

Knowledge and awareness towards Cryptosporidiosis in Baghdad

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Abstract:

Knowledge and awareness towards cryptosporidiosis were assessed in this study during the period from April 2009 till June 2011, among 188 person of both gender which were divided in different groups and sub groups as following Group 1: include 48 physician from different hospitals and primary health care centers in Baghdad this group were sub divided into 30 Specialist doctors and 18 General practitioners doctors. Group 2 : include 45 teaching staff member from Biology department , Biotechnology department in University of Baghdad and AL-Nahrain University as well as teaching staff member from the college of medicine – University of Baghdad and University of Mustansiriyah, this group were sub divided into 9 Ph.D and 36 M.Sc. + B.Sc. member and Group 3: include 95 students from Biology department – University of Baghdad this group were sub divided into 13 postgraduate students and 82 undergraduate students group from the last year in the college. Interview method was depended on a questioner made of three parts (general knowledge , mode of transmission and epidemiology + life cycle) .

Results showed that the awareness was moderate towards cryptosporidiosis in the three groups of this study the mean of scores were (66.54 ± 14.69) towards all items of questioner, the mean of scores obtained in general knowledge part (72.39 ± 20.26) were higher than mean of scores obtained in both mode of transmission (63.93 ± 18.57) and epidemiology + life cycle part (63.29 ± 18.69) , gender are non significant factor affected in awareness towards cryptosporidiosis as well as there were no significant grade differences among the three groups in this study.

Introduction

Cryptosporidiosis, an intestinal zoonotic and anthroponotic parasitic infection, caused by protozoan parasites genus *Cryptosporidium*, it has gained considerable media attention since a 1993 waterborne outbreak in Milwaukee, in which more than 400 000 persons became ill [1,2]. Nowadays it becomes a major public health implications because infections can result from exposure to low doses of *Cryptosporidium* oocysts. The oocysts are highly resistant to

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chlorination and common household disinfectants, ability to pass through physical water treatment processes, and survive long periods in the environment. Humans can acquire *Cryptosporidium* infections through several transmission routes, such as direct contact with infected persons or animals, and ingestion of contaminated food (food borne transmission) and water (waterborne transmission) [3].

In Iraq, however there is several epidemiological studies deal with Cryptosporidiosis [4, 5, 6, 7, 8, 9], It has been suggested, but not documented, that medical persons are generally unaware of this disease as well as a literature search has revealed no data about the degree of awareness about *Cryptosporidium* infections among Iraqis. So the aim of this study is to assess some medical person awareness of cryptosporidiosis and knowledge of some topics deal with this disease.

Methods

The study was designed to assess knowledge and awareness towards cryptosporidiosis during the period from April 2009 till June 2011, among 188 persons randomly selected of both gender (male 78 , female 110) divided into three major groups according to their occupation.

Group 1: include 48 physician from different hospitals and primary health care centers in Baghdad ,the median age 36.97 year range from (24 - 59) year , this group were sub divided into Specialist doctors (30) and General practitioners doctors (18).

Group 2 : include 45 teaching staff member from Biology department , Biotechnology department in University of Baghdad and AL-Nahrain University as well as teaching staff member from the college of medicine – University of Baghdad and University of Mustansiriyah. The median age 35.86 year range from (26 - 63) year, this group were sub divided into Ph.D group (9) and M.Sc. + B.Sc. group (36).

Group 3: include 95 students from Biology department – University of Baghdad. The median age 23.31 year range from (19-43) year , this group were sub divided into postgraduate students group (13) undergraduate students group (82) from the last year in the college. Table (1) showed the details of groups and sub groups in this study.

A special questionnaire designed from review of many literature about cryptosporidiosis , this was divided to three parts each consist ten questions :Part (1) deal with general knowledge about the disease , Part(2) deal with mode of transmission and Part (3) epidemiology + life cycle ,Table (2) . Interview method was depended in this study, each interview lasted in mean of (20-25) minutes. Response of the subjects are distributed in six categories of scores : less than 50 of true response considers weak , (50-59) considers acceptable , (60-69)

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considers moderate , (70-79) consider good , (80-89) consider very good and (90-100) consider excellent.

Results were presented in terms of observed numbers and percentage frequencies, and then analyzed by Statistical Package for Social Sciences (SPSS 10.01) using the Chi square: P value ≤ 0.05 was considered statistically significant.

Table (1): Major characteristics of Groups and sub-groups in this study

Group	Sub- group	Male	Female	Median age / Year	Age range/ Year	Histopathologist	Surgeons	Pediatrics	Gynecology	Ophthalmology	Dermatology	Community medicine	Emergency
Group 1 physician	Specialist	20	10	40.06	29-59	2	4	8	3	1	6	1	5
	General practitioners	9	9	31.83	24-54	----	----	----	----	----	--	----	--
Group 2 teaching staff	Ph.D	8	1	41.44	33-49	----	----	----	----	----	--	----	--
	M.Sc+B.Sc.	18	18	34.47	26-63	----	----	----	----	----	--	----	--
Group 3 students	Undergraduate	20	62	22.38	19-43	----	----	----	----	----	--	----	--
	Postgraduate	3	10	29.15	24-36	----	----	----	----	----	--	----	--

Table (2): Items of the questionnaire used in this study

	Questions / part(1) Knowledge about the disease	YES	NO
1	The cause of cryptosporidiosis is protozoan parasites.		
2	This disease was first discovered in human		
3	This diseases occurred in human and some animals		
4	The disease is not curative		
5	The diseases can be diagnosed through laboratory investigation		
6	Sign and Symptoms of the diseases appear after 2-15 days		
7	The major clinical symptoms is diarrhoea		
8	The pathogen cause this diseases(<i>Cryptosporidium</i>) infect gastro intestinal tract		
9	There is only one species of <i>Cryptosporidium</i>		
10	This disease found in our country		
	Questions / part(2) Mode of transmission	YES	NO
1	Oocyst is the infective stage		
2	The disease can transmitted through contaminated drinking water		

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3	Recreational water may be source of infection with this diseases		
4	Person to person transmission can occur in some households.		
5	This diseases considered as food born disease		
6	Soil may be source of infection with this diseases		
7	Some insects play as a mechanical vector of this pathogen		
8	Animal to person transmission can occur		
9	Autoinfection was recorded in some patients		
10	Air born transmission can be occurred rarely		
	Questions / part(3) Epidemiology + life Cycle	YES	NO
1	This pathogen can cause an outbreaks		
2	Travelling can be one of the risk factors associated with this diseases		
3	This diseases is widely spread in day care centres		
4	<i>Cryptosporidium</i> can be detected in some sea foods		
5	<i>Cryptosporidium</i> have only one stage in life cycle		
6	Diagnostic stage of <i>Cryptosporidium</i> can be detected in the faeces of patient		
7	<i>Cryptosporidium</i> is mostly infected children		
8	Medical and health staff is more infected than others		
9	HIV patients is more susceptible to cryptosporidiosis		
10	Diagnostic stage of <i>Cryptosporidium</i> can be detected in the sputum of patient		

Results and Discussion

Results showed that the mean of scores were (66.54 ± 14.69) of overall questions in all three groups, this consider as moderate response , high mean of scores (72.39 ± 20.26) were seen in the questions deal with general knowledge about the disease which consider as good response , followed by lower mean of scores in both questions deal with mode of transmission and the part of epidemiology + life cycle which were (63.93 ± 18.57) and (63.29 ± 18.69) respectively Figure (1). These results can be explained as following : Most apicomplexans (except the eugregarines) have a complicated life cycle consisting of asexual and sexual stages [1] , *Cryptosporidium* spp lack of species specificity, allowing cross-transmissibility between multiple hosts [10,11], that is mean there are wide range of hosts and different mode of transmission : zoonotic , anthroponotic , faecal oral , food born , water born and by recreational water as well as some insect my play an important role in transmission [3] . Because prevention is based largely on knowledge of the biology, life cycle, and modes of transmission of *Cryptosporidium* spp [12], the general knowledge towards the disease is not enough for prevention strategies.

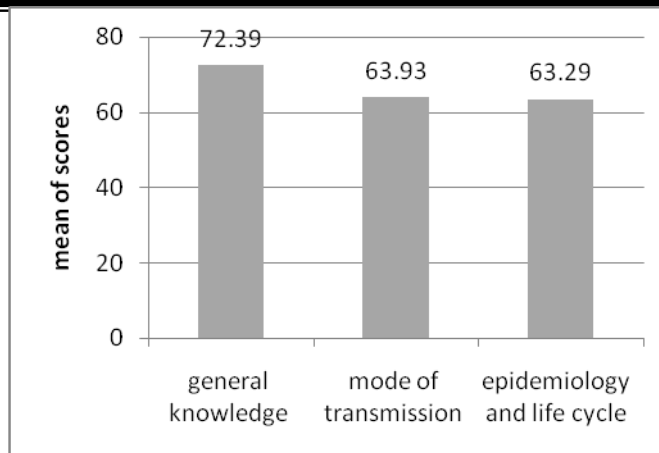


Figure (1): Mean of scores in different groups towards General knowledge , mode of transmission and epidemiology and life cycle

General knowledge

Among all items of general knowledge part, item 3 "the disease occurred in human and some animals "showed high percentage (83.77%) of true response while item 10 "the disease found in our country" and item 6 " Sign and Symptoms of the dieses appear after 2-15 days" showed the lower percentages of true response which were (64.65%) and (63.51%) respectively. this low percentage may due to the following : the limitation of medical data base deal with this disease in Iraqi official websites (Universities , Ministry of health , Ministry of higher education and some researches institutes) ,not all of the Iraqi medical and scientific journal are available on the internet although there were several studies deal with cryptosporidiosis in Iraq [4, 5, 6, 7, 8, 9] , limitation of mass media (such as television, radio, magazine, and newspaper) programs that deal with this disease in our country although some articles suggested that mass media, are not a very important source of information for some parasitic disease [13,14] , while the low percentages showed in item 6 because the clinical and epidemiologic significance of various *Cryptosporidium* species and genotypes in humans is not yet clear [15].

Results also showed significant differences ($p < 0.05$) between three groups in all items of general knowledge part except item 7 "the major clinical symptoms is diarrhea" , because diarrhea is the symptom of most gastrointestinal parasites such as *Giardia lamblia* and *Entamoeba histolytica* [16] . On other hand results showed no significant differences ($p < 0.05$) between the sub group of physicians (specialist physicians and general practitioners) in all items of general knowledge part except item 10 which showed significant differences ($p < 0.05$) between the two sub group of physicians , the general practitioners showed high percentage (83.33%) in true response when it compare with low percentage(50%) of true response in specialists , the general practitioners

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supposed to have interest with the most medical branches while the specialist have interest only in their branches especially the surgeons , dermatologist and gynecologist. Results of teaching staff response showed no significant differences ($p < 0.05$) between the two sub group of teaching staff (Ph.D group and M.Sc. +B.Sc group) as well as no significant differences ($p < 0.05$) were shown in all items of general knowledge part except in item 2 "this disease was first discovered in human" between the two sub group of student(Post graduate and under graduate student , the postgraduate students showed high percentage (69.23%) of true response when it compare with low percentage (35.36%) in undergraduate students of true response in item 2 of general knowledge table (3). Undergraduate students in our Biology departments , mostly , studied medical human parasitology as well as they did not always read specific articles about the disease , and they also did not very interested with the historical background of the disease , while the post graduate students may read more specific articles and they had comprehensive exam especially the Ph.D student , reports of cryptosporidiosis during this decade appeared in nearly 40 publications on cattle, sheep, pigs, horses, turkeys, rabbits, monkeys, snakes, and guinea pigs [1].

Mode of transmission

Among all items of mode of transmission part, item 2 "the disease can transmitted through contaminated drinking water "showed high percentage (80.13%) of true response while item 10 "air born transmission can be occurred rarely" showed the lower percentage (45.20%) of true response. These results were expected in this study because airborne transmission to humans is not well documented [17]. moderate response (65.29%) were noticed in item 3 "recreational water may be source of infection with this disease" and this item thought to be one of the very important items in mode of transmission part because some textbooks deal with this disease refer to the low level of public awareness about recreational water illnesses has served as the foundation for *Cryptosporidium's* becoming a major recreational-water-associated pathogen in developed countries [18]. some other papers showed how improved outbreak detection can be achieved through raised awareness of routes of infection, which may account for the recent increase in the numbers of outbreaks associated with swimming pools[19].

Results showed that there were significant differences ($p < 0.05$) between all three group in the following items 1,3,4,7,8,9 and 10 , the very high significant difference were observed between the three groups in item 7 and item 10 "which were "some insects play as a mechanical vectors of this pathogen" and "Air born transmission can be occurred" respectively , students and teaching staff member show high percentage of true response in item 7 which reached (51.11%) and (73.68%) respectively when compared with low response

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(47.91%) in physicians table (3) , this results may due to the high interest of biological student with insects because they studied Entomology in two semesters , while Entomology was not included in physicians semesters in a very wide details when it compared with wide details in biology courses. While the group of physicians showed high significant ($p<0.05$) percentage of true response in item 10 compared with other two groups, because physicians are in contact with patients as a routine practices.

Results showed that there were no significant differences ($p<0.05$) between the two sub group of physicians in all items of mode of transmission, 66.25% was the average of true response in mode of transmission parts among the physicians which considered as moderate response, this result was agreed with a survey in the USA showed that awareness is low among primary care physicians [20].

, as well as no significant differences were noticed between the two sub group of teaching staff except in item 5 , also there were no significant differences between the two groups of students except in item 9.

Epidemiology and life cycle

Among all items of epidemiology and life cycle part, item 9 "HIV patients is more susceptible to cryptosporidiosis "showed high percentage (86.14%) of true response while item 10 "diagnostic stage of *Cryptosporidium* can be detected in the sputum of patients" showed the lower percentage (31.59%) of true response. The high response about HIV patients was similar to the results of (Al-Hussein, 2009) [21], who indicated a good knowledge about AIDS among students. While the low percentage can be discussed as following: Many fluids and tissues can be submitted for analysis, including stools, sputum, bile, mucoid secretions, and tissue biopsies, but stools are the primary specimens examined for enteropathogenic species and genotypes of *Cryptosporidium*[22]. Although cases of biopsy-proven pulmonary cryptosporidiosis are rarely reported, the clinical significance of isolation of oocysts in the sputum remains unclear [23].

Item 6 " diagnostic stage of cryptosporidium can be detected in faeces of patient" showed low but no significant percentages of true response in physicians which reached (72.91%) when it compared with other groups: teaching staff and students which reached (80%) and (81.05%) respectively , this low percentage showed in physicians group may be similar to the results of (Morin et al. , 1997) [20] who showed that more than 75% of gastroenterologists, general or family practitioners, internists, and pediatricians never or rarely order diagnostic testing for *Cryptosporidium* even when their patients have symptoms consistent with cryptosporidiosis and more than 30% of physicians assumed *Cryptosporidium* testing was included in a standard ova and parasite examination.

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As well as physicians showed high significant true response (93.75%) of item 9 followed by teaching staff who showed (88.88%), while student showed low percentage of true response (75.78%) in this item. On other hand there were no significant differences between the two sub group of physicians (table 4) and between the two sub groups of teaching staff (table 5) , in all items of epidemiology and life cycle also there were no significant differences between the sub groups of student in all items of this part except item 8 and item 9 (table 6) these significant differences may due the variation in literacy level among groups and sub-groups.

Table (3): Percentages of true response among different groups towards General knowledge , mode of transmission and epidemiology + life cycle

Items of part (1)	Physicians	Teaching staff	Students	mean	X ²	p- value
	% of true response	% of true response	% of true response			
1	66.66	93.33	57.89	72.63	17.923	0.00012825
2	68.75	66.66	84.21	73.20	7.056	0.02936358
3	89.58	93.33	68.42	83.77	15.586	0.00041261
4	87.5	82.22	50.52	73.41	25.696	0.00000263
5	89.58	88.88	57.89	78.78	23.668	0.00000725
6	77.083	55.55	57.89	63.51	6.118	0.04693461
7	75	73.33	65.26	71.19	1.805	0.40555451
8	79.16	88.88	54.73	74.26	19.727	0.00005204
9	68.75	84.44	46.31	66.50	20.249	0.00004009
10	62.5	77.77	53.68	64.65	7.519	0.02329539
Items of part (2)						
1	64.58	80	54.73	66.44	8.435	0.01473544
2	83.33	84.44	72.63	80.13	3.498	0.1739478
3	68.75	75.55	51.57	65.29	8.784	0.01237595
4	77.08	73.33	55.78	68.73	8.027	0.01807004
5	64.58	80	69.47	71.35	2.817	0.24450977
6	66.66	71.11	81.05	72.94	3.997	0.13553844
7	47.91	51.11	73.68	57.57	11.768	0.00278363
8	72.91	77.77	57.89	69.52	6.613	0.0366442
9	56.25	62.22	75.78	64.75	6.321	0.04240453
10	60.41	48.88	26.31	45.20	17.157	0.00018811
Items of part (3)						
1	58.33	71.11	54.73	61.39	3.441	0.17897664
2	87.5	71.11	72.631	77.08	4.669	0.0968589
3	39.58	57.77	51.578	49.64	3.267	0.19524502
4	60.41	42.22	55.78	52.80	3.422	0.18068502
5	72.91	77.77	69.47	73.38	1.063	0.58772272
6	72.91	80	81.05	77.98	1.318	0.51736844
7	64.58	71.11	73.68	69.79	1.28	0.52729242

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8	64.58	51.11	57.89	57.86	1.731	0.42084108
9	93.75	88.88	75.78	86.14	8.713	0.01282319
10	39.58	28.88	26.31	31.59	2.714	0.25743192

Table (4): Percentages of true response among physicians sub-groups towards General knowledge , mode of transmission and epidemiology + life cycle

Items of part (1)	Specialist	GP	X ²	p- value
	% of true response	% of true response		
1	56.66	83.33	3.6	0.0577
2	73.33	61.11	0.782	0.736
3	83.33	100	3.349	0.067
4	83.33	94.44	1.27	0.259
5	93.33	83.33	1.206	0.272
6	73.33	83.33	0.637	0.424
7	80	66.66	1.067	0.3016
8	80	77.77	0.007	0.933
9	66.66	72.22	0.162	0.687
10	50	83.33	5.533	0.029
Items of part (2)				
1	63.33	66.66	0.055	0.814
2	90	72.22	2.56	0.109
3	66.66	72.22	0.162	0.687
4	70	88.88	2.272	0.131
5	63.33	66.66	0.055	0.814
6	60	77.77	1.6	0.205
7	46.66	50	0.05	0.823
8	73.33	72.22	0.007	0.933
9	60	50	0.457	0.499
10	60	61.11	0.123	0.725
Items of part (3)				
1	66.66	44.44	2.286	0.13
2	83.33	94.44	1.27	0.259
3	40	38.88	0.006	0.938
4	53.33	72.22	1.678	0.195
5	80	61.11	2.033	0.153
6	70	77.77	0.345	0.556
7	70	55.55	1.026	0.311
8	70	55.55	1.026	0.311
9	93.33	94.44	0.024	0.213
10	33.33	50	1.0307	0.252

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Table (5): Percentages of true response among teaching staff sub-groups towards General knowledge , mode of transmission and epidemiology + life cycle

Items of part (1)	Ph.D	M.Sc + B.Sc	X ²	p- value
	% of true response	% of true response		
1	88.88	94.44	0.357	0.550177
2	88.88	61.11	2.5	0.113846
3	100	91.66	0.804	0.3699
4	77.77	83.33	0.152	0.696631
5	88.88	88.88	0	1
6	66.66	52.77	0.563	0.453054
7	66.66	75	0.256	0.612882
8	88.88	88.88	0	1
9	66.66	88.88	2.707	0.099909
10	66.66	80.55	0.804	0.3699
Items of part (2)				
1	77.77	80.55	0.035	0.851596
2	100	80.55	2.072	0.150025
3	66.66	77.77	0.481	0.48797
4	77.77	72.22	0.114	0.735635
5	55.55	86.11	4.201	0.0404
6	55.55	75	1.325	0.249697
7	55.55	50	0.089	0.765452
8	88.88	75	0.197	0.657153
9	77.77	58.33	1.158	0.281881
10	55.55	47.22	0.2	0.654721
Items of part (3)				
1	77.77	69.44	0.243	0.622048
2	77.77	69.44	0.243	0.622048
3	55.55	58.33	0.023	0.879457
4	55.55	38.88	0.82	0.36518
5	66.66	80.55	0.804	0.3699
6	66.66	83.33	1.25	0.263552
7	88.88	66.66	1.731	0.188283
8	44.44	52.77	0.2	0.654721
9	77.77	91.66	1.406	0.235722
10	33.33	27.77	0.108	0.742433

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Table (6): Percentages of true response among students sub-groups towards General knowledge , mode of transmission and epidemiology + life cycle

Items of part (1)	Postgraduate	Undergraduate	X ²	p- value
	% of true response	% of true response		
1	100	76.82	3.76	0.052
2	69.23	35.36	5.362	0.02058
3	84.61	70.73	1.088	0.296915
4	84.61	47.56	6.18	0.01292
5	84.61	79.26	0.201	0.653915
6	76.92	56.09	2.011	0.156162
7	76.92	81.70	0.167	0.682792
8	92.30	84.14	0.595	0.440492
9	92.30	67.07	3.437	0.063751
10	46.15	56.09	0.448	0.503286
Items of part (2)				
1	46.15	59.75	0.852	0.355
2	100	81.70	2.824	0.092865
3	84.61	65.85	1.828	0.176364
4	69.23	47.56	2.108	0.146531
5	61.53	57.31	0.082	0.774605
6	53.84	58.53	0.101	0.750633
7	53.84	67.07	0.866	0.352065
8	69.230	52.43	1.277	0.258458
9	76.92	41.46	5.674	0.017218
10	76.92	50	3.271	0.070515
Items of part (3)				
1	61.53	53.65	0.281	0.596
2	84.61	70.73	1.088	0.296915
3	53.84	51.21	0.031	0.86024
4	69.23	53.65	1.103	0.293609
5	76.92	68.29	0.394	0.530204
6	76.92	81.70	0.167	0.682792
7	69.23	74.39	0.154	0.694742
8	30.76	62.19	4.546	0.032996
9	100	71.95	4.811	0.028279
10	30.76	25.60	0.154	0.694742

Grade differences

Results showed that there were no significant differences ($p < 0.05$) between male and female in awareness towards cryptosporidiosis , the percentage of weak , acceptable , moderate , good very good grade were higher in male when it comparing with male except the excellent grade which was higher in female when comparing with female (table 7). Nowadays both male and female have the same chance in learning and working [8] so the awareness towards infectious agent may not be varied very much between genders , these result was agreed with the study of (Unnikrishnan *et al.* ,2008) [24] who showed that awareness towards malaria was not found to vary significantly with gender , while other paper showed that the males had higher levels of literacy than females[13].

Table (7): Grade differences between male and female towards all items of questioner

Grade	Male	%	Female	%
Weak	6	7.69	17	15.45
Acceptable	9	11.53	12	10.90
Moderate	22	28.20	26	23.63
Good	28	35.89	33	30
very good	9	11.53	20	18.18
Excellent	4	5.12	2	1.81
Total	78	100	110	100
Chi square X^2 : 5.999		P value: 0.306316	Df: 5	

Table (8) illustrated the differences in grade between the three groups of the study, group 3 (students) showed high percentage in each weak (16.84%) , acceptable (12.63%) and moderate (29.47%) grade of response , while group 2 (teaching staff) showed high percentage in both good (48.88%) and excellent (6.66%) grade of response , while group 1 (Physicians) showed high percentage in very good (18.75%) grade , statistical analysis showed no significant differences ($p < 0.05$) between the three groups in their degree of awareness towards cryptosporidiosis. This non significant result may due to good literacy of all most of the persons which included in this study.

Finally our finding showed that the awareness was moderate towards cryptosporidiosis in the three groups of this study, the general knowledge towards the disease was higher than mode of transmission , epidemiology + life cycle , gender are non significant factor affected in awareness towards cryptosporidiosis as well as there were no significant grade differences among high literacy individuals. So we recommend the involvement of Cryptosporidiosis in wide details in the curriculum of biology department and

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college of medicine of our universities, as well as enhance the websites that deal with microbiology , parasitology , public health and prevention in our country.

Table (8): Grade differences among major groups towards all items of questioner

Grade	Group 1 (Physicians)	%	Group 2 (Teaching staff)	%	Group 3 (Students)	%
Weak	6	12.5	1	2.22	16	16.84
Acceptable	4	8.33	5	11.11	12	12.63
Moderate	12	25	8	17.77	28	29.47
Good	15	31.25	22	48.88	24	25.26
very good	9	18.75	6	13.33	14	14.73
Excellent	2	4.16	3	6.66	1	1.05
	48	100	45	100	95	100
Chi square:16.499		P value: 0.086211		Df: 10		

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تقييم واقع المعرفة والوعي لداء الأبواغ الخبيثة في بغداد

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اجريت هذه الدراسة لتقييم واقع المعرفة و الوعي خلال الفترة من نيسان 2009 و لغاية حزيران 2011 ، لدى 188 شخص من كلا الجنسين والذين تم تقسيمهم الى مجاميع رئيسية وفرعية و كما يأتي:
المجموعة الأولى تضمنت 48 طبيباً من مختلف المستشفيات و مراكز الرعاية الصحية الأولية في بغداد ، قسموا الى 30 طبيب اخصائي و 18 طبيب ممارس عام ، المجموعة الثانية تضمنت 45 تدريسي من اقسام علوم الحياة و التقنيات الأحيائية في جامعة بغداد و النهرين و بعض من تدريسي كلية الطب جامعة بغداد ، قسموا الى 9 من حملة شهادة الكتوراه و 34 من حملة شهادة الماجستير او البكالوريوس. المجموعة الثالثة تضمنت 95 طالب يدرسون في قسم علوم الحياة ، قسموا الى 13 طالب دراسات عليا و 82 طالب دراسة اولية في المرحلة الأخيرة من دراستهم. وقد استخدم اسلوب المقابله باستخدام استبانته خاصه مقسمهالى ثلاث اجزاء: جزء خاص بالمعرفة العامة ، جزء خاص بطرق انتقال المرض و جزء خاص بكل من الوبائية و دورة الحياة.

اظهرت النتائج ان الوعي العام كان متوسطا اتجاه داء الأبواغ الخبيثة حيث بلغ معدل النقاط التي حصل عليها افراد المجاميع الثلاثة اعلاه (14.69 ± 66.54) في كل مفردات الأستبانة ، وقد كان معدل النقاط التي حصل عليها افراد المجاميع الثلاثة في الجزء الخاص بالمعرفة العامة اتجاه المرض اعلى من المعدلات (20.26 ± 72.39) التي حصل عليها افراد المجاميع الثلاثة في كل من الجزء الخاص بطرق انتقال المرض و الجزء الخاص بالوبائية + دورة الحياة والتي بلغت (18.75 ± 63.93) و (63.29 ± 18.57) على التوالي ، بينت النتائج ايضا ان عامل الجنس هو عامل غير مؤثر معنويا على مستوى الوعي اتجاه المرض بالإضافة الى عدم وجود اختلافات معنويه في مستويات الوعي اتجاه هذا المرض بين المجاميع الثلاثة .