Original Article **Open Access**

Association of Text Neck Pain with prolonged Studying and Excessive Smart Phone Usage Among Medical Students

Shamaila Hassnain, M. Nouman Latif, M. Hassan Arshad, M Aneeque Adil, Noor Shahid

ABSTRACT:

Objective: Globally, neck pain is the most frequent pain, rating fourth among the disabilities. Text neck pain is an emergent epidemiological problem, especially among young adults. This study aims to check the frequency of text neck syndrome in both prolonged studying and excessive smartphone usage amongst the young undergraduates of medical college.

Study Design and Setting: A cross-sectional study was conducted among at Central Medical College, Lahore.

Methodology: The data was collected using a self-designed questionnaire.118 medical students were included in the study. The designed questionnaire gathered information on age, gender, academic year, any health issue, the experience of pain or discomfort, hours for use of any electronic device, and book reading. The reliability was 62% using Cronbach's alpha. Data were analyzed using SPSS 26.

Results: The mean age of the study participants was 22.35 +1.85 years. About 93.2% of the medical students reported discomfort or pain in the neck, shoulder, or back. About 74.6% of the female medical students and 54.5% of male students suffered from headaches with neck pain. The most used device was mobile among 94.1% of students. Experience of pain and discomfort was significantly associated with the number of hours consumed in using the device.

Conclusion: The frequency of text neck pain is found to be 93.2%, which is very high among the young population and smartphones are found to be the highest risk factor; use of laptop being the second most common. Female students comparatively suffer more from frequent pain and discomfort.

Keywords: Medical students, Musculoskeletal pains, posture, smart devices, text neck, .

How to cite this Article:
Hassnain S, M. Nouman Latif, M. Hassan Arshad, M Aneeque Adil, Noor Shahid. Association of Text Neck Pain with prolonged Studying and Excessive Smart Phone Usage Among Medical Students. J Bahria Uni Med Dental Coll. 2023;13(1):29-33 DOI: https://doi.org/10.51985/ JBUMDC202263

INTRODUCTION:

Text neck syndrome refers to repetitive stress to the neck triggered by having the head in a forward position for an extended period. Globally, neck pain is the most frequent pain, rating fourth among the disabilities.[1] It is the commonest musculoskeletal condition that limits the daily activity performance. Musculoskeletal pain is common children and adults.[2] Text neck pain is an emergent epidemiological problem, especially among young adults. This pain is caused by persistent usage of cell phones, tablets, or other devices mostly in frequent and longtime users.[3] Bending the shoulder, neck, and head while using cell phones or other portable devices, distorting the neck position while watching television, studying or sitting progressively increases stress on cervical spine.[2] Furthermore, a forward head posture may increase the mechanical load on joints and ligaments of the cervical spine and may boost the demand on the posterior neck musculature by the increased gravitational moment.[4] The increased use of mobile phones especially among the young age group has posed harmful effects with the growing prevalence of neck pain.[5] Mobiles are mostly used devices among adults, and text messaging is the most popular form of communication.[6] According to Pakistan Telecommunication Authority, cell phone users have reached 150 million in Pakistan.[7] Bad postures, over-use of modern technological tools, spine in neutral position, and excessive neck flexion for several hours were the habits that are difficult to avoid and hence becoming the major contributing factor for neck pain.[2]

Shamaila Hassnain
Assistant Professor, Department of Community Medicine
Central Park Medical College, Lahore
Email: sash_04@yahoo.com

M. Nouman Latif
4th Year MBBS Students, Department of Community Medicine
Central Park Medical College, Lahore
Email: nouman.latif99@gmail.com

M. Hassan Arshad
4th Year MBBS Students, Department of Community Medicine
Central Park Medical College, Lahore
Email: hassanarshad384@gmail.com

M. Aneeque Adil
4th Year MBBS Students, Department of Community Medicine
Central Park Medical College, Lahore
Email: aneeque222@gmail.com

Noor Shahid
Statistician, Department of Community Medicine
Central Park Medical College, Lahore
Email: noorshahid.aug@gmail.com

Received: 20-Apr-2022
Accepted: 14-Dec-2022

The term "Text Neck" is derived from the onset of spinal degeneration resulting from the repeated action of forward head flexion while looking down at the screen of mobile devices and "texting" for a long period.[8] The weight put on the spine dramatically increases when flexing the head forward at varying degrees. The weight of head increases intensely when it is forward flexed and the weight and effect progressively increased by changing the degrees.[2] A full-grown head weighs 4.54 to 5.44 kg in the neutral position. As the head tilts forward, the forces seen by the neck surges to 12.25 kg at 15°, 18.14 kg at 30°, 22.23 kg at 45°, and 27.22 kg at 60°.[9] The effects of forwarding flexion of the neck transcend pain, contribute to more associated complications. Most people display a forward head posture when viewing a mobile phone screen.[9] But still, the association between neck posture and neck pain is unclear. Forward flexion of neck can change the cervical spine, bony segments, curvature, posture change, supporting ligaments, and neck and associated areas pain. Frequency of head bending along with the degree of neck flexion induces additive effects on the human neck physiology.[2]

Increased usage of cell phones in the modern era for notes and communication adds to this problem.[3] It is suggested that when someone drops their head and rounds their shoulders while looking at a smartphone or a tablet, it is harder for them to take a full breath because of the restriction to their muscles.[10] Musculoskeletal pain follows the pattern of recurring exacerbations and remissions on the long-term and so the previous episodes can be a better predictor of new episodes. It may be important to observe the musculoskeletal conditions earlier in life to understand its main aspect and risk factors of the onset of illness and its symptoms.[2] This study aims to check the frequency of text neck syndrome among medical students due to prolonged studying and excessive smartphone usage among MBBS students of medical college. The frequency of other associated medical illness was also investigated.

METHODOLOGY:

This cross-sectional study was carried out in Central Park Medical College Lahore, Pakistan. The data were collected from 118 medical students using systematic random sampling in December 2021. The minimum sample size was calculated as 96 using 46.7% as the prevalence of neck pain, 5% as the level of significance and 90% as the power of the test.[11] The calculated sample size was quite small, however, it was good representative of the population. A list of all five-year MBBS students was generated. After a random start, every 5th student was included in the sample. Those students who were not interested to participate were excluded and next in the list was included.

This study was reviewed and approved by the Institutional Review Board (IRB) of Central Park Medical College. (CPMC/IRB-No/1307) Written consent was obtained before data collection to ensure the voluntary participation of each participant. Study participants were informed about the purpose of the study. Researchers were assured about the confidentiality of the data.

The data was collected using a self-designed questionnaire. The designed questionnaire gathered information on age, gender, academic year, any health issue, the experience of pain or discomfort, hours for use of any electronic device, and book reading. The reliability was 62% using Cronbach's alpha.

The prevalence of discomfort or neck pain, headache, and general pain in the shoulder were observed. The most common symptom regarding text neck pain were seen. The prevalence of various other health issues such as diabetes, hypertension, psychiatric issues, muscular or joint pain, anemia, iron and calcium deficiency, migraine, vitamin D deficiency and asthma were also observed. Test of association was performed to obtain the association of pain with the number of hours of device use and hours for book reading. Association was also tested between gender and pain experience. Binary logistic regression was applied to observe the intensity of pain for each increasing hour of book reading and device use. Data was analyzed using SPSS 26.

RESULTS:

In total, 118 medical students participated in this study. The mean age of the participants was 22.35 ± 1.85 years. The ratio of male to female students was 0.87. The total percentage of female participants was 53.5%. Approximately 93.2% of the medical students reported discomfort or pain in the neck, shoulder, or back. Among those, 55% were female participants. About 74.6% of the female medical students suffered from headaches with neck pain whereas the percentage was 54.5% for male students. The prevalence of general pain in the shoulder and back was seen as highest among other symptoms (Figure 1).

Female students comparatively suffer more from frequent pain and discomfort. Approximately 94.1% of the students use mobile phones relatively more as compared to other devices. Students who used desktop systems suffer more frequently from neck pain. About 01 (0.1%) of the patients used desktop system and suffered from pain.

Besides neck pain and discomfort, most of the students mentioned other health issues. Anemia is the most common followed by psychiatric issues, muscular or joint pain, and calcium deficiency (Fig. 1). Psychiatric issues include bipolar or depressive disorders, anxiety, schizophrenia spectrum, obsessive-compulsive behavior, trauma or stress, sleep-wake disorder, eating disorder and breathing related sleep disorders.

Chi-square test of association was used to observe the significant relation of neck pain with various factors such as gender, used device, hours spend each day using the device, and book reading. A p-value of 5% was used as significant. Experience of pain and discomfort was significantly associated with the number of hours consumed

in using the device and reading the book (Table 1).

Binary logistic regression was applied by taking the factors as independent variables and experience of pain being the dependent variable. Hosmer and Lemeshow showed a significant p-value for regression analysis. The overall percentage of correctly classified was 93.2%. The reference category was 1-2 hours for device use and for book reading. The odds were high for neck pain with more time spent using the device. Time spends in using the device was observed as significantly related to neck pain or discomfort (Table 2).

Most of the students who were engaged in book reading, read books in sitting position. Whereas the mid-chest level is the most popular position of using any device followed by leaning forward and laying down. The least common position for book reading was reading at eye level (Fig. 2)

Figure 1: Prevalence of Various Symptoms and other Health Issues

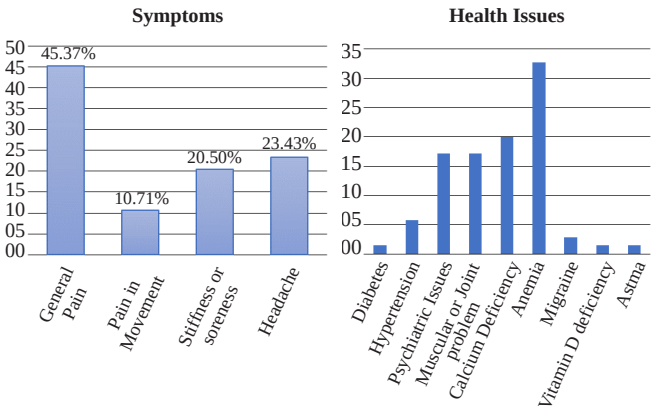


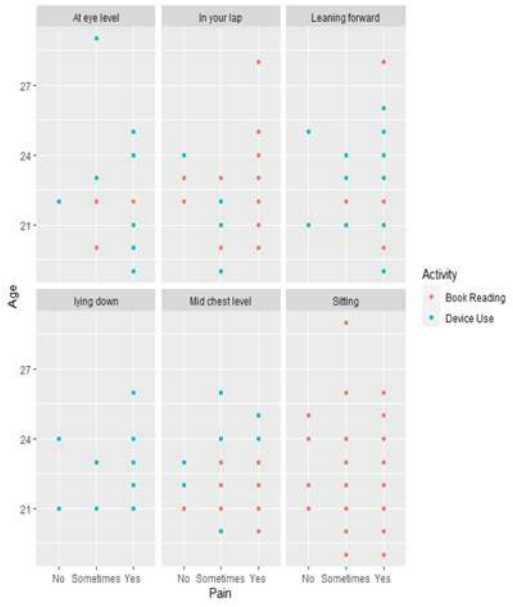
Table 1: Crosstab of Experience of neck pain with risk various factors

Factor	Categories	Experience Pain		Total	Chi-square (p-value)
		No	Yes		
Gender	Male	05	50	55	0.871 (0.470)
	Female	03	60	63	
Device	Mobile Phone	08	103	111	0.541 (0.910)
	Laptop	0	04	04	
	Tablet	0	02	02	
	PC	0	01	01	
Hours for device use	1-2 hours	04	11	15	14.981 (0.005)
	3-4 hours	01	28	29	
	5-6 hours	01	40	41	
	7-8 hours	0	22	22	
	9-10 hours	02	09	11	
Hours for book reading	No reading	0	10	10	26.238 (0.000)
	1-2 hours	02	26	28	
	2-3 hours	01	42	43	
	3-4 hours	01	28	29	
	5 or more hours	04	04	08	
Total		08	110	118	

Table 2: Binary Logistic Regression for Experience of Pain

Factors	B	p-value	OR	95% C.I
Device Time	1.761	0.030	5.818	1.191-28.426
Book Reading Time	-0.564	0.517	0.569	0.103-3.140

Figure 2: Prevalence of pain across various postures while book reading & device use



DISCUSSION:

In our study, 93.2% of participants experienced pain in the neck, shoulder, or back. Among them 45.3% had general pain, 23.4% reported headache, 20.5% with stiffness or soreness and 10.7% had pain on movement. This percentage was quite high in our population. This might be due to the fact that students mostly ignore initial symptoms of pain in neck and keep on going with the same routine. Another reason may be the lengthy curriculum in medical sciences. Similar findings regarding pain in the neck were found in a study conducted in India of (46.9%), whereas a contrast among findings of stiffness or soreness (42.5%) and pain on movement (29.2%) was seen in the same study.[12] The prevalence of neck and shoulder pain ranged from 15% to 28% among European adolescents.[13] In another study, the prevalence of neck pain in Chinese teenagers was 42.1%.[14] Female students suffered more frequently with neck pain. Another study based on observing musculoskeletal pain among adolescents reported the similar findings that musculoskeletal pain and headache was more prevalent among girls as compared to boys.[3] However, the pain symptoms were different among different age-group and gender and other demographic factors.[3]

Mobile phones (94.1%) were the most frequently used device used by the CPMC medical students with neck pain followed by 3.4% tablets, 1.7% laptops, and 0.8% desktops. These results are in contrast to research conducted in another medical college in Lahore stated that 48.5% preferred

smartphones.[15] Whereas another research identified 95% of the medical students with neck pain who preferred to use tablets as their main device.[16] Another study with the similar findings reported that all 100% participants had flawed flexion of their back and neck while studying and/or using smartphones and tablets.[11] A study also reported that there is strong association between text messaging and neck pain.[17]

The study results showed that 34.7% of students who had neck pain use devices for 5-6 hours daily. Whereas 26.3% had 3-4 hour use of device who developed neck pain.[18] Similar results are seen in an international study where longer than 2 hours duration increases the risk of neck and shoulder pain along with headache, blurred vision, dryness, and eyestrain.[15] Headache with neck pain was the main complaint in 65.3% of students in our study, among which 4.2% had a headache all the time and 61.1% had slight to severe headache along with neck pain. A study conducted in India showed that 89.83% of mobile phone users reported headaches with neck and shoulder pain.[19]

About 42.3% do stretching exercises for neck pain while 39.9% tried to improve their posture during the use of devices, 12.7% reduced their screen time, and 5.1% reduced study time in our study. These results are similar to a study conducted in India in which the majority of the participants do the postural correction by following stretching exercises daily to prevent the severity of text neck syndrome.[20] A study reported that there is no association between neck pain and neck posture. Also there was insignificant association between neck posture and frequency f neck pain.[21] Besides neck pain and discomfort, most of the students mentioned other health issues as well. Anemia is the most common (30%) followed by calcium deficiency (20%), muscular or joint pain (16%), and psychiatric issues (16%).

Our research has some limitations, one of them being a low student response rate. The paucity of sample size also prevents us to project observed trends upon students of all institutions. Since medical students of only one institute were included in this study, we cannot eliminate institutional bias. This sets the ground for further research work to be done to overcome these limitations.

CONCLUSION:

The frequency of text neck pain is found to be 93.2% which is very high among the young population and smartphones were found to be the highest risk factor for this text neck pain. Female students comparatively suffer more from frequent pain and discomfort. Experience of pain and discomfort was significantly associated with the number of hours consumed in using the device and reading a book.

Authors Contribution:
Shamaila Hassnain: Conceived the main concept, design, drafting revision
M. Nouman Latif: Discussion writing
M. Hassan Arshad: Contributed in initial drafting
M Aneeque Adil: Collected the data and assisted in analysis
Noor Shahid: Statistical analysis, interpretation of results

REFERENCE:

1. Hoy D, March L, Woolf A, Blyth F, Brooks P, Smith E, Vos T, Barendregt J, Blore J, Murray C, Burstein R. The global burden of neck pain: estimates from the global burden of disease 2010 study. Annals of the rheumatic diseases. 2014; 73(7):1309-15.
2. David D, Giannini C, Chiarelli F, Mohn A. Text neck syndrome in children and adolescents. International journal of environmental research and public health. 2021;18(4):1565. DOI: 10.3390/ijerph18041565
3. Melhorn JM, Goff WJ. "Text neck pain" and Hand held devices. DOI: 10.15761/MRI.1000166
4. Cuéllar JM, Lanman TH. " Text neck": an epidemic of the modern era of cell phones?. The spine journal: official journal of the North American Spine Society. 2017;17(6):901-2. DOI: 10.1016/j.spinee.2017.03.009.
5. Toh SH, Coenen P, Howie EK, Straker LM. The associations of mobile touch screen device use with musculoskeletal symptoms and exposures: A systematic review. PloS one. 2017;12(8):e0181220. DOI: 10.1371/journal.pone.0181220
6. Haroon H, Mehmood S, Imtiaz F, Ali SA, Sarfraz M. Musculoskeletal pain and its associated risk factors among medical students of a public sector University in Karachi, Pakistan. JPMA. The Journal of the Pakistan Medical Association. 2018;68(4):682-8.
7. Home | PTA. (2021) https://www.pta.gov.pk/en. Accessed 17 Nov 2021
8. Ariëns GA, Bongers PM, Douwes M, Miedema MC, Hoogendoorn WE, van der Wal G, Bouter LM, van Mechelen W. Are neck flexion, neck rotation, and sitting at work risk factors for neck pain? Results of a prospective cohort study. Occupational and environmental medicine. 2001;58(3):200-7. DOI: 10.1136/oem.58.3.200
9. Lawanont W, Mongkolnam P, Nukoolkit C. Smartphone posture monitoring system to prevent unhealthy neck postures. In2015 12th International Joint Conference on Computer Science and Software Engineering (JCSSE) 2015 Jul 22 (pp. 331-336). IEEE.
10. Fares J, Fares MY, Fares Y. Musculoskeletal neck pain in children and adolescents: risk factors and complications. Surgical neurology international. 2017;8. DOI: 10.4103/sni.sni_445_16
11. Shah PP, Sheth MS. Correlation of smartphone use addiction with text neck syndrome and SMS thumb in physiotherapy students. Int J Community Med Public Health. 2018;5(6):2512.
12. Adamson G, Murphy S, Shevlin M, Buckle P, Stubbs D. Profiling schoolchildren in pain and associated demographic and behavioural factors: a latent class approach. Pain. 2007; 129(3):295-303. DOI: 10.1016/j.pain.2006.10.015

13. Shan, Zhi MD*,†; Deng, Guoying MD*; Li, Jipeng MD*; Li, Yangyang MD*; Zhang, Yongxing MD*; Zhao, Qinghua MD* How Schooling and Lifestyle Factors Effect Neck and Shoulder Pain? A Cross-sectional Survey of Adolescents in China, Spine: February 15, 2014 - Volume 39 - Issue 4 - p E276-E283 doi: 10.1097/BRS.0000000000000124
14. Ahmed S, Akter R, Pokhrel N, Samuel AJ. Prevalence of text neck syndrome and SMS thumb among smartphone users in college-going students: a cross-sectional survey study. Journal of Public Health. 2021; 29(2):411-6.
15. Mahmood T, Afzal W, Ahmad U, Arif MA, Ahmad A. Comparative effectiveness of routine physical therapy with and without instrument assisted soft tissue mobilization in patients with neck pain due to upper crossed syndrome. Journal of the Pakistan Medical Association. 20216;71(10):2304-8. DOI: 10.47391/JPMA.03-415
16. Gustafsson E, Thomée S, Grimby-Ekman A, Hagberg M. Texting on mobile phones and musculoskeletal disorders in young adults: a five-year cohort study. Applied ergonomics. 2017;58:208-14. DOI: 10.1016/j.apergo.2016.06.012
17. Pinto A, Rekha S, Evangelin J. A Study to assess the effectiveness of Structured teaching programme on knowledge regarding Text Neck Syndrome among young adults. Asian Journal of Nursing Education and Research. 2021;11(3):311-6. DOI: 10.52711/2349-2996.2021.00075
18. Vahedi Z, Mazloumi A, Sharifnezhad A, Kazemi Z, Garosi E. Head forward flexion, lateral bending and viewing distance in smartphone users: A comparison between sitting and standing postures. Work. 2020;67(4):837-46. DOI: 10.3233/WOR-203303
19. Ayhualem S, Alamer A, Dabi SD, Bogale KG, Abebe AB, Chala MB. Burden of neck pain and associated factors among smart phone user students in University of Gondar, Ethiopia. Plos one. 2021;16(9):e0256794. DOI: 10.1371/journal. pone. 0256794
20. Damasceno GM, Ferreira AS, Nogueira LA, Reis FJ, Andrade IC, Meziat-Filho N. Text neck and neck pain in 18–21-year-old young adults. European Spine Journal. 2018; 27(6):1249-54. DOI: 10.1007/s00586-017-5444-5
21. Sarraf F, Varmazyar S. Comparing the effect of the posture of using smartphones on head and neck angles among college students. Ergonomics. 2022 Feb 24(just-accepted):1-3.