

NECK PAIN AMONG STUDENTS AND ITS ASSOCIATION WITH SMART PHONE AND LAPTOP USAGE

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ABSTRACT

Introduction: In the modern era of advancement and technology, use of smart phones and laptops is common. Literature suggests that these digital devices have many negative effects on the health of humans. One of the most common adverse effects associated with prolonged use of mobile and laptop is neck pain.

Material & Methods: A cross sectional study was carried out at Khyber Medical University (KMU) from July 2019 to December 2019. A total of 206 undergraduate physical therapy students having age 18 to 25 years participated in the study. For data collection, smart phone & laptop usage and neck pain questionnaire was used. For data analysis, SPSS version 20 was used.

Results: The mean age of the subjects was 21.15 ± 1.89 years. The prevalence of neck pain was 82.5% (n=170). Neck pain was significantly associated (P-value < 0.05) with smart phone and laptop usage for greater than 4 hours. Surprisingly, neck pain was not associated (p value > 0.05) with different positions (standing/sitting/lying) in which students use smart phones for majority of the time, however, it had significant association (P-value < 0.05) with use of laptops in sitting position for majority of the time.

Conclusion: The prevalence of neck pain is high in students who used smart phones and laptops for long hours.

Key Words: Back pain, Laptop, Neck pain, Phone, Students.

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INTRODUCTION

In the modern era of advancement and technology, use of smart phones and laptops is common.¹ The primary purpose of the invention of these devices was to bring comfort in the lives of human beings; however, literature suggests that these digital devices have many negative effects on the health of humans.² One of the most common adverse effects associated with prolonged use of mobile and laptop are musculoskeletal disorders (MSD's).³ Use of these digital

devices for long hours put constant pressure on the musculoskeletal system and thus prone human body to variety of MSD's. Of the MSD's, neck pain is more prevalent in mobile and laptop users because neck is responsible for maintaining the position of head in space.⁴ To operate laptop or mobile phone, the users generally adopt the forward head posture, which put constant pressure on the muscles around the neck, leading to chronic neck pain.⁵ Literature suggests that neck pain is highly

prevalent in smart phone and laptop users.⁶ According to a study in Poland, prevalence of neck due to laptop usage was 55.6%⁷ while another study reported that prevalence of back pain due to laptop usage was 56.1%.⁸ A study conducted in South Australia reported that prevalence of neck in smart phone users was 32.50%.⁹ A systematic review reported that lifetime prevalence of neck in smart phone users is 54.8% while its prevalence in laptop users is >67%.¹⁰ The high prevalence of neck pain among laptop and mobile phone users can be attributed to the faulty posture adopted during usage of these digital devices.¹¹ The cervical vertebrae and associated joints and soft tissues placed in prolonged poor positioning for using these digital devices alter the normal biomechanical function of the neck, thus prone the users to neck pain.¹²

In the last two decades, use of digital devices such as smart phones and laptops has dramatically increased.¹³ They can be used for different purposes including study, professional work, and entertainment. However, prolonged use of these devices can cause neck pain. Despite the fact previous studies reported that young students are more likely to use smart phones and laptops than old age people, nevertheless few studies evaluated the effects of smart phones and laptops usage on health of these young students.^{14,15} For that reason, this cross-sectional study was carried out to find out neck pain among students and scrutinize its association with smart phone and laptop usage.

MATERIAL AND METHODS

A cross sectional study was carried out at Khyber Medical University from July 2019 to December 2019. Undergraduate physical therapy students having age 18 to 25 years participated in the study. Students with history of major trauma, surgery or any other medical complication were excluded.

Ethical approval was taken from graduate committee of Institute of physical medicine and rehabilitation. To calculate sample size, Raosoft online sample size calculator was used. With total population of 440 students, 206 subjects were required to conduct the study. Smart phone & laptop usage and neck pain questionnaire was used to collect data. Hard copies of the questionnaires were provided to students directly by hands. To

each participant's study was explained in detail and informed consent was acquired before collecting data from each participant.

For analysis of data, SPSS version 20 was utilized while Chi-square test was applied to find association between categorical variables.

RESULTS

A total of 206 physical therapy students participated in the study. Mean age of subjects was 21.15 ± 1.89 years. Of total subjects, 128(62.1%) were females while 78(37.9%) participants were males. Of total, 82.5% (n=170) had neck pain. Neck pain had significant association (P-value < 0.05) with smart phone and laptop usage for greater than 4 hours (Table 1 and Table 2). Surprisingly, neck pain had no significant association (P-value > 0.05) with different positions in which students use smart phones for majority of the time, however, it had significant association (P-value < 0.05) with use of laptops in sitting position for majority of the time. (Table 3 and Table 4)

Out of 170 participants who had neck pain, 110 (64.7%) were female and 60 (35.3%) were male. On visual analogue scale, 27(15.9%) participants had mild neck pain, 76(44.7%) had moderate, 61(35.9%) had severe and 6(3.5%) had very severe neck pain.

DISCUSSION

Neck pain is increasing day by day and one of the major causes of these preventable musculoskeletal disorders is abnormal postures for prolonged durations.^{16,17} With advancement in the field of technology, the use of smart phones and laptops is substantially increased, which lead to neck and low back pain due to sustained incorrect posture.^{2,3} Because students commonly used smart phones and laptops for study and entertainment purposes, therefore they are prone to develop to develop neck pain.¹⁸ Nevertheless, neck pain due to frequent use of laptop and smart phones does not received much attention from rehabilitation researchers. From the results, it is clear that high percentage (82%) of students had neck pain. In accordance to current study, previous studies also showed that neck pain is highly prevalent in students. Obembe et al. carried out a research study to evaluate musculoskeletal disorders in students who used laptops. Their study reported that 69.2% students had neck pain due to regular laptop usage. Surprisingly,

neck pain was the most prevalent complaints among laptop users as compared to other musculoskeletal disorders.¹⁹ Another study conducted in California reported that prevalence of neck pain in laptop users was 67% while a study conducted in Thailand reported that neck pain among smart phone users was 32.50%.^{9,17} Prevalence of neck pain reported in current study is much greater than previously conducted studies. It may be due to the fact that in current study only physical therapy students participated. Moreover, it is pertinent to mention that current study was conducted in developing country where awareness about ergonomics is scarce that can be the reason for high prevalence of neck pain in students.

Literature suggests that risk of neck pain increases with prolong usage of laptops and smart phones.²⁰ Because mostly students use these devices in flexed forward head posture, that's why posterior neck structures remain in constant strain during the use of these devices.²¹ Our research study also confirmed that neck pain is significantly associated with smart phone and laptop usage for greater than 4 hours. Besides this, laptop usage in sitting position for prolonged time was significantly associated with neck pain. Biomechanically, sitting put more load on back as compared to other position, that's why sitting for prolonged times may be the risk for developing neck pain in laptop users.²²⁻²⁴

Though current study thoroughly evaluated neck pain in students and scrutinized association of neck pain with laptop and smart phone users, still, there are some limitations which are worthy to mention. Firstly, current study included only physical therapy students, that's why participants of current study may not be the true representative of the student population. Secondly, due to small sample size, results of the study may not be generalized to wider population. Furthermore, it was not possible to control confounding variables.

CONCLUSION

Neck pain is highly prevalent in students who used smart phones and laptops for long hours. It is appeared that use of these digital gadgets for long hours can prone students for neck pain. Large multicentre studies may be carried out to truly find out association of neck pain with smart phone and laptop usage.

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Table 1: Association of neck pain with smart phone usage

| | | Average time students use smart phone daily | | | | | P-value |
|-----------|-----|---|-----------|------------|------------|------------|---------|
| | | 0-30mins | >30mins | >1-2hrs | >2-4hrs | >4hrs | |
| Neck Pain | Yes | 4 (2.4%) | 8 (4.7%) | 27 (15.9%) | 43 (25.3%) | 88 (51.8%) | 0.003 |
| | No | 3 (8.3%) | 5 (13.9%) | 12 (33.3%) | 6 (16.7%) | 10 (27.8%) | |

Table 2: Association of neck pain with laptop usage

| | | Average time students use laptop daily | | | | | P-value |
|-----------|-----|--|------------|------------|------------|------------|---------|
| | | 0-30mins | >30mins | >1-2hrs | >2-4hrs | >4hrs | |
| Neck Pain | Yes | 16 (9.4%) | 25 (14.7%) | 51(30.0%) | 26 (15.3%) | 52 (30.6%) | 0.04 |
| | No | 2 (5.6%) | 11 (30.6%) | 10 (27.8%) | 7 (19.4%) | 6 (16.7%) | |

Table 3: Association of neck pain with different positions while using smart phones

| | | Different positions in which students use smart phones for majority of the time | | | P-value |
|-----------|-----|---|----------|------------|---------|
| | | Sitting | Standing | Lying | |
| Neck Pain | Yes | 75 (44.4%) | 6 (3.6%) | 88 (52.1%) | 0.207 |
| | No | 21 (58.3%) | 0 (0.0%) | 15 (41.7%) | |

Table 4: Association of neck pain with different positions in which students use laptops

| | | Different positions in which students use laptops for majority of the time | | | P-value |
|-----------|-----|--|----------|------------|---------|
| | | Sitting | Standing | Lying | |
| Neck Pain | Yes | 117 (68.8%) | 4 (2.4%) | 49 (28.8%) | 0.019 |
| | No | 33 (91.7%) | 0 (0.0%) | 3 (8.3%) | |