cold-compress and warm-compress are effective to reducing MDA levels in primary dysmenorrhoea

Ethical Clearance-obtained from the ethics commission of Nursing Faculty, Airlangga University.

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regarding the publication

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Modification of Chicken Egg Shell and Lime Extract (*Citrus amblycarpa*) for Minimizing Lead (Pb) Level on Blood Cockles (*Anadara granosa*)

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Abstract

Heavy metal in human body generally is from food consumed by the human either through fish or other aquatic animals in fresh water or seawater which are polluted by heavy metal. The presence of heavy metal in human body in certain level can cause several diseases, such as kidney disease, liver, nerve, and brain disease. Moreover, this research aimed at analyzing the decrease of lead (Pb) level on blood cockles (*A. granosa*) through engineering of stirring time, adsorption temperature, and variation of lime extract (*C. amblycarpa*) concentration by using Stirring Chamber tools through using chicken egg shell adsorbent. The research design used simple experiment in posttest only control group design. Meanwhile, the subject in this research was divided by two groups randomly in which a treatment was given to one group as control group and experiment group. Sample of blood cockles that was used was in 72 samples. Lime extract concentration in 1%, 1.5%, and 2% in stirring time of 5 minutes, 10 minutes, and 15 minutes before and after heating in 35°C utilized stirring speed in 150 rpm. Meanwhile, the chicken egg shell adsorbent was in 50 gram for each treatment. The sampling technique in this research utilized purposive sampling and data was analyzed by utilizing Statistic test of Two-Way Anova. Result showed that Pb level in fresh cockles before heating was 0.223 ppm and after heating, it reduced to be 0.062 ppm. Result of hypothesis test was obtained p-value <0.05, which was 0.000, and it indicated that there was a significant enhancement of chicken egg shell adsorption capacity in minimizing Pb level on blood cockles after being conducted the addition of lime extract with temperature variation and stirring time in certain stirring speed through engineering tool of Stirring Chamber. All in all, conclusion of this research was there was a significant enhancement of modified chicken egg shell adsorption capacity and lime extract in minimizing Pb level on blood cockles. Moreover, it was expected that this research could give contribution to food technology in reducing heavy metal of Pb level in pre-treatment of blood cockles (*Anadara granosa*) with modifying lime extract and chicken egg shell through Stirring chamber tool.

Keywords: pH of a solution; adsorption temperature; lime extract

Introduction

Sea environment in the world has been discovered that it is contaminated by heavy metal. Concentration of heavy metal in environment varies partially or totally as

an impact of environmental condition and human activity.

⁽¹⁾ Condition of aquatic environment that is polluted by heavy metal can impact on biota that lives in it. Pereira, *et al* conducted a research against aquatic biota and it was known that the fish that was tested contained chromium metal, which was 1.5 mg kg⁻¹.⁽²⁾ In the water, through food chain process, first heavy metal is absorbed by phytoplankton, bacteria, fungi and low-level organisms which then, they are eaten by higher-level organisms until they enter into human body if the human consumes them.⁽³⁾ Referring to this statement, it can be meant that one of causes the human can be contaminated by heavy

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metal is from food consumption pattern that is gotten from the waters which are contaminated by heavy metal.

Kenjeran beach Surabaya, East Java Province, Indonesia is one of water areas which has been contaminated by heavy metal. Indication of heavy metal contamination in Kenjeran beach Surabaya has been proven by conducted research by Suryono, *et al* and they stated that the presence of Hg level in 0.582 ppm in blood cockles was taken from Kenjeran beach Surabaya.

⁽⁴⁾ Result of laboratory test that had been conducted by researchers showed that Cd level and Pb level on blood cockles were in the average of 0.93 ppm and 1.92 ppm. Water biota, particularly blood cockles, can be become one indicator of pollution level which is occurred in the water. The blood cockle's body contained heavy metal level which exceeded normal limit that had been determined. Therefore, it could be used as bio indicator of pollution in the environment.⁽⁵⁾ Conducted research in first stage by Suryono, *et al* had proven that potency for chicken egg shell waste in reducing Hg metal on blood cockles (*Anadara granosa*) was through stirring chamber tools without controlling stirring speed, adsorption temperature, or pH of a solution. This research was studied further in second research in same year edition in research report that analyzed intervention of temperature and stirring speed of Stirrer chamber in improving potency of egg shell as adsorbent for reducing Cd metal and Pb metal on blood cockles.⁽⁴⁾

Result of the research showed that the decrease of Cd metal and Pb metal level was not occurred optimally. Effort in improving chicken egg shell capacity in adsorption process was conducted continuously and one of them was manipulation of pH of a solution. pH in a solution was known that it could influence the presence of metal. Meanwhile, the metal characteristic in low pH generally was as free cation. Whether, on basic pH, metal tended to precipitate as hydroxide, oxide, carbonate or insoluble phosphate.⁽⁶⁾ This explained that in acidic condition, metal ions could bind easily to the surface of adsorbent. According to conducted research by Abdel-Khalek *et al*, they explained that there was a significant enhancement of capacity of bio-composite chicken egg shell waste in pH 5,23 and contact time in 5 minutes with room temperature. Research result showed that there was maximum adsorption capacity in higher pH 5.23, which was 94,9 mg/g rather than pH 7,09 in which the adsorption capacity was only occurred in 49.5 mg/g.⁽⁷⁾ Besides, this research explained that pH of a solution which was acidic had potency in influencing the

enhancement process of metal adsorption. This research strengthened researcher's argumentation that model in manipulation of solution by adding acid could increase egg shell potency in binding heavy metal. One of substances that could make acidic solution was by using lime extract (*Citrus amblycarpa*).

Lime (*C.amblycarpa*) is one of orange types that can reduce pH value because it contains acid. Acid in orange mostly is citric acid. Kordial in his research evaluated pH value by adding several types of orange extract and one of them was lime extract. Adding lime extract in 1.3% of solution had pH 4.6, meanwhile, concentration of lime extract in 1.5% of solution had pH 3,97. Furthermore, this research aimed at analyzing the decrease of lead (Pb) on blood cockles (*A. granosa*) through manipulation of stirring time, adsorption temperature, and variation of lime extract concentration (*C. amblycarpa*) by using Stirring Chamber tools which used adsorbent of chicken egg shell.

Research Method

This research was simple experiment research by Posttest Only Control Group Design in order to investigate the influence of stirring time, adsorption temperature, and concentration of lime extract against Pb metal level, either in control group or experiment group. In simple experiment, the subject was divided by two groups (or more) randomly. A treatment was given to one (or more) group(s) as treatment group and another group (without any treatment/ giving other treatments) as control group. Furthermore, pattern of this design could be seen as followed:

Pretest	Treatment	Posttest
Treatment group	X1	O2
Control group		)2

Figure 1. The research design

Findings and Discussion

This research used chicken egg shell as adsorbent that had been through activation process chemically and it used HCL solution. Besides, blood cockles (*A. granosa*) that was become sample in this research was taken from Kenjeran beach Surabaya. Moreover, model development in this research was Stirrer chamber tool which was rearranged its component of stirring speed

settings and adsorption temperature. The setting of stirring speed included: 150 rpm and could be conducted a stirring either in temperature of 35°C or before heating. Besides, it had been conducted laboratory test against Pb level on blood cockles as the sample and the result of the laboratory test was showed in table 1.

Table 1. Recapitulation of Average of Pb level on Blood Cockles (*Anadara granosa*) before Heating based on Lime Extract Concentration in 2019

Sample Code	Concentration of	Stirring Time	Average of
	Lime Extract		Pb Level (ppm)
KW1T0	0%	5	0.197
KW2T0		10	0.19
KW3T0		15	0.18
AW1T0	1%	5	0.10
AW2T0		10	0.07
AW3T0		15	0.05
BW1T0	1.5%	5	0.077
BW2T0		10	0.053
BW3T0		15	0.04
CW1T0	2%	5	0.047
CW2T0		10	0.03
CW3T0		15	0.027
Total			1.061
Average			0.088

Table 1 showed that total of Pb level in the average from each treatment before heating was 1.061 ppm with average totally in 0.088 ppm. Data in table above showed that there was a significant enhancement of lime extract concentration and the Pb level on blood cockles reduced significantly. The lowest Pb level was in lime extract concentration of 2% with stirring time in 15 minutes, which was in 0.027 ppm.

Table 2. Recapitulation of Average of Pb Level on Blood Cockles (*Anadara granosa*) based on Lime Extract Concentration after Heating in 2019

Sample Code	Lime Extract	Stirring Time	Average of
	Concentration		Pb Level (ppm)
KW1T1	0%	5	0.17
KW2T1		10	0.16
KW3T1		15	0.14
AW1T1	1%	5	0.07
AW2T1		10	0.03
AW3T1		15	0.02
BW1T1	1.5%	5	0.06
BW2T1		10	0.027
BW3T1		15	0.017
CW1T1	2%	5	0.037
CW2T1		10	0.013
CW3T1		15	0.01
Total			0.754
Average			0.063

Table above showed that Pb level on blood cockles for total average of all treatments was 0.754 ppm with average totally in 0.06 ppm. Besides, based on the table, it could be known that a tendency of Pb level on blood cockles reduced more in 3 variations of stirring time and variation of lime extract concentration after being conducted heating. The highest reduction on the treatment of adding 2% of lime extract concentration in 15 minutes of stirring time was 0.01 ppm.

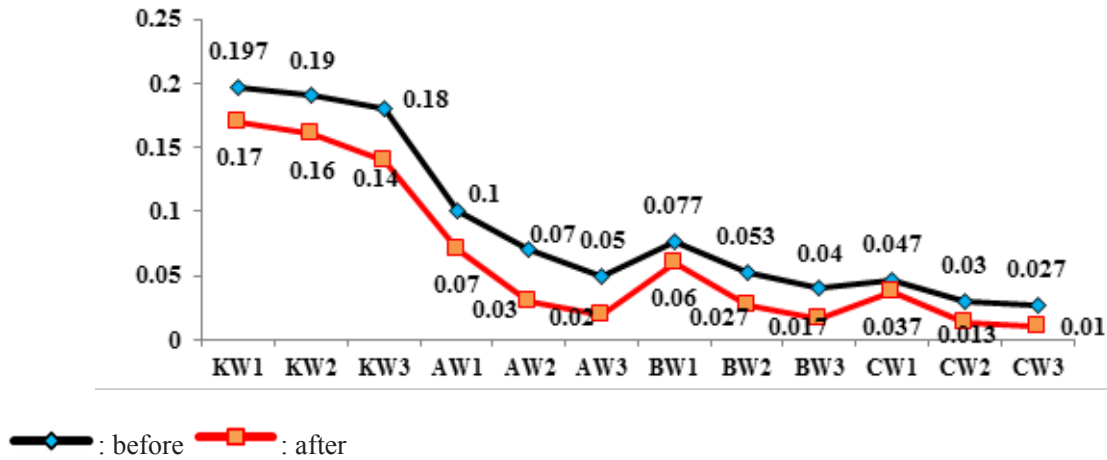


Figure 1. Pb Level (ppm) on Blood Cockles Based on Concentration and Stirring Time Before and After Heating

That graphic showed a tendency of difference of Pb Level on Blood Cockles before and after heating. Pb level after heating was lower than Pb level before heating, which was 0,01 ppm.

According to concentration of adding lime extract before and after heating could be seen the average of difference of Pb level on blood cockles from control group (KW), which was 0.047 ppm, group of AW sample code by giving lime extract in 1% was 0.033 ppm, group of BW sample code by giving lime extract in 1.5% was 0.022 ppm, and group of CW sample code by giving lime extract in 2% had average of difference in 0,017 ppm.

In other words, it could be stated that the higher the lime extract concentration, the bigger the differences of Pb level on Blood Cockles rather than blood cockles that was not added by lime extract anymore.

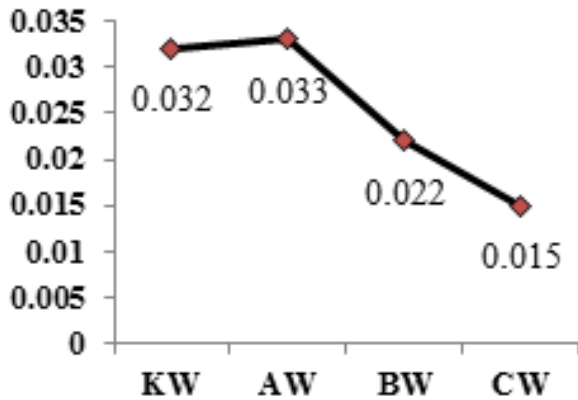


Figure 2. The Difference of Average of Pb Level (ppm) on Blood Cockles Before and After Heating Based on Lime Extract Concentration

That graphic showed that sample which was a control had a tendency of higher Pb level rather than in treatment group which was given lime extract. It was seen that concentration of lime extract in 2% had difference of lower Pb level rather than in sample group of lime extract concentration in 1% and in 1.5%. Hence, it indicated that there was a significant difference of Pb level on blood cockles based on variation of lime extract concentration before and after heating.

Analysis of Difference of Pb Level on Blood Cockles (*A.granosa*) among several treatments

In order to investigate the influence of lime extract and stirring time against Pb level on blood cockles (*A. granosa*) in twice observations, which were before and after heating, the researchers utilized Anova test. Requirements of Two-Way Anova test was conducted if it was completed the homogeneity test. According to the homogeneity test, it showed that all p-value Lavene test >0.05 (p-value before being heated up was 0.690 and after being heated up was 0.348), which meant that the variation of between groups was not significant different either before or after being heated up, thus, data was homogeneous and qualified the homogeneity assumption. Besides homogeneity test, normality test was also conducted in order to fulfill Anova test, which was through Kolmogorv Smirnov normality test with lilliefors correction which showed that anova residuals before and after heating was 0.200 (>0.05) for each, thus, the data contributed normally and it fulfilled the normality assumption.

Moreover, there was a significant influence between lime extract and stirring time against Pb level on twice

observations, which were before and after heating. Besides, it could be showed on table of Anova test and the result showed that there was a significant influence between lime extract and stirring time separately against the average of Pb level before and after heating. This could be proven from p-value of 0.000, and it indicated that there was a significant influence between lime extract and the average of Pb level on blood cockles before and after heating. Besides, there was a significant influence between stirring time and Pb level on blood cockles before and after heating, which was showed by p-value <0.05. In the other hand, there was an addition of lime extract and stirring time together and it was obtained p-value of 0.010. Thus, it indicated that there was a significant influence of lime extract concentration and stirring time together against the average of Pb level on blood cockles.

Furthermore, in order to investigate the difference of average in Pb level between each treatment of lime extract concentration, it could be showed in Post Hoc test by utilizing Tukey test. In Post Hoc test, it showed a significant difference of Pb level average between lime extract concentration that had p value 0,000, which meant that both lime concentrations which were compared with it had significant difference of Pb level value. The difference of the highest Pb level on blood cockles was showed between lime extract concentration of 0% and lime extract concentration of 15%, which was in 0,1461 rather than lime extract concentration of 5% (0.1144) and 10% (0.1278). This indicated that there was a significant influence between lime extract concentration and the decrease of Pb level on blood cockles. Furthermore, data from the table above showed that the higher the lime extract concentration, the bigger the difference of Pb level on blood cockles rather than on blood cockles which was not added by lime extract anymore.

The Post Hoc test (Tukey) in order to assess the difference of Pb level based on stirring time that was obtained data from all variations of stirring time which had significant difference against Pb level on blood cockles. The difference of the highest Pb level on blood cockles was showed on the comparison of stirring time in 5 minutes against stirring time in 15 minutes, which was 0,0346 rather than stirring time in 10 minutes, which was 0,0229. In other words, this data showed that the longer the stirring time in this research, the higher the difference of Pb level.

Conclusion

It could be concluded that manipulation of stirring time, adsorption temperature, and variation of lime extract concentration (*C. amblycarpa*) was through Stirring Chamber tools by utilizing adsorbent of chicken egg shell, which could reduce Pb level on blood cockles.

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Ethical Clearance- Yes

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Illnesses as an Excuse for Corrupt Indonesian Officials to be Free From Legal Liabilities

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Abstract

This research aims to explain the phenomena of illnesses used by corrupt Indonesian leaders to be free from legal liabilities. Illnesses in the law enforcement of corruption cases became a problem which may inhibit the legal processes. The research method used is the sociolegal method, which analyzes the society's social behavior related to the constitutional regulations. The research data is obtained from the various examples of the cases of officials with corruption cases who use the excuse of being sick in order to be free from legal liabilities. The data also includes constitutional regulations which are related to the theme's problem. The research results show the phenomenon of sicknesses used by the corrupt Indonesian officials to be free from legal liabilities. With the basis of humanity, thus the legal process is paused for some time, and they receive special treatment which gives more comfort just as that for sick people. This is also related to the constitutional regulations in Indonesia which give protection towards the health rights for the Defendant. Yet, this is usually misused by the defendants to lie or to pretend to be sick.

Keywords: *illness, excuse, officials, corrupt, law.*

Introduction

Indonesia is a country which is currently occupied in eradicating corruption cases conducted by its officials, both in the central and regional scales.¹ Numerous corruption cases had occurred and attracted public attention,² particularly the ones related to the attitude and behavior of the suspects of corruption in order to be free from legal liabilities. They use various ways to avoid being sentenced, from bribery, fleeing, to the classic excuse of being sick. However, amongst many recent corruption cases, there were tendencies in misusing illnesses to avoid being legally punished. The majority of corruption cases involve most suspects claiming to be ill during the process. It might be perceived as an easier and less-risky alternative for the case they face. By being sick, the suspects are treated in a special, different way. It may allow the suspects to be free from the legal liabilities of corruption.

The large number of suspect corrupt officials who use the excuse of being sick turn this into an ironic public phenomenon, as prior the said occurrence, they seemed to be in good health. By using illnesses as an excuse, the corrupt suspects gain special treatment which will advantage them compared to the healthy suspects to the point that they might obtain certain permit to leave prison to seek for treatment or to be treated in hospital. For corrupt suspects who claim to be sick, naturally, the treatment given is of the standards of those who actually suffer illnesses. They are treated by medical personnel instead of prison guards most of the time. They also gain another advantage in a form of a proper and comfortable room for medical patients or in one of hospital rooms—which is, obviously, located outside of the prison. By being in those places, they obtain certain facilities which allow them to enjoy said facilities and their freedom, by not experiencing the inconvenience they might have around the prison cells and its surroundings.

Illnesses then become a condition abused by the corrupt individuals to inhibit or even to escape from legal liabilities – despite whether the said illness are deemed to be the actual condition or was staged to make a healthy individual seem to be ill. In proceeding their

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operation, the corrupt cases who use the excuse of being sick also involve medical personnel such as doctors, nurses, and health institutions such as hospitals. These perpetrators have usually worked together to make this condition as an appropriate reason or basis to be treated differently which may inhibit or hinder the legal processes. A doctor's note from the doctor or from the hospital may be used as a material for consideration in proceeding legal liabilities on corrupt suspects. They might gain permit to seek for treatment for their illness prior resuming the current legal processes. They often manage to make themselves seem to be sick to avoid being legally sentenced as they are sick. Therefore, this state of illness may affect the legal processes towards corruption cases in Indonesia.

Method

This study used Sociological method.³ Research data may be the phenomenon of illnesses being an excuse for corrupt officials to escape from legal liabilities and also legal data in the form of laws and regulations related to the research problems⁴ therefore, it may result in providing further comprehension of the law.

Findings and Discussion

Phenomena of Illnesses within Corruption Cases in Indonesia

Illnesses have become an ironic yet amusing phenomenon in proceeding legal actions related to corruption in Indonesia. The majority of corruption cases conducted by the Indonesian officials are mostly followed by the classic excuse of being sick. The said condition shows how one's disability might be used to disrupt the humanity of law in the context of social life in society. It is both inappropriate, unethical, and may even be considered as violating the law itself to demand ill corruption suspects to follow the legal processes. Various conditions can be described to indicate illnesses, such as: dizziness, short of breath, abdominal pain, unwell, depression, severe stress, and even mental disorders. They are the reasons used by corrupt suspects to avoid legal processes.⁵ However, the said condition is often misused by the corrupt suspects to be able to benefit themselves in doing activities outside of the prison comfortably and also be used to inhibit or hinder the legal processes. Therefore, illness is often used as an excuse by corrupt suspects to escape from legal liabilities.

By witnessing the corrupt suspects being ill, the humanist side may emerge which then might affect the legal processes. It may be reasonable as being ill is such an inconvenience for anyone and has to be treated immediately. The humanitarian reasons in such circumstances are most preferred, which explains the special and specific treatment for them in order to make them more comfortable for their speed recovery. This leniency given for their recovery to the point providing health facilities outside of Correctional Institution. This matter is considered as a peculiar phenomenon which then emerges public questions as to this being a fact or a mere farce.

Indonesian Officials who Use Illnesses as An Excuse to Be Free from The Legal Liabilities

Illness is considered as the most effective way used by Indonesian officials who got entangled in corruption which doesn't have legal risk amid the State's incessant fight against corruption, these can be seen from many legal processes in corruption that full of sicknesses drama. It can be seen from several cases below:

1) Setya Novanto (ex-chief of People's Representative Council for the 2014-2019 period) who got entangled in the case of E-KTP corruption, complained to have hypertension and complication illness when he was investigated by Corruption Eradication Commission (KPK) and even fabricated the car accident's case that he experienced, so he must be treated specifically and intensively with various medical equipment at the Hospital. Hence, the legal investigation process against him was interrupted.

2) Miryam S. Haryani (ex-member of People's Representative Council for the 2014-2019 period) who also got entangled in the case of E-KTP corruption, complained to be sick when she was about to be investigated by KPK. She gave fake information to the Hospital Doctor Team and was faking her illness to escape from the KPK's investigation. Hence, the legal process against her was delayed for a long time.

3) Irman Gusman (ex-chief of Regional Representative Council for the 2014-2019 period) who got entangled in the corruption and bribery case of imported sugar, complained to have a heart issue when he was about to be investigated by KPK. Hence, the legal case investigation process against him was delayed for several days.

4) Romahurmuzyi (ex-member of People's Representative Council for the 2014-2019 period) who was captured red-handed by KPK in the bribery case for the Chief election of East Java Province's Department of Religion and Gresik Regency's Department of Religion. He claimed to have abdominal pain and bleeding when defecating. Therefore, the legal case investigation process against him was delayed for several days.

5) Idrus Marham (ex-member of People's Representative Council for the 2014-2019 period) who got entangled in the corruption of Riau 1 Electric Steam Power Plant (PLTU) project, claimed to be sick when he was about to be investigated by KPK. Therefore, the legal case investigation process against him was postponed.

6) Zumi Zola (ex-Governor of Riau for the 2017-2022 period) who got entangled in the corruption and bribery case of the ratification of Riau Province's Local Government Budget, claimed to have shortness of breath when KPK was investigating him. Thus, the legal case investigation process against him was stopped and postponed for several days until he regained his health.

Analysis on Positive Law in the Constitutional Regulations Which May Be Used as the Excuse of Illness in Order to Be Free from Legal Liabilities

There are several constitutional regulations in Indonesia which may be used as the basis for the corrupt officials as excuses of illnesses in order to defend themselves from the snares of law.⁶ Below are several the referred regulations:

1) The 1945 Constitution of the Indonesia's Republic CHAPTER XA Human Rights, Article 28H paragraph (1) Everyone has the right to live in physical and spiritual prosperity, to live, and to have a good and healthy living environment and the right to obtain health services. Paragraph (2) Everyone has the right to get special treatment and facilities to obtain equal opportunities and benefits in order to achieve equality and justice. Article 28J paragraph (1) Everyone must respect the human rights of others in the orderly life of the community, nation and state.⁷

2) The Constitution of the Indonesian Republic Number 39 of 1999 regarding Human Rights CHAPTER I General Provisions, Article 1 Humans Rights are a set of rights inherent to the nature and the existence of humans as a creature of the God Almighty and are His

gifts that must be respected, upheld and protected by the State law, the Government, and everyone for the honor and protection of human dignity.⁸

3) The Constitution of the Indonesia's Republic Number 36 of 2009 Regarding Health CHAPTER I General Provisions, Article 1 Health is a healthy condition, both physically, mentally, spiritually, and socially that enables everyone to live productively both socially and economically. CHAPTER III Rights and Obligations, Article 4 Everyone has the right to health. Article 5 paragraph (1) Everyone has the same right in obtaining access to resources in the health sector. Paragraph (3) Everyone has the right to determine independently and responsibly the health services required for themselves.⁹

4) The Constitution of the Indonesia's Republic Number 31 of 1999 Regarding Eradication of Corruption CHAPTER IV Investigation, Prosecution and Examination at the Trial Court. Article 26 Investigation, prosecution and examination at the Trial Court for a criminal act of corruption shall be carried out based on the applicable criminal procedure code, unless stipulated otherwise in this Constitution.¹⁰

5) The Indonesian Criminal Code (KUHP) CHAPTER VIII Lapse of the Right to Prosecute and of the Punishment, Article 78 Paragraph (1) The right to prosecute shall lapse by lapse of time.¹¹

6) The Indonesian Criminal Procedure Code (KUHAP) CHAPTER VI Suspects and Defendants, Article 58 Suspects or defendants who are subject to detention shall have the right to contact and receive a visit from their private doctor for the interest of their health whether it has any connection or not to the case process.¹²

7) The Constitution of the Indonesia's Republic Number 12 of 1995 Regarding Corrections CHAPTER III Corrections' Inmates, Article 14 paragraph (1) point d Inmate has the right to receive proper health services and food.¹³

8) The Government Regulation of the Indonesia's Republic Number 31 of 1999 Regarding Development and Guidance of Corrections' Inmates CHAPTER I General Provisions, Article 1 point 1 Development is an activity to improve the quality of devotion to God Almighty, intellectual, attitude and behavior, professional, physical, and spiritual health of the inmates

9) The Government Regulation of the Indonesia's Republic Number 32 of 1999 Regarding Requirements and Procedures for the Implementation of Inmates Rights CHAPTER I General Provisions, Article 1 paragraph 4 Health services are promotive, preventive, curative, and rehabilitative efforts in health for Inmates and Correctional students in the Correctional Facility. Article 17 paragraph (1) In the case that the patient as referred to in Article 16 paragraph (3) requires further treatment, the Correctional Facility's doctor provides recommendations to the Head of the Correctional Facility so that the health services are carried out at the Government public hospitals outside of the Correctional Facility.¹⁵

10) The Republic of Indonesian Government's Decree No. 58 year 1999 regarding the Conditions and Procedures for the Implementation of the Authority, Duties, and Responsibilities for the care of the Prisoners, Chapter I Basic Conditions, Article 1 states that the prisoner service process is done starting from the admission until the release of the prisoners from the National Prison.¹⁶

11) Decree of the Correctional General Director No. E.03.PP.02.10 year 2003 has determined the minimum standard of health services for the inmates in Correctional Centers, which are; a) Institutionally, the health services provided are still in the basic level, which is first-aid doctors and clinics; b) Referral health treatments for the ill inmates are given based on the condition of each Correctional Centers. C) The forms of promotive, preventive, curative, and rehabilitative services are given systematically.¹⁷

Conclusion

Illnesses become a mode of condition used by many Indonesian officials who are detained for corruption to be free from legal liabilities. With the excuse of being ill, they receive special treatments which are more comfortable, like not being placed in prison cells like healthy inmates. They may even be placed in hospitals outside of the Correctional Center area with minimum surveillance. The receive services from health workers and family members who take care of them. The important matter regarding this issue is the fact that the legal processes are paused until their condition is stated healthy again. This may inhibit or hinder the enforcement of the corruption laws. The constitutional

regulations in Indonesia has actually regulated the things which regards the health rights protection of Defendants or inmates. Yet, these regulations seem to be misused by the inmates to make illnesses as an excuse to create a condition or a situation which brings them favorable conditions.

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Model of Social Support for Adolescent Mental Health with Disabilities

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Abstract

For adolescents, disability is more than a physical limitation. Discrimination, social stigma, and pressure from the environment can induce a social limitation that excludes them from social. The lack of support causes them to suffer from physical limitations that will affect their mental health, and worse will create not only physically disabled but also impact their life. This study aims to find an appropriate social support model for maintaining the mental health of adolescents with disabilities from examining the factors of adolescents' characteristics, family, peers, health workers, and community leaders. This research method used cross sectional study, a total of 100 adolescents with disabilities from Cerebral Palsy Center Jakarta and Surakarta special schools were involved in this observation. This research consisted of collecting data, conducting FGD with teachers, health workers, family, and processing data with Smart-PLS. The results was that the adolescent mental health with disabilities were formed by individual characteristics (such as age, gender, education), the role of family, friends and teachers. Support from family, friends, teachers, community leaders in their roles are needed in stabilizing emotions and maintaining mental health of adolescents with disabilities.

Keywords: adolescents; disabilities; support; social support model; mental health

Introduction

Children with special needs have physical disabilities, or intellectual disabilities: Autism, Down-Syndrome, low intelligence quotient deficiencies associated. This may be due to genetic errors, problems during pregnancy and birth or social conditions of living.¹ Young persons with disabilities are like young people everywhere: they have dreams and ambitions, interests and desires, also hopes for their futures.² Disabilities categorized into four health conditions, developmental disabilities (DD), mental health conditions (MH), physical disorders (PD)

and the fourth condition is a combination of the three.³

Worldwide, as many as more than 1 billion humans live in various form of disability.⁴ The number of people with disabilities live in our environment sometimes makes us feel that we 'know' them. However, understanding the meaning and impact of the disabilities they have in relation to their ability to be actively involved in social, political, cultural and economic matters is a challenge that can distort. Not only have physical challenges, millions of people with disabilities across the world still have to struggle with social and legal challenges that limit them in accessing education, physical and sexual health care, employment, recreational activities, and harmony in family life.⁵ Such obstacles are a serious challenge for persons with disabilities who are still adolescents.² In fact, adolescents with DD and MH cannot access health care facilities freely. A large proportion of children with DD have unmet preventive health and therapy services.⁶

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Krauss et al. found children with mental retardation and autism to have greater problems in specialty medical accessing care than children with other special needs.⁷ A growing body of research indicating that children with MH have poor health care access and extensive unmet needs.^{8,9} Kataoka et al. found that 80 percent of children who needed mental health services, did not receive those services.¹⁰

The most difficult constraints are social challenges stemming from discrimination, stigma, prejudice, and routine failure to include persons with disabilities in development policies and various designs on civil programs.² Physical, socio-economic, socio-cultural, and legal barriers continue to limit access to education, health care including SRH, employment, leisure activities, and family life for millions persons with disabilities worldwide, and violence against young persons with disabilities is widespread.¹¹ Persons with disabilities, including young persons with disabilities, are at greater risk of living in poverty than are their peers without disabilities.¹² They are more vulnerable to violence, including gender-based violence (GBV), and are less likely to attend school.² This also includes how children with special needs have the right access and support from their environment regarding information and adequate use of health services. Hence there are differences difficulties using health care services for Children with Special Health Care Needs (CSHCN) with different health conditions.¹³

Negative attitudes, a lack of understanding about disability, and stigma can have profound consequences for all persons with disabilities but especially for young persons with disabilities. These attitudes represent one of the greatest impediments of young persons with disabilities face in achieving inclusion. Children with disabilities are among the most marginalized and excluded groups of children.¹⁴ According to one report in Canada, 53 percent of children with disability reported having no or one close friend, and significant percentages said they were shunned or avoided at school.¹⁵ Children with disabilities are also facing risk of bullying, which can have long-term consequences for their social development and mental health.² In many cases, stigma against children with disabilities extends to family members and caregivers, as a result, this matter causes parents and families allow teenagers with disabilities to continue to stay at home with reasons to protect them from prejudice and violence.¹⁶ Discrimination is felt not only in form of limited restrictions of

facilities or infrastructure in various fields for children with disabilities. Today, peer pressure is in the form of *bullying* against children with disabilities is a thing that is rife. *Bullying* is a form of aggression in which there is an imbalance of power between the bully and the victim^{17,18} that occurs largely in the context of the peer group.^{19,20} Bullying, which may be indirect (eg, name-calling) or indirect (eg, gossip), covers a wide range of behaviors, from social exclusion to physical assault.^{21,22}

This research aims to analyze the influence of adolescent characteristics, parental characteristics, adolescent health status, family support, peer support, health worker support, teacher support, and support from community leaders on adolescent mental health with disability.

Method

This research used method uses cross sectional study in three stages. The first stage was named identification stage, begins with collecting data on the condition of young people with disabilities as exploration material. The next stage was conducting interviews with questionnaires as quantitative data collection followed by Focus Group Discussion (FGD) with teachers, health workers (Community Health Center) and family. Data was collected by mental health screening through Strength and Difficulties Questionnaire (SDQ). Data analysis was carried out with the help of Smart Partial Least Square (Smart-PLS) software. Data from the FGD results were analysed from a review of strategic issues and the concept of the solution to producing a model. The third stage was conducted by testing the model obtained through analysis of the appropriate model and continued by interpreting it.

Population in this research was adolescent with disabilities in Extraordinary School (SLB) for Disabled Children Education Foundation / Cerebral Palsy Center (CP Center) in Jakarta and Surakarta. The sample criteria were: 11-18 years old), teenagers were physically disabled or blind, willing to be a respondent. The sample size were 100. The sampling technique was multistage random sampling technique, with the stages of location determination, groups determination, sample determination, data collection, model formation. Data were analysed by Structural Equation Modeling .

Findings

The majority of adolescent were in 15-16 years old,

male, elementary school and have a normal condition. The majority of adolescents with disabilities have fathers with professions involved in the world of entrepreneurship and mothers as a house wife.

Table 1. The Path Coefficients in The Structural Model

No	Relationship Path	Path-Coefficient	T
1	Effect of adolescent characteristics on adolescent mental health	0.409677	5.788648
2	Effect of parental characteristics on adolescent mental health	0.375323	4.255468
3	Effect of health status on adolescent mental health	0.099224	1.518259
4	Effect of family support on adolescent mental health	- 0.027197	0.368035
5	Effect of peer support on adolescent mental health	- 0.142037	2.060303
6	Effect of health worker on adolescent mental health	0.027049	0.305939
7	Effect of teacher support on adolescent mental health	0.252390	3.455639
8	The influence of community leader support on adolescent mental health	0.049226	0.488571

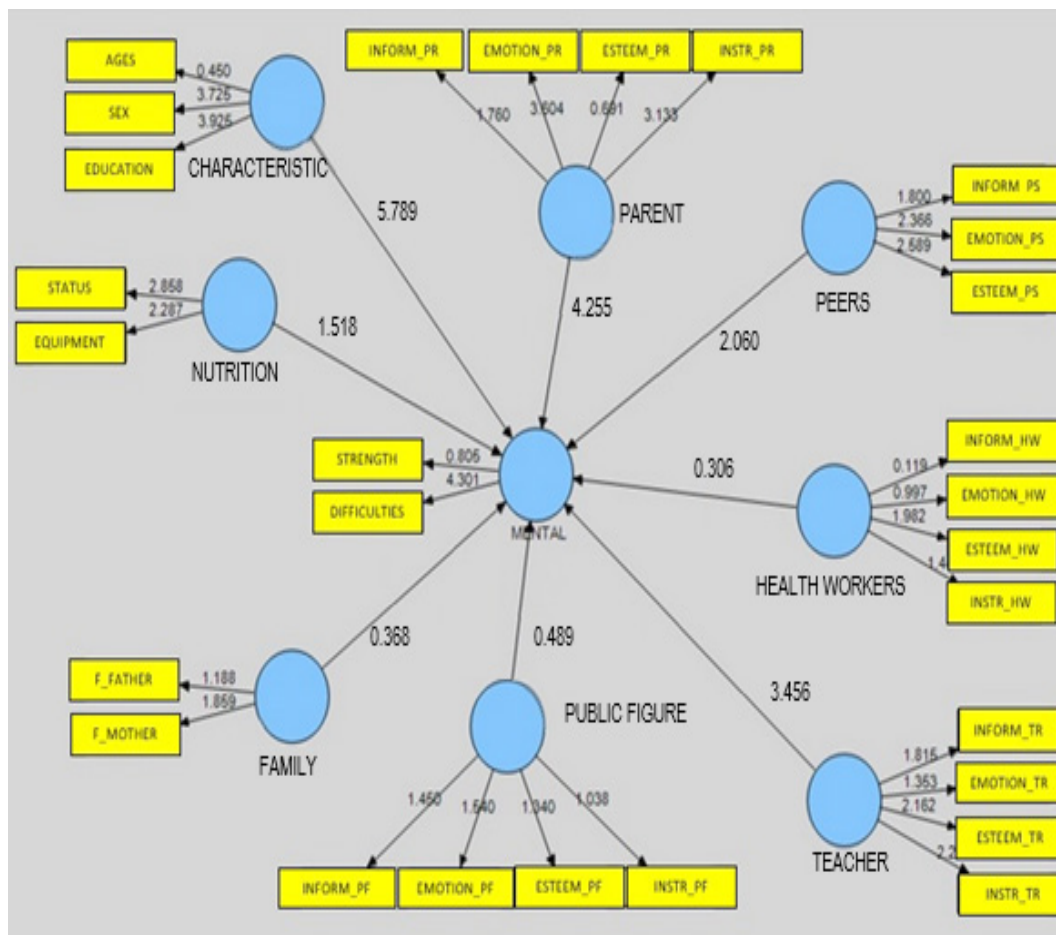


Figure 1. Social Support Model Analysis

There was a significant effect of adolescent characteristics, parental characteristics, health status, family support, peer support, health worker, teacher support, public figure on adolescent mental health (Table 1 and Figure 1).

Discussions

This can align with previous studies correlate that the result was the finding that family and school support are protective factors underscores the need to target the environment.^{28,29} Coordination is needed among school, home, and community because adults must intervene on behalf of children and youth with disabilities, in this context of children with Learning Disabilities (LD) who are bullied.^{22,30} School climate and community attitudes that tolerate bullying and promote negative attitudes toward students with LD must change. As the main source of difficulty is attributed to the student, an increased awareness of the impact of labels is needed.³¹ Therefore, more systemic interventions, such as changing schools and community orders to help children with friends and friends,^{32,33} are recommended and implemented. Effective strategies to include positive contact with children who have disabilities, along with indirect experience offered through information in books and discussions guided by adults. Such approaches should be incorporated into the curriculum to foster understanding of LD.

A mental health problem can be seen as a 'disturbance in functioning' in an area such as relationships, mood, behaviour or development. When a problem is particularly severe or persistent over time, or when a number of children are often described as having mental health disorders. Serious mental illness can lead to significant distress and disability that undermines quality of life.³⁴ This study is aligned with the statement that family and a close friend could decrease depression of adolescent with disabilities.^{35,36} Therefore, love and appreciate have a really significant value for them.^{37,38,39} Accordingly, there is a framework to resist mental illness for adolescent with special needs. Based on the results of hypothesis testing, there is a significant trajectory or path that describes the results of this study: (1)-Characteristics of adolescents (age, gender, and education) influence adolescents mental health (strength and difficulties); (2)-Support of friends (providing information, emotional support, esteem) influence adolescents mental health; (3)-Support parents (providing information, emotional support, appreciation, and instruments) influence

adolescents mental health; (4)-The support of friends (providing information, emotional support, respect) influence adolescents mental health.

Conclusion

This research study adds a new result in the world of science in the field of improving the emotional quality of adolescents with special needs or disabilities through a model framework that illustrates the need for fundamental and intense support from family, friends, teachers, community leaders in their role in stabilizing emotions and maintaining health mental adolescents with disabilities. Characteristics of adolescents also influence this condition, so a good emotional understanding of adolescents with disabilities is needed to convince them that they are matter and valuable.

Caring for a child with disability, depending on the type of disability, can result in physical health problems, mentally health problems, and time or financial burdens on parents.²⁴ Therefore, it is important for health professionals to focus on the mental health of a child with a disability in different family structures, and to assess their needs for psychological support. In particular, maternal mental health is important for both parents and children because poor maternal mental health is related to unfavourable parenting practices, child health problems, and poor school performance.

Many situations have proven, poor families provide inadequate nutritional support for their children with disabilities, and children with disabilities do not get the care and special care in accordance with their special needs from parents/family, and must feel miserable condition due to various limitations of the ability of poor families. Parent orientation is ultimately more priority on efforts to meet family survival, and ignoring the need for children with disabilities due to limited financial resources. Environmental support is a support system that can reduce the risk of depression and pressure on persons with physical disabilities.

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The Implication of the Indonesian Local Regulations Revocation towards the Local Economy and Out of Pocket Healthcare

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Abstract

This research discusses the implication of the local regulation revocation towards the economic and health condition in a number of regions in Indonesia. And also, some of the cases which resulted in the implication conditions. This article was the result of a doctrinal study with literature review study and secondary data. The result of the research shows that (i) there is a government's authority in revoking Perdas; (ii) the revocation of the local regulations in certain regions exerts adverse effect on the economy and healthcare. This article suggests that there is a need for the development of Perda with high-quality substances so that it can cope with the implication of legal regulations.

Keywords: Local, Regulations, Revocation, Healthcare

Introduction

The revocation of 3,143 local regulations (Perda) on June 13th, 2016 generates various reactions from many parties, including those from the media. The Chairperson of the Republic of Indonesia's House of Representatives, Hasan¹ for example, agrees very much with the revocation of the Perda. It is because it is unnecessary to maintain the Perda which inhibits investment and gets the people into trouble, according to Hasan¹. However, most people gave negative response towards the revocation of the Perda. For example, Aulianshah² in *Beritagarid* news web wrote, that the revocation of these Perdas are aimed to eliminate obstacles for the sake of economic development from investment including healthcare investment.

The revocation is conducted on Perdas inhibiting investment deregulation program because many Perdas are still in contradiction with the higher regulations and lengthen the investment licensing bureaucracy. This decision exerts serious effect on the government. The revocation of the Perda becomes the government's instrument in implementing deregulation to remove the problematic Perdas inhibiting investment, as argued by Sholikin² and Utami³.

Those Perdas are related to retribution, tax, and investment in regions in Indonesia, because they are not consistent with the vision of development led by the government with *Nawacita* (ten ideals) through a variety of economic policy packages. The impacts include the more complicated process of health services as these Perdas are also partly related to tax or retributions of healthcare workers or healthcare facilities. A study conducted mentioned that 21,7% of the population seeks medical care to doctors, whereas only 3-4% seeks medication from hospitals, thus extra financial regulations may burden it.

In the attempt of improving the nation's competitiveness, legal politics in Indonesia directs the law development to support the manifestation of sustainable economic growth, to govern economy relevant to the problem particularly in business world and industrial world, and to create investment certainty, particularly in the law enforcement and protection, as explained by Agustiwi⁴. The guarantee cannot be nationalized. In addition, it is also easy to manage the license by developing one-stop service policy. The facilities provided do not only include the regulation to get law certainty but also tax exemption or deduction or postponement and no nationalization, and if any the

corresponding investor will be given compensation approved government and investor as argued by Budiarta⁵. Aulianshah also have Statement that many of the perda gave extra burdens for the people because in the end, the extra tax, retributions and others would become production cost.

Therefore, it is expected that local agency organizations would be slimmer according to the spirit of government reinvention in order to achieve good governance, as argued by Simangunsong and Hutaso⁷. The local government's action in making regulation which burdens the medical workers or doctors' health facilities may not give healthcare services thus may hinder the patients' care as there is a limitation of facilities or human resources, which are caused by inconsiderate regulations.

Parallel to that, it was reported by Susanti in *Kompasiana*⁸ that the Perdas are against the constitutional regulations. They inhibit licensing and gives various tariff burdens to the society. Surely, those problematic Perdas are also against the spirit of decentralization and regional autonomy, which are believed to be able to increase the quality of regional service, competitiveness, work effectivity, and the people's welfare. The reality which happens is that the Perda actually increase the financial burdens of the patients (out of pocket) in obtaining healthcare.

Constitutional Economics as a scholarly direction, the subject of which constitutional-legal regulation and economic development are directly interrelated; the impact of the constitutional rules and principles on the process of adoption and implementation of economic decisions as well as the inverse correlation to the healthcare system, as mentioned by Budiarta⁶.

The results of the conducted research allow identifying the following features of investment activity. According to Kuwado in *Kompas media*⁹, the annulation or the eradication of those Perdas create a significant domino effect towards the increase of investment in Indonesia. The first domino effect which happen is the increase of the society's burden in the economic sector as it increases the society's expenditures in accessing healthcare.

The investment activities of foreign investors including in the health sector, in their territory are generally governed by national laws, regulations and administrative procedures, as well as bilateral investment

agreements. According to Sagynbekova, Allanina, and Babaeva¹⁰, the main provisions of these legislative acts are, as a rule, identical in developed countries as a whole. In almost all states, foreign investors are unable to carry out their investment activities in key sectors of the host. To invest abroad, there are declarative orders and authorization-based procedures, as argued by Sagynbekova et al¹⁰.

Materials and Method

This study employed normative juridical approach and qualitative normative analysis technique based on secondary data supported with primary data to sharpen the analysis in discussion as argued by Soekanto and Mamudji¹¹. Therefore, the library study conducted in this study provided in-depth information relevant to the problem studied.

Data analysis was conducted using qualitative approach. Qualitative approach, according to Soekanto¹², is the method of research resulting in descriptive analysis in which what is stated by respondents in written form or orally and also their behavior is investigated and studied as a whole¹³.

Results and Discussion

Hundreds of Perdas have been revoked by Ministry of Internal Affairs in Java and Bali islands, most of which are related to natural resource management. In 6 provinces in Java Island, the Ministry of Internal Affairs has revoked more than 400 Perdas. The majority of the regulations regards regional retribution, tax, and tariffs in various sectors, including the health sector.

This has impacts towards the fact that the tariffs will be burdened to the patients, which results to out of pocket healthcare. More perdas were revoked in regions in Indonesia and it occurs because those regulations were in contradiction with the higher constitutions or Law – thus certainly breaking the *lex superiori derogate legi inferiori* principle, meaning that when there are different regulations, the provision of the higher legislation disables the lower legislation. In addition, according to Fitra¹⁴ in the online media *katadata.id*, the government expects that the reduction of Perdas. The aim is so that the existing healthcare and health infrastructures can grow, thereby advancing the Indonesian and it is in line with the ideals of development.

The investment developed in Indonesia is intended to create development in regions by giving the foreigners

the opportunity of investing through international cooperation, to make the development of the regions run smoothly. Although the private sector is progressing more rapidly, but the law, the financial institutions, the growth goes very well. The legal system, as well as the financial system are well developed and they are sustainable with the private sector, as argued by Allen et al¹⁵.

In the Federation of Russia, to attract foreign investment, the development of the rule of law is necessary. The investments are done through a mechanism of a statutory law in Russia in line with the norms of international law. This law will create a supportive environment for attracting foreign investment in Russia, as explained by Skvortsova et al¹⁶.

In Indonesia, many legal products are developed, particularly related to the investment, are revoked due to some factors. To rebuild the medium-class economy and to give the foreign investors the opportunity of investing in Indonesia toward the free trade, some factors still need improvement. In the online media, *finance.detik*, Damarjati¹⁷ reported an interview with the Indonesian president, who stated that Perdas made should not complicate and make investment difficult. This statement was reported in the media as the government's explanation regarding the eradication of some Perdas.

Viewed from human resource aspect, it can be said that the quality and the quantity of the legislative drafters are still very worrying. It is not only related to their skill and knowledge, but also to their career levels and incentives. According to Abdullah¹⁸, the number of legislative drafters in Indonesia is still small and this profession has not been a functional post until today.

The development of the Perda substance is of course adjusted with individual regions' need, meaning that the development of Perda should obligatorily contain the following principles: objective clarity, institutional or organizational, compatibility of content type to material, and effectivity or effectiveness, as mentioned by Amir¹⁸. The Perda intended to facilitate regional investment also requires the local government's high-quality contribution, either formally or materially, by considering domestic local values in order to promoting Indonesian economy in general and local economy in particular.

Perdas which collect tax, retribution, contribution, and other forms of tariffs to health facilities actually

results to negative impacts to the facilities and to the people. The hospitals are obligated by the government to provide services for the poor, yet the hospitals are expected to survive and take care of the organization's condition by obtaining profit. It may cause cost recovery which happens if the total cost may be recovered by the total revenue of the services provided. The loss or the out of pocket services experienced by the people are because of the tariff burdens based on the Perdas, to increase the regional income, which is burdened to the people.

The Chairperson of Governmental Law Agency for South Sulawesi Province, Nasir¹⁹, stated that thousands Perdas have been revoked, 143 of which are products of South Sulawesi Province. South Sulawesi Province Government states that they will not make lawsuits against the revocation of Perdas. Out of those regulations revoked, 31 Perdas are products of the regency and the city governments. They include Perdas about telecommunication tower, public service, businesses, procurement retribution and liquor circulation and control. These taxes and retributions are also burdened to health instances of facilities, as they are regarded as businesses. "These 31 Perdas come from 19 out of 24 regencies/cities existing in South Sulawesi".

Surakarta City is also threatened to be poor due to the revocation of Local Tax Perda. Rudy, the Mayor of Surakarta,²⁰ said that the revocation of Local Tax Perda will affect the potential of the Local economy. It also affected on the out of pocket of Solo City healthcare significantly. It is because more than 80 percent of Local Original Income comes from local tax post. He said that Surakarta City government will be at loss with the lost potential local tax income of IDR 227 billion.

In addition to Solo, Depok City government reacts directly to the revocation of thousands Perda conducted by central government. Depok City government coordinates immediately with the West Java Province Government to confirm the Perda revocation plan. If there will be revocation, it will not be done entirely. The West Java Governor, Ahmad Heryawan²¹ stated that he would ask the Indonesian Ministry of Internal Affairs for an explanation about the revocation of some Perdas, because it would impact the local development. If the Perdas contain inappropriate articles considered as inhibiting, it should not be revoked entirely. If revision can be made, the revocation would not be needed. Most Perdas revoked are those which can inhibit investment. So far, there is no constraint with investment in West

Java²¹.

In Ternate area, there are five Perdas revoked that will putatively result in the loss of IDR 11 billion to Ternate City Government. The loss results from Local Original Income. Those five Perdas come from Ternate City and these will affect significantly. But the Ternate City Government (2016) does not know which Perdas will be revoked, because the local government and Local Legislative Council have not received the confirmation yet until today, as argued by Ariefana²².

A similar report has been written by Kresna, which stated that the Ministry of Internal Affairs has officially announced the revocation of 3.143 Perdas and Decrees of the Regional Government which are considered as problematic. Some of the 391 revoked Perdas are regarding local tax or retribution for healthcare and education and this became a burden for the people. From the start, the government has stated that the aim of revoking the Perdas are to increase investment dan to decrease the burdens of the people, as explained by Kresna²³.

The Perda is the law which regulates the local needs of the people who is indeed at that time is needed, therefore it becomes illogical if the cancellation is done because it conflicts with the rules above, although it is against the principle, as argued by Posner²⁴. the revocation of the perdas actually have the tendency to be similar with the government's opinion, in which the aim of the revocation is to decrease the burdens of the people. It may have effect in the decrease of the out of pocket healthcare system. According to the media reports, the revoked Perdas are those which may decrease the society's burden in the healthcare service payment from personal funds, thus impacts the public welfare. The Indonesian media stated that such annulment is crucial to develop the public welfare.

Conclusion

According to the media report, the revocation of many Perdas by the local government is actually problematic; the substance and material of the Perda regards the financial burdens of business workers, the healthcare and the education sectors, which includes licenses requirements and other factors such as tax, retributions, and financial burdens which will have impacts to the economy, to the out of pocket healthcare services, and the public welfare.

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The Patient Safety Model within Decubitus Ulcer Patients in Hospital: Based on the Organizational Citizenship Behavior and Knowledge Management

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Abstract

Decubitus ulcer event is an indicator of patient safety in nursing care at the clinic, so a method is needed to reduce the incidence of decubitus ulcer in the patient in hospital. The research aims to create a model for increasing patient safety based on Organizational Citizenship Behavior (OCB) and knowledge management on unexpected events (decubitus ulcer) in achieving the target of patient safety program in Hospital, using cross-sectional design. The subjects were 100 nurses who work in the inpatient room of Surabaya Haji Hospital, selected by purposive sampling. Data collection was done by questionnaire, then analyzed using Partial Least Square (PLS). The model of increasing patient safety based on OCB and knowledge management has proven effective in reducing the incidence of decubitus ulcer in the patient ward. This model is recommended to implement in the hospital to enhance the quality of nursing care.

Keywords: patient safety, organizational citizenship behavior, knowledge management, decubitus ulcer

Introduction

Patient safety has become a global issue since the IOM (Institute of Medicine) report, the United States in 2000 which stated that “to err is human”⁽¹⁾. Patient safety is a top priority in providing services to patients related to the issue of quality and image of the hospital. Safety is a fundamental principle of patient care and a critical component of quality management⁽²⁾.

Patient safety in hospital includes managing risks, identifying and managing risks to patients, analyzing incidents, learning abilities and following up incidents, and implementing solutions to reduce risk. Nurses are the key to development quality through patient safety⁽³⁾. The incidence of decubitus ulcer patients is an indicator of patient safety in clinical nursing care. If the patient safety indicator has not reached the specified standard, it will affect the quality of services. As a result of the frequent occurrence of decubitus ulcer patients are at risk

of increasing unexpected events or at risk of occurrence of adverse events.

Basically, the performance of individuals or groups is what ultimately affects the progress of the organization as a whole. Other factors that affect individual performance which ultimately lead to organizational performance are OCB. OCB can be defined as extra behavior related to work outside of routine tasks determined by job descriptions or measured in formal evaluations⁽⁴⁾.

OCB is implemented for a long time and by many people it will result in organizational effectiveness⁽⁵⁾. The components of OCB are: altruism, conscientiousness, sportsmanship, civic virtue, courtesy.

Knowledge management is used as an effort to maintain, analyze, organize, improve, and share understanding and experience. Such understanding and experience is built on knowledge, both manifested in individuals or inherent in the processes and real applications of an organization. Knowledge management is used by organizations as a new innovation to channel raw data into information and knowledge. Unexpected events occur because nurses commit negligence or errors in handling decubitus ulcer due to various factors

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including burden high work and inpatient room has a high complexity and risk.

Knowledge management according⁽⁶⁾ is a knowledge management development from the concept of Nonaka and Takeuchi Knowledge management has 7 stages including knowledge identification, knowledge acquisition, knowledge creation, knowledge application, knowledge transfer, knowledge sharing, knowledge documentation. The advantages of the model are that data becomes information processed through collecting, classifying and grouping, processing data so that it changes shape and properties according to its uses, interprets data, stores data, delivers data to users, and uses in supporting the interests of the organization⁽⁶⁾.

Efforts to prevent decubitus ulcers based on OCB which is an extra role are expected to make nurses more capable, responsive, alert, empathetic, and responsible in handling decubitus ulcers. Knowledge management approach is a technique to create knowledge harmony so as to achieve optimal performance. The approach of OCB and knowledge management is a combination of two concepts to maximize the role of extra-role and intra nurse roles in managing knowledge that has been obtained to be applied to practice in accordance with the knowledge gained and reflected in the performance of a nurse so decubitus ulcer can be minimized.

Method

This research used a quasy-experimental pre post test design with the complete sampling 100 nurses in Haji Hospital Surabaya. Their mean age was 28 years (26-30), and 78 (70.9%) were female, and 22 (20.1%) were male, 40 (40%) had experience of work more than

five years. Path analysis with PLS was used to test the effect of patient safety model based on organizational citizenship behavior and knowledge management toward nurses performance in decrease ulcus decubitus in hospital. The data collection was done by the way the questionnaire and observation. The population to bring up this strategic issue is by giving a survey to evaluate the patient safety implementation that modified factors that influence service quality from Donabedian, which include individual factors, organizational factors, management factors, applying the OCB from Organ and Bateman and knowledge management theory from Nonaka and developed into a modified questionnaire from Kuntarti's previous research on the stages of knowledge management.

FINDINGS

It is essential establish the reliability and validity off the latent variables to complete the examination of the structural model. subvariable knowledge, commitment, decision making, culture, monitoring, assessment, intervention, implementation, evaluation, unexpected incidence of decubitus ulcer, the incidence is almost an decubitus ulcer injury is declared valid where the outer loading value is in accordance with the expected criteria >0.5. This shows that indicators in the structure have met the validity test. Whereas for the attitude and leadership type sub variables it is declared invalid where the value of outer loading >0.5.

The composite reliability was >0.7. The cronbach alpha was >0.5. Thus it can be concluded that each variable has fulfilled the reliability test.

Table 1. The result summary for reflective outer models

Variables	Indicators	Outer-Loading	Composite-reliability	Cronbach-Alpha
Individual	Knowledge	0.894	0.870	0.702
	Attitude	-0.322		
	Commitment	0.640		
Organization	Decision making	0.965	0.716	0.680
	Leadership	-0.461		
Management	Culture	0.823	0.889	0.757
	Monitoring	0.843		

Cont... Table 1. The result summary for reflective outer models

Decubitus Ulcer prevention	Assesment decubitus ulcer prevention	0.724	0.758	0.515
	Intervention decubitus ulcer prevention	0.665		
	Implementation decubitus ulcer prevention	0.670		
	Evaluation decubitus ulcer prevention	0.668		
The incidence of decubitus ulcer	Unexpected incidence of decubitus ulcer	0.905	0.853	0.808
	The incidence is almost an decubitus ulcer injury	0.899		

Table 2. The path coefficient and t-statistic of inner model

Variables	Path Coefficient	T Statistic	Remark
Effect of individual factors on the implementation of decubitus ulcer prevention	0.383	2.798	Significant
Effect of organizational factors on the implementation of decubitus ulcer prevention	0.230	2.171	Significant
Effect management factors on implementation of decubitus ulcer prevention.	0.522	3.668	Significant
The effect of implementing ulcus decubitus prevention on events is not expected	0.490	2.735	Significant

The results of the PLS analysis of the influence of individual factors on the implementation of ulcus decubitus prevention obtained path coefficient values of 0.383 and t statistics of 2.798 ($t > 1.96$). These results indicate that there is a significant influence between individual factor variables on the implementation of decubitus ulcer prevention. The positive sign of the coefficient indicates a unidirectional relationship. The same direction can be interpreted that the higher the individual factor, the more the implementation of decubitus ulcer prevention will increase.

The results of PLS analysis of the influence of organizational factors on the implementation of decubitus ulcer prevention obtained path coefficient values 0.230 and t statistics 2.171 ($t > 1.96$). These results indicate that there is a significant influence between organizational

factor variables on the implementation of decubitus ulcer prevention. The positive sign of the coefficient indicates a unidirectional relationship. This unidirectional relationship can be interpreted that the higher the organizational factors, the more the implementation of decubitus ulcer prevention will increase

The PLS analysis of the effect of factor management on the implementation of decubitus ulcer prevention is obtained path coefficient value 0.522 and t statistic 3.668 ($t > 1.96$). This result shows that there is a significant influence between factor management variables on the implementation of ulcus decubitus prevention. in the same direction. This unidirectional relationship can be interpreted that the higher the factor management, the more the implementation of ulcus decubitus prevention will increase. Strategic issues obtained from PLS

analysis are individual factors, organizational factors, and management factors.

The results of the PLS analysis influence the implementation of ulcus decubitus prevention on unexpected events obtained path coefficient value 0.490 and t statistic 2.735 ($t > 1.96$). This result indicates that there is a significant influence between the variables of implementation of ulcus decubitus prevention on unexpected events. show a unidirectional relationship. The same direction can be interpreted that the higher the implementation of ulcus decubitus prevention, the event is not expected to decrease.

The quality of the structural model using R-square of the dependent variables is measured with the stone-Geisser Q-square test for predictive relevance. Based on these figures, the Q-square predictive relevance is calculated as follows:

Q Square predictive relevance

$$Q^2 = 1 - (1 - R1^2)(1 - R2^2) = 1 - (1 - 0.763)(1 - 0.504) = 0.88 \text{ (88\%)}$$

Since $Q > 0$, so the model is stable, and the predictive relevance requirement is satisfied.

Discussion

Sub variables on individual factors include demographics which consist of age, years of service, and level of education, knowledge, attitude. The ability and affordability sub variables are the main factors that influence are the main factors that influence behavior and individuals⁽⁸⁾, sub-demographic variables have indirect effects on individual behavior and performance. Demographic characteristics it is also an important thing known by the leader or someone inside motivate and improve its performance.

According to Anvari there are 5 supporting areas for knowledge management, namely human resources, leadership, organization, internal processes and vision. Human resources in this case are nurses which include age, years of service, level of education⁽⁹⁾. Age is related to maturity and maturation level, in the sense that increasing age will also increase technical/psychological maturity/maturity, as well as increasingly able to carry out their duties⁽¹⁰⁾. Davis & Newstorm argue that the more age increases the more job satisfaction and achievement. Age can affect one's physical, mental, work ability and responsibility, so that it can be interpreted that the more

mature a person is, the better his performance in safe nursing care⁽¹¹⁾. Older nurses have maturity in thinking and acting and have the ability to recognize and prevent the danger they get along with the development of age and maturity. This fact will make him more careful and pay close attention. Increasing age and technical and psychological will increase, the more able to make decisions, the more wise and think rationally, so the better performance⁽¹⁰⁾.

Higher the level of education, the greater the desire to use their knowledge and skills. Higher nurse education is easier to understand the task⁽¹²⁾. Nurses who have higher education have higher work ability⁽¹³⁾. Behavior is based on knowledge will be more lasting than behavior that is not based on knowledge⁽¹⁴⁾.

Knowledge is part of cognitive process which can be improved through education. This is confirmed by Winslow et al in CHSRF and FCRSS which explain that there is a relationship between nursing education and patient needs. Nurses must improve education and training opportunities for all aspects of nursing that have an impact on patient safety and can reduce unexpected events. Knowledge is the main capital to obtain good skills and attitudes, with good knowledge individuals will be motivated to do ulcus decubitus prevention⁽¹⁴⁾. Knowledge is information that has been organized and analyzed to make it understandable and applicable to problem solving or decision making⁽¹⁵⁾. Competency is ability and characteristics possessed by someone with knowledge, skills and attitude behavior required in carrying out his job duties, so that can carry out their duties in a professional, effective and efficient manner and in accordance with the performance standards carried out⁽¹⁶⁾.

Knowledge is a basic element for every employee to change his behavior in implementing something⁽¹⁷⁾. Knowledge can not only be seen as a useful investment at any given time but how knowledge influences nurse performance is important in managing HR. The results of this study support Yulia's research that within the framework of facilitating knowledge transfer, patient safety training programs need to be carried out on an ongoing basis⁽¹⁸⁾.

Nurses have a positive attitude and commitment in preventing ulcus decubitus. Individual needs will arise if the individual feels there is an imbalance between hope and reality, so that an impulse will emerge to meet

expectations.

Organizations are consciously coordinated social units, which are composed of two or more people who function on a relatively continuous basis to achieve a common goal or set of goals⁽¹⁹⁾. Organizational variables that influence a person's behavior and performance, namely resources, leadership, reward, structure and job design⁽⁸⁾. According to Swanborg in Molina, one of the functions of management is to lead the process of delegation, supervision, coordination, and control of the implementation of organizational plans. The focus is to guide and increase motivation with the efforts made, namely by creating a reward system, providing positive feedback, integrating organizational goals with staff/individuals, reducing job dissatisfaction, supporting resources. Nurse performance is influenced by various factors including individual factors and the environment/organization. Organizations have a large role to plan, move and evaluate the goals to be achieved. The organizational structure shows a way group assignments, lines of communication and authority relations and manufacture decision⁽²⁰⁾.

On the subvariables of organizational factors: leadership, leadership is one of the main factors that influence staff performance because leadership is a driver for all existing resources within an organization. The success of human resources in achieving organizational goals is also inseparable from the influence and behavior of leaders in developing their employees. The effectiveness of employees in carrying out their work depends on the influence received from their leaders. Leadership in nursing is the ability and skill of a nurse leader in influencing other nurses under his supervision to carry out their duties and responsibilities in providing care and nursing care so that the goals of nursing are achieved. Leadership influences organisational citizenship behaviour⁽²¹⁾, particularly through trust⁽²²⁾.

Organizational structure is the way a group is formed, communication lines and authority relations and decision making⁽²⁰⁾. This means that with a good organizational structure, staff will be more obedient in carrying out their work, especially in implementing prevention of ulcus decubitus. The intended organizational structure contains a command line and a good communication system to provide information to each other regarding the task fields of each section. Organizational structure is a factor that is closely related to nurse compliance in implementing patient safety. Quality and safety of

nurses associated with various factors in the system, organization and work environment are things that affect patient quality and safety⁽³⁾.

OCB in health care are encouraged, employees and organisations are more likely to be more productive and flourish⁽²³⁾. The final results of the implementation of knowledge management will be reflected in someone's performance⁽²⁴⁾. Knowledge management consists of knowledge identification (acquisition and creation), knowledge application, knowledge sharing and transfer, the knowledge repository is a way or tool for an organization to build a knowledge, where knowledge will later be used by organization to develop itself⁽⁷⁾. A knowledge-sharing culture and organisational learning were found to be core factors affecting nursing performance⁽²⁵⁾.

Conclusion

Prevention of decubitus ulcer based on OCB and knowledge management is an approach method as an effort to prevent the occurrence of decubitus ulcer.

Ethical Clearance- Yes

Source of Funding- Author

Conflict of Interest- No

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