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Original Article

Impact of Mobile Phone Usage on Cervical Mobility Among Physiotherapy Students in Bangalore

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ABSTRACT

Young adolescent people use mobile phones for various purposes and use them for min 6 – max 10 hours a day. The sitting posture during mobile use in people affects the neck muscles so the extension and lateral rotation of normal range of motion are restricted, which leads to pain and stiffness in the neck. The objective of the present study was to find the effect of mobile phone use on the cervical range of motion. A total of 70 People who met the inclusion criteria were included in this study Neck pain was assessed using the VAS scale. Range of motion was assessed using the goniometer and the total duration of mobile usage in a day was also assessed for this study. The result from the present study showed that the increase in the flexion Range of motion was more than normal and a decrease in the ROM than normal for extension and lateral rotation to the left side of the cervical spine. The mean values of the VAS scoring showed that there was a mild increase in pain in mobile users. The person's correlation showed that there was a significant relation between the duration of mobile use and an increase in cervical ROM and a decrease in cervical extension and lateral rotation. Prolonged use of mobile affects the cervical ROM and leads to pain and stiffness so limiting the duration of use of mobile will reduce such risk factors and its complications.

Keywords: Mobile Phone Usage; Cervical Range of Motion; Musculoskeletal Complications; Adolescent Well-being

INTRODUCTION

In recent years, mobile phones' ubiquity has changed how we interact with the world. It has become integral to modern life, providing unprecedented connectivity and convenience. While these devices have undoubtedly enhanced our ability to communicate and receive information, they have also ushered in a new era of concern regarding their effects on the health of the body, especially in the musculoskeletal in the frequency of occurrence¹.

It is characterized by prolonged text messaging, scrolling and screen communication, extensive use of mobile phones, and generally deviating from recommended positions^{2,3}.

Aims and objectives

The aim of this research study is to investigate the association between mobile phone use and its potential impact on

neck motion among physical therapy students in Bangalore, a technologically advanced and independent city with increased cell phone connectivity It is well known that an understanding of how prolonged cell phone use affects the biomechanics of the cervical spine is paramount for predicting any adverse outcome early results and effective preventive treatment.

As future physiotherapists, these students play an important role in maintaining musculoskeletal health. Thus, assessing the impact of their mobile phone use on their own neck movements is not only a personal concern but also relates to their professional skills.

METHODOLOGY

In accordance with the defined inclusion criteria, a total of 70 individuals were enrolled as participants in this study. The assessment encompassed an evaluation of neck pain using

the Visual Analog Scale (VAS) and an analysis of cervical range of motion employing a goniometer. Additionally, the investigation involved the meticulous examination of the total daily duration of mobile phone usage.

These comprehensive assessments and the resulting dataset of 70 participants serve as the foundation of our study, allowing for the in-depth exploration of the relationship between mobile phone usage, cervical health, and pain perception. The utilization of objective measurements and validated scales ensures the rigor and reliability of our research findings. This methodological approach facilitates a nuanced understanding of the impact of mobile technology on musculoskeletal well-being, providing valuable insights for clinical practice and public health recommendations.

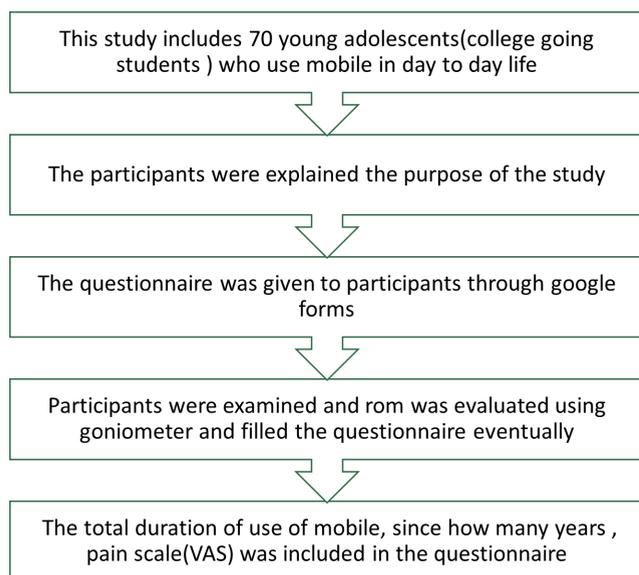


Fig. 1: Methodology overview

- Inclusion Criteria
 - Healthy young adolescents (18-25).
 - Neck pain
- Exclusion Criteria
 - Cervical tumor, brain injury, history of fracture, cervical spondylitis, wound.
- Outcome Measures
 - VAS
 - Range of motion (ROM) employing a goniometer.

RESULTS

The findings derived from our present study unveiled distinctive patterns in cervical spine mobility and associated pain levels among participants. Notably, an increment in the range of motion for flexion surpassed the expected norm, while a decrement in the range of motion for

both extension and leftward lateral rotation was observed, exhibiting deviations from the established standards for cervical spine mobility.

Furthermore, our investigation encompassed the assessment of pain levels using the VAS. Our analysis of the mean VAS scores indicated a mild increase in perceived pain among mobile phone users. This observed increase in pain intensity underscores the potential relevance of the study’s findings to musculoskeletal discomfort experienced by individuals regularly engaged in mobile phone usage.

To substantiate the relationships between mobile phone usage duration and cervical spine mobility alterations, we conducted Pearson’s correlation analysis. The outcomes of this analysis demonstrated a statistically significant association between the duration of mobile phone use and the observed increase in cervical flexion, as well as the concurrent decrease in cervical extension and leftward lateral rotation. These correlation results accentuate the impact of prolonged mobile phone usage on cervical spine dynamics and may offer crucial insights for musculoskeletal health management and preventive measures.

These findings collectively contribute to our understanding of the implications of mobile phone usage on cervical spine health and underscore the importance of proactive measures to mitigate potential musculoskeletal consequences associated with this prevalent behavior.

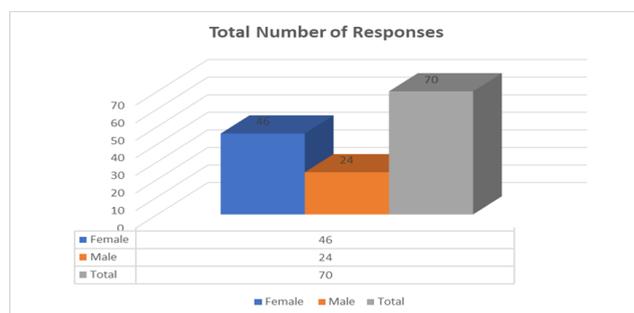


Fig. 2: Total number of responses with Male: Female ratio

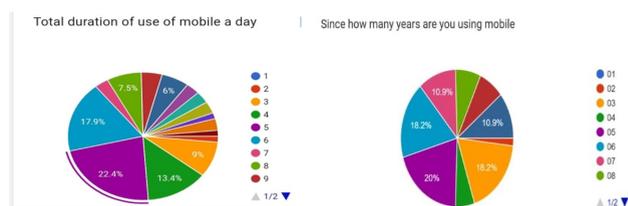


Fig. 3: A: the total duration of mobile usage per day in hours. B: Since how many years they are using mobile phone

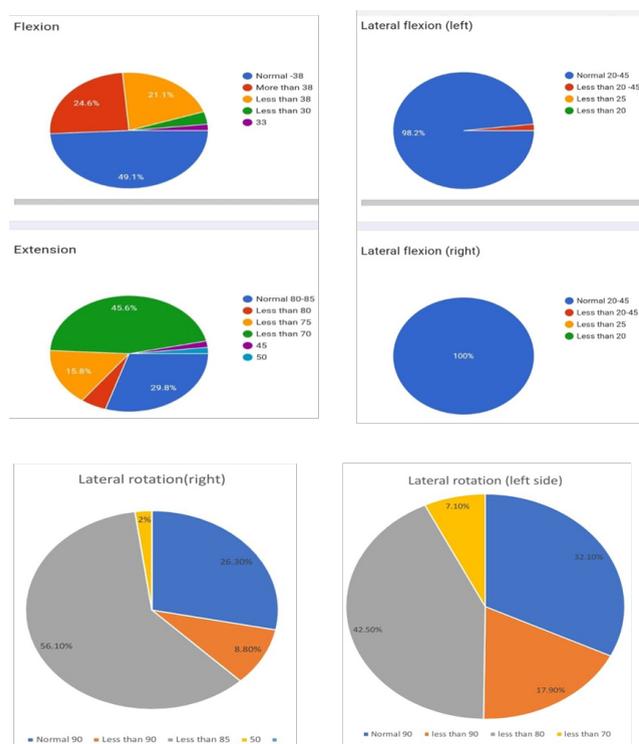


Fig. 4: Percentage of distribution in the variation of angles

Pain

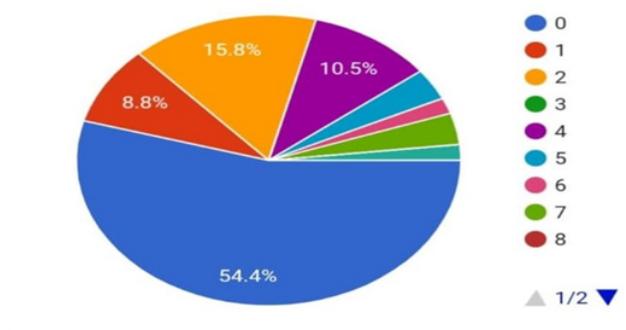


Fig. 5: Distribution of pain using VAS

DISCUSSION

This study sought to examine the impact of prolonged mobile phone usage on cervical range of motion (ROM) and the incidence of associated neck pain. Our investigation revealed several noteworthy observations:

- In terms of cervical ROM, our findings demonstrated a significant increase in flexion. However, lateral rotation and extension movements exhibited restrictions. Notably, lateral rotation on the left side was notably

more constrained when compared to the right side⁴.

- The assessment of neck pain revealed that only 20% of participants reported experiencing discomfort during mobile phone use, primarily while in a flexed neck position. A smaller subset also reported pain during cervical extension. This suggests that neck pain is more commonly associated with specific positions adopted during mobile phone usage⁵.
- Our data further indicated a reduction in the range of motion for extension, with a decrease of less than 70 degrees, and a limited range of lateral rotation, typically falling below 80-85 degrees. These findings underscore the impact of mobile phone usage on cervical biomechanics, particularly in the context of extension and lateral rotation⁶.
- In contrast, lateral flexion movements generally remained within the expected range, with most participants exhibiting normal lateral flexion capabilities⁷.

These findings provide valuable insights into the effects of prolonged mobile phone usage on cervical ROM and pain perception. Understanding the specific patterns of restriction and discomfort associated with mobile phone use can inform preventive strategies and interventions to promote musculoskeletal health in individuals who frequently engage with mobile technology.

LIMITATION

In the course of our current study, we have identified certain limitations that warrant consideration:

Posture Neglect in Data Collection: One limitation of our research lies in the fact that the assessment of posture during both writing and studying was not comprehensively accounted for. This aspect could be further investigated in future studies to gain a more holistic understanding of the potential impacts of posture on musculoskeletal health.

Sample Size Consideration: Another limitation relates to our sample size, which, while sufficient for our study's objectives, could be expanded to enhance the generalizability of our findings. Larger sample sizes could provide a more robust basis for drawing broader conclusions.

Exclusivity to Physiotherapy Students: Additionally, our research has been primarily centered on physiotherapy students. While this focus aligns with the specific nature of our study, it should be acknowledged that other health science courses' students were not included in our sample. Expanding the scope to encompass a more diverse set of health science students in future research may offer a more comprehensive understanding of the issue at hand.

These limitations should be taken into account when interpreting the results and implications of our study, and they open avenues for further research to build upon and address these areas of concern.

CONCLUSION

In conclusion, our study provides compelling evidence that prolonged mobile phone usage has a discernible impact on cervical ROM, resulting in the manifestation of pain and stiffness in the neck region. These findings underscore the inherent risk factors associated with extended mobile phone use and the subsequent development of complications in cervical health.

The implications of our research are clear: a prudent approach to mitigate these risk factors and their related complications lies in the reduction of mobile phone usage duration. By adopting responsible and well-informed mobile phone practices, individuals can proactively safeguard their cervical well-being and, in doing so, reduce the likelihood of encountering musculoskeletal challenges.

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