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Correlation of Screen Time with Neck Pain, Sleep Quality, and Stress among University Students

[1]Fatima Zafar[a], [2]Aqsa Majeed[a], [3]Sahreen Anwar[a], [4]Nawal Zafar[b], [5]Asma Akram[a]

[a]University Institute of Physical Therapy, The University of Lahore, Lahore, Pakistan

[b]Physiogic Physiotherapy Clinic, Lahore, Pakistan

ABSTRACT

Background: In the digital age, university students are increasingly reliant on electronic devices such as smartphones, laptops, and tablets for academic, social, and recreational purposes. The widespread adoption of digital devices has dramatically transformed the lifestyle of university students, making screen time an unavoidable aspect of daily academic and recreational activities.

Objective: The objective was to evaluate the correlation of screen time with neck pain, sleep quality and stress among university students.

Methods: A cross-sectional survey was conducted from university students of university of Lahore. 189 participants was by convenient sampling technique criteria. Data was collected by Neck Disability Index (NDI), Perceived Stress Scale (PSS), and Pittsburgh Sleep Quality Index (PSQI) to assess neck pain, stress, and sleep quality, respectively.

Results: This study examined the impact of screen time on neck pain, stress, and sleep quality among 189 college students (mean age = 23.66 years; 55% female). Most participants were from a middle socioeconomic background (73.5%). Mean scores were 21.3 for the Neck Disability Index (NDI), 20.1 for the Perceived Stress Scale (PSS), and 6.2 for the Pittsburgh Sleep Quality Index (PSQI).

Conclusion: This study found a significant association between increased screen time and adverse outcomes in university students. Higher screen time was correlated with greater neck pain, elevated stress levels, and poorer sleep quality. The majority of students used screens primarily for social media, often exceeding 5 hours daily.

Keywords: Neck Pain, Screen Time, Sleep Quality, Perceived Stress

Correspondence

Aqsa Majeed | aqsa.majeed@uipt.uol.edu.pk

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Introduction

With the advent of digital technology, students in universities are over-dependent on electronic devices like smartphones, laptops, and tablets for learning, communication, and entertainment purposes. The use of these devices in daily activities has rendered screen time an integral component of contemporary student lives (1). Though providing learning convenience and connectivity, prolonged exposure to screen time has drawn attention to its potential effects on students' physical and mental well-being (2).

The most common physical outcome is musculoskeletal pain, especially in the neck and shoulders. The condition also known as "text neck" or "tension neck syndrome" results from prolonged forward head posture while using screens that leads to cervical muscle strain, spinal disc strain, and ligament strain (3,4). As dependency on devices increases, the condition is now identified as a budding public health concern, particularly in the young (5). Extended flexion of the neck can double the cervical spine load from a mean of 10–12 pounds to up to 60 pounds, depending on the tilt angle (6). These mechanical loads may lead to postural alterations, headache, compression of the cervical disc, and chronic musculoskeletal injury (7,8).

Also, prolonged screen exposure particularly in the evening has been found to compromise sleep quality. Blue light from screens inhibits melatonin secretion, interferes with circadian rhythms, and retards the onset of sleep (9). The arousing content on devices and persistent notifications also add to mental alertness and disrupted sleep. Compromised sleep, in return, has been correlated with decreased emotional resilience and increased stress reactions (10).

Mental health is also severely impacted by extensive digital interaction. Extended exposure to social media, multitasking, and overload of the digital world are linked with higher psychological stress, anxiety, and burnout. Literature has shown increased levels of stress among students with excessive screen time, especially among female students (11).

In spite of increasing digital consumption among young people, few local studies examine the inter-association of screen time, neck pain, sleep, and stress in university students. This study seeks to determine the incidence of neck pain and examine its association with screen exposure, sleep disturbance, and perceived stress ultimately informing effective preventive interventions and health promotion programs.

Material and Methods

A descriptive cross-sectional study was undertaken to investigate screen time prevalence and its association with neck pain, sleep quality, and stress among university students. The study was undertaken at the University of Lahore for six months after the research synopsis was approved. The study involved the recruitment of 189 participants with a non-probability convenient sampling technique (11). The inclusion parameters included university students in the 18- to 30-year age group, pursuing undergraduate or postgraduate studies (either full-time or part-time), reporting at least two hours of screen use daily via devices like smartphones, laptops, or tablets. Participants had to read and respond to the questionnaire in the specified language and give informed consent (12).

Students were not included if they had a recognized musculoskeletal disorder of non-screen origin (e.g., cervical spine pathology), neurological disorder (e.g., epilepsy or Parkinson's disease), or psychiatric disorder (e.g., depression or generalized anxiety disorder) that may have independently affected sleep or stress. Other exclusion factors were recent use of prescription drugs like sedatives or muscle relaxants, recent history of surgery or physiotherapy for the neck over the previous six months, regular engagement in high-intensity sports likely to cause neck pain, and partial questionnaires (13).

Data were obtained through a self-administered, structured questionnaire with standardized instruments to measure the variables of interest. Neck pain and related disability were assessed with the validated 10-item Neck Disability Index (NDI) with scores from 0 to 50 (14). Higher percentages denoted greater disability. Stress was measured with the 10-item version of the Perceived Stress Scale (PSS), a 0 to 4 Likert scale, with greater scores denoting greater perceived stress (15). Sleep quality was assessed with the Pittsburgh Sleep Quality Index (PSQI), which rates several aspects of sleep in the past month, with total scores between 0 and 21; higher than 5 reflects poor quality sleep (16). These measures have shown excellent reliability and validity in previous studies.

Participants also reported on screen time each day. After informed consent, the information was collected, coded, and analyzed through the use of IBM SPSS version 25.0. Descriptive statistics involving means and standard deviations were used to report continuous variables, while frequencies and percentages were used for the categorical variables. Correlations between screen time and each of the three variables were determined through the use of the chi-square test. Statistical significance was determined if the p-value was less than 0.05; anything greater than 0.05 was taken as non-significant.

Results

A total of 189 university students participated in the study. The mean age of the participants was 23.66 ± 1.73 years, with females accounting for 55% (n = 104) and males 45% (n = 85). Most participants belonged to the middle socioeconomic class (73.5%). The average daily screen

time was 5.14 ± 1.85 hours. Smartphones were the primary device used for screen-based activities (83.1%), and social media (73.5%) was the most common purpose of screen use, followed by academic work (13.8%), watching videos (6.9%), and gaming (5.8%).

Table 2: Socio demographic Characteristics and Clinical Profile of Participants (N = 189)

Variables	Category	n (%) / Mean ± SD
Age (years)	Mean ± SD	23.66 ± 1.73
Gender	Male	85 (45.0)
	Female	104 (55.0)
Socioeconomic Status	Upper	43 (22.8)
	Middle	139 (73.5)
	Lower	7 (3.7)
Daily Screen Time (hours)	Mean ± SD	5.14 ± 1.85
Primary Device Used	Smartphone	157 (83.1)
	Laptop	23 (12.2)
	Tablet	9 (4.8)
Purpose of Screen Use	Social media	139 (73.5)
	Academic work	26 (13.8)
	Watching videos	13 (6.9)
	Gaming	11 (5.8)
Neck Disability Index (NDI)	Mild disability	130 (68.8)
	Moderate disability	46 (24.3)
	Severe disability	7 (3.7)
	Complete disability	6 (3.2)
Perceived Stress Scale (PSS)	Low stress	22 (11.6)
	Moderate stress	156 (82.5)
	High stress	11 (5.8)
Pittsburgh Sleep Quality Index (PSQI)	Better sleep	153 (81.0)
	Poor sleep	36 (19.0)

The assessment of neck disability using the Neck Disability Index (NDI) showed that 68.8% of participants had mild disability, while 24.3% reported moderate disability. Severe and complete disability were observed in 3.7% and 3.2% of participants, respectively. Assessment of perceived stress demonstrated that the majority (82.5%) experienced moderate stress, whereas 11.6% reported low stress and 5.8% experienced high perceived stress. Evaluation of sleep quality using the Pittsburgh Sleep Quality Index (PSQI) revealed that 81.0% had better sleep quality, while 19.0% had poor sleep quality. Significant associations were observed between daily screen time and all three health outcomes. Increased screen time was significantly associated with greater neck disability ($p = 0.014$), higher perceived stress ($p = 0.004$), and poorer sleep quality ($p = 0.022$). Overall, higher daily screen time was significantly associated with increased neck disability, higher perceived stress, and poorer sleep quality among university students.

Table 2: Association of Screen Time with Neck Disability, Stress, and Sleep Quality

Outcome Variable	Categories	n (%)	P-value
Neck Disability Index	Mild disability	130 (68.8)	**0.014***
	Moderate disability	46 (24.3)	
	Severe disability	7 (3.7)	
	Complete disability	6 (3.2)	
Perceived Stress Scale	Low stress	22 (11.6)	**0.004***
	Moderate stress	156 (82.5)	
	High stress	11 (5.8)	
Pittsburgh Sleep Quality Index	Better sleep	153 (81.0)	**0.022***
	Poor sleep	36 (19.0)	

Discussion

The current research found a noteworthy correlation between higher screen use and poor health consequences among university students, particularly in areas of neck pain, stress status, and sleep disturbance. This is concurrent with the escalating evidence pointing towards the musculoskeletal and psychologic load of excessive digital use among young adults.

Neck disability was common in the sample, with 68.8% of the participants reporting mild disability and 27.5% reporting moderate to severe disability. There was a statistically significant association between screen time and neck disability (*p* = 0.014), reflecting that students with more than 5–6 hours of daily screen use were more likely to have higher musculoskeletal strain. These results are corroborated by Almutairi et al. in 2024, who found greater neck dysfunction among students who used electronic devices for more than five hours a day (17).

Likewise, screen time was strongly related to high levels of stress (*p* = 0.004). Those students exposed to 6–8 hours of screen time every day recorded a higher prevalence of moderate to high perceived stress. This further supports research by Laghari et al. conducted in 2023, which found that excessive use of digital technologies during the COVID-19 period was related to stress and disrupted sleep patterns among students (18).

In addition, an interesting correlation between screen exposure and sleep quality was established (*p* = 0.022), where those who spent more than 6 hours on screens were more likely to have poor sleep. This finding aligns with the research of Maurya et al. conducted in 2022, where it was established that smartphone use of over two hours was significantly correlated with self-reported sleep issues among adolescents and young adults (19).

Taken together, these findings indicate that extended screen exposure could play a role in the cumulative health cost of physical discommoding, psychological tension, and deranged circadian function. Intervening in the hygiene of screen use through awareness and behavioral changes might prove key to ensuring more salubrious digital habits among student groups.

Conclusion

In conclusion, this study found a significant association between increased screen time and adverse outcomes in university students. Higher screen time was correlated with greater neck pain, elevated stress levels, and poorer sleep quality. The majority of students used screens primarily for social media, often exceeding 5 hours daily. These findings highlight the need for awareness and interventions to promote healthier screen habits among young adults.

Authors' Contributions

ICMJE authorship criteria	Detailed contributions	Authors
Substantial Contributions	Conception or Design of the work	1,4,5
	Data acquisition	1, 2
	Data analysis or interpretation	1,3
Drafting or Reviewing	Draft the work	2
	Review critically	1,2,3,4,5
Final approval	Final approval of the version to be published.	1,2,3,4,5
Accountable	Agreement to be accountable for all aspects of the work.	1,2,3,4,5

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