The Relationship of Neck pain and Smart Phones Usage among students: A Cross-Sectional Study in Erbil City

Alaa Usama Ahmed* ShwanQadir Media**

Abstract:

Background and objectives: Innovative technology devices, such as smartphones and tablets can do numerous activities that users need daily. Mishandling of this technology has an impact on utilizers health. The aim of this study was to find the prevalence of neck pain induced by smart phones usage among students of medical faculty in Erbil city

Methods: A cross-sectional study on 400 students from Hawler Medical University was conducted from 1st July 2021 till 1st July 2022.The investigator designed a self-administered questionnaire, distributed it to the students. Investigator inquired about participants sociodemographic characteristics, purpose and hours of using phones, hand dominance, how to enter data, frequent position while using the phone.Whether other devices are applied for study, neck pain and its severity ,pain relief medications and the usual exercise routine of the respondents.

Results: More than two third of the studied sample (63.5%) had neck pain, and (36.5%) were free from pain during smartphone use in last 12 months. The mean severity of pain was higher in females than in males (4.54 ±1.53 vs 3.28 ± 1.31) and the difference was statistically significant (p=0.003). Overusing phones for more than 4hours per day was 78%, and only 22% underused the smartphone (less than and equal to four hours).

Conclusion: Prevalence of neck pain related to phone use among medical faculty students in Erbil city was high. Most of them were overusing smartphones

Keywords: Medical students, Neck pain, Smartphone addiction

Introduction

Innovative technology devices, such as tablets and smartphones do many activities that users need daily. Those are employed for multiple purposes, like Internet access, software applications, social communication, digital cameras, as learning and entertainment appliances. Smartphones give users access to the internet just like computers through online communications (Snapchat, Instagram, Twitter), these applications can be used anytime and anywhere, resulting in dependence on them.

* M.B.Ch.B ,KBMSs trainee. Rizgari Teaching Hospital, Erbil.   Email :alaausama977@gmail.com. Corresponding auhtor
**M.B.Ch.B, Assist. Prof. Rheumatolgy/Hawler Medical university. MU. Program director of KHCMs Rheumatology, Rizgari Teaching Hospital. Email: mediashwan@hotmail.com

Overuse of these devices will harm users' health, causing an addiction.[1] Studies revealed that using smart phones for more than four hours is considered as an overuse.[2] Students who were at risk of addiction will have health issues including cognitive, emotional, musculoskeletal and psychological problems.[3] Neck, shoulders and lower back pain are caused by smartphone overuse.[4]Headache also is considered one of the common health effects of smart phone use, followed by lack of concentration, depletion of academic performance of students.[5]The addiction level in young adults is much higher than in older adults.[6] Despite that a positive relationship was revealed between social networking and smart phone use.[7] Neck pain is a multifactorial condition and is the most common musculoskeletal disorder with a tremendous economic burden. It is reported as the fourth leading cause of disability, with a prevalence of 30%. It resolves without treatment, but 50% of individuals will continue to experience repeated attaches.[8]Neck pain induced by phones is due to extended period in an undesirable position, there is a relationship between hours using the screens and progress to addiction (average use: ≤ 5 h, more than average: (6–10), ≥ 11 hours addiction).[9] Cellphones are currently very widely used among young adults; therefore, the effect could be very harmful to their wellness. Research has yet to be done in this part of the world, and new guidelines are required for using phones among young adults. The investigator finds it necessary to conduct this research to highlight the prevalence of neck pain induced by smartphone usage among students and its association with gender. And to find the relationship between neck pain and the pattern of smartphone usage, taking into consideration gender differences.

Patients and methods

A descriptive cross-sectional study was conducted among students of Hawler Medical University (Medicine, Pharmacy and Dentistry Faculty) from 1st July 2021 till 1st July 2022.The sample size was calculated by the Epi-info program version 7.2.5.0. the prevalence rate of neck pain used was 30%,[10] with a 95% confidence interval with a margin of error of 6% and a 10% non-response rate, the required sample size will be 300. However, the investigator collected 400 for convenience purposes. The investigator designed a self-administered questionnaire and distributed it to the students. The questionnaire consisted of three domains; first part included sociodemographic characteristics of the studied population: age, gender and faculty. Second part was questions about the starting age of using a mobile phone, hours of mobile use per day. Hours of using the cellphone (more than 4 hours are over users).[11]The investigator inquired about the purpose of using cell phones, hand dominance, how to enter data, the most frequently used position to use the phone, type of other devices used for study, the usual exercise behavior. Third part included questions about pain during last 12 months, location, duration, severity and frequency of pain per week, seeking medical help, taking medicine for pain or not. The severity of pain was measured by a visual analogue scale (VAS). The VAS consists of a 10cm line, with two endpoints representing 0 (no pain) and 10 (severe pain). All students had the right to be included in the study except those with a history of injury around the neck, a history of surgery, malignancy and rheumatic diseases. Students willing to be included in the study during the data collection period were involved. The data were entered into an excel sheet. The statistical package of social science version 26 was used for data analysis (SPSS Inc., Chicago, IL, USA). The frequency

distribution was used for sociodemographic variables. The chi-square test was used to find an association between categorical variables, the t-test, and Mann-Whitney U for comparing mean severity scores. A p-value ≤ 0.05 was considered significant. This study was submitted to the Ethics and Scientific Committees of the Kurdistan Higher Council of Medical Specialties for scientific and ethical approval (Number 9). The purpose of the study was explained to each student, informed verbal consent was obtained, and confidentiality was assured.
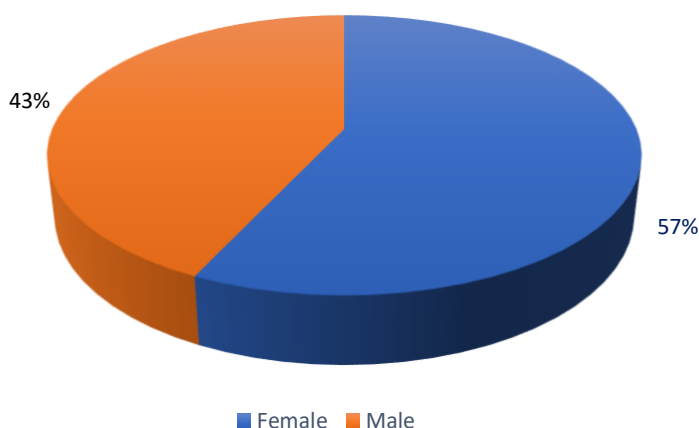
Results

Neck pain was present in (63.5%) of the studied sample, while (36.5%) of them were free from pain during smartphone use in the last 12 months. No significant difference between gender and the presence or absence of pain (Chi-square= 0.784, P value=0. 376).
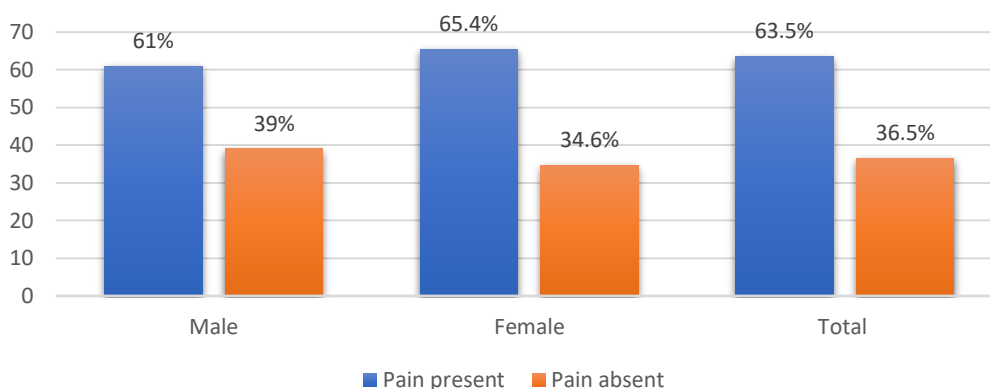
Figure (1): distribution of the studied sample by pain during smartphone use.

The enrolled population were (228/400) females which represent (57%) of the studied sample. and (172/400) were males (43%) of the sample.

Figure (2): Gender distribution of the studied sample

The difference in mean age between males and females (21.14±1.52) vs (20.74±1.68), the result was significant(P-value=0.004). The difference in age groups between males and females was statistically significant P-value=0.004,using Chi-square as the following;(17-19)years: (69.9%) vs (30.1%) ,females vs males ,(20-22)years:(52.5%) vs (47.5%).females vs males,(23-24)years:(50.6%) vs (49.4%),females vs males. The difference in college faculty between the two groups was significant, p value=0.003 using Chi -square.

Table (1): The Distribution of sociodemographic characteristics by gender.

Variables	Male	Females	Total	p value
	No (%) 172(43)	No (%) 228(57)	No (%) 400(100)	
Mean age ± SD	21.14 ±1.52	20.74±1.68	20.91±1.62	0.004**
Age groups				0.004*
17-19	34(30.1)	79(69.9)	113(28.2)	
20-22	94(47.5)	104(52.5)	198(49.5)	
23-24	44(49.4)	45(50.6)	89(22.3)	
College				0.003*
Medical	53(39.8)	80(60.2)	133(33.3)	
Dentistry	65(56)	51(44)	116(29)	
Pharmacy	54(35.8)	97(64.2)	151(37.8)	
Chi-square* t-test **				

The difference of mean pain severity between males and females was higher in females than in males (4.54 ±1.53 vs 3.28 ± 1.31), it was statistically significant (p=0.003).

Table (2): Distribution of the studied sample by mean pain severity scores and gender.

	Number No=400	Mean pain severity	Standard deviation	Standard error	p value	95% confidence interval
Male	172(43)	3.28	1.31	0.121	0.003	(0.62-0. 80)
Female	228(57)	4.54	1.53	0.128		(0.61-0.89)
Mann-Whitney U test						

The most common device used by females was smartphone (60.8%), while PC was the most common device used by males (67.9%). The p value = 0.047, it was significant.
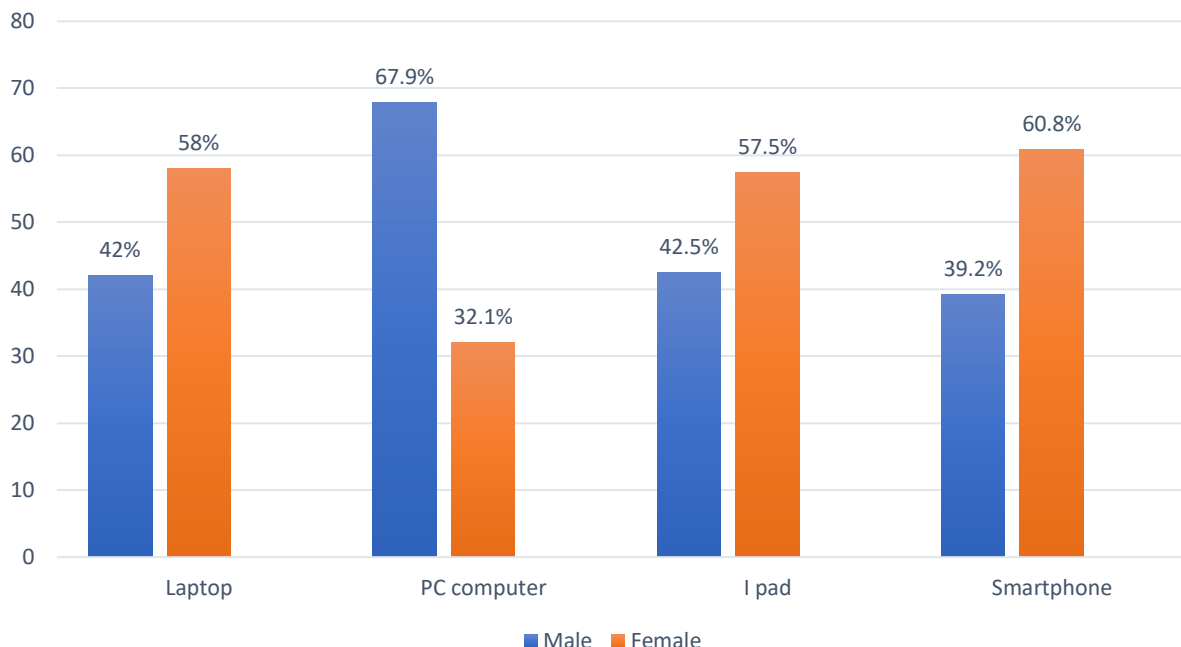
Figure (3): Type of device used by students.

The difference in mean age between pain present (20.86±1.60) and pain absent group (21±1.67) was not statistically significant (P-value=0.406) using t-test. The difference in gender between the two groups, pain present and pain absent was not statistically significant (p value=0.217) using t-test. The pain was present among those who used mobile between 3-4 hours in more than two third (64.6%). More than half (57.9%) experienced pain after using a mobile for 5-6 hours. More than 6 hours usage cause pain in 71.8%. The difference between the two groups was significant (p=0.021).

Table (3): Distribution of the studied sample by presence or absence of pain in the last 12 months

| Variables	Pain present 254(63.5)	Pain absent 146(36.5)	Total N=400	p value
	No (%)	No (%)	No (%)	
Age mean± Sd	20.86 ± 1.60	21 ±1.67	20 91 ± 1.62	0.406**
Gender				
Male	105(61)	67 (39)	172(43)	0.217*
Female	149(65.4)	79(34.6)	228(57)	
Time spent on the device				
1-2hours	10(43.5)	13(56.5)	23(5.75)	0.021*
3-4	42(64.6)	23(35.4)	65(16.25)	
5-6	92(57.9)	67(42.1)	159(39.75)	
More than 6	110(71.89)	43(28.10)	153(38.25)	
Chi-square *	t test**			

More than half (55.5%) used mobile in a sitting position, males vs females (35.6% vs 64.4%), and the result was significant p=0.002.

Table (4): The difference in position by gender

	Male	Female	Total	Chi-square test p value
	No (%)	No (%)	No (%)	
	172	228	400	
Position				
Sitting and head down	79(35.6)	143(64.4)	222(55.5)	0.002
Sitting on desk	19(50)	19(50)	38(9.5)	
Walking	8(42.1)	11(57.9)	19(4.75)	
Standing	4(28.6)	10(71.4)	14(3.5)	
Supine	62(57.9)	45(42.1)	107(26.75)	

Males complained of pain in the right hand in two third of cases, and only one-third of females had pain in the exact location (62.5% vs 37.5%). Right shoulder pain was more dominant among females (68.3%). The Chi-square test was 7.081, the P value = 0.089 and the differences were insignificant.
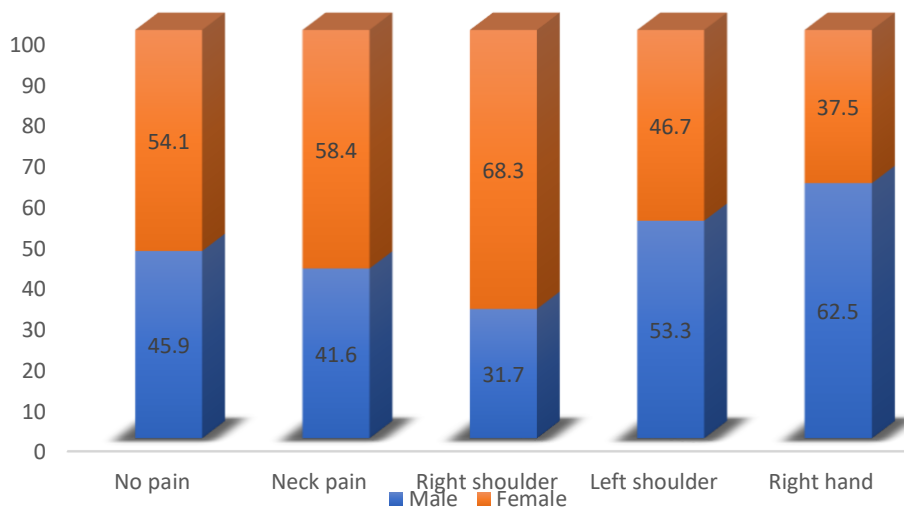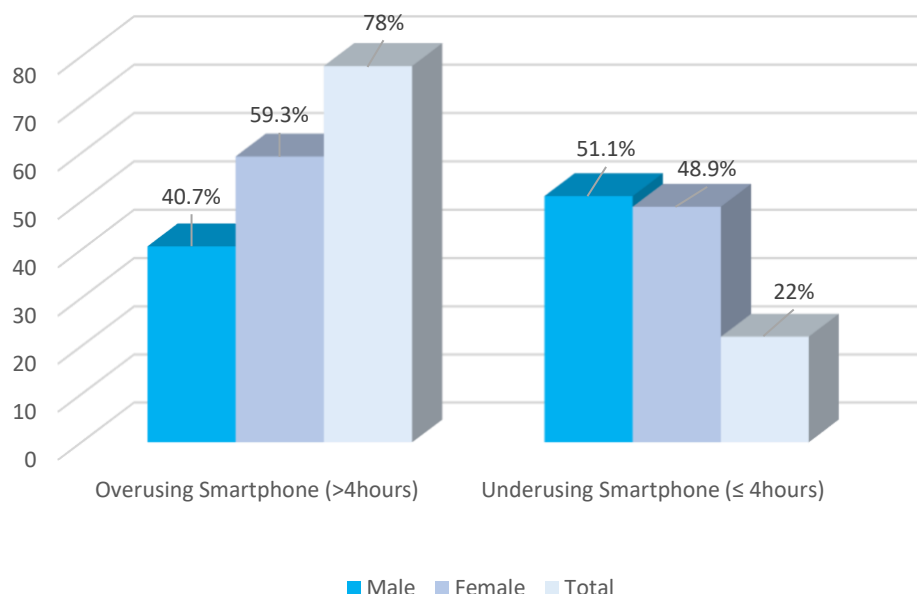

Figure (4): The site of max. pain with gender

Overusing the phone for more than 4hours was reported by 78%, and only 22% underused the smartphone (less than and equal to four hours). Females overused the

Smartphone more than males, and the difference was statistically significant (Chi-square = 3.047, p value = 0.032).

Figure (5): Overusing and underusing of the smartphone by students.

Discussion:

This study was the first to be conducted in this region to address smartphones overuse and neck pain. Neck pain was the most prevalent musculoskeletal complaint associated with mobile use among medical faculty students enrolled in current study (63.5%), an exact figure was reported by Rashid MD (64.5%) .[12] While Salameh MA. found that the prevalence of text neck syndrome in medical students was 65%.[13] A higher prevalence (71.7%) registered by Güneş S. survey.[14] That can be explained by various patterns of universities dependency on internet to contact students via emails and social groups for educational purposes, therefore students use smartphones widely every day to connect Internet more than laptops or computer for convenience

purposes. The trend of overuse and addiction to this technology was revealed by many studies, the systematic review and meta-analysis conducted by Meng and his colleagues concluded a global prevalence estimated rate of 26.99% for smartphone addiction.[15] A higher results (53.6%) of addictions in medical students were mentioned by Eldesokey S.[16] Over users in current study were 78%, exceeding the global figure. An extended period of using smart phones could lead to a high likelihood of musculoskeletal disorders and increased risk of addiction among users. Alsiwed KT. mentioned that 58% of medical students used the phone for more than 5 hours which is considered as an overusing.[17] Rashid MK. reported that 84% of respondents were using mobiles for more than 4hours/day,[12] a near figure was found by current study: 78% of

students used phones for more than 4 hours/day, with a statistically significant difference (p=0.021) between those who had neck pain (64.7%) and those who were free from pain (36. 3%). A risk of addiction to screens among students can be predicted by prolonged hours of usage, in a survey done by Bavli, he found that 36.3% of medical students are using smartphones for 4-6hours/per day, and 19.6% used it for 9 hours were addicted.[18] Our data found that users of mobile for more than 9 hours/day were 2.8% only. Spearman's correlation was done for smartphone addiction scores with other factors of interest (r=0.646, p< 0.001) showed a highly significant and positive correlation.[19] A weak positive correlation (r =0.141, p=0.005) was revealed between the gender and pain severity scores in the current study. Buabbas registered that 63.9% of his sample data developed neck and shoulder pain, they also used their mobiles for more than 4 hours/day (p< 0.001). On average, most students who used mobile for more than 4 hours per day were high users.[11] 47% of students with neck pain in study of Daniyal M. were among the high cell phones user group.[20] These variations in the prevalence rate of overuse and addiction in various studies could be explained by different design studies, different cultures and the use of different scales to define overuse and addiction. Out of 400 students recruited in this study, 57% were females, 43% were males, mean age was 20.91±1.62. which was statistically significant (p=0.004) between the two groups; males vs females (21.14 ±1.52 vs 20.74±1.68), respectively. This study showed a distribution concerning pain location; neck (47.5%), shoulders (18.8%), hands (6%) with a frequency of using the right thump 23%. The negative health effects of devices resulted from mishandling of this technology.[5] Leaning the head towards the phones will create a forward flexion of neck, poor posture of shoulders, elbow, and a

repetitive thumb movement. This position is required for extended periods in front of screens, that may cause musculoskeletal pain. This finding was in line with Kim H-J, who recorded posture of use as: sitting 40%, lying on the back 34.9% and standing 10.6%.[21] This study revealed similar postures but with higher or lower rates; sitting (55.5%), lying on the back (26.8%), and standing (3.5%). And showed right-handedness while entering data in 85.5%, which was consistent with others.[21,22] The poor working environment made the development of musculoskeletal pain more likely. The current study has limitations, the results of the present study cannot be generalized to the rest of other universities because it was confined to one university only from the public sector. The cross-sectional design of this study could not find a cause-effect relationship.

Conclusion:

The prevalence of neck pain related to phone use among students in Erbil city was high, with significant gender variation in mean pain severity. Most students were overusing smartphones. The right hand and sitting position were preferable. Students were at risk of addiction, a phenomenon that has a negative impact on quality of life. Further studies are recommended with a larger population to explore the addictive nature of cellphone use that influences students' health and academic performance.

Conflict of interest:

The authors recorded no conflict of interest.

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