



Relationship Between Screen Time, Physical Activity And Multidimensional Fatigue Among School Children From Pune City

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ABSTRACT

The present study aimed to examine the relationship between screen time, physical activity, and multidimensional fatigue among school children in Pune city. The target population consisted of children aged 8 to 12 years. A total of five CBSE schools from Pune were selected, and 40 students from each school were chosen using a convenience sampling method, resulting in a total sample size of 200 participants. Standardized questionnaires were used to assess screen time, physical activity, and multidimensional fatigue among the participants. Descriptive statistics revealed that the mean score of screen time was 10.91 (SD = 7.018), physical activity was 3.44 (SD = 0.861), and multidimensional fatigue was 38.33 (SD = 11.438). Pearson's correlation analysis was applied to determine the relationship among the variables. The results indicated a significant negative correlation between screen time and physical activity ($r = -0.475$, $p < 0.01$), suggesting that higher screen time is associated with lower levels of physical activity among children. Furthermore, a significant positive correlation was found between screen time and multidimensional fatigue ($r = 0.497$, $p < 0.01$), indicating that increased screen exposure is associated with higher fatigue levels. Additionally, a significant negative correlation was observed between physical activity and multidimensional fatigue ($r = -0.447$, $p < 0.01$), implying that children who engage in higher levels of physical activity tend to experience lower fatigue. The findings of the study highlight the adverse impact of excessive screen time and the beneficial role of physical activity in managing fatigue among school children. Increased physical activity is associated with improved energy levels, better sleep quality, and reduced physical and mental fatigue, whereas prolonged screen time may contribute to fatigue due to sedentary behaviour and sleep disturbances. The results emphasize the importance of promoting active lifestyles and regulating screen



time to enhance the overall health and well-being of children.

Key words: - Screen time, Physical Activity and Multidimensional fatigue.

Introduction

Children's health and well-being represent a critical foundation for optimal physical, cognitive, and psychosocial development, particularly during the formative years of life. This developmental stage is characterized by rapid growth and heightened sensitivity to environmental and behavioural influences, making lifestyle factors especially significant determinants of long-term health outcomes (World Health Organization [WHO], 2020). A balanced lifestyle encompassing adequate physical activity, limited sedentary behaviour, sufficient sleep, and proper nutrition is essential for maintaining overall well-being and preventing early onset of health-related complications. In recent decades, rapid technological advancements have significantly altered children's daily routines, leading to increased engagement with digital devices and a corresponding rise in screen-based sedentary behaviours. Elevated screen time has been consistently associated with reduced levels of physical activity and disruptions in sleep patterns, both of which are fundamental to healthy development (Tremblay et al., 2016). Prolonged sedentary engagement not only compromises physical fitness but is also linked to adverse outcomes such as increased risk of obesity, impaired cognitive functioning, and diminished psychological well-being (Twenge & Campbell, 2018). Furthermore, the interplay between insufficient physical activity, excessive screen exposure, and poor sleep quality contributes to the emergence of multidimensional fatigue, a condition encompassing physical exhaustion, cognitive decline, and emotional dysregulation (Hale & Guan, 2015). These interrelated lifestyle behaviours do not operate in isolation; rather, they form a complex, dynamic system in which changes in one domain can significantly influence others. For instance, increased screen time may displace opportunities for physical activity while simultaneously impairing sleep quality, thereby exacerbating fatigue and reducing overall functional capacity. Given these interconnected relationships, there is a growing need to examine the combined impact of screen time, physical activity, and fatigue on children's health and well-being. Understanding these associations is essential for developing effective interventions and evidence-based guidelines aimed at promoting balanced lifestyle behaviours. Such efforts are crucial not only for enhancing immediate health outcomes but also for fostering long-term well-being and preventing the development of chronic health conditions across the lifespan (WHO, 2020).



Methodology

Method : To study relationship between the screen time, physical activity level and multidimensional fatigue among school children from Pune City. The researcher will adopt the descriptive correlation research method.

Subject : Total 5 CBSC schools will be selected from Pune city, from each school will be selected with the help of convenience sampling method. total 200 will be the sample of this study.

Tools and variables : The study employed three standardized tools to assess key variables. Screen time was measured using the Screen Time Assessment Questionnaire developed by Hardy L. L., Booth M. L., and Okely A. D. (2007), which records time spent on activities such as watching television, using computers, and playing video or mobile games; responses are noted in hours and minutes for weekdays and weekends, and total average daily screen time is calculated, with higher values indicating greater screen exposure and sedentary behaviour. Physical activity was assessed using the Physical Activity Questionnaire (PAQ, 2004), a self-administered instrument consisting of multiple items rated on a 5-point scale (1 = low activity to 5 = high activity); the final score is obtained by averaging all items, where higher scores indicate higher levels of physical activity. Multidimensional fatigue was measured using the Paediatric Quality of Life Inventory (PedsQL) developed by James W. Varni, which includes a multidimensional fatigue scale with items rated on a 5-point Likert scale (0 = never to 4 = almost always); scores are reverse-transformed to a 0–100 scale, where higher scores indicate better functioning and lower fatigue, while lower scores reflect greater fatigue levels.

Procedure : The objective of this research was to identify the relationship between screen time, physical activity, and multidimensional fatigue among school children. Initially, the researcher contacted selected schools in Pune city. However, the school granted permissions to proceed with data collection, hence the study was conducted in 5 schools by visiting in person within a period of 2 weeks. Before administering the questionnaire, the researcher briefed the students on the purpose of the study and the importance of their participation. The data collection was conducted using a pen and paper technique. The researcher explained the set of the questionnaires, after distributing the questionnaire. the students were instructed to carefully read each statement and respond accordingly. Once all the responses were collected, the scoring was done according to the set of norms. Data analysis was performed using descriptive statistics to determine the relationship between screen time, physical activity and multidimensional fatigue among school children.



Results

The data of the present study were collected to examine the relationship between screen time, physical activity, and multidimensional fatigue among school children. A total of 200 school children were selected from various schools in Pune city. Screen time was assessed using a standardized Screen Time Assessment Questionnaire, physical activity levels were measured using the Physical Activity Questionnaire (PAQ), and multidimensional fatigue was evaluated using the Paediatric Quality of Life Inventory (PedsQL) Multidimensional Fatigue Scale. The collected data were analysed using descriptive statistics to determine the mean, standard deviation, and overall trends, as well as inferential statistics to examine the relationships among the selected variables.

Table No. 1 : *Descriptive statistics of screen time, physical Activity and multidimensional fatigue*

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
screentime	200	10.91	.496	7.018
physical activity	200	3.447	.0609	.8616
multidimensional fatigue	200	38.33	.809	11.438
Valid N (listwise)	200			

The table shows the descriptive statistics of screen time, physical activity and multidimensional fatigue among 200 CBSC school children aged 8-12. The number of valid responses for all variables is 200. And there is no missing value. The mean of screen time is 10.91 with a standard deviation of 7.018. the mean of physical activity is 3.447 with standard deviation of 0.8616. the mean score of multidimensional fatigue 38.33 with standard deviation of 11.438.

Table No. 2 : *Inference statistics of screen time, physical Activity and multidimensional fatigue*

Variables	Pearson Correlation	Sig. (2-tailed)
Screen Time	0.497	.00
Physical Activity	-0.475	.00
Multidimensional fatigue	-0.447	.00



The study examined the relationship between screen time, physical activity, and multidimensional fatigue among school children. The correlation between screen time and multidimensional fatigue ($r = 0.497$) shows a moderate positive and significant relationship, indicating that higher screen time is associated with higher levels of fatigue. The correlation between screen time and physical activity ($r = -0.475$) shows a moderate negative and significant relationship, suggesting that increased screen time is associated with lower levels of physical activity among children. Furthermore, the correlation between physical activity and multidimensional fatigue ($r = -0.447$) shows a moderate negative and significant relationship, indicating that higher levels of physical activity are associated with lower fatigue.

Discussion

The present study examined the relationship between screen time, physical activity, and multidimensional fatigue among school children in Pune city. The findings revealed that higher screen time is significantly and positively associated with increased levels of multidimensional fatigue, indicating that children who spend more time on screens tend to experience greater physical, mental, and overall fatigue. In contrast, physical activity showed a significant negative relationship with fatigue, suggesting that children who engage in higher levels of physical activity experience lower fatigue and better overall well-being. Additionally, a significant negative relationship was observed between screen time and physical activity, indicating that increased screen exposure is associated with reduced participation in physical activities. These results highlight that both factors influence children's health, with physical activity playing a protective role against fatigue.

These findings are supported by previous research. For instance, Twenge J.M. (2017) reported that increased screen time is associated with poorer psychological health and higher fatigue levels among adolescents. Similarly, Saunders T.J. et al. (2016) found that excessive sedentary behaviour, including prolonged screen exposure, is linked with negative health outcomes such as fatigue and reduced well-being in children. Furthermore, Janssen I. and LeBlanc A.G. (2010) emphasized that regular physical activity contributes to improved energy levels, better sleep quality, and reduced physical and mental fatigue. These studies are consistent with the present findings and reinforce the importance of maintaining an active lifestyle.

However, some studies present slightly different perspectives. For example, Pearson N. and Biddle S.J.H. (2011) suggested that screen time and physical activity may not always be strongly related, as children can be physically active while still engaging in considerable screen use. While the present study found a significant negative



relationship between these variables, the strength of association may vary depending on lifestyle patterns, type of screen usage, and individual behaviour. Additionally, some research indicates that not all screen time has negative effects, as educational or interactive screen use may have neutral or context-dependent impacts on health.

Overall, the majority of research supports the conclusion that excessive screen time is associated with higher levels of multidimensional fatigue, whereas physical activity plays a crucial role in reducing fatigue and promoting better physical and psychological well-being among children. Therefore, the present study, along with existing literature, emphasizes the need to encourage regular physical activity and regulate screen time among school-aged children to support their overall health and quality of life.

Conclusion

The study concludes that higher screen time is associated with increased multidimensional fatigue among school children, while greater physical activity helps reduce fatigue and improve overall well-being.

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