

Exploring the Relationship between Screen Time and Physical Activity among Secondary School Students

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ABSTRACT

This study explores the relationship between screen use and physical activity among 15-year-old secondary school students at SMK USJ 4. The main goal is to investigate the impact of different types and periods of screen time, spanning educational purposes to leisure activities like social networking and gaming, on students' physical activity levels. A carefully selected group of 150 students took part in surveys evaluating their daily screen time and physical activity routines. Data was gathered using self-reported questionnaires and examined with Pearson's correlation method to assess the strength and direction of the relationship between the two variables. Initial results show a weak to moderate opposite relationship between screen time and physical activity, implying that increased screen use could adversely impact physical activity levels. Nonetheless, the relationship shows significant variability, reflecting the impact of mediating factors like individual motivation, socioeconomic background, and the accessibility of physical education programs in schools. This analysis offers important perspectives for educators and policymakers in crafting specific strategies to encourage physical activity in the context of rising screen time. Conducting additional studies to explore long-term impacts and possible underlying processes is advisable.

Keywords: screen time; physical activity; secondary school students; individual motivation; educators

INTRODUCTION

The growing presence of screen-based technologies in modern society has notably impacted the daily habits of secondary school students, leading to worries regarding the implications of prolonged screen time on their physical activity levels. As smartphones, tablets, computers, and televisions become increasingly prevalent, students engage with screens for extended durations, whether for leisure activities like gaming, social media, and watching TV or for their educational pursuits. The transition to screen-focused activities has resulted in a more sedentary way of living, marked by fewer chances for physical activity. Consequently, there is increasing worry regarding the potential effects of these lifestyle changes on the physical health and well-being of adolescents, especially concerning their participation in moderate-to-vigorous physical activity (MVPA), which is recognized for its various health advantages, such as enhanced cardiovascular fitness, muscular strength, and bone health (Duncan et al., 2012).

Engaging in physical activity is crucial for the healthy development of adolescents, fostering both their physical and mental wellness. Consistent engagement in physical activity during the teenage years is associated with lower levels of stress, anxiety, and depression, resulting in improved mental health outcomes (Duncan et al., 2012). While these advantages exist, investigations indicate a negative relationship between screen time and physical activity levels, as heightened screen usage tends to replace the essential time that might be devoted to engaging in physical pursuits. Additional studies have shown that prolonged screen exposure may promote inactive lifestyles, which can carry over into later life, consequently heightening the likelihood of obesity, heart-related issues, and musculoskeletal problems (Sampasa-Kanyinga et al., 2019). Considering the significance of physical activity for the health of adolescents, it is essential to investigate the impact of increasing screen time on this important behaviour.

Prolonged screen exposure, especially through sedentary activities such as watching television and playing video games, is frequently linked to negative health effects. Such activities restrict the chances for physical activity and could also encourage detrimental habits, including unhealthy eating and irregular sleep schedules. Young individuals who spend too much time in front of screens tend to experience lower sleep quality, which impacts their energy and willingness to engage in physical activities (Davies et al., 2012). The persistent presence of captivating content, including advertisements and social media, can diminish the motivation to participate in physical activities, leading to a continuous cycle of inactivity. The transition to more sedentary lifestyles is linked to decreased physical activity, as digital media encourages engagement in more passive entertainment options.

Alongside the direct impacts of screen time on physical activity, it is essential to consider various mediating factors, such as socioeconomic background, school-based physical education programs, and personal motivation. Socioeconomic status significantly influences adolescents' access to technology and their opportunities for physical activity (Rideout & Robb, 2019). Furthermore, physical education programs in schools have the potential to either reduce or increase the impacts of screen time, contingent upon their effectiveness in encouraging active lifestyles. The influence of personal motivation and individual attitudes towards physical activity and screen use can shape the effects of screen time on physical activity levels. This analysis aims to clarify the complex relationships between screen usage, physical activity, and other significant factors.

This study aims to enhance the current understanding by examining the connection between screen time and physical activity in secondary school students. By employing quantitative data, such as self-reported screen time and physical activity levels, alongside examining mediating factors, this study aims to offer significant insights into the impact of screen time on adolescents' physical and mental health. The findings will guide the development of informed strategies to foster better screen habits and promote physical activity. The insights gained from this study will serve as valuable resources for educators, parents, and policymakers as they develop strategies aimed at enhancing the health and well-being of adolescents in today's digital landscape (Bucksch et al., 2020; Carson et al., 2016; Houghton et al., 2015; Ng et al., 2012; Orben et al., 2019; Twenge et al., 2018).

METHODOLOGY

The subjects of this study are fifteen-year-old secondary school students from SMK USJ 4, Selangor. The total population of SMK USJ 4 consists of 180 individuals. Focusing on 15-year-olds allows for a study of a group that experiences comparable stages of growth and development. This study employed a random sampling method to gather respondents, as this design facilitated the collection of data from individuals who were readily available to participate. Participants who met the inclusion criteria were required to have their parents complete the ASSENT form before taking part in the study. The information sheet for participants was included with the questionnaire to clarify the study's objectives. Approval for ethical considerations has been secured from UiTM's Research Ethics Committee.

The study's defined criteria for selecting students from SMK USJ 4 as participants were followed. The samples were selected due to the diverse extracurricular activities and educational

programs offered at SMK USJ 4, which influence student lifestyles and create an ideal setting to explore the connection between screen time and physical activity. The questionnaires have been divided into four parts, labeled as sections A, B, C, and D. Section A focused on gathering the demographic profiles of the respondents, encompassing variables like age and gender. The respondent's screen time status is established through the nine items found in Section B of the questionnaire. Section C comprises a total of six elements to determine the physical activities. In the final segment, section D, an open-ended question allows participants to share their thoughts on the time they dedicate to physical activities versus screen time. This investigation utilized a meticulously designed questionnaire to collect data on participants' demographic traits, screen time behaviors, physical activity levels, and personal perceptions. The questionnaire was meticulously designed to align with the study's goals, incorporating insights from prior literature and expert input. The pilot testing phase validated the tool's clarity and reliability, ensuring that ethical considerations were meticulously followed.

The analysis of data in this study utilized the Statistical Package for the Social Sciences (SPSS) version 28.0 for Windows.

RESULTS

Demographic data

Table 1 shows a balanced gender distribution among students. 79 (52.7%) of the 150 pupils are male and 71 (47.3%) are female. The six classes are evenly distributed, with 3A (26.0%) and 3M (24.7%) having the biggest percentages and 3T (5.3%) the smallest. Racial variety is evident, with Malays (40.7%) and Chinese (39.3%) as the majority and Indians (20.0%) as the minority. Most parents (38.6%) have a diploma or degree, while a sizable number have master's (13.3%) or PhD (12.0%) degrees.

Table 1. Descriptive table of demographic.

Demographic		N	%
Gender	Male	79	52.7 %
	Female	71	47.3 %
Class	3UA	23	15.3 %
	3S	19	12.7 %
	3M	37	24.7 %
	3A	39	26.0 %
	3R	24	16.0 %
	3T	8	5.3 %
Race	Malay	61	40.7 %
	Chinese	59	39.3 %
	Indian	30	20.0 %
Parents Academic Qualification	PMR	11	7.3 %
	SPM	28	18.7 %
	STPM	15	10.0 %
	DIPLOMA	29	19.3 %
	DEGREE	29	19.3 %
	MASTER	20	13.3 %
	PHD	18	12.0 %

What is the potential effect of screen time among secondary school students?

Table 2. Descriptive of screen time activity (N=150).

ITEM	Very Rarely		Rarely		Sometimes		Often		Very Often	
	n	%	n	%	n	%	n	%	n	%
Watching TV Shows or Movies	26	17.3%	26	17.3%	40	26.7%	35	23.3%	23	15.3%

Table 2. (continued).

Playing Video Games	28	18.7%	37	24.7%	32	21.3%	28	18.7%	25	16.7%
Using Social Media Platforms	13	8.7%	31	20.7%	30	20%	44	29.3%	32	21.3%
Surfing the Internet	20	13.3%	35	23.3%	36	24%	34	22.7%	25	16.7%
Online Chatting or Messaging	10	6.7%	31	20.7%	25	16.7%	51	34%	33	22%
School Work	17	11.3%	29	19.3%	36	24%	43	28.7%	25	16.7%

Table 2 presents a descriptive analysis of screen time activities and demonstrates strong trends in students' use of digital gadgets. 34% of students say they "often," and 22% say they "very often" engage in online chatting or messaging, the most prevalent activity, showing this group's reliance on digital communication. Social media is also common, with 29.3% saying "often" and 21.3% saying "very often," making it a major part of their screen time. Students' choices for viewing TV shows or movies and browsing the internet were varied, as they were evenly dispersed across all frequency levels. Most students (24.7% "rarely," 21.3% "sometimes") said they play video games less than other screen activities. However, homework accounts for a large part of screen time, with 28.7% of students indicating they use it "often" and 24% saying they use it "sometimes." These trends show that social media and online messaging are the leading screen time sources, which may affect physical activity and mental health. The number of activities like gaming and TV viewing, as well as the essential part that educational screen use plays, stresses the need for greater study into how these behaviors influence physical health, academic success, and general lifestyle balance.

What is the factor effect physical activity status among secondary school students?

Table 3. Descriptive of screen time activity.

Do you feel that your screen time affects your participation in physical activity?				
	n	%	Mean	SD
Yes	69	46%		
No	36	24%		
Not Sure	45	30%		
Total	150	100%	1.84	0.86
Are there factor that prevent you from being more physically active, such as lack of access, time constraints or other commitment.				
	n	%	Mean	SD
Lack of access to facilities	26	17.3%		
Time constraints	49	32.7%		
Other commitment	52	34.7%		
No specific factors	23	15.3%		
Total	150	100%	2.48	1.044

Table 3. (continued).

Do you find it challenging to balance your screen time with physical activity and if so, why?				
	n	%	Mean	SD
Yes, due to schoolwork	26	17.3%		
Yes, due to social commitments	41	27.3%		
Yes, due to lack of motivation	49	32.7%		
No, I don't find it challenging	34	22.7%		
Total	150	100%	2.61	1.023

Table 3 presents the descriptive statistics of students' views of their degree of physical activity over the prior week. Part C of the survey has six questions, as shown in the table above. This study employed a Likert scale.

In the first 150 questions, 46% of students say screen time affects physical activity, while 24% disagree. Interestingly, 30% are still confused, showing variances in self-awareness or perceptions of the effect. Responses trend toward agreement, with a mean of 1.84 and a standard deviation of 0.86, demonstrating that screen time could limit physical activity for many.

For the second question, the most generally reported barriers to physical exercise are time limits (32.7%) and other commitments (34.7%), which far surpass the absence of facilities (17.3%) and the lack of particular limiting factors (15.3%). This distribution shows that conflicting demands and personal commitments affect physical activity more than environmental limits. The mean value of 2.48 and standard deviation of 1.044 shows that although some students face one challenge, others face many.

The third question's most prevalent barrier to balancing screen time and exercise is lack of motivation (32.7%), showing that internal difficulties are a key barrier to an active lifestyle. Schoolwork (17.3%) and social commitments (27.3%) are also major constraints, indicating how outside demands impair individuals' ability to schedule exercise. 22.7% of respondents think they can balance all three elements. The mean score was 2.61, with a standard deviation of 1.023.

What is the relationship between screen time and physical activity among secondary school students?

Table 4. Correlations between ST and PA weekdays.

		ST	PA Weekdays
ST	Pearson Correlation	1	.068
	Sig (2-tailed)		.406
	N	150	150
PA Weekdays	Pearson Correlation	.068	1
	Sig (2-tailed)	.406	
	N	150	150
Mean		3.03	2.95

Table 4 shows the link between weekday screen time (ST) and physical activity (PA). The results show a minor positive association ($r = .068$) between ST and PA on weekdays. However, the association was barely statistically significant ($p = .406$), showing no strong link between ST

and PA on weekdays in this sample of 150. ST and PA's means are 3.03 and 2.95, respectively, indicating moderate levels.

Table 5: Correlations between ST and PA weekends.

		ST	PA Weekends
ST	Pearson Correlation	1	-.080
	Sig (2-tailed)		.333
	N	150	150
PA Weekends	Pearson Correlation	-.080	1
	Sig (2-tailed)	.033	
	N	150	1500
	Mean	3.27	3.07

Table 5 examines the link between screen time (ST) and weekend physical activity (PA). The data show a weak inverse connection ($r = -0.080$) between ST and PA on weekends. However, this association is not statistically significant ($p = 0.333$), indicating no strong link between ST and PA on weekends in this sample of 150. ST and PA's weekend averages are 3.27 and 3.07, respectively.

DISCUSSION

The study indicated that most secondary school students spend over six hours on screens daily, with younger generations increasingly engaged with technology, gadgets, and online platforms like YouTube. Wszyńska (2017) says that many kids and teens spend over four hours on sedentary activities despite advice to restrict screen time to two hours. Excessive screen time is linked to poor body composition, low fitness, low self-esteem, and high blood pressure. Weekday screen time can be good or bad, but weekend activity patterns differ with more physical activity. However, sedentary behavior is common during school days, while moderate-to-vigorous physical activity increases on weekends (Sanz-Martín et al., 2022). Screen usage habits are affected by school tech integration, educational apps, and health issues like visual discomfort, sleep disturbance, and inactivity. Exceeding screen time limitations might cause weight gain, sleep troubles, and mental health concerns (Sanz-Martín et al., 2022). Given individual variances, a balanced approach to screen usage is essential, including educational advantages and health dangers, with collaboration among educators, parents, and students to address overall well-being.

Most respondents think their screen time reduces their physical activity. Excessive screen usage, typically connected to inactivity, diminishes possibilities for physical engagement, potentially leading to health risks. This is far from the WHO's recommendations of 150–300 minutes of moderate-intensity physical activity, 75–150 minutes of vigorous-intensity exercise per week for adults, and 60 minutes of moderate-to-vigorous activity daily for children and adolescents (Bull et al., 2020). Almost half of students say screen time negatively affects their physical activity, but the varied responses indicate a complicated relationship. Time limits and other duties, including school and socializing, are major obstacles to exercise, highlighting the relevance of lifestyle considerations. The results suggest that cutting screen time may not boost physical activity. Instead, a wide lifestyle approach is needed. Schools may play a vital role by promoting physical exercise, teaching time management skills, and encouraging involvement in active school sports and technology that stimulates mobility (Bull et al., 2020). The correlation data shows a weak but significant link between more screen time and less physical activity among SMK USJ 4 secondary school students. Students said they spent 3–4 hours on devices on weekends, with over 4 hours on gadgets, notably gaming, which had a low link with physical activity. This implies that gaming might not impact physical activity as much as other screen activities. Students can combine long screen time with physical exercise based on routines, family habits, or social obligations. The link is also affected by students' motivation, physical ability, and socio-economic backgrounds, with

those in poorer socio-economic areas at increased risk of health difficulties (Lindgren et al., 2016). The study shows that the link between screen time and physical activity is complicated and not entirely reflected by basic frameworks. Future research should investigate more variables and qualitative methodologies to study the personal, social, and environmental aspects that affect these behaviors.

CONCLUSION

In conclusion, the study on the association between screen time and physical activity among secondary school students at SMK USJ 4 demonstrates a weak to moderate negative correlation, suggesting that increasing screen time may negatively affect physical activity levels. However, socioeconomic background, personal drive, and access to physical education programs affect this link. The findings underline the complexity of teenage lifestyle choices and the necessity for multimodal interventions to encourage physical activity since simply reducing screen time may not be adequate. Future research, especially longitudinal studies, is needed to study the long-term impacts and causes of screen time on physical activity, which will assist in designing better methods to promote healthy habits in adolescents.

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CONFLICT OF INTERESTS

The authors affirm that this study was carried out without any personal advantages, commercial or financial conflicts, and they declare no conflicting interests with the funding sources.

AUTHORS' CONTRIBUTIONS

All authors contributed equally to the conception, design, data collection, analysis, and writing this paper. Each author reviewed and approved the final manuscript for submission.

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