Al-Kindy College Medical Journal (KCMJ)

Research Article

Cervical Pain Related to Position of the Neck during E-Learning

Mohammed Sh. Al-Edanni[1]*, Mustafa Saad Ghanim,[2] Abdul Kareem Tariq Abdul Kareem[1], Hamza Abdulsalam Ibrahim[1], Abdul-Jabbar Abdullah Naji[1]

[1] Al-Kindy College of the Medicine, University of Baghdad, Baghdad, Iraq
[2] Al-Kindy Teaching Hospital, Risafah Health Directorate, Baghdad, Iraq
*Corresponding author: mohammedshihab@kmc.uobaghdad.edu.iq

Article history:
Received 1 April 2022
Accepted 9 July 2022
Available online 31 August 2022

https://doi.org/10.47723/kcmj.v18i2.822

Keywords: posture, Laptops, neck pain, smartphones.

ABSTRACT

***Background*:** During the pandemic, Corona virus forced many people, especially students, to spend more time than before on the computer and smartphone to study and communicate. The poor posture of the body may have worse effect on its body parts , most of which is the cervical spine (forward head posture).

***Objective*:** To assess the incidence of neck pain and the associated factors among undergraduate medical students related to position during E learning

***Subjects and Methods*:** Cross-sectional study was conducted among medical students in three Iraqi universities during 2021. The sample size was 152. Online questionnaire by Google forms sampling method were used to collect the data which was analysed using SPSS 25.

Results: The percentage of students who suffered cervical pain was (80.3%) of the 152 who participated in this study and the majority of those who suffered pain were complained from increase pain during the pandemic (72.1%). This study also showed the students recumbent on the floor 67 (44.1%) more than those who use the table and chair 62 (40.8%) during E-learning. The percentage of students who use the phone for more than 4 hours were (73.7%).

***Conclusion*:** there is a relationship between poor posture and cervical pain during E-learning in the pandemic. Most of students were suffering from neck pain with greatest percentage were in those who student in recumbent on the floor and when using chair and table.

Introduction

In 2020, the COVID19 cases arises in Iraq, which lead to the application of lockdown and social isolation has been imposed as one of the defensive actions to extent the coronavirus infection with economic burden in medical resources, quarantine measures, restriction of trade, disruption of production, loss of job, deteriorated finance, etc. (1)

The correct posture of the head occurs when the ears are located right above the shoulders with the chest open and shoulders back, thus stress on the neck is lessened since the head's weight is certainly well-adjusted on the cervical spine even the normal head weight about 10 to 13 pounds. (2) In poor position of the head, the lower cervical spine become hyperflexion with loss of the lordosis curvature of the spine and become flattening, this lead to hyperextension of the upper cervical and the lordosis becoming further obvious, this lead to more stress on the intervertebral discs, vertebrae, and facet joints. (2) Like sitting for prolonged periods of time in awkward positions in front of a computer for about 8 hours

per day in working office and additional 2-4 hours on their smartphones, (3) this poor neck posture can be associated with musculoskeletal disorders and physiologic dysfunction of the body.
Pain in the upper neck is typically arise from C2–3, and pain in the lower neck from C5– 6 and C6–7, resulting in somatic pain, dull, aching in nature pain, shooting pain (neurogenic origin) (4).
Global Burden of Disease (GBD) 2017 stated the musculoskeletal disorders is the second global debility illnesses (5). Neck pain can cause distress, debility, and decreased quality of life. (5,6) Undergraduate students represent a high incidence of neck and upper limbs pains up to 48-78%. (6,7)

Quick progress of communication, increasing custom of electronic devices like laptops, smartphones, tablets, have direct relation to severity of neck pain in general population especially in students. (7-9).

Pain is a main source of morbidity and debility in ordinary life and at work in several nations. It affects the person's physical, public, and emotional behavior with increase costs to society and businesses. (10-12) Neck pain also increase with aging especially in medium- and low-income countries. (13).

The cervical pain is the main musculoskeletal disorders in the adult account from 13.5% and 47%, with a complex etiology, like ergonomic factors (vigorous physical action, vibration, and poor position), individual factors (age, weight, and genome), behavioral factors (smoking), and psychosocial factors (occupation, stress, nervousness, and depression. (14-16).

There are a limited studies of the incidence of neck pain in medical students 12,13,14, and also in Iraq, which have focused on the musculoskeletal pain in undergraduate medical students.

Aim of this study is to assess the incidence of neck pain and the associated factors among undergraduate medical students related to position during E learning.

Subjects and Methods

This cross-sectional study was conducted among 152 medical students using an online questionnaire, focused on neck, shoulder pain in the past week and the past year during pandemic and depending on E-learning. Three universities were enrolled in this survey (University of Baghdad/AL-Kindy College of medicine, University of Almustansyria / College of medicine and University of Falluja/College of medicine). We included all medical students in these three medical colleges and excluded students with previous document cervical pain or surgery. The questionnaire including several parameters like demographics, site of pain. onset, character, radiation of the pain, associated symptoms, time /duration, any exacerbating and relieving factor, previous and the current neck pain symptoms, and potential risk factors (e.g., gender, age, study programs, electronic devices usage, study hours, sports participation, neck pain, stage of students, average use of mobile, using table, chair, etc., aggregated factor, consult doctor, smoking, and types of pillow use right, high or low).

Results

Regarding the sex , (52.63%) of students are females, while (47.37%) are males. (Fig. 1).

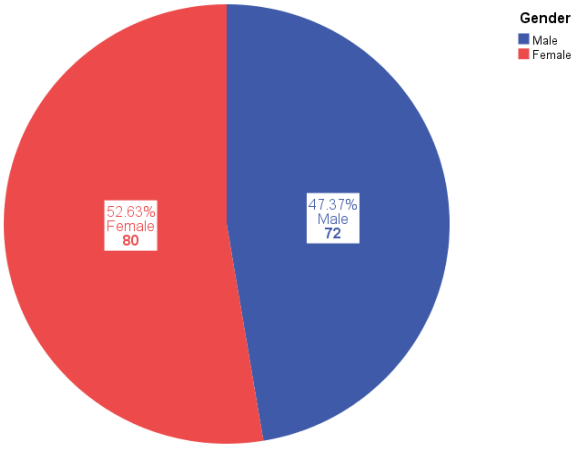

Figure (1): Gender distribution

The rate of recurrence of the pain among students of different stages, there were 77.8% of males suffering from neck pain, and 82.5% of females had a neck pain. (Tab 1)

Table (1): Show the frequency of pain among students of different stages

		Gender							
		Male 72 47.4%				Female 80 52.6%			
		Suffered from neck pain				Suffered from neck pain			
		Yes		No		Yes		No	
		56 77.8%		16 22.2%		66 82.5%		14 17.5%	
		No.	%	No.	%	No.	%	No.	%
Stage	First 9.2%	2	66.7%	1	33.3%	9	81.8%	2	18.2%
	Second 23.7%	15	100.0%	0	0.0%	15	71.4%	6	28.6%
	Third 34.2%	18	78.3%	5	21.7%	24	82.8%	5	17.2%
	Forth 16.4%	9	60.0%	6	40.0%	9	90.0%	1	10.0%
	Fifth 14.5%	10	71.4%	4	28.6%	8	100.0%	0	0.0%
	Sixth 2%	2	100.0%	0	0.0%	1	100.0%	0	0.0%
T.	152	72	47.4%			80.	52.6%		

Our result show that 75 of the students using pillow, more than half of them were suffering from neck pain only, other's pain was radiating to shoulders, either one or both of them. 53 of students are using low pillows, 21 of them has neck pain only, while 20 of them the pain was radiation to both shoulders. Who using high pillow were the least. (Tab. 2)

Table (2): Show the correlation between location of pain and pillow's heights

		Just right pillow 75 (49.3%)		**High pillow 24 (15.8%)**		**Low 53**	**Pillow (34.9%)**
		No.	%	No.	%	No.	%
The pain is	Neck only 77 (50.7%)	45	58.4	11	14.3	21	27.3
	Neck and radiate to one shoulder 31 (20.4%)	14	45.2	5	16.1	12	38.7
	Neck and radiate to both shoulders 44 (28.9%)	16	36.4	8	18.2	20	45.5

Table (3): Show the correlation between position of students during studying

				Neck pain			
				Yes 12280.3%		No 30 19.7%	
				No.	%	No.	%
Position during studying	Using chair and table 62 40.8%	Homework is	Just right	21	87.5%	3	12.5%
			Too much	24	82.8%	5	17.2%
			Not enough	8	88.9%	1	11.1%
	Walking 23 15.1%	Homework is	Just right	3	60.0%	2	40.0%
			Too much	10	71.4%	4	28.6%
			Not enough	4	100.0%	0	0.0%
	Lying on the floor 67 44.1%	Homework is	Just right	13	68.4%	6	31.6%
			Too much	34	85.0%	6	15.0%
			Not enough	5	62.5%	3	37.5%

The correlation between sitting position of students on chair/desk during studying and neck pain. We found that 62 of 152 were sitting on chair and table, 53 of them are suffering from neck pain and direct related to homework period time. 67 of the students were lying prone on the floor during study, 52 of them complaining from neck pain also. The students who were walking during studying were the least, also 12 students who using chair and table visit the doctor from neck pain, while 8 students visited the doctor who lying prone on the floor. (Tab. 3).

The correlation between the student's time during pandemic (habits) and neck pain summarize in (Tab. 4) , it obviously showed that 85 of students using mobile and 71 of them are suffering from pain in the neck ,and those who are reading were 48 student, 39 of them are having neck pain. The remains are the least.

Table (4): Show the correlation between position of students during studying

		Neck pain			
		Yes 122 80.3%		No 30 19.7%	
		No.	%	No.	%
During pandemic ,most of your time is	Reading 48 (31.6%)	39	81.3%	9	18.8%
	Using a mobile 85 (55.9%)	71	83.5%	14	16.5%
	Watching the TV 3 (2.0%)	3	100.0%	0	0.0%
	Other things 16 (10.5%)	9	56.3%	7	43.8%

The correlation between the daily average of using smart phone and neck pain summarized in (table 5). The students who using smart phone from 1 to 2 hours were 3.9% of total. From 2 to 4 hours were 34, about 75%of them were suffering from neck pain and the pain increase during pandemic, and those who using mobile more than 4 hours were the majority, 112 students, 65 of them were suffering from neck pain and pain increased during pandemic

Table (5): Show the correlation between the daily average of using smart phone and neck pain.

			Neck pain			
			Yes 80.3%		No 19.7%	
			Pain during E-learning		Pain increase during E-learning	
			Yes 88 72.1%	No 34 27.9%	Yes 11 36.7%	No 19 63.3%
Average daily of using smart phone	From 1 to 2 hours' daily 6 (3.9%)	No.	5	0	0	1
		%	100.0%	0.0%	0.0%	100.0%
	From 2 to 4 hours' daily 34 22.4%	No.	18	6	3	7
		%	75.0%	25.0%	30.0%	70.0%
	More 112 (73.7%)	No.	65	28	8	11
		%	69.9%	30.1%	42.1%	57.9%

The relation of neck pain and smoking, show that were 23 students have smokers, 15 of them, suffering from neck pain only, 4 in the neck and radiating to one shoulder, also 4 radiating to both shoulders. (tab.6).

Table (6): Show the correlation between neck pain and smoking

		Smoking				P value
		Yes 23	15.1%	No 129	84.9%	
		No.	%	No.	%	
The pain is	Only in the neck 50.7%	15	19.5%	62	80.5%	0.286
	Neck and radiating to one shoulder 20.4%	4	12.9%	27	87.1%	
	Neck and radiating to both shoulder 28.9%	4	9.1%	40	90.9%	

The associated symptoms with the neck pain, summarized in (Fig. 2). There are 98 student has a headache as result of neck pain, and 59 (39.6%) of students has a muscles weakness in the arm, 48 (32.2%) was suffered from stiffness of the neck

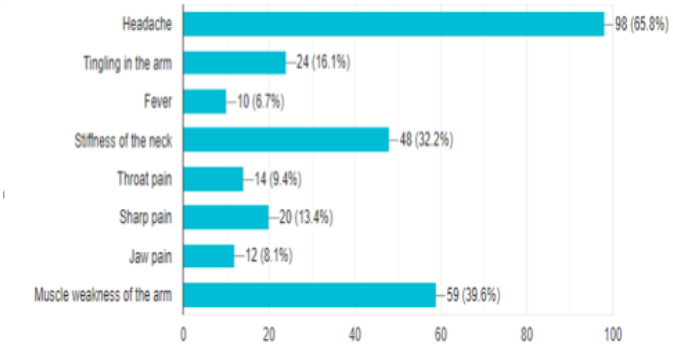

Figure (2): Show the associated symptoms with the neck pain

Discussion

Neck pain is a main source of morbidity and debility in ordinary, it affects the person's physical, public, and emotional behavior with increase costs to society and businesses, (10,11), Undergraduate students represent a high incidence of neck and upper limbs pains up to 17-28%. (7)

Regarding the gender (in table1), 72 males and 80 females, the result of asking about neck the result was as expected actually, 77.8% of males were suffering from neck pain, while in females was 82.5%. Our result is higher than the result done by T. T. W. Chiu et al 2002 (17), and same result by Laith Al-Ameri et al 2018. (18)

We also asked about the environment of student. So we started with sleep period; since humans spent third of their life's sleeping, everything affects sleeping will affect its life including the neck. (In table2), the questionnaire was about the heights of pillow, our results were unexpected, because 45 students suffering from neck pain without radiation to shoulders, with right (medium) height of pillow which may indicate harmful position during sleeping. The second majority were students who using low pillow, represented in 53 students with different location of pain, from neck to neck with both shoulders or one shoulder respectively. An approaching study was established, which results was an approach done by Gordon et al (2011), unsuitable cushion support has adverse effects on the cervical spine, leading to neck pain and headache, and disturbed sleeping. (19, 21)

The second environment after sleeping, is the position during studying. The results about this issue (in table3) show, that the majority of students lying on the floor (67) and using chair and table (62) for studying, most of them were suffering from neck pain with greatest percentage were in those who sitting on chair and table. Our result was similar to Faiza Sabeen et al. study 2013 (22) who state "Neck pain and computer users are direct relation due to prolong periods of sitting in a certain location with no disruptions to stretch the neck muscles because the neck bent onward, and thus shorting and tighten of the muscles in anterior aspect of the neck, while the muscles in the back of neck will grow longer and weaker. These changes will lead to development of neck pain", and also to study of Smith et al 2009 (23) who reported high prevalence of headaches and neck pain due to prolong sitting in fixed postures in front of computer or tables, and also done by Black et al 1996 (24), and Kang et al 2012 (25).

The free time of student during pandemic, since there is quarantine, there is more time being in the home and more and more of using smart phone or watching TV. The students that spent their time using smart phone was the great majority with 71 students ,83.5% of them were suffering from neck pain. This result was the same in above studies. Our result apposite to Bortuzzo et al study 2021. (26)

In (table 5), the great majority of student who suffering from pain and the pain increase was in those who using smart phone more than 2 hours, and thus a directed relationship between time of mobile usage and neck pain.

Table 6 show the correlation between smoking and the pain in the neck. The students who were smoking was only 23, 15 of them were suffering from pain, with 50:50 in those who's their pain was radiating to one shoulder and both. The smoking will damage blood vessels and thus affect the nourishment of the spinal discs, and from the microvasculature that line the endplates on either side of each disc and this may speed up the degenerative process. (27).

Last but not least, in figure2, the association factors which comes usually with neck pain, 98 students with a percentage of 65.8% in those who included in this research, was having a headache. This result corresponds to Bragatto et al 2019 (28).

Conclusions

Neck pain is not rare among undergraduate medical students. History of preceding neck pain during schooling makes a student prone for the current episode of pain. Academic stress, smartphone and laptop use tend to aggravate the pain in those who have neck pain.

References

[1] Peng M. Outbreak of COVID-19: An emerging global pandemic threat. Biomed Pharmacother. 2020 Sep;129:110499.

[2] Tariq,I...,Riaz,H..,Anwar,M..,&Ahmed,A..(2022). Correlation Between Forward Head Posture and neck pain in IT Professionals by using Postural Screen Mobile App: Forward Head Posture and neck pain in IT Professionals. Pakistan BioMedical Journal, 5(4).

[3] Falla D, Jull G, Russell T, Vicenzino B, Hodges P. Effect of neck exercise on sitting posture in patients with chronic neck pain. Phys Ther. 2007 Apr;87(4):408-17.

[4] Cohen SP, Hooten WM. Advances in the diagnosis and management of neck pain. BMJ. 2017 Aug 14;358:j3221.
[5] GBD 2016 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet. 2017 Sep 16;390(10100):1211-1259..
[6] Kanchanomai S, Janwantanakul P, Pensri P, Jiamjarasrangsi W. Risk factors for the onset and persistence of neck pain in undergraduate students: 1-year prospective cohort study. BMC Public Health. 2011 Jul 15;11:566.
[7] Hanvold TN, Wærsted M, Mengshoel AM, Bjertness E, Twisk J, Veiersted KB. A longitudinal study on risk factors for neck and shoulder pain among young adults in the transition from technical school to working life. Scand J Work Environ Health. 2014 Nov;40(6):597-609.
[8] Woo EHC, White P, Lai CWK. Musculoskeletal impact of the use of various types of electronic devices on university students in Hong Kong: An evaluation by means of self-reported questionnaire. Man Ther. 2016 Dec;26:47-53.
[9] Shan Z, Deng G, Li J, Li Y, Zhang Y, Zhao Q. Correlational analysis of neck/shoulder pain and low back pain with the use of digital products, physical activity and psychological status among adolescents in Shanghai. PLoS One. 2013 Oct 11;8(10):e78109.
[10] Smith DR & Leggat PA.Prevalence and Distribution of Musculoskeletal Pain Among Australian Medical Students, Journal of Musculoskeletal Pain, 2007. 15:4, 39-46
[11] Smith DR, Wei N, Ishitake T, Wang RS. Musculoskeletal disorders among Chinese medical students. Kurume Med J. 2005;52(4):139-46..
[12] Yue P, Liu F, Li L. Neck/shoulder pain and low back pain among school teachers in China, prevalence and risk factors. BMC Public Health. 2012 Sep 14;12:789.
[13] Strine TW, Hootman JM. US national prevalence and correlates of low back and neck pain among adults. Arthritis Rheum. 2007 May 15;57(4):656-65.
[14] Hush JM, Michaleff Z, Maher CG, Refshauge K. Individual, physical and psychological risk factors for neck pain in Australian office workers: a 1-year longitudinal study. Eur Spine J. 2009 Oct;18(10):1532-40.
[15] Malchaire JB, Roquelaure Y, Cock N, Piette A, Vergracht S, Chiron H. Musculoskeletal complaints, functional capacity, personality and psychosocial factors. Int Arch Occup Environ Health. 2001 Oct;74(8):549-57.
[16] Cimmino MA, Ferrone C, Cutolo M. Epidemiology of chronic musculoskeletal pain. Best Pract Res Clin Rheumatol. 2011 Apr;25(2):173-83.
[17] Chiu TT, Ku WY, Lee MH, Sum WK, Wan MP, Wong CY, Yuen CK. A study on the prevalence of and risk factors for neck pain among university academic staff in Hong Kong. J Occup Rehabil. 2002 Jun;12(2):77-91.
[18] Al-Ameri LT, Issa SB, Ahmad Abd Marzook AA, Hameed EK, and Jasem NH. Efficacy of Chlorzoxazone versus Orphenadrine in the management of pain associated with cervical spondylosis. Rawal Medical Journal. 2018; 43(3): 488-490.
[19] Gordon SJ, Grimmer-Somers KA, Trott PH. A randomized, comparative trial: does pillow type alter cervico-thoracic spinal posture when side lying? J Multidiscip Healthc. 2011;4:321-7.
[20] Bernateck M, Karst M, Merkesdal S, Fischer MJ, Gutenbrunner C. Sustained effects of comprehensive inpatient rehabilitative treatment and sleeping neck support in patients with chronic cervicobrachialgia: a prospective and randomized clinical trial. Int J Rehabil Res. 2008 Dec;31(4):342-6.
[21] Persson L.Neck pain and pillows – A blinded study of the effect of pillows on non-specific neck pain, headache and sleep, Advances in Physiotherapy.2006. 8:3, 122-127,
[22] Sabeen F, Bashir MS, Hussain SI, and Sabeen SE . Prevalance of neck pain in computer users. Annals of King Edward Medical University 19.2 (2013): 137-137.
[23] Smith L, Louw Q, Crous L, Grimmer-Somers K. Prevalence of neck pain and headaches: impact of computer use and other associative factors. Cephalalgia. 2009 Feb;29(2):250-7.
[24] Black KM, McClure P, Polansky M. The influence of different sitting positions on cervical and lumbar posture. Spine (Phila Pa 1976). 1996 Jan 1;21(1):65-70.
[25] Kang JH, Park RY, Lee SJ, Kim JY, Yoon SR, Jung KI. The effect of the forward head posture on postural balance in long time computer based worker. Ann Rehabil Med. 2012 Feb;36(1):98-104.
[26] Bertozzi L, Negrini S, Agosto D, Costi S, Guccione AA, Lucarelli P, Villafañe JH, Pillastrini P. Posture and time spent using a smartphone are not correlated with neck pain and disability in young adults: A cross-sectional study. J Bodyw Mov Ther. 2021 Apr;26:220-226..
[27] Fassa AG, Spada Fiori N, Dalke Meucci R, Müller Xavier Faria N, Peres de Carvalho M. Dolor cervical entre agricultores que producen tabaco en el sur de Brasil [Neck pain among tobacco farm workers in Southern Brazil]. Salud Colect. 2020 Jul 23;16:e2307. Spanish.
[28] Bragatto MM, Bevilaqua-Grossi D, Benatto MT, Lodovichi SS, Pinheiro CF, Carvalho GF, Dach F, Fernández-de-Las-Peñas C, Florencio LL. Is the presence of neck pain associated with more severe clinical presentation in patients with migraine? A cross-sectional study. Cephalalgia. 2019 Oct;39(12):1500-1508.

To cite this article: Al-Edanni M, Ghanim M, Abdul Kareem A, Ibrahim , Naji A. Cervical Pain Related to Position of the Neck during E-Learning. Al-Kindy College Medical Journal. 2022;18(2):127-131.