

Prevalence of Text Neck Syndrome and Its Associated Risk Factor among College Students

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ABSTRACT

Background: Text neck syndrome is a modern condition arising from prolonged use of handheld digital devices, particularly in poor postural alignment. With increased screen time among college students, the risk of developing associated neck pain and postural deviations has become a growing concern.

Objective: To determine the prevalence of text neck syndrome and its associated risk factors among college students aged 18–24 years.

Methodology: A cross-sectional study was conducted on 400 students using both subjective and objective outcome measures. TNS symptoms assessed through questionnaire; The Neck Disability Index (NDI) and Nomophobia Questionnaire (NMP-Q) and associated factor such as pain disability were used to assess functional disability and smartphone dependency, respectively. Objective assessments included craniovertebral angle (CVA) and Sagittal tilt, measured through photographic postural analysis.

Results: The NDI results indicated 21% had no disability, 49% mild, 22% moderate, and 8% severe disability. NMP-Q scores revealed 26% mild, 59% moderate, and 15% severe nomophobia. The mean scores were 22.51 for NDI, 75.12 for NMP-Q, 26.18° for Sagittal tilt, and 55.44° for CVA. Although questionnaire data showed a significant prevalence of mild to moderate text neck symptoms, postural angles remained largely within normal ranges, indicating minimal structural change. The study shows the prevalence of 27.25% of participants present with TNS.

Conclusion: A prevalence of text neck-related symptoms exists among college students, primarily affecting the pain intensity and disability. However, major postural deviations have not yet been observed, highlighting the need for early preventive strategies to mitigate long-term musculoskeletal consequences.

Key words: Text neck syndrome, Neck Disability Index, Nomophobia, Craniovertebral angle, College Students, Postural analysis, Smartphone addiction.

INTRODUCTION:

Text Neck Syndrome (TNS) is an increasingly common postural disorder primarily caused by prolonged and improper use of electronic devices, especially smartphones. The condition is marked by forward head posture (FHP) and rounded shoulder posture (RSP), which result from sustained head flexion while using gadgets^[1]. Coined by Dr. Dean L. Fishman, TNS is associated with pain, discomfort, and long-term musculoskeletal issues if left untreated^[2]. It can lead to muscle strain, joint dysfunction, spinal degeneration, and chronic neck and upper back pain. The global spread of smartphones has significantly contributed to the rising prevalence of TNS^[3]. Around 83% of the global population—approximately 6.65 billion people—owned smartphones by 2022. Prevalence rates vary across regions, with 32% reported in India, 41% in Malaysia, and up to 68.1% among Saudi Arabian medical students. Countries like India, Pakistan, and Saudi Arabia show rates as high as 42.5%, 43.6%, and 71.2%, respectively. This high prevalence, especially among young adults, raises concerns about long-term health impacts^[4,5].

TNS and RSP are closely connected to muscular imbalances, including a shortened pectoralis minor and weakened middle trapezius. These imbalances contribute to scapular tilt, fatigue, and dysfunction^[6]. Prolonged FHP increases activity in the upper trapezius and suboccipital muscles, causing neck pain, headaches, and impaired cervical mobility^[2]. It also disrupts proprioception, affecting joint position sense and worsening posture. Biomechanical studies show that neck stress increases dramatically with flexion—reaching up to 60 pounds of force at a 60° angle^[7]. Smartphone activities such as video watching and typing lead to increased neck flexion, elevating biomechanical stress on cervical structures^[8]. Assessment tools such as the Neck Disability Index (NDI)^[9,10], Craniovertebral Angle (CVA)^[11,12], and Sagittal tilt help

evaluate TNS's physical effects. The Nomophobia Questionnaire (NMP-Q)^[13] assesses psychological dependence on smartphones.

Despite widespread smartphone use among college students, limited research explores the link between TNS, posture, and psychological factors like nomophobia. This study aims to address that gap by assessing the prevalence of TNS and its correlation with postural deviations and smartphone addiction among college students in Pondicherry, India, using validated assessment tools.

AIM OF THE STUDY:

The aim of this study is to determine the prevalence of Text Neck Syndrome among college students and identify associated risk factors such as poor posture, excessive smartphone use, and psychological dependency.

MATERIAL AND METHODS:

This cross-sectional study was conducted over a period of six months in an Educational Institute at Puducherry, which includes colleges of physiotherapy, paramedical sciences, and engineering. The study population comprised 400 college students between the ages of 18 and 24 years, including 136 male and 264 female participants. The aim was to assess the prevalence of Text Neck Syndrome (TNS) and its association with neck disability, nomophobia (smartphone dependency), and postural deviations. Data collection involved the use of several validated tools and procedures. Participants completed a TNS symptom screening questionnaire to initially identify symptomatic individuals. Functional neck disability was assessed using the Neck Disability Index (NDI)^[9,10], while smartphone dependency was measured through the Nomophobia Questionnaire (NMP-Q)^[13]. In addition to these subjective tools, objective postural assessments were carried out by analyzing the Craniovertebral Angle (CVA)^[11,12] and Sagittal Tilt using lateral photographs taken in a standardized position. Anthropometric measurements, including height, weight, and Body Mass Index (BMI), were also recorded for all participants. All subjects provided written informed consent before participation. The data collected were analyzed statistically to determine the prevalence of TNS among the student population and to explore associations between neck pain, postural changes, and smartphone dependency.

Inclusion criteria:

1. College students aged 18-24.
2. Prolonged use of mobile phone.
3. Willingness to participate and provide informed consent.

Exclusion criteria:

1. History of cervical spine injury or surgery.
2. History of Neurological disorder affecting neck function.
3. Ongoing treatment for neck pain.
4. Unwilling to participate or complete the protocol.
5. Subject with no objection on taking photos for assessing angle with the mobile application.

RESULT:

Table 1 shows the mean and SD for the demographic data for the group of 18-23 years of both male and female. Mean and SD of age (18.94 ± 1.14), Height (1.62 ± 0.10), Weight (57.61 ± 13.16) and BMI (22.07 ± 4.47).

Table 1: Mean and SD for the Demographical Data

	AGE (Years)	HEIGHT (m)	WEIGHT (kg)	BMI
MEAN	18.93	1.62	57.61	22.07
SD	1.14	0.10	13.16	4.47

Objective 1: To determine prevalence of Text Neck Syndrome (TNS).

Figure 1 illustrates that among 400 participants 143 participants are using electronic devices for less than 3 hrs and 257 participants are using devices for more than 3 hrs.

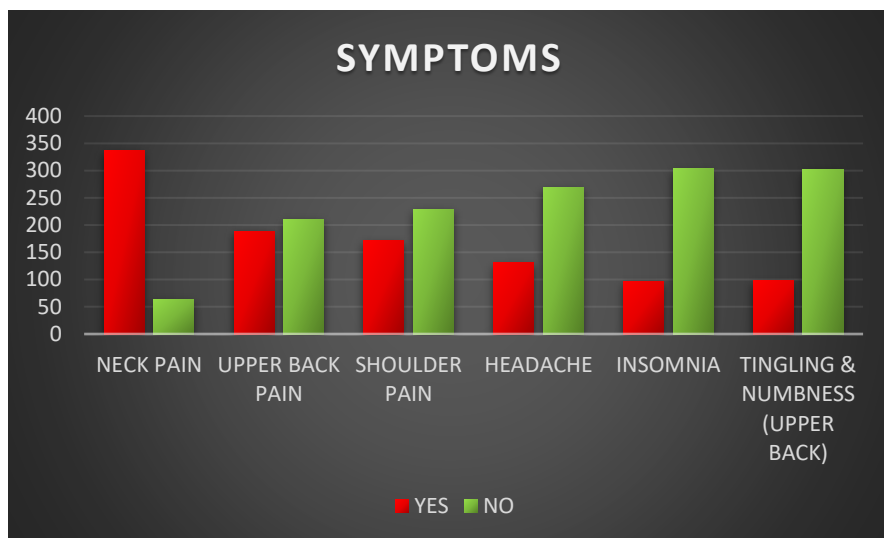
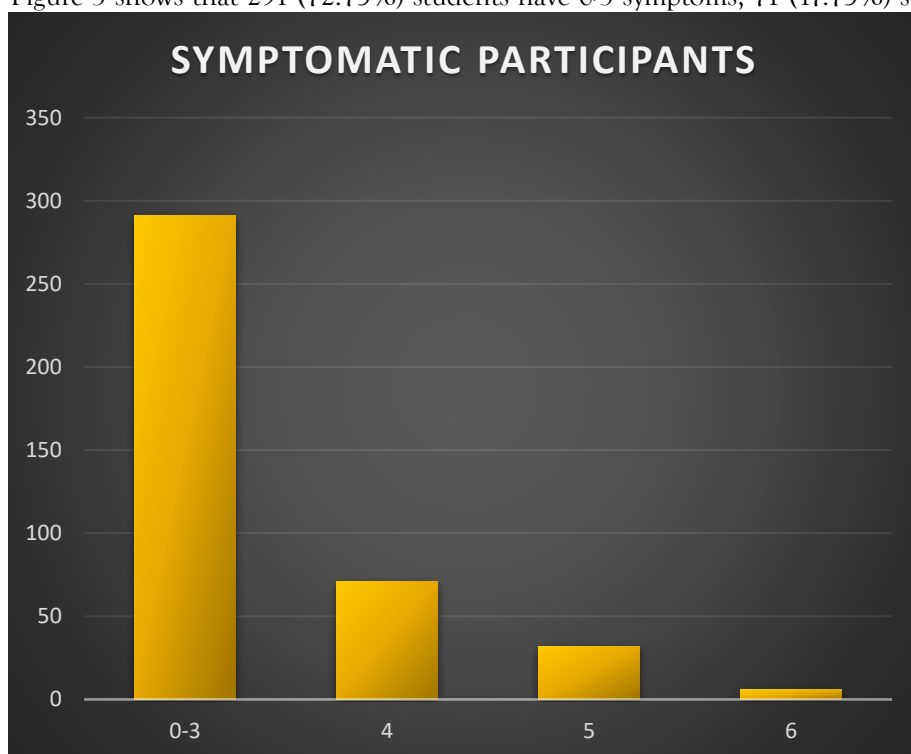


Figure 1: Frequency of screen time

In this study 336 students were suffering from neck pain, 189 students have upper back pain, 171 students have shoulder pain, 131 students have headache, 97 students have insomnia, 98 students have tingling and numbness over the upper limb due to prolong use of mobile phone given in figure 2.

Figure 2: Prevalence of TNS symptom wise.

Figure 3 shows that 291 (72.75%) students have 0-3 symptoms, 71 (17.75%) students have 4 symptoms,

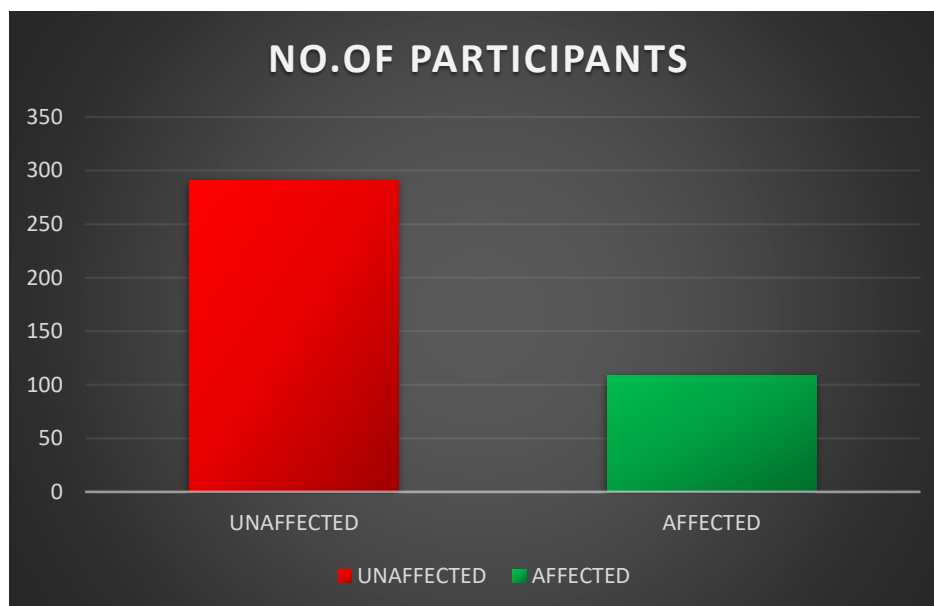


32 (8%) students have 5 symptoms, 6 (1.5%) students have 6 symptoms.

Figure 3: Prevalence of TNS symptomatic participants and percentage

Figure 4 shows that among 400 participants 291 (72.75%) were unaffected (who had TNS) and 109 (27.25%) were affected due to TNS

Figure 4: Prevalence of TNS



Objective 2: To assess the pain and disability.

NDI (%) Distribution for every participant and NDI (%) of affected 109 participants:

Statistical cross tabulation analysis showed that NDI with 21% of students have no disability, 49% of students have mild disability, 22% of students have moderate disability, 8% of students have severe disability and 0% of students have complete disability of text neck syndrome.

NDI with 21.1% of students have no disability, 45.8% of students have mild disability, 19.2% of students have moderate disability, 13.7% of students have severe disability and 0% of student have complete disability of text neck syndrome. This was depicted in table 2.

TABLE 2: NDI (%) Distribution for every participant and of affected 109 participants

S.NO	NDI SCORE	INTERPRETATION	n	N	PERCENTAGE
NDI (%) Distribution for every participant					
1.	0-4	No	84	400	21%
2.	5-14	Mild	196		49%
3.	15-24	Moderate	86		22%
4.	25-34	Severe	33		8%
5.	35-50	Complete	1		0%
NDI (%) of affected 109 participants					
1.	0-4	No	23	109	21.1%
2.	5-14	Mild	50		45.8%
3.	15-24	Moderate	21		19.2%
4.	25-34	Severe	15		13.7%

NMP-Q (%) Distribution for every participant and for affected 109 participants:

The tabulation show the interpretation of the NMP-Q with 0% of absent NMP Level, 26% of mild NMP level, 59% of moderate NMP level and 15% of sever NMP level. It gives the interpretation of the NMP-Q with 0% of absent NMP Level, 23% of mild NMP level, 59.6% of moderate NMP level and 16.5% of severe NMP level (table 3).

TABLE 3: NMP-Q (%) Distribution for every participant

S.NO	NMP-Q SCORE	INTERPRETATION	N	N	PERCETAGE
NMP-Q (%) Distribution for every participant					
1.	NMP-Q Score = 20	Absent	0	400	0%
2.	21 ≤ NMP-Q Score < 60	Mild	103		26%
3.	60 ≤ NMP-Q Score < 100	Moderate	236		59%
4.	100 ≤ NMP-Q Score ≤ 140	Severe	61		15%
NMP-Q (%) of affected 109 participants					

1.	NMP-Q Score = 20	Absent	0	109	0%
2.	21 ≤ NMP-Q Score < 60	Mild	26		23%
3.	60 ≤ NMP-Q Score < 100	Moderate	65		59.6%
4.	100 ≤ NMP-Q Score ≤ 140	Severe	18		16.5%

Frequency of CVA and Sagittal tilt for every participant and for 109 participants:

This tabulation shows the 336 participants have normal CV angle and rest of 64 members have abnormal CV angle. Also, the 363 participants have normal Sagittal tilt and rest of 37 members have abnormal Sagittal tilt. Table shows among the participants who had TNS symptoms, 94 participants have normal CV angle and rest of 15 members have abnormal CV angle. Also, the 100 participants have normal Sagittal tilt and rest of 9 members have abnormal Sagittal tilt (table 4).

TABLE 4: Frequency of CVA and Sagittal tilt for every participant and for Affected 109 participants

INTERPRETATION	N	NUMBER OF PARTICIPANTS (CVA)	NUMBER OF PARTICIPANTS (SAGITTAL TILT)
Frequency of CVA and Sagittal tilt for every participants			
NORMAL	400	336	363
ABNORMAL		64	37
CVA and Sagittal tilt of Affected 109 participants (Participants with positive TNS symptoms)			
NORMAL	109	94	100
ABNORMAL		15	9

In college, 109 (27.25%) of the 400 students polled had symptoms of Text Neck Syndrome (TNS), whereas 291 (72.75%) did not have the symptom. According to the Neck Disability Index (NDI), 21% of people were completely disabled, 49% were mildly disabled, 22% were moderately disabled, 8% were severely disabled, and 0.25% completely disabled.

Among those with TNS, the average NDI score increased somewhat to 24.46 (SD = 17.63) from 22.51 (SD = 15.67), suggesting a higher level of neck-related functional impairment a link between increased smartphone dependency and TNS symptoms.

Postural analysis revealed that the average Craniovertebral Angle (CVA) was 54.04° (SD = 6.02), and the mean sagittal tilt was 22.46° (SD = 3.46). Among TNS-affected, the CVA averaged 53.65° and sagittal tilt 22.15°, indicating subtle forward head posture and neck misalignment consistent with early-stage TNS.

DISCUSSION:

According to this study, more than 25% of college students at an educational institution in Pondicherry have Text Neck Syndrome (TNS), which is typified by a high degree of nomophobia and mild to moderate neck impairment. These findings are consistent with global trends showing an increase in musculoskeletal and psychological problems among young adults who use smartphones excessively. The majority of students have functional restrictions as a result of neck discomfort, according to their Neck Disability Index (NDI) ratings. Although the somewhat higher NDI scores in this study might be the result of regional characteristics or greater screen time during the COVID-19 epidemic, these findings are in line with prior research, such as Javed et al. (2023).^[13]

The Nomophobia Questionnaire (NMP-Q) results reveal significant psychological dependence on smartphones, with many students showing moderate to severe levels of nomophobia. This dependence likely contributes to poor posture and prolonged device use, worsening TNS symptoms. Addressing both physical and psychological components is crucial in developing effective intervention strategies. Early-stage postural deviation that might be remedied with prompt intervention was suggested by the mild indications of forward head position found in postural evaluations. These results highlight the necessity of early identification and prevention in order to steer clear of long-term structural issues.

In order to effectively manage TNS, a comparison with Piruta and Kułak's (2025) review supports the use of integrated physiotherapeutic interventions, including manual therapy, strengthening, and posture correction. Furthermore, the integrated methodology of this study provides a thorough understanding of TNS by utilizing both subjective questionnaires and objective postural measurements.^[14]

CONCLUSION:

This cross-sectional study of 400 college students (aged 18–24) in an Educational Institute at Puducherry found that 27.25% suffer from Text Neck Syndrome, with most showing mild to moderate neck disability and significant smartphone dependency. While forward head posture was noted, it was generally mild, indicating early-stage postural changes. The findings highlight the need for early interventions, including ergonomic education, smartphone use moderation, and physiotherapy. Addressing nomophobia is also vital. The study underscores TNS as a growing public health concern among young adults and calls for integrated physical and psychological strategies, along with improved, non-invasive posture assessment methods.

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