

Original Article

Prevalence of Neck Pain and Associated Disabilities among Students Who Use Computers

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ABSTRACT

Background: Neck pain is increasingly prevalent among computer users, leading to significant health concerns and impacting daily activities. Understanding the prevalence and associated disabilities of neck pain in this population is crucial for developing effective preventive measures and interventions.

Objective: To investigate the prevalence of neck pain and associated disabilities among university students who use computers, and to identify the factors contributing to these conditions.

Methods: This cross-sectional study was conducted over six months at Akhtar Saeed Medical and Dental College, Lahore. A sample of 144 students from DPT, MBBS, BDS, and Pharm-D programs, aged 20-28 years, was selected. Participants included both males and females who used computers for more than two hours daily and had no history of cervical trauma or underlying medical conditions. Data were collected using the Neck Disability Index (NDI) questionnaire and the Numeric Pain Rating Scale (NPRS). Ethical approval was obtained from the Institutional Review Board, and informed consent was secured from all participants. Data analysis was performed using SPSS version 25, with descriptive statistics summarizing demographic information and inferential statistics examining associations between neck pain and risk factors.

Results: The study found that 29.2% of participants reported no pain, 20.8% had very mild pain, 45.8% had moderate pain, and 4.2% experienced severe pain. Weak correlations were observed between neck pain and disabilities, with 33.33% of participants able to care for themselves without pain, 62.50% able to care for themselves with extra pain, and 4.17% finding personal care difficult and slow. Regarding headaches, 16.67% reported no headaches, 20.83% had slight headaches infrequently, and 62.50% experienced moderate headaches frequently.

Conclusion: The study concluded that a significant number of university students suffer from neck pain due to prolonged computer use, with most experiencing mild to moderate pain. Preventive measures, including ergonomic interventions and educational initiatives on proper posture and taking breaks, are essential to reduce the incidence of neck pain and improve the quality of life for computer users.

Keywords: Neck pain, computer users, university students, musculoskeletal disorders, Neck Disability Index, Numeric Pain Rating Scale, ergonomic interventions, preventive measures, cross-sectional study, daily activities.

INTRODUCTION

Musculoskeletal complaints are increasingly common, with significant implications for the workforce due to the financial burden they impose. One prevalent condition across various age groups, especially among middle-aged adults, is neck pain, primarily resulting from stressors affecting the upper back and neck. Neck pain is notably prevalent among computer users, contributing to the demand for medical interventions and health maintenance, which, in turn, leads to economic strain due to absences from work caused by illness. A study conducted in the Netherlands revealed that 31.4% of the population had experienced neck pain (3). Anatomically, the neck, or cervical region, connects the shoulder and chest to the head through the cervical spine, encompassing vital structures such as muscles, vasculature, and nerves. The cervical spine, consisting of seven vertebrae, supports movement and is integral to the passage of the spinal cord, which facilitates reflexes and signal transmission within the body. Between each vertebra

are intervertebral discs that function as shock absorbers, composed of the inner nucleus pulposus (NP), the outer annulus fibrosus (AF), and cartilaginous endplates that anchor the discs to adjacent vertebrae (5).

Neck pain, characterized by discomfort in the muscles, nerves, bones, joints, or discs, can arise from various factors, including emotional stress, fatigue, movement, posture, and structural issues. Symptoms often include soreness, swelling, stiffness, and muscle spasms, and may be accompanied by constitutional symptoms like fever, headache, nausea, vomiting, swollen glands, and limb weakness. Neck pain is classified based on duration: acute (less than 4 weeks), sub-acute (1-4 months), and chronic (greater than 4 months). Computer users experiencing neck pain often exhibit musculoskeletal and postural changes, including reduced cervical extensor muscle activity and increased activity of the upper trapezius muscles compared to non-computer users (8). The most commonly reported symptom is neck stiffness, likely due to the continuous effort required by neck muscles to maintain posture during sitting and standing (9). Pain, as defined by the International Association for the Study of Pain (IASP), is a sensory and emotional experience that is unpleasant and associated with actual or potential tissue damage (10). Chronic pain is described by IASP as pain that extends beyond the normal healing period, typically greater than three months, but this duration can vary depending on the context.

This study investigates nonspecific neck pain, which refers to pain in the musculoskeletal area of the neck without a specific cause such as trauma, tumor, or arthritis. The cervical spine not only protects the spinal cord and nerves but also supports the arteries supplying blood and facilitates movement of the neck. Each vertebra is separated by a disc that allows movement by absorbing pressure, while muscles are responsible for the support and motion of the head and neck (11). Neck pain among computer users is multifactorial, involving various pathophysiological mechanisms (12). A common posture associated with this pain is forward head posture, where the head is positioned anteriorly relative to the body's center of gravity (13). The static work posture of computer users makes them susceptible to musculoskeletal disorders (14). Research conducted at Northeastern University showed that 41% of students experienced neck pain, with prolonged computer use being a significant contributing factor (15).

In 2018, a study by Mohamed Sherif Sirajudeen et al. on computer-related health problems among university students found that musculoskeletal disorders were prevalent, with neck disorders being particularly common (45.9%), followed by upper back (29.4%) and lower back (26.7%) issues. The study indicated a significant association between prolonged computer use without breaks and the development of musculoskeletal disorders in the shoulder, elbow, and wrist/hands (17). Smith et al. (2008) also reported a high prevalence of headaches and neck discomfort among university students in developing countries who use computers, emphasizing the need for better ergonomics education (18). Bhardwaj et al. (2015) observed a high prevalence of neck discomfort (99.2%) among computer users and used the Neck Disability Index and Visual Analog Scale to assess the intensity of the discomfort, noting that disability was less common (19). This study aims to investigate the prevalence of neck pain and associated disabilities among university students who use computers, highlighting the need for effective preventive measures and ergonomic interventions.

MATERIAL AND METHODS

Over the course of six months, a cross-sectional study was conducted at Akhtar Saeed Medical College to evaluate the prevalence of neck discomfort among 144 college students who used computers. The sample size was determined using a 95% confidence level and included individuals from DPT, MBBS, BDS, and Pharm-D programs, ranging in age from 20 to 28 years, across all professional years. Both male and female students were included in the study, specifically those who reported using a computer for more than two hours per day and had no history of trauma or injury to the cervical region. Students with any underlying medical conditions such as infections, tumors, or ankylosing spondylitis, as well as those with a history of neck discomfort following surgery, were excluded.

For data collection, two validated and reliable instruments were utilized: the Neck Disability Index (NDI) questionnaire and the Numeric Pain Rating Scale (NPRS). The NDI was used to evaluate the severity of neck-related impairment, while the NPRS was employed to assess the intensity of pain. Prior to participation, eligible students provided written informed consent and were given comprehensive information about the study. The ethical standards outlined in the Declaration of Helsinki were strictly adhered to, ensuring respect for individuals and justice.

Data analysis was conducted using SPSS version 25. Descriptive statistics were used to summarize demographic information, while inferential statistics were employed to investigate associations between neck discomfort and identified risk factors. The use of SPSS v25 facilitated precise data analysis, ensuring accurate results. Ethical norms, including informed consent and confidentiality, were rigorously observed. The study was approved by the Institutional Review Board of Akhtar Saeed Medical College, adhering to stringent ethical guidelines. This research provided valuable insights into the prevalence and contributing factors of neck discomfort among college students, emphasizing the importance of preventive measures and ergonomic interventions.

RESULTS

The analysis of descriptive statistics for the study population revealed that the sample consisted of 144 participants, with Participant IDs ranging from 1 to 144. The mean Participant ID was 72.50, with a standard deviation of 41.713, indicating a well-distributed sample across the participant ID range (Table 1). Gender distribution within the sample showed a mean value of 1.58 with a standard deviation of 0.495, where males and females were coded as 1 and 2, respectively. This indicates a slight predominance of female participants in the study. Age distribution was relatively homogeneous, with a mean of 1.87 and a standard deviation of 0.332, reflecting the narrow age range of the study population, all within the specified range of 20 to 28 years.

Pain intensity distribution among the participants was comprehensively assessed, as shown in Table 2. It was found that 29.2% of the participants reported experiencing no pain, providing a baseline understanding of the pain-free segment within the population. Meanwhile, 20.8% of participants reported very mild pain, which, although present, did not significantly impact their daily activities. The most notable finding was that 45.8% of the participants experienced moderate pain. This substantial proportion underscores the prevalence of moderate neck pain among university students who use computers frequently. Additionally, a smaller segment of the population, 4.2%, reported very severe pain, indicating that while severe pain is less common, it is still a significant concern for a minority of students.

Table 1: Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Participant ID	144	1	144	72.50	41.713
Gender	144	1	2	1.58	0.495
Age	144	1	2	1.87	0.332
Valid N (listwise)	144				

Table 2: Pain Intensity Distribution

Pain Intensity	Frequency	Percent	Valid Percent	Cumulative Percent
No pain	42	29.2%	29.2%	29.2%
Very mild	30	20.8%	20.8%	50.0%
Moderate	66	45.8%	45.8%	95.8%
Very severe	6	4.2%	4.2%	100.0%
Total	144	100.0%	100.0%	100.0%

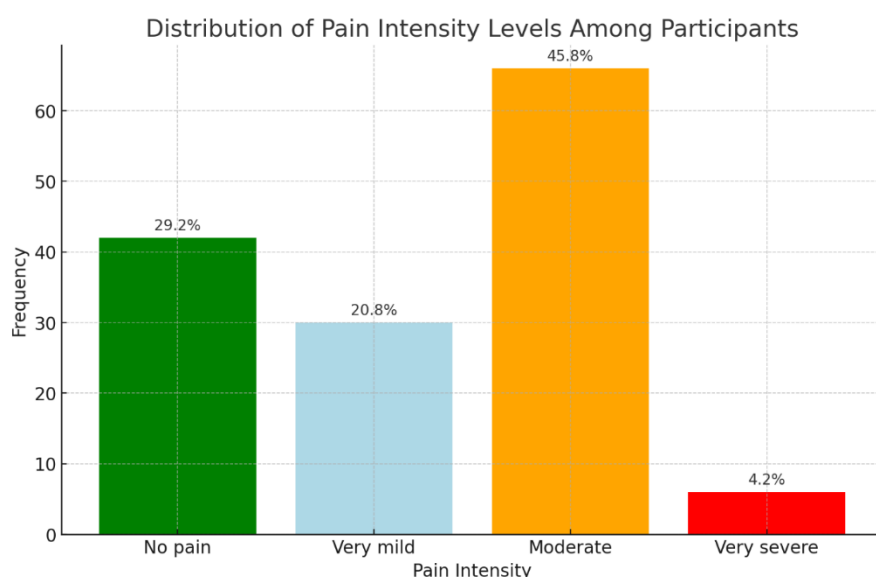


Figure 1 Pain Intensity

Further analysis of the data indicated a weak correlation between neck pain and disabilities in daily activities. Specifically, 33.33% of the participants were able to care for themselves without any pain, which highlights that a significant portion of the population remains functional despite their pain levels. Conversely, 62.50% of the participants could manage self-care activities but with additional pain, indicating that while they remained functional, their quality of life was affected. For a small subset, 4.17%, personal care was challenging and required slow, careful movements, demonstrating the disabling nature of severe neck pain for this group. Regarding headaches, another associated symptom of neck pain, 16.67% of participants reported no headaches, 20.83% experienced slight headaches infrequently, and a majority, 62.50%, had moderate headaches frequently. This distribution highlights the significant

co-occurrence of headaches with neck pain among the participants, suggesting a potential link between prolonged computer use and headache frequency (16-1).

The graphical representation of pain intensity levels in the form of a bar chart (Figure 1) further elucidates these findings, offering a clear visual summary of the distribution of pain intensity among the participants. The bar chart illustrates the proportional differences in pain intensity categories, emphasizing the predominance of moderate pain within the study population.

DISCUSSION

This cross-sectional study, conducted over six months, explored the association of neck pain with activities of daily living among computer-using students at Akhtar Saeed Medical and Dental College, Lahore. The study utilized the Neck Disability Index (NDI) questionnaire, a validated instrument for assessing the severity of neck pain and its impact on daily activities. The primary objective was to provide an evidence-based appraisal of neck pain and associated disabilities in university students who frequently use computers. A sample of 144 students was selected to investigate this issue (15-18).

Previous studies have highlighted the high prevalence of neck pain among computer users. For instance, a study reported that 99.2% of computer users experienced neck pain, although disability was less common. Participants in that study were assessed using the Neck Disability Index and Visual Analog Scale. Another study on computer-related health problems among university students found that nearly half of the participants had musculoskeletal disorders, with neck-related disorders being particularly prevalent (45.9%), followed by upper back (29.4%) and lower back (26.7%) issues. The study also showed significant associations between prolonged computer use without breaks and musculoskeletal disorders of the shoulder, elbow, and wrist/hands ($p=0.005$, $p=0.02$, and $p=0.001$, respectively) (20).

In our study, 29.2% of computer users reported no pain, 20.8% had very mild pain, 45.8% had moderate pain, and 4.2% experienced severe pain. The findings indicated a weak correlation between neck pain and disabilities. About 33.33% of participants could care for themselves without any pain, while 62.50% could do so but with extra pain. Personal care was difficult and slow for 4.17% of the participants. Regarding headaches, 16.67% reported no headaches, 20.83% had slight headaches infrequently, and 62.50% experienced moderate headaches frequently. This analysis suggested that untreated neck pain could significantly affect daily activities.

The strengths of this study include its use of validated instruments for assessing neck pain and disability, a comprehensive sample of students from various programs, and adherence to ethical standards. However, the study had limitations, such as its cross-sectional design, which precludes causal inferences, and potential self-reporting biases. Furthermore, the sample size, while adequate, may limit the generalizability of the findings to a broader population.

Recommendations for future research include longitudinal studies to establish causal relationships and the exploration of ergonomic interventions to reduce neck pain among computer users. Educational initiatives on proper posture and the importance of taking breaks during computer use should be implemented to mitigate the risk of developing musculoskeletal disorders. Additionally, further studies should investigate other potential contributing factors to neck pain, such as psychological stress and overall physical activity levels.

CONCLUSION

In conclusion, the study found that a significant proportion of students experienced mild to moderate neck pain due to prolonged computer use, with severe neck pain being less common. Preventive measures and ergonomic interventions are necessary to reduce the incidence of neck pain among computer users, ultimately improving their quality of life and productivity.

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