



Original Article

## The Text Neck Epidemic: Unveiling the Hidden Burden of Neck Pain among Medical Students

Yasir Shahzad<sup>1</sup>, Fraz Mehmood<sup>2</sup>, Soban Sarwar<sup>3</sup>, Kashif Ramooz<sup>1</sup>, Nadeem Akhtar<sup>3</sup>, Arslan Akram<sup>4</sup>  
Eesha Yaqoob<sup>5</sup>, Saad Javed<sup>6</sup>

<sup>1</sup>Department of Neurosurgery, Rawal Institute of Health Sciences, Islamabad

<sup>2</sup>Department of Neurosurgery, Holy Family Hospital, Rawalpindi Medical University, Rawalpindi

<sup>3</sup>Department of Neurosurgery, District Headquarter Hospital, Rawalpindi Medical University, Rawalpindi

<sup>4</sup>Qasim medical complex, Malakwal

<sup>5</sup>Department of Public Health, Health Services Academy, Ministry of National Health Services Regulations and Coordination, Government of Pakistan, Islamabad

<sup>6</sup>Department of Neurosurgery, Holy Family Hospital, Rawalpindi Medical University, Rawalpindi- Pakistan

### ABSTRACT

**Objective:** Text neck syndrome, caused by prolonged mobile device use, is increasingly common, especially among teenagers. Neck pain is a significant public health issue, affecting 40% of the population. Little research has focused on musculoskeletal pain in children and adolescents, including medical students. A cross-sectional study is needed to investigate text neck syndrome among medical students and provide effective prevention and treatment strategies.

**Materials & Methods:** This cross-sectional study (n=508) utilized an online self-designed questionnaire incorporating the Neck Disability Index and the Nordic Musculoskeletal questionnaire. Descriptive and inferential statistics, including chi-square tests and p-value calculations using SPSS version 25, were employed. The study aimed to examine neck pain prevalence and consequences to inform interventions for improved health outcomes.

**Results:** Among the 508 participants, 69.4% reported past neck pain. Females, those with higher stress levels, individuals using laptops/tablets for four or more hours, and medical students studying for 4 to 6 hours daily had higher neck pain prevalence (52.0%, 88.2%, 61.9%, and 57.5% respectively). Prevalence remained consistent between pre-clinical and clinical-year medical students. Multivariate analysis revealed a significant association between neck pain and longer mobile phone use, extended study hours, and lack of exercise. Only 16% sought treatment from a chiropractor/physiotherapist for their neck pain.

**Conclusion:** The study emphasizes the importance of better education on neck pain prevention and seeking professional help. Adding exercise to daily routines can also be extremely helpful in preventing neck pain. To fully understand the effect on medical students and develop effective interventions, more research is necessary.

**Keywords:** Text Neck Syndrome, Neck Pain, Medical Students, Pain, Disability, Quality of Life.

**Corresponding Author:** Saad Javed  
Department of Neurosurgery, Holy Family Hospital  
Rawalpindi Medical University, Rawalpindi, Pakistan  
WFNS GNC Secretariat Team Member  
Email: saadjaved10095@gmail.com

Date of Submission: 06-06-2023  
Date of Revision: 07-09-2023  
Date of Acceptance: 09-09-2023  
Date of Online Publishing: 30-09-2023  
Date of Print: 30-09-2023

**DOI:** 10.36552/pjns.v27i3.898

## INTRODUCTION

Text neck syndrome, a condition that has only recently started to become more common, is primarily caused by repeated stress on the neck and spine from prolonged forward head flexion while using mobile devices.<sup>1,2</sup> Teenagers who use their smartphones and computers for extended periods while slouched over are more likely to have the condition.<sup>3</sup> According to reports, approximately 75% of people around the world suffer from this condition as a result of prolonged use of handheld devices.<sup>4</sup>

Neck pain is a significant public health issue because it can be brought on by a variety of neck structures, including the intervertebral discs, ligaments, muscles, facet joints, dura, and nerve roots.<sup>5</sup> "Musculoskeletal neck pain" is the most common type of neck pain, but it can also be caused by tumors, infections, inflammatory diseases, and congenital disorders.<sup>6</sup> Neck pain is common, affecting up to 40% of the general population.<sup>7</sup> The World Health Organization (WHO)<sup>8</sup> ranks neck pain and musculoskeletal disorders as the fourth and tenth most common causes of years spent disabled, respectively. Furthermore, neck pain is the eighth most common cause of disability among those aged 15 to 19,<sup>9</sup> surpassing other adolescent health issues such as asthma, alcohol and drug use, and automobile accidents.

There has been little research done on

musculoskeletal pain in children and adolescents, even though it has been extensively studied in adults.<sup>10-14</sup> However, recent data indicate that persistent pain during adolescence and childhood increases the risk of chronic pain in adulthood.<sup>15,16</sup> A previous episode is also the best predictor of a new one because many musculoskeletal conditions have a pattern of long-term exacerbations and remissions.<sup>17</sup> Since musculoskeletal conditions in children and adolescents are on the rise, it is critical to investigate the condition early in life to comprehend the onset of risk factors and offer effective treatment.<sup>18</sup> A thorough understanding of the condition may also aid in primary disease prevention.

Medical students are more likely to experience neck pain (NP) than the general population due to extensive reading, writing, clinical work, and the widespread use of computers and tablets.<sup>19,20</sup> In a Malaysian study, it was discovered that 41.8% of students had NP the year before, a high prevalence that is in line with earlier studies. A relationship between NP and computer use, clinical experience, and traumatic experience was discovered by the study team.<sup>21</sup>

Considering the rising prevalence of text neck syndrome among the general population and the higher susceptibility of medical students due to their extensive computer use, a cross-sectional study is crucial for understanding its impact on this specific group and providing effective preventive measures and treatments.

The current study aimed to determine the prevalence of neck pain and disability among medical students aged 18-35 years. This study also assessed the association between neck pain and demographic factors such as gender, occupation, and physical activity levels.

## MATERIALS & METHODS

### Study Design & Setting

A Cross-sectional research study was conducted

at the Department of Neurosurgery, District Headquarters Hospital, Rawalpindi Medical University. The sample population was the medical students of Rawalpindi Medical University.

### **Ethical Statement**

The study was approved by the Departmental Review Board. Participant consent was taken for the data collection.

### **Sampling**

The current study has a sample size of 508 participants. The sample was gathered over two months, from July 1 to September 1, 2022, using a convenient sampling technique. To ensure the validity of the results and to provide a representative snapshot of the study population, this sample size and time frame were chosen.

### **Tool**

An online self-designed questionnaire that was adapted from the Nordic Musculoskeletal questionnaire and the Neck Disability Index was used to collect the data.

### **Inclusion Criteria**

Participants aged 18-35 years medical students have access to the internet and, the ability to understand and respond to the questionnaire.

### **Exclusion Criteria**

Participants with pre-existing neck injuries, musculoskeletal disorders, or unable to complete the questionnaire accurately.

Data on the participants' symptoms, functional restrictions, and perceived health status were gathered from them using an online self-designed questionnaire. This strategy was chosen because it can quickly reach a large number of participants and is convenient and

effective for gathering data online. The survey was made to be user-friendly and simple to finish, with questions that were brief and to the point and a variety of response options. Participants' age, gender, occupation, levels of physical activity, history of neck pain, and level of disability were all requested information.

### **Data Analysis**

Data analysis was done using SPSS version 25 (Statistical Package for the Social Sciences). Descriptive statistics were used to summarize the sample's demographics, and inferential statistics were used to look into the connections between the important variables. Chi-square tests were used to analyze the data, and p-values were computed. The relationships between categorical variables like neck pain, gender, self-perceived stress levels, length of study time, and length of mobile device use were investigated using these statistical techniques. Tables and figures were used to present the data analysis results, and the results were then interpreted in light of the study's goals and pertinent literature. Overall, the study aimed to inform the development of efficient interventions and strategies to enhance the health and well-being of those affected by this condition and to provide insightful information about the prevalence and impact of neck pain and disability in the study population.

## **RESULTS**

The goal of the current study was to look into the prevalence of neck pain (NP) among medical students as well as potential risk factors. A cross-sectional design was used with a sample size of 508 people. The information was gathered over two months, from July 1st, 2022 to September 1st, 2022, using an online self-designed questionnaire that was adapted from the Nordic Musculoskeletal questionnaire and the neck disability index. The data were analyzed using SPSS version 25 software.

## Demographics

The study's findings showed that 69.4% of the participants had previously encountered NP. Students who were female (52.0%), under more stress (88.2%), spent four or more hours on laptops or tablets (61.9%), and medical students who studied for four to six hours per day had a higher risk of developing NP (50.6% and 57.5%, respectively, for pre-clinical and clinical years). Multivariate analysis revealed that prolonged use of mobile phones, long study sessions, and a lack of exercise were all significantly associated with NP. It is noteworthy that only 16% of the patients sought treatment for their NP from a physiotherapist or chiropractor. The importance of better education and increasing awareness among medical students of the benefits of seeking professional treatment for NP is highlighted by this finding.

Table 1 shows the correlation between neck pain and various demographic factors, including gender, age, self-perceived stress, length of study time, and time spent using a mobile device. A total of 508 participants were included in the study, of whom 352 reported neck pain (neck pain present), and 157 reported no neck pain (neck pain absent).

## Gender

According to the findings, female students (106 out of 187 participants) had a higher prevalence of neck pain than male students (246 out of 365 participants). This relationship's p-value ( $p=0.040$ ) was found to be significant. The results showed that age did not significantly affect neck pain.

## Age

According to research, participants aged under 20, between 20 and 25, and over 25 all mentioned experiencing neck pain on average. This relationship's p-value was found to be insignificant ( $p=0.270$ ).

## Self-Perceived Stress

The results reveal that self-perceived stress had a significant effect on neck pain. Participants who reported high levels of stress (148 out of 295 participants) had a higher prevalence of neck pain compared to participants who reported low levels of stress (87 out of 165 participants). This relationship's p-value ( $p=0.041$ ) was found to be significant.

## Duration of Studying

The findings indicate that neck pain was

**Table 1:** Factors Related to Neck Pain: Gender, Age, Self-perceived Stress, Duration of Studying, and Duration of Mobile Use.

Factors related to neck pain		Neck Pain Present N=352	Neck Pain Absent N=157	P value
Gender	Male	246	76	0.040*
	Female	106	81	
Age	Less than 20	98	71	0.270
	20 to 25	130	54	
	More than 25	124	32	
Self-perceived stress	Low	87	78	0.041*
	Medium	117	45	
	High	148	34	
Duration of studying	Less than 4 hours	132	116	0.037*
	4 to 6 hours	220	41	
Duration of mobile use	4 to 6 hours	220	41	0.021*
	Less than 4 hours	95	111	

significantly affected by the length of the study. In comparison to participants who reported studying for less than 4 hours (132 out of 258), participants who reported studying for 4 to 6 hours (220 out of 342 participants) had a higher prevalence of neck pain. This relationship's p-value ( $p=0.037$ ) was found to be significant.

### Duration of Mobile Use

The findings show that neck pain was significantly affected by the amount of time spent using a mobile device. In comparison to participants who reported using a mobile phone for less than 4 hours (95 out of 255 participants), participants who reported using a mobile phone for 4 or more hours (257 out of 453 participants) had a higher prevalence of neck pain. This relationship's p-value ( $p=0.021$ ) was found to be significant.

**Table 2:** Neck Disability Index.

Neck Disability Index	
Less than 20%	10%
20-40%	46%
40-60 %	43%
More than 60%	1%
Total	100%

### Disability According to the Neck Disability Index

The effect of neck pain on the functional abilities of the sample of 508 medical students was evaluated using the Neck Disability Index (NDI). The findings indicated that the majority of participants (96%) had some level of neck pain-related disability. Concerning the participants, 46% had a score between 20 and 40%, which indicated mild disability, and 10% had a score between 0 and 20%, which indicated minimal disability. A significant proportion of participants (43%) had a score between 40 and 60%, indicating moderate disability. Only 1% of the participants scored higher than 60%, indicating severe disability.

These findings suggest that neck pain has a significant impact on medical students' functional abilities, with the majority experiencing at least some level of disability. The high prevalence of moderate disability highlights the need for interventions and strategies to reduce the impact of neck pain on medical students' functional abilities. Furthermore, the low prevalence of severe disability suggests that early intervention and management of neck pain may prevent it from worsening.

### DISCUSSION

Text neck syndrome is a growing concern in our digital age, particularly among adolescents who use smartphones and computers for extended periods while hunched over. The most common type of neck pain is musculoskeletal neck pain, which is a significant public health issue. According to the findings of our study, 69.4% of participants had previously experienced neck pain, with a higher prevalence observed among female students, those with higher levels of stress, and those who used laptops or tablets for four or more hours. Longer mobile phone use, longer study hours, and a lack of exercise were found to be significantly associated with neck pain in a multivariate analysis. Furthermore, the study discovered that only 16% of individuals sought professional treatment for neck pain from a chiropractor or physiotherapist, indicating a need for increased awareness and education among medical students about seeking professional treatment for neck pain.

The study's goal was to learn more about the prevalence and risk factors for neck pain (NP) in medical students. The study's findings were gathered using an online self-designed survey adapted from the Nordic Musculoskeletal questionnaire and the neck disability index. Over two months, data from 508 participants was collected using a lottery system. The study found that 69.4% of participants had previously

experienced NP, which is consistent with previous research from Pakistan,<sup>22</sup> Australia<sup>23</sup> and Central Saudi Arabia<sup>24</sup> However, the prevalence of NP in this study is higher than in previous studies conducted in Brazil,<sup>25</sup> China,<sup>26</sup> United States,<sup>27</sup> Iran,<sup>28</sup> Malaysia<sup>29</sup> and Nigeria.<sup>30</sup> These findings imply that NP is a widespread health concern among medical students.

Students who used laptops or tablets for four or more hours or who were stressed, as well as those who studied medicine for four to six hours a day, were more likely to have NP. This outcome was consistent with research from Thailand & Pakistan. However, multivariate analysis revealed that increased mobile phone use, increased study hours, and lack of exercise were all significantly associated with NP. The findings highlighted the need for increased awareness and education among medical students about the benefits of seeking professional treatment for NP.

The study's findings also revealed the factors associated with NP in medical students. Gender, self-perceived stress, duration of study, and duration of mobile use were found to be significant factors associated with NP in the study. Female students had a higher prevalence of NP than male students. Participants with high levels of stress had a higher prevalence of NP than participants with low levels of stress. Participants who reported studying for 4 to 6 hours had a higher prevalence of NP than those who reported studying for less than 4 hours. Finally, participants who used their phones for four hours or more had a higher prevalence of NP than those who used them for less than four hours. The findings emphasize the significance of addressing these factors to reduce the prevalence of NP in medical students.

The study has several strengths, including a large sample size and data collection via an online self-designed questionnaire, which allowed for efficient data collection and a higher response rate. The study does, however, have some limitations, such as the use of a cross-sectional

design, which limits the ability to establish a causal relationship between the variables of interest. Furthermore, the study relied on self-reported data, which is susceptible to recall bias and social desirability bias.

## CONCLUSION

As the study emphasizes the high prevalence of NP among medical students, it is critical to address the associated risk factors to reduce the prevalence of NP. The study's findings can be used to guide the development of successful interventions and strategies to improve the health and well-being of NP-affected medical students. Gender, self-perceived stress, amount of studying, and time spent on a mobile device are all significant contributors to neck pain. More research is needed to understand the underlying mechanisms of these relationships and to develop effective interventions to protect those at risk of neck pain.

## RECOMMENDATIONS

- Medical students should be made more aware of text neck syndrome, its pathophysiology, and preventive measures.
- Screen time should be reduced, and small breaks every 20 minutes should be taken while using a mobile phone.
- To reduce strain on neck muscles, keep mobile phones in a higher position aligned with the eyes.
- Neck strengthening posture exercises should be done regularly.

## LIMITATIONS

Limitations: The results of the study might not apply to populations other than the sample of 508 participants. Data accuracy may be impacted by self-reporting bias and reliance on online data collection. A short period for data collection.

## REFERENCES

1. Fares J., Fares M.Y., Fares Y. Musculoskeletal neck pain in children and adolescents: Risk factors and complications. *Surg. Neurol. Int.* 2017;87:2. Doi: 10.4103/sni.sni\_445\_16.
2. TEXT NECK®: A Global Epidemic. The Text Neck Institute. [(accessed on 29 August 2016)] Available online: <http://text-neck.com/>
3. Chronic Conditions Team Text Neck: Is Smartphone Use Causing Your Neck Pain? [(accessed on 1 September 2016)]; *Health essentials*. 2015 Available online: <https://health.clevelandclinic.org/2015/03/text-neck-is-smartphone-use-causing-your-neck-pain/>
4. Hestbaek L, Leboeuf-Yde C., Kyvik K.O. The course of low back pain from adolescence to adulthood: Eight-year follow-up of 9600 twins. *Spine (Phila Pa 1976)* 2006;31:468–472.
5. Bogduk N. Neck pain: An update. *Aust. Fam. Physician.* 1988;17:75.
6. Bogduk N. Neck pain. *Aust. Fam. Physician.* 1984;13:26–30.
7. Ariens G.A.M., Borghouts J.A.J. *Epidemiol Pain.* IASP Press; Seattle, DC, USA.: Neck pain; 1999:pp.235–236.
8. Vos T., Barber R.M., Bell B., Bertozzi-Villa A., Biryukov S., Bollinger I., Charlson F., Davis A., Degenhardt L., Dicker D., et al. Global, regional and national incidence, prevalence and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: A systematic analysis for the Global Burden of Disease Study 2013. *Lancet.* 2015;386:743–800.
9. Institute for Health Metrics and Evaluation–IHME HealthData.org 2015. [(accessed on 1 September 2016)]; Available online: <http://vizhub.healthdata.org/gbd-compare/>
10. Cohen E., Uleryk E., Jasuja M. An absence of pediatric randomized controlled trials in general medical journals, 1985–2004. *J. Clin. Epidemiol.* 2007;60:118–123.
11. Fares Y., Fares J. *Neurosurgery in Lebanon: History, Development, and Future Challenges.* World Neurosurg. 2017 doi: 10.1016/j.wneu.2016.12.014. (Epub ahead of print)
12. McBeth J. Epidemiology of chronic musculoskeletal pain. *Best Pract. Res. Clin. Rheumatol.* 2007;21:403–425.
13. Michaleff Z.A., Kamper S.J., Maher C.G., Evans R., Broderick C., Henschke N. Low back pain in children and adolescents: A systematic review and meta-analysis evaluating the effectiveness of conservative interventions. *Eur. Spine J.* 2014;23:2046–2058.
14. Rodgers A. Managing chronic pain in children and adolescents. *BMJ.* 2002;324:1570–1576
15. Brattberg G. Do pain problems in young school children persist into early adulthood? A 13-year follow-up. *Eur. J. Pain.* 2004;8:187–199.
16. Jones G.T., Silman A.J., Power C. Are common symptoms in childhood associated with chronic widespread body pain in adulthood? Results from the 1958 British birth cohort study. *Arthritis Rheum.* 2007;56:1669–1675.
17. Taylor J.B., Goode A.P., George S.Z. Incidence and risk factors for first-time incident low back pain: A systematic review and meta-analysis. *Spine J.* 2014;14:2299–2319.
18. Kamper S.J., Henschke N., Hestbaek L., Dunn K.M., Williams C. Musculoskeletal pain in children and adolescents. *Braz J. Phys. Ther.* 2016;20:75–84.
19. Crawford RJ, Volken T, Schaffert R, Bucher T. Higher low back and neck pain in final year Swiss health professions' students: worrying susceptibilities identified in a multi-Centre comparison to the national population. *BMC Public Health*, 2018;18(1):1188.
20. Noack-Cooper KL, Sommerich CM, Mirka GA. College students and computers: assessment of usage patterns and musculoskeletal discomfort. *Work*, 2009;32(3):285–98.
21. Alshagga MA, Nimer AR, Yan LP, Ibrahim IAA, Al-Ghamdi SS, Al-Dubai SAR. Prevalence and factors associated with neck, shoulder and low back pains among medical students in a Malaysian medical college. *BMC Res Notes*, 2013;6(1):244.
22. Ayaz SB, Malik R, Khan AA, Gill ZA, Akhtar N, Matee S. Intensity of neck pain secondary to excessive flexion posturing, its association with study activities and duration of posturing and impact on sleep in students of women medical college, Abbottabad Editorial Advisory Board, 2016;Vol.66:p.22.
23. Smith DR, Leggat P. Prevalence and distribution of musculoskeletal pain among Australian medical students. *J Musculoskeletal Pain.* 2007;15(4):39–46

24. Gharib N, Hamid N. Prevalence of mechanical neck pain in Taif university female students: a survey study. *J Am Sci.* 2013;9(6)347–54.
25. Kanchanomai S, Janwantanakul P, Pensri P, Jiamjarasrangi W. Risk factors for the onset and persistence of neck pain in undergraduate students: 1-year prospective cohort study. *BMC Public Health*, 2011;11(1):566.
26. SMITH DR, Wei N, ISHITAKE T, R-S WANG. Musculoskeletal disorders among Chinese medical students. *Kurume Med J.* 2005;52(4):139–46.
27. Du JY, AA, S JE, Kiely PD, Nguyen JT, Lebl DR. Neck Pain and Low Back Pain in Medical Students: A Cross-Sectional Study, 2017:Vol.1.
28. Sadat BE, Babaei-Ghazani A, Azizi R, Parizad M. Prevalence and risk factors of neck and shoulder pain in medical students of Tabriz University of Medical Sciences. *Med J Tabriz Univ Med Sci Health Serv.* 2013;35(3):12–7.
29. Alshagga MA, Nimer AR, Yan LP, Ibrahim IAA, Al-Ghamdi SS, Al-Dubai SAR. Prevalence and factors associated with neck, shoulder and low back pains among medical students in a Malaysian medical college. *BMC Res Notes*, 2013;6(1):244.
30. Ayanniyi O, Mbada CE, Iroko OP. Neck Pain Occurrence and Characteristics in Nigerian University Undergraduates. *TAF Preventive Med Bull.* 2010;9(3):167–74.

### Additional Information

Disclosures: Authors report no conflict of interest.

Ethical Review Board Approval: The study was conformed to the ethical review board requirements.

Human Subjects: Consent was obtained by all patients/participants in this study.

Conflicts of Interest:

In compliance with the ICMJE uniform disclosure form, all authors declare the following:

Financial Relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.

Other Relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Financial Relationships: None

### AUTHORS CONTRIBUTIONS

Sr.#	Author's Full Name	Intellectual Contribution to Paper in Terms of:
1.	Yasir Shehzad & Saad Javed	1. Study design and methodology
2.	Fraz Mehmood & Soban Sarwar Gondal	2. Paper writing
3.	Kashif Ramooz & Arslan Akram	3. Data collection and calculations
4.	Eesha Yaqoob	4. Analysis of data and interpretation of results
5.	Saad Javed	5. Literature review and referencing
6.	Nadeem Akhtar	6. Editing and quality insurer