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PREVALENCE OF SCREEN EXPOSURE AND MUSCULOSKELETAL RELATED SYMPTOMS AMONG TEENAGERS.

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Abstract

Introduction: This article discusses the association between high screen time and musculoskeletal symptoms in adolescents. The prevalence of musculoskeletal symptoms among adolescents is high, and the symptoms can cause physical discomfort and functional limitations, affecting the overall quality of life. The aim of the study was to determine the prevalence of screen exposure and musculoskeletal related symptoms among teenagers **Methods:** The cross sectional survey based study was conducted in Hyderabad, Pakistan, with a sample of 200 participants aged between 13 to 19 years, engaged in screen-based activities for at least 2 hours per day. Duration of study was 4month from Sept 2023 to January 2023. The musculoskeletal symptoms were assessed using a standardized questionnaire, the Nordic Musculoskeletal Questionnaire (NMQ). Data was analyzed through SPSS ver 23. **Results:** The study finds that the majority of participants spend between 6 to 9 hours per day engaged in screen-based activities. Specifically, 30.5% of participants spend 8 hours per day on electronic devices, while 28% spend 9 hours per day. The highest screen exposure reported is 9 hours per day, with 56 participants (28%) exceeding this threshold. The prevalence of musculoskeletal symptoms is found to be high in the neck (42%), followed by the lower back (29%), and wrist (14.5%). **Conclusion:** The study concludes that high screen time is associated with musculoskeletal symptoms in adolescents, highlighting the importance of reducing screen time and promoting physical activity.

Keywords: Musculoskeletal, Prevalence, Screen exposure, Teenagers

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How to cite this article: Rathi H¹, Anis PT T², Latif FA³, Sheikh B⁴, Memon AG⁵, Shah S⁶. **PREVALENCE OF SCREEN EXPOSURE AND MUSCULOSKELETAL RELATED SYMPTOMS AMONG TEENAGERS.** JPUMHS; 2023: 13:01, 172-178 <http://doi.org/10.46536/jpumhs/2023/13.01.402>

Received february 10, 2023, Accepted On 25 March 2023, Published On 31 March 2023.



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INTRODUCTION

Adolescents spend a significant amount of time engaging in screen-based activities, including but not limited to watching television, using computers, smartphones, and gaming devices. This has become a cause of concern, as several studies have reported that high levels of screen time are associated with various musculoskeletal symptoms^{1,2}. These symptoms can cause physical discomfort and functional limitations, affecting the overall quality of life³. Musculoskeletal symptoms can occur due to a variety of reasons, including sedentary behavior, lack of physical activity, prolonged sitting or standing, and poor posture⁴. These factors can contribute to the development of musculoskeletal symptoms, particularly in the upper extremities, lower back, and neck⁵.

The prevalence of musculoskeletal symptoms among adolescents is high, with several studies reporting rates ranging from 10% to 70%^{6,7}. For instance, a study is reported that 68% of Finnish adolescents experienced musculoskeletal symptoms at least once a week, with neck and shoulder pain being the most commonly reported symptoms⁸. Similar results were reported by Smith et al. in a sample of American college students, where 62% of participants reported musculoskeletal pain related to mobile device use⁹. In addition, a recent study conducted in India reported that the prevalence of musculoskeletal symptoms was higher among adolescents who spent more time on screens than those who did not¹⁰.

Epidemiological data also supports the association between screen time and musculoskeletal symptoms among adolescents. A systematic review and meta-analysis revealed that higher levels of screen time were positively associated with musculoskeletal symptoms in Chinese adolescents¹¹. Similarly, a study suggested that increased screen time was associated with a higher likelihood of musculoskeletal symptoms among a sample of Brazilian adolescents¹². Other studies have also reported similar findings in different populations^{13,14}.

METHODOLOGY

The study was a cross-sectional survey conducted in Hyderabad from September 2022 to January 2023. The sampling technique used was convenience sampling, and the sample size was determined using Raosoft software, which estimated a sample size of 200 based on a margin of error of 5% and a confidence level of 95%.

Participants were recruited from schools and colleges in Hyderabad. Inclusion criteria for participants were aged between 13 to 19 years and engaged in screen-based activities for at least 2 hours per day. Participants who reported a history of musculoskeletal disorders or injuries were excluded from the study.

Data collection was carried out through a self-administered questionnaire, which consisted of two parts. The first part contained questions on demographic information, screen time, and musculoskeletal symptoms. The second part

consisted of questions related to posture, physical activity, and other lifestyle factors that could affect musculoskeletal symptoms. The musculoskeletal symptoms were assessed using a standardized questionnaire, the Nordic Musculoskeletal Questionnaire (NMQ). The NMQ is a reliable and valid tool for assessing musculoskeletal symptoms and is widely used in epidemiological studies.¹⁵ The questionnaire included questions about the prevalence, frequency, and severity of musculoskeletal symptoms in various body regions.

Data were analyzed using statistical software, and descriptive statistics were used to summarize the demographic characteristics of the participants.

Ethical approval for the study was obtained from the institutional review board, and informed consent was obtained from all participants or their legal guardians.

Confidentiality and anonymity were ensured throughout the study.

RESULTS

The study examined the age distribution of the sample, with a total of 200 participants included in the analysis. The sample ranged in age from 12 to 19 years, with a mean age of 16.2 years. The majority of the participants (64%) were between the ages of 15 and 19 years, with the most common age being 19 years (21.5% of the sample). Participants aged 12 and 13 years constituted a smaller proportion of the sample (4% and 7.5%, respectively), while those aged 14 to 18 years comprised between 7% and 16.5% of the sample. These findings suggest that the study population was predominantly composed of late adolescents, with a smaller proportion of early adolescents included in the sample.

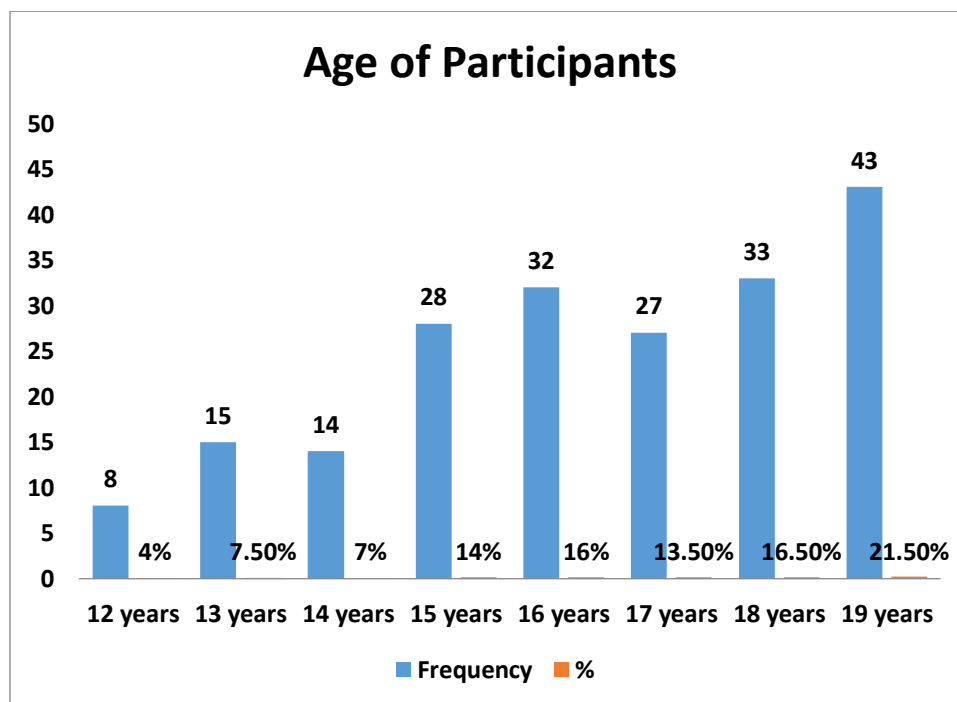


Figure 1: Participant age distribution

Table 2: Screen Exposure per day

Hours	Frequency	Percentage
3 hours	5	2.5%
4 hours	11	5.5%
5 hours	17	8.5%
6 hours	26	13%
7 hours	24	12%
8 hours	61	30.5%
9 hours	56	28%

Table 2 presents the screen exposure of participants in the study, indicating the number of hours per day spent on electronic devices. The results show that the majority of participants spent between 6 to 9 hours per day engaged in screen-based activities. Specifically, 30.5% of participants spent 8 hours per day on electronic devices, while 28% spent 9 hours per day. A smaller proportion of participants spent less time on

screens, with only 5 individuals (2.5%) reporting 3 hours per day, 11 (5.5%) reporting 4 hours per day, and 17 (8.5%) reporting 5 hours per day. The highest screen exposure reported was 9 hours per day, with 56 participants (28%) exceeding this threshold. These findings suggest that screen time is a common and potentially significant contributor to the daily routine of participants in this study.

Table 3: Incidence of Musculoskeletal problems reported within the past year

Hours	Frequency	Percentage
Neck	84	42%
Shoulder	06	3%
Elbow	10	5%
Wrist	29	14.5%
Lower Back	64	32%
Hip	02	1%
Knee	02	1%
Ankle	03	1.5%

The musculoskeletal symptoms experienced by the participants in the study are presented in above Table. The results show that the most commonly reported symptom was neck pain, with 84 participants (42%) experiencing this type of discomfort. Lower back pain was the second most commonly reported symptom, with 64 participants (32%) reporting this issue. Wrist pain was experienced by 29 participants (14.5%),

while elbow pain was reported by 10 participants (5%). A smaller proportion of participants reported experiencing shoulder pain (6 participants, 3%), ankle pain (3 participants, 1.5%), or hip pain (2 participants, 1%). These findings suggest that neck and lower back pain are the most prevalent musculoskeletal symptoms experienced by adolescents in this study, with wrist and elbow pain also being

reported by a significant number of participants.

DISCUSSION

The study aimed to investigate the relationship between screen time and musculoskeletal symptoms in adolescents. The analysis results revealed that the majority of participants spent between 6 to 9 hours per day engaged in screen-based activities. This finding is consistent with previous research indicating that high levels of screen time are common among adolescents.¹⁶ The prevalence of neck and lower back pain was also high, with 42% and 32% of participants reporting these symptoms, respectively. Wrist and elbow pain were reported by a significant number of participants as well, indicating that upper extremity symptoms are also a concern for this population.

The observed relationship between screen time and musculoskeletal symptoms is consistent with prior research.¹⁷ Another study found that screen time was positively associated with musculoskeletal symptoms in Chinese adolescents. The authors also found that the duration of screen time and the frequency of breaks during screen time were both significant predictors of musculoskeletal symptoms.¹⁸ Similarly, a study found that high levels of screen time were associated with a greater likelihood of experiencing musculoskeletal symptoms in Indian adolescents.¹⁹ The authors suggest that this association may be due to the fact that screen-based activities are typically performed in a seated position, which can lead to poor posture and increased stress on the musculoskeletal system. The repetitive movements and sustained postures required by many screen-based activities, such as texting and gaming, can lead to musculoskeletal strain and discomfort. Moreover, the lack of physical activity associated with screen time may contribute

to the development of musculoskeletal symptoms in adolescents.²⁰

Another study found that frequent use of mobile devices was associated with an increased risk of musculoskeletal pain in a sample of American college students. The authors suggest that this may be due to the fact that mobile devices are often used in non-ergonomic postures, which can lead to musculoskeletal strain and discomfort.²¹

The study findings have important implications for healthcare providers, educators, and parents. The high prevalence of musculoskeletal symptoms among adolescents highlights the need for increased awareness of these issues and early intervention strategies. Strategies to reduce screen time, such as educational programs, may also be beneficial for reducing the risk of musculoskeletal symptoms in this population. Moreover, interventions aimed at increasing physical activity and promoting good posture and ergonomic practices during screen time may help reduce the incidence of musculoskeletal symptoms in adolescents.

CONCLUSION

In conclusion, this study highlights the concerning prevalence of musculoskeletal symptoms in adolescents and their relationship with screen time. The results suggest that high levels of screen time are common among adolescents and may contribute to the development of musculoskeletal symptoms, such as neck, lower back, wrist, and elbow pain.

Consent to Participate: written and verbal consent was taken from subjects and next of kin

Funding: The work was not financially supported by any organization. The entire expense was taken by the authors

Acknowledgements: We are thankful to all who were involved in our study.

Authors' Contributions: All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

Conflict Of Interest: No competing interest declared.

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