

# Adolescent Text Neck Syndrome: A review of awareness levels and Prevalence

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## ABSTRACT

This review explores the prevalence and awareness levels of Text Neck Syndrome (TNS) among adolescents in the context of increased smartphone usage. TNS, characterised by neck pain and postural misalignment from prolonged forward head posture, has emerged as a significant health concern among young people. The aim of this study is to assess the prevalence of TNS in adolescents and evaluate their awareness of the condition. The review examines studies from diverse geographical regions, including Pakistan, Iraq, India, and Thailand, highlighting the high prevalence of TNS linked to excessive screen time and poor ergonomic habits.

Despite the widespread occurrence of symptoms, awareness of preventive measures remains low. Educational interventions have shown promise in improving knowledge, but behaviour changes remain limited. This review concludes that raising awareness, promoting ergonomic practices, and incorporating digital health literacy into adolescent education are crucial to mitigating the long-term musculoskeletal consequences of TNS.

**Keywords:** Text Neck Syndrome, Adolescents, Smartphone Usage, Prevalence, Posture, Musculoskeletal Disorders, Awareness, Health Education, Digital Devices

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In the digital age, the use of handheld devices such as smartphones and tablets has become deeply integrated into the daily lives of adolescents. While these technologies offer numerous benefits in terms of connectivity, education, and entertainment, their overuse has given rise to health concerns, one of which is Text Neck Syndrome.

Characterised by neck pain and postural misalignment resulting from prolonged forward head posture, text neck syndrome has emerged as a prevalent issue among adolescents who spend significant time interacting with their devices.

Dr. Dean L. Fishman, a visionary chiropractor and pioneer in the field of musculoskeletal health, stands at the forefront of unveiling this modern malady. “Dr. Fishman originated the phrase 'Text Neck' to explain the repeated stress injury to the body caused by excessive texting and overuse of all handheld electronic devices.

The term, and the health condition, is derived from the onset of cervical spinal degeneration resulting from the repeated stress of frequent forward head flexion while looking down at the screens of mobile devices and 'texting' for long periods of time.”(Home, n.d.) Originating from his astute observations, Text Neck Syndrome has now transcended from a clinical curiosity to a pressing concern, especially

among adolescents. Dr. Dean L. Fishman's groundbreaking work in identifying and elucidating Text Neck Syndrome has redefined our understanding of the

consequences of prolonged devices.

“WHO Global Burden of Disease revealed neck pain

as 8<sup>th</sup> ranked disability for 15– 19 year olds which is higher than other well-known adolescent health problems.

Approximately adolescents spend a minimum of 5–7 h a day on smartphones with heads flexed forward to read and text.”(David et al., 2021). Adolescents, still in critical stages of physical development, are particularly at risk of developing postural issues related to device usage (David et al., 2021)

& (Fares et al., 2017). Despite this, many remain unaware of the potential

dangers associated with prolonged smartphone use and the risk of developing text neck syndrome. The lack of awareness about this emerging health issue means that many adolescents do not recognise the connection between their

device habits and the discomfort they experience,

nor are they aware of the

long-term consequences that can arise from untreated postural problems (Khan, 2017). This review aims to explore the current prevalence of text neck syndrome among adolescents, while critically assessing the levels of awareness about the condition. By examining existing research, this paper will shed light on whether adolescents are informed about the risks associated with excessive smartphone use and whether they understand how their device habits may contribute to the development of text neck syndrome. Raising awareness is key to promoting

healthier device habits and preventing future musculoskeletal problems in the younger population.

## Methods

**Search Strategy:**

A narrative review was conducted to evaluate the prevalence of Text Neck Syndrome among adolescents and their awareness of the condition. The review included relevant studies focusing on both prevalence data and awareness levels regarding the syndrome, particularly in the adolescent population. To identify these studies, we performed an extensive electronic search across several databases, including **PUBMED, MEDLINE, ResearchGate, Google Scholar**, up to **September 2024**.

We employed both **Medical Subject Headings (MeSH)** terms and free-text keywords, such as “Text Neck Syndrome,” “Adolescent Posture,” “Awareness of Text Neck,” “Smartphone Usage,” “Prevalence of Musculoskeletal Disorders,” “Digital Device Overuse,” “Neck Pain in Adolescents,” and “Postural Health in Youth.” Boolean operators like “**AND**,” “**OR**,” and “**NOT**” were used to refine the search results and ensure a comprehensive selection of studies. Manual searches were also performed, using reference lists of identified studies to capture any additional relevant articles.

**Study Selection:**

The review considered studies published in **English** up to **September 2024**. Eligible studies included those focusing on the **prevalence of text neck syndrome** in adolescents aged **10 to 19 years** and those examining **awareness levels** regarding the condition in this population. The review prioritised cross-sectional studies, cohort studies, randomised controlled trials (RCTs), and observational studies that included data on device usage, postural habits, and awareness of the risks associated with prolonged smartphone or tablet use.

The exclusion criteria included studies that focused on populations outside the adolescent age range or articles that examined the prevalence and awareness of other musculoskeletal disorders unrelated to text neck syndrome. Studies targeting only treatment modalities without data on awareness or prevalence were also excluded.

**Data Extraction:**

The titles and abstracts of all identified references were screened for relevance. Full texts of the selected articles were reviewed to assess their eligibility based on the inclusion criteria. Studies that met the criteria were thoroughly analysed to extract data on **prevalence rates, awareness levels**, and contributing factors such as **smartphone usage** and **screen time**. Hence, 11 papers fulfilling the eligibility criteria were found.

The final selection of these studies was reviewed and discussed, and relevant data were categorised based on themes related to **awareness levels** and **prevalence** in adolescents, emphasising geographic, demographic, and behavioural trends in the reported data.

Title  
Reviewed Papers

Title	Author	Year	Country	Sample N	Age	Tools Used	Study Design	Results
A Study to Assess the Effectiveness of Video Assisted Teaching Program on Knowledge regarding Prevention of Text Neck Syndrome among Adolescents at Selected School of SGRR Dehradun	Shivani Kirola, Rashmi Joshi	2024	India	80	15-18	self-structured knowledge questionnaire	Pre-experimental research design	In comparing the mean and standard deviation (SD) of pre- and post-test knowledge regarding Text Neck Syndrome among adolescents, it was observed that prior to the implementation of the video-assisted teaching program, the participants had an overall mean score of 10.00 with an SD of 3.43. After the teaching program, the mean score increased to 15.53 with an SD of 2.45. The calculated t-value was 14.37, indicating a statistically significant difference at the 0.05 level. This suggests that the video-assisted teaching program effectively enhanced the adolescents' knowledge of Text Neck Syndrome.

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Title	Author	Year	Country	Sample N	Age	Tools Used	Study Design	Results
A comparison between the lecture and self-study methods on female students' awareness and attitudes about text neck syndrome	Mahsa Soheili, Mahnaz Shakerian	2024	Iran	94	15-18	Self reported questionnaire	quasi-experimental study	The study revealed that the mean post-test awareness scores were 8.74 for the lecture group and 5.83 for the self-study group, showing a significant improvement in awareness for the lecture group. However, there was no significant change in attitude scores between the pre-test and post-test for either group.
Awareness about text neck syndrome amongst adolescents	Pranita Rathi	2023	India	302	13-17 years	prevalidated self-made questionnaire	observational cross-sectional study	A total of 86.4% of the participants reported using their smartphones for more than 1 hour daily. While 67.2% had heard of text neck syndrome (TNS), 32.8% were unaware of it. Only 47.7% of respondents were informed about all the possible causes, and just 20.5% knew that holding smartphones at eye level could help prevent TNS. Furthermore, only 11.6% of adolescents preferred using their fingers for texting. Of those who had heard of TNS, 58.3% were knowledgeable about preventive measures.

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Text neck syndrome among undergraduates students in Lahore, Pakistan	Syed Ali Zunair, Babar Butt, Farhan Fateh Jang	2023	Pakistan	266	16-23	Self structured questionnaire	Descriptive study	It was found that around 67% of students have been using smartphones for 3 to 6 hours daily over the past 3 to 7 years. Among 266 undergraduate students surveyed, 122 (46%) were male and 144 (54%) were female. A total of 157 students (59%) reported experiencing neck pain, with 88 (56.1%) describing it as mild, 55 (35%) as moderate, and 14 (8.9%) as severe. In terms of pain patterns, 97 students (61.8%) reported intermittent pain, 35 (22.3%) experienced continuous pain, and 25 (15.9%) reported debilitating pain. These findings suggest a higher prevalence of Text Neck Syndrome among young adults and teenagers who began using smartphones at an early age.

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Title	Author	Year	Country	Sample N	Age	Tools Used	Study Design	Results
Text Neck Syndrome and Associated Risk Factors: Prevalence in Medical Students	Ayesha Javed, Gul Andama	2023	Pakistan	300	17-20 years = 24.67% 21-25 years= 61% 26-30 years= 14.33%	Neck Disability Index (NDI) & Nomophobia Pain Questionnaire (NPQ)	Descriptive cross sectional study	Among the 300 participants, 4.333% exhibited mild nomophobia, 54% reported moderate nomophobia, and 41.67% experienced severe nomophobia. Based on the Neck Disability Index (NDI), 6.333% of subjects had no disability, 41.67% showed mild disability, 30% displayed moderate disability, 12.67% experienced severe disability, and 0.333% reported complete disability. A significant positive correlation was found between the NDI and the Nomophobia Questionnaire (NMP-Q), with a Pearson correlation coefficient of 0.88. The study highlights a high prevalence of Text Neck Syndrome among medical students, driven primarily by gadget addiction, despite their awareness and education on the issue.

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Title	Author	Year	Country	Sample N	Age	Tools Used	Study Design	Results
The Text Neck Epidemic: Unveiling the Hidden Burden of Neck Pain among Medical Students	Yasir Shehzad	2023	Pakistan	508	Less than 20= 169 20-25 years= 184 More than 25 years =156	self-designed questionnaire adapted from the Nordic Musculoskeletal questionnaire and the Neck Disability Index	Cross sectional research study	Results showed that 96% of participants experienced some level of neck pain-related disability. Specifically, 46% had mild disability, 10% had minimal disability, and 43% reported moderate disability. Severe disability was observed in only 1% of participants. Additionally, 69.4% reported past neck pain. Females, those with higher stress levels, extended gadget use, and longer study hours had a higher prevalence of neck pain. Multivariate analysis indicated significant associations between neck pain, prolonged mobile phone use, extended study hours, and lack of exercise.

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Title	Author	Year	Country	Sample N	Age	Tools Used	Study Design	Results
Effect of Ergonomic Levels on Text Neck Syndrome Among Students: A Correlational Study	Haidar Ahmad Raihan	2023	West Java	292	15-20	rapid upper limb assessment (RULA) neck disability index (NDI)	Observational study	Ordinal linear regression analysis reveals a significant correlation ( $p < 0.05$ ) between ergonomic levels and text neck syndrome. The pseudo-R-Square value of 13.1% indicates that ergonomic factors explain 13.1% of the variability in text neck syndrome. Additionally, the Wald value of 14.240 suggests an increased risk of text neck syndrome by 14.240 for each unit increase in ergonomic level. In conclusion, this study highlights the significant impact of ergonomics on the development of text neck syndrome, accounting for 13.1% of the observed variability.

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Title	Author	Year	Country	Sample N	Age	Tools Used	Study Design	Results
Prevalence of Text Neck Syndrome in Children and Adolescents Using Smartphones in Erbil City	Areen Nimat Aziz,	2022	Iraq	400	6-15 years	Copenhagen Neck Functional Disability Scale.	Cross sectional study	The prevalence of text neck pain was found to be 69.0% among children. The neck disability score averaged 17.15 out of 21 in this group. Adolescents (96.05%) who used smartphones for over 3 hours daily (83.56%) and those studying at the secondary level (94.24%) were more prone to developing text neck syndrome. Other contributing factors included reduced sleep, lower engagement in sports, increased use of computers, extended TV viewing, and gaming for more than 3 hours. Additionally, psychological, social, and physical functions also played a role in the likelihood of developing this condition.

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Title	Author	Year	Country	Sample N	Age	Tools Used	Study Design	Results
A study on prevalence of text neck syndrome among undergraduate students of a medical college in Puducherry	Nirupama Kamaraj	2022	India	354	Mean age = 19.91±0.244  maximum (71.5%) were aged less than 20	neck disability index (NDI)	Cross sectional study design	Among the participants, 295 (83.3%) had no disability, 50 (14.1%) exhibited mild disability, 6 (1.7%) had moderate disability, and 3 (0.8%) showed severe disability. The prevalence of Text Neck Syndrome was found to be 16.7%. A significant association was observed between gender, MBBS academic year, and the duration of electronic gadget use, with p-values of 0.030 and 0.001, respectively. Additionally, a significant statistical association was identified between the duration of electronic gadget usage and the occurrence of Text Neck Syndrome, with a p-value of 0.038.

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Title	Author	Year	Country	Sample N	Age	Tools Used	Study Design	Results
Effectiveness of Structured Teaching Programme on Knowledge Regarding Text Neck Syndrome among College Students in Villupuram District	Latha.P	2020	India	50	17-19 years = 31 20-22 years = 19	structured questionnaire (self reported)	Experimental study	The results indicate a significant improvement in knowledge following the structured teaching program. The pre-test mean score was 8.44 with a standard deviation of 2.6561, while the post-test mean score increased to 21.96 with a standard deviation of 2.551. The mean difference between pre- and post-test scores was 13.52, with a standard error of 1.254. A paired <i>t</i> -test yielded a <i>t</i> value of 13.126, which was highly significant at $p < 0.05$ , suggesting that the structured teaching program effectively enhanced students' knowledge of text neck syndrome.

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Title	Author	Year	Country	Sample N	Age	Tools Used	Study Design	Results
Text Neck Epidemic: a Growing Problem for Smart Phone Users in Thailand	Poonsri Vate-U-Lan	2016	Thailand	642	11-20= 45.33%  21-30= 27.73%  Over 30= 26.94%	Online self-administered survey	Cross sectional research study	Nearly two-thirds (62.3%) of participants reported experiencing neck and/or shoulder pain while using computers. Additionally, the study uncovered concerning behaviors contributing to health risks: 64.33% of respondents do not wear glasses to protect their eyes from blue light emitted by screens, and 30.84% of participants work on computers for prolonged periods without taking breaks. These findings emphasize the urgent need for awareness regarding proper device usage and preventive health measures to mitigate the rising incidence of Text Neck and related health issues in Thailand.

symptoms (Zunair et al., 2023). Similarly, among medical students in Pakistan, 96%

### Results

#### 1. Prevalence and Symptom Severity

- Across the studies, high prevalence rates of Text Neck Syndrome (TNS) symptoms were observed among adolescents and young adults. In Lahore, Pakistan, **59%** of undergraduates reported neck pain, with 35% experiencing moderate symptoms and 8.9% reporting severe

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of participants reported neck pain, with 46% experiencing mild disability and 43% moderate disability (Shahzad et al., 2023). In Erbil, Iraq, 69% of children and adolescents reported neck pain, with secondary-level students who used smartphones for over three hours daily being more prone to TNS (Aziz & Bakir, 2022). The high prevalence across various regions highlights the widespread impact of TNS among younger populations.

### 2. Impact of Smartphone Use Duration and Ergonomics

- Studies consistently identified extended smartphone use as a significant risk factor for TNS. In Pakistan, 67% of students reported using smartphones for 3-6 hours daily (Zunair et al., 2023), and similar patterns were observed in other studies, with smartphone use over three hours strongly correlating with neck pain in Erbil (Aziz & Bakir, 2022). In West Java, Indonesia, a significant correlation ( $p < 0.05$ ) was found between poor ergonomics and TNS, where ergonomics explained 13.1% of the variability in TNS symptoms (Raihan & Rahman, 2023).

### 3. Educational Interventions and Awareness Levels

- Educational programs were shown to be effective in improving awareness and knowledge about TNS. In India, a video-assisted teaching program significantly increased the knowledge scores of adolescents about TNS, with a mean increase from 10.00 to 15.53 ( $t$ -value = 14.37,  $p < 0.05$ ) (Rashmi, 2024). Similarly, a structured teaching program in Villupuram, India, increased knowledge scores from 8.44 to 21.96 ( $t$ -value = 13.126,  $p < 0.05$ ) (A.Anbarasu, 2020). These findings suggest that structured educational interventions can be highly effective in raising awareness and knowledge about TNS among adolescents and young adults.

### 4. Knowledge Gaps and Misconceptions

- Awareness of TNS and its preventive measures remains low. In a cross-sectional study in India, only 67.2% of adolescents had heard of TNS, and of those, only 58.3% were aware of preventive measures (Talwar et al., 2022). Furthermore, among Thai

participants, 62.3% reported neck pain but were unaware of preventive health measures, with many not practicing ergonomic habits like taking breaks (P. Vate-U-Lan, 2016). In Iran, while lectures were found to improve awareness more effectively than self-study, no significant change was noted in attitudes (Soheili et al., 2024), suggesting a gap between knowledge acquisition and behavioral change.

### 5. Association with Other Factors

- In Pakistan, a study found a significant correlation between neck disability and nomophobia, with 41.67% of participants reporting severe nomophobia (Javed et al., 2023). Psychological and lifestyle factors such as prolonged study hours, stress, lack of exercise, and social habits were also linked to TNS symptoms in studies across Pakistan and Thailand ((Shahzad et al., 2023) and (P. Vate-U-Lan, 2016).

## Discussion

### 1. Prevalence of TNS Among Adolescents and Young Adults

- The consistently high prevalence rates of TNS symptoms across multiple countries indicate that it is an emerging health concern among adolescents and young adults. The findings from studies in Pakistan, Iraq, and Thailand confirm that extended smartphone use—often exceeding three hours daily—is common in this demographic, making them particularly susceptible to TNS. The widespread use of smartphones, particularly among teenagers and young adults, aligns with global trends and suggests an urgent need for interventions.

### 2. Efficacy of Educational Interventions

- The positive outcomes from educational interventions, as demonstrated in studies conducted in India, emphasize the importance of awareness campaigns and educational programs. Teaching methods, such as video-assisted and structured programs, have proven effective in significantly increasing knowledge scores among students. However, while knowledge improved, the lack of change in attitudes observed in the Iranian study (Soheili et al., 2024)

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underscores the need for programs that not only inform but also inspire behavioral adjustments in daily device use habits.

### 3. Knowledge Gaps and Preventive Practices

- Despite widespread smartphone use, there is a notable lack of awareness regarding preventive measures, such as maintaining proper posture, reducing screen time, and taking frequent breaks. This gap is evident in studies from India and Thailand, where knowledge about TNS did not necessarily translate into preventive practices (Talwar et al., 2022 and P. Vate-U-Lan, 2016). The limited knowledge on ergonomic practices suggests that awareness initiatives should emphasize practical, actionable steps that adolescents can adopt easily, such as using phones at eye level or taking regular breaks.

### 4. Role of Ergonomics and Risk Factors

- Ergonomic practices significantly impact the development of TNS, as shown in West Java (Raihan & Rahman, 2023), where improper ergonomics were strongly associated with TNS symptoms. Additionally, lifestyle factors such as prolonged study hours, stress, and lack of physical activity were correlated with increased TNS severity, as observed in Pakistan and Thailand (Shahzad et al., 2023 and P. Vate-U-Lan, 2016)
- These findings highlight the need for ergonomic education and lifestyle adjustments that promote regular physical activity and stress management.

### Implications for Future Research and Interventions

Given the significant correlation between smartphone addiction and neck pain, interventions addressing digital health literacy and ergonomic practices are essential. Future research could explore strategies for more sustainable behaviour change and the development of smartphone usage guidelines tailored for adolescents. Cross-cultural studies and longitudinal research are also necessary to understand the long-term impacts of TNS and to validate intervention strategies in diverse settings.

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