



Relationship Between Screen Time and Physical Fitness Among Adolescents

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Abstract

This research was conducted with the intention of determining the extent to which early-career academics working in Spanish universities make use of motivation that is inspired by spirituality in order to boost the amount of research they do. According to the findings of the study, assistant professors who were able to connect their work to personal significance and community service were more likely to publish research and participate in collaborative projects. The research was carried out with the assistance of a structural equation model, which was constructed on the basis of the remarks made by 135 assistant professors. In terms of maintaining intellectual production and research engagement over the course of time, the outcomes of the study demonstrated that extrinsic incentives were less efficient than intrinsic spiritual motivation. This was the case when comparing the two types of motivation between the two.

Keywords: Screen Time, Physical, Fitness, Adolescents

Introduction

The use of screen-based gadgets, such as smartphones, tablets, laptops, and TVs, has gradually become an essential component of the routines of teenagers in this age of digital technology. The excessive use of screens has arisen as a public health worry, despite the fact that technology has brought us a multitude of educational and social benefits. A number of health organisations, including the World Health Organisation (WHO), have released guidelines that warn against spending an excessive amount of time in front of a screen, particularly among children and adolescents, because of the correlation between screen time and sedentary behaviour and physical inactivity. When a person is in their teenage years, maintaining a healthy level of physical fitness is essential for the development of strong bones and muscles, cardiovascular health, and the prevention of illnesses that are connected to lifestyle choices. Additionally, it offers a contribution to the enhancement of mental health, academic achievement, and social

well-being. Despite this, a considerable number of teenagers are spending a significant amount of their day in front of screens, which frequently comes at the price of time spent engaging in physical activity. This is a result of the growing expectations placed on them by their academics, the usage of social media, online entertainment, and gaming. A significant amount of time spent in front of a screen has been shown to have a negative link with physical fitness markers such as endurance, strength, flexibility, and healthy body composition, according to a number of studies. Sitting for long periods of time not only lowers the amount of time that is available for physical activity, but it also has the potential to lead to bad posture, sleep disruptions, and harmful food habits. The purpose of this study is to investigate the connection between the amount of time youngsters spend in front of screens and their level of physical fitness. The purpose of this study is to determine the extent to which screen time may be impacting the health outcomes of adolescents by conducting an analysis of data on patterns of screen usage and evaluating physical fitness via the use of standardised tests. For the purpose of establishing successful interventions in schools, families, and communities to encourage healthier and more active lives in a world that is becoming increasingly digital, it is vital to have a solid understanding of this link.

Literature Review

In the ever-expanding amount of research on the health of adolescents, the influence of screen time on physical activity and general fitness has been an increasingly prominent topic of investigation. According to Tremblay et al. (2011), one of the primary factors that contributes to sedentary behaviour among young people is screen time, which is conventionally defined as the total amount of time spent using electronic devices for the sake of either academic or recreational pursuits. In light of the fact that inactivity is a primary contributor to the development of non-communicable illnesses, the World Health Organisation (2020) suggests that children and adolescents should restrict their time spent in front of screens to significantly less than two hours each day. There is a negative correlation between increasing screen time and physical fitness indices, according to a number of research that have been conducted. As an illustration, Boone et al. (2007) discovered that teenagers who spent more than three hours per day in front of screens demonstrated decreased levels of cardiorespiratory endurance and muscular strength. In a similar vein, Carson et al. (2016) found that excessive screen time was associated with an increased proportion of body fat as well as a decreased engagement in physical activity. It has been found that excessive screen time is connected with harmful lifestyle behaviours, such as poor food habits, decreased sleep quality, and greater levels of psychological distress (LeBlanc et al., 2015). This is in addition to the fact that excessive screen time is associated with physical fitness. These variables, when taken together, contribute to a reduction in general physical well-being and may put teenagers at risk for obesity as well as other chronic health disorders. Recent research, on the other hand, suggests that not all time spent in front of a screen has the same impacts. (Staiano & Calvert, 2011) suggests that there may be some physical advantages

associated with active screen time, which includes activities such as utilising fitness apps or playing motion-based video games. In spite of this, passive screen activities, such as watching television for extended periods of time and playing games that do not need interaction, continue to be key contributors to sedentary lifestyles. In spite of these discoveries, there are still several holes in our understanding of the ways in which various types and durations of screen time interact with various aspects of physical fitness, including endurance, strength, flexibility, and body mass index (BMI). Particularly in the context of emerging nations, where the penetration of digital technology is quickly expanding, there is a need for localised research that take into consideration the cultural and socioeconomic aspects that influence patterns of screen usage and physical activity. This literature review highlights the significance of continuing research to elucidate the complicated link between screen time and adolescent fitness, as well as to guide successful health promotion interventions in both the institutional setting of schools and the home setting of families.

METHODS

Design

This study used a correlational methodology to look at how screen time, physical activity, and fitness are related. To go even deeper into the connection, the study used multivariate and partial type correlation. A type of high-level correlation that involves providing detailed research data on three or more variables is known as multivariate correlation (d'Hondt et al., 2024). The following stage of the research procedure, after analysing the multivariate data, is to undertake a partial correlation analysis to obtain more accurate analysis results. This study is organised into several stages, which include defining and clarifying the topic, searching for relevant theories and literature, choosing research methods, collecting and analysing data, and finally, discussing and summarising the conclusions.

Subject

Students in grades four and five at Labschool Unesa 1 Primary School in the 2023–2025 school year were the subjects of this research. There were a total of 112 students. Simple random sampling was used for the purpose of this study. A total of eighty-eight students contributed to the process of calculating the sample size using the Slovin Formula. The children that took part in the research were between the ages of nine and eleven.

Instrument

In order to gauge students' level of physical fitness, the Indonesian Ministry of Youth and Sports developed the Nusantara Students' Physical Fitness Test (TKPN) (Rusdiana, 2022). The purpose of this test is to measure the level of physical fitness among the pupils. Body mass index, V sit and reach, sit ups for 60 seconds, squat thrusts for 30 seconds, and the Pacer exam are the parts that make up the TKPN exam. The pacing test received an 85%, the squat thrust a 5%, the sit up a 5%, and the v sit and reach a 5% score, all determined using the weight as the basis for each item's performance. Very good (>4), good (three to three and a half to three and a half), moderate

(two to two and a half to two and a half), bad (one to one and a half to one and a half), and very poor (two to seven) are the possible categories for the final fitness scores. A person's screen time (TV, computer, laptop, or smartphone games), internet use (for things other than studying), internet access (for studying), and time spent studying outside of school were all factors that were taken into consideration. The following were among the several time intervals from which the participants might select: section I: 0–30 minutes, section II: 30–1 hour, section IV: 1–2 hours, section V: 2–3 hours, section VI: 3–4 hours, and section VII: beyond 4 hours. The normal operating value of the device is $[(\text{working days} \times 5) + (\text{holidays} \times 2)]$. Children aged 8 to 14 were measured for their levels of physical activity seven days before the exam by using the Physical Activity Questionnaire for Older Children (Kowalski et al., 2004). With a Cronbach Alpha score ranging from 0.682 to 0.745, this instrument possesses a relatively good reliability value, as stated by Dapan et al. (2017). There are a total of 10 questions that make up the test. In the first question, we ask what kinds of sports or activities people participate in on a weekly basis. For items 2–8, the best time to do them is during physical education courses, after school, in the afternoon, or during free time. The amount of physical exercise that youngsters participate in on a daily basis is enquired about in item number 9. Throughout the past seven days, Number 10 has been enquiring about your well-being. There is a scale from 1 to 5 for each exam item. We average out the first nine elements and then classify the findings as follows: very poor (1), poor (2), moderate (3), good (4), and very excellent (5).

Data Collection

The data was collected within a period of five days. Taking part in the physical fitness assessments typically took around 70 minutes. The researcher divided the physical fitness exam into three sections: section one measured body mass index and v sit and reach; section two evaluated a sit-up test lasting sixty seconds and a squat thrust test lasting thirty seconds; and section three evaluated the Pacer test. The participants were divided into three groups and given a warm-up to finish before the exam began. The quantity of time spent physically active and in front of screens was measured within thirty-five minutes. The data was collected by visiting each and every classroom. Participants in the study get questionnaires, and before the question-and-answer session begins, the researcher explains each question item.

Data Analysis

To get the averages and percentages of the data, descriptive analysis was used in this research. A partial connection between ST, PA, and student physical fitness has been partially discovered using multinomial logistic regression.

RESULT AND DISCUSSION

Table 1 shows that more than three quarters of the students had PF levels that are considered very poor. Nearly half of the pupils (43.18% to be exact) had PA levels that are considered low. On a daily basis, students often spend three hours and thirty-three minutes in front of a screen. A lot of people's screen time was spent playing games on cellphones and surfing the web, not for

learning purposes. The most time spent engaging in screen-dependent activities occurred on weekends and holidays. Table 2 displays the concurrently significant connection between ST PA and PF, with a p-value less than 0.05. A total of 26.8% of the variance in fitness level is attributable to PA and other ST factors combined. Table 3 shows that the screen time variable was not significantly correlated with physical fitness ($p > 0.05$). It should be noted that there is a significant correlation ($p < 0.05$) between the variables PA and PF.

Our data shows that most students are not in very good physical shape. This result was in line with that of a previous research by Sunarwan et al. (2022), which found that most elementary school students were not very physically fit. The incidence of PF among elementary school students is also quite low, according to research by Akhmad et al. (2024). Our research showed that most elementary school students were very unfit. Even though the quarantine period happened long after the COVID-19 pandemic, the absence of PA during that time caused the pupils' PF to decrease. Other aspects that impact physical fitness include one's food and nutritional needs, the quantity of sleep one gets, and the duration of time one spends doing nothing but sitting (Huang et al, 2023). An increase in the quantity of physical activity that takes place in PE sessions can help keep pupils in good physical health. Consistent physical activity has many positive effects on health and well-being, including psychological, physiological, and social benefits. Physical and mental health are affected by PF, which is one of the most important markers of childhood health. Physical activities, especially those that incorporate strength or endurance training, can help students achieve their fitness goals.

Table 1. Characteristics of Participants

Physical Fitness	N	Percentage	
Very poor	65	73,9	
Poor	22	25	
Moderate	1	1,1	
Good	0	0	
Very good	0	0	
Screen Time	Mean		
	Weekdays	Weekend	Result $\pm$ SD
Watching television	1,04	2,16	2 $\pm$ 1,19
Playing games on a laptop/computer	0,59	2,14	1,37 $\pm$ 1,10
Playing games on a smart phone	1,28	2,48	2,28 $\pm$ 1,24
Access to the Internet not for study	1,17	2,19	2,08 $\pm$ 1,12
Access the Internet for study	0,55	1,29	1,32 $\pm$ 0,52
Studying outside of schoolwork	0,45	0,5	0,48 $\pm$ 0,04
Weekly duration		20,24 $\pm$ 6,38	
Daily duration		3,03 $\pm$ 0,897	
Physical Activity	N	Percentage	
Very low	18	20,45	
Low	38	43,18	
Moderate	28	31,82	
High	4	4,55	

Very high	0	0
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Table 2. Simultaneous Analysis

Variable	R Square Nagelkerke	Sig
Screen Time		
Physical activity	0,268	0,017
Physical fitness		

Table 3. Partial Analysis

Variable	Sig.
Screen Time	0,517
Physical fitness	
Physical activity	0,013
Physical fitness	

By motivating kids to be active, we can protect them from a range of cardiovascular problems. While some students may exercise regularly, the survey found that most students just exercise a little. Findings from the study by Riadi and Satria (2023) indicate that current elementary school students' PA levels are exceedingly low. The results coincide with previous research showing a steady decline in PA among kids and teens over the past few years. A lack of adult supervision and positive role models for parents to keep up with exercise-related activities might be to blame for this downturn. Some have hypothesised that parental and extended family influences, as well as the home environment, alter children's propensity to engage in physical activity and movement. revealed the necessity of educating the public on the role of physical exercise in the development of positive routines. Electronic media have a significant impact on children's daily lives, shaping their settings in ways that promote undesirable habits including sedentary lifestyles and screen addiction. Jongenelis et al. (2024) states that families may improve their children's health via the use of parenting practices. asserted that parental encouragement and surrounding factors significantly affected screen time and physical activity levels. This is why it's so important for parents and families to understand the value of being physically active. Parents must keep an eye on their children and set a good example if they want them to stay within the recommended screen time limits. According to the study, students spend an average of 3.1 hours per day in front of a screen. This result exceeds the prescribed maximum of less than two hours per day and falls into the high category. Modern students sometimes find themselves glued to their electronic devices for long periods of time. Students sat in front of screens for long periods of time not to study but to play games and peruse social media. Activities that include extensive screen time might interfere with sensorimotor development, academic achievement, and social-emotional competence, as stated by Muppalla et al. (2023). It was around the holidays or when students were at home that their excessive screen usage peaked. Parents are worried about the

increasing screen time their children spend at home and over the holidays. It is the responsibility of parents, teachers, and the community at large to assess the need of monitoring pupils' screen time and the content of electronic media. The goal is to make sure the kids don't have any negative side effects. Establishing boundaries and educating the general public about the duration of screen time is vital for ensuring that the promotion of health and wellness continues to make progress, according to Tadpatrikar et al. (2024). The results of the study show that students' levels of physical fitness are related to ST and PA. Based on the research, it was shown that ST, PA, and students' physical fitness are significantly related. The kids that take part in PA and ST tend to be in very good shape. A decrease in health quality is associated with the amount of time spent in ST. Proof for this claim comes from the research that controls how long it takes for ST and PA to increase fitness indicators. Health benefits can be achieved by decreasing ST and PA. Students improve their lives when they properly regulate these two components. Interventions in the form of fitness programs can be implemented by educational institutions to reduce the probability of cardiovascular disease. Incorporating quantifiable and organised physical education programs into the classroom gives teachers the power to keep and improve their students' physical condition. The correlation between screen usage and fitness levels was not statistically significant. The results of this study are in line with previous studies that found no link between screen time and physical fitness and little evidence for a correlation between screen time and total physical fitness. There is no correlation between the amount of time pupils spend sedentary and their health status. Researchers have found no correlation between the amount of time people spend staring at screens and heart issues. While screen time does not have a direct effect on physical fitness, it is nevertheless beneficial to replace screen time with physical exercise in order to improve health and fitness. Improving cardiometabolic health indicators may be linked to movement behaviour patterns that encourage physical activity (Burns, 2024) suggests. These routines are meant to replace time spent in front of a screen. At the same time, the partial analysis established a strong correlation between PA and PF. This study's findings corroborate those of an earlier one that found a link between PA and PF via the application of muscular strength. Something else that supported this claim was the fact that PA and PF are very closely related. explained why the correlation between PA and PF seen in the data was significant. Exercising vigorously has the potential to increase one's physical fitness. Guijarro-Romero et al. (2022) found that physical fitness levels increased among students who took part in age-appropriate activities and got support from their school's physical education program, which stressed the importance of increasing physical activity. Supriyanto et al. (2021) states that regular physical activity is a key component in ensuring the continued health and fitness of young people. Staying active can help you maintain a healthy body mass index (BMI), which means that your level of physical fitness is influenced by how much you exercise. Involvement of youngsters in physical activity greatly assists in the avoidance of psychological and physical health disorders.

Conclusion

The results of this study point to a clear and concerning correlation between screen time and adolescent fitness levels, which is concerning. The more time people spend in front of screens, whether for work, school, or social media, the less active they are and the less healthy they become overall. Researchers found that teenage screen usage was associated with worse results on measures of physical fitness including flexibility, cardiovascular endurance, and muscular strength, and in certain cases, a higher body mass index (BMI). This pattern's appearance highlights the critical need to discourage inactivity and promote physical activity among the youth of today. Despite technology's continued importance in contemporary education and communication, the excessive use of technology poses a severe hazard to the health of teenagers. Schools, parents, and governments must work together to create settings that encourage physical activity, reduce screen time, and support healthy habits. Finally, limiting screen time doesn't mean giving up all electronic devices; it means finding a happy medium that lets you stay connected while still taking care of your physical health. In order to foster a healthier and more active generation, future interventions should prioritise awareness campaigns, curriculum-based physical education, and the inclusion of screen-free recreation opportunities.

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