Original Article

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

Yasir Shahzad¹, Fraz Mehmood², Soban Sarwar³, Kashif Ramooz¹, Nadeem Akhtar³, Arslan Akram⁴ Eesha Yaqoob⁵, Saad Javed⁶

¹Department of Neurosurgery, Rawal Institute of Health Sciences, Islamabad
²Department of Neurosurgery, Holy Family Hospital, Rawalpindi Medical University, Rawalpindi
³Department of Neurosurgery, District Headquarter Hospital, Rawalpindi Medical University, Rawalpindi
⁴Qasim medical complex, Malakwal
⁵Department of Public Health, Health Services Academy, Ministry of National Health Services Regulations and Coordination, Government of Pakistan, Islamabad
⁶Department 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 prolonged 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.
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.\(^1,2\) Teenagers who use their smartphones and computers for extended periods while slouched over are more likely to have the condition.\(^3\) According to reports, approximately 75% of people around the world suffer from this condition as a result of prolonged use of handheld devices.\(^4\)

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.\(^5\) "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.\(^6\) Neck pain is common, affecting up to 40% of the general population.\(^7\) The World Health Organization (WHO)\(^8\) 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,\(^9\) 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.\(^10-14\) However, recent data indicate that persistent pain during adolescence and childhood increases the risk of chronic pain in adulthood.\(^15,16\) 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.\(^17\) 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.\(^18\) 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.\(^19,20\) 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.\(^21\)

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).

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

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

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
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>
<thead>
<tr>
<th>Table 2: Neck Disability Index.</th>
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<tbody>
<tr>
<td>Neck Disability Index</td>
</tr>
<tr>
<td>Less than 20%</td>
</tr>
<tr>
<td>20-40%</td>
</tr>
<tr>
<td>40-60 %</td>
</tr>
<tr>
<td>More than 60%</td>
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<tr>
<td>Total</td>
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</table>

**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 20 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, Australia and Central Saudi Arabia. However, the prevalence of NP in this study is higher than in previous studies conducted in Brazil, China, United States, Iran, Malaysia and Nigeria. 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 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 next 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

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Additional Information
Disclosures: Authors report no conflict of interest.
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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:
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Other Relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.
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AUTHORS CONTRIBUTIONS

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<tr>
<th>Sr.#</th>
<th>Author’s Full Name</th>
<th>Intellectual Contribution to Paper in Terms of:</th>
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<tr>
<td>1.</td>
<td>Yasir Shehzad &amp; Saad Javed</td>
<td>1. Study design and methodology</td>
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<td>2.</td>
<td>Fraz Mehmood &amp; Soban Sarwar Gondal</td>
<td>2. Paper writing</td>
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<td>4.</td>
<td>Eesha Yaqoob</td>
<td>4. Analysis of data and interpretation of results</td>
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<td>5.</td>
<td>Saad Javed</td>
<td>5. Literature review and referencing</td>
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