

Does Screen Time Decrease Students' Physical Activity Levels During COVID-19 Pandemic?

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Abstract

This article aims to find out the relationship between screen time and student physical activity levels during the COVID-19 pandemic. This research was quantitative research with a case-control study design. The population in this study were 160 students of the Faculty of Sports Sciences, Universitas Negeri Surabaya. This study used structured questionnaires. This study used a short version of IPAQ containing seven questions that have been validated and used around the world. The statistical analysis used in this study was the Spearman correlation test and cross-tabulation test. The screen device most often used by respondents is a mobile phone (96.5%). The majority of respondents' activity levels are in the high category (53.5%). A total of 81.6% of respondents had a normal body mass index. The majority of respondents do activity in front of the screen for >2 hours/day. The coefficient correlation indicates a positive relationship (0.057) between screen time and physical activity level. There is no relationship between screen time and physical activity level (sig: 0.550). This result indicates that students have full awareness of physical activity, especially during pandemics. Although the screen time of respondents >2 hours in one day, their physical activity level is high. Screen time does not affect students to do physical activity because they have physical awareness. Awareness to increase physical activity can help to change the lifestyle to be healthier. It has a positive effect on a person's health status.

Keywords:

Screen time, Physical Activity, Sedentary Lifestyle, Physical Activity Awareness, COVID-19, Learning from Home.

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Introduction

The coronavirus disease (COVID-19) has become the world's leading health problem. The virus caused great panic and public concern. This pandemic has caused significant loss of lives and undermined well-being throughout the world [1]. Indonesia is one of the countries impacting COVID-19 with positive patients that continue to grow every day. The Indonesia Department of Education and Culture encourages learning from home. Some government policies related to education could minimize the spread of coronaviruses. These policies include online learning for school [2].

The problem faced by students during learning from home is the increasing level of screen time. Much of adults' sedentary time is allocated to electronic screen use, such as

watching television and computer [3]. Screen time is included in the sedentary lifestyle. Sedentary activities do not increase energy expenditure, and it consists of activities such as sleeping, sitting, lying down, watching television, and other screen-based entertainments [4]. The sedentary lifestyle leads to low levels of physical activity. Passive behavior is associated with various diseases and some health problems [5]. The use of screen devices for > 5 hours in one day correlated with multiple other bad habits such as low physical activity, consumption of sugar-containing beverages, and poor sleep patterns [6]. As a recommendation, adults should not spend > 2 hours per day to do screen time [7]. The habit will lead a person to weight gain [8], obesity, stress, and inadequate sleep quality [9]

Indonesian settlers with less physical

activity (< 150 minutes/week) each year are increasing. Proposed population aged > 10th who lacked physical activity as much as 26.1%, and grew to 33.5% in 2018 [10]. This data indicates that Indonesian settlers are applying sedentary behavior. Sedentary behavior is a prolonged sitting activity accompanied by low muscle activity [11]. One of the consequences of sedentary behavior is obesity [12]. People with physical inactivity have a 30% risk of death compared with those who are physically active [13]. Low physical activity can increase the risk of obesity due to high screen time and a sedentary lifestyle [14]. Less physical activity and increased screen time have some effects on metabolic risk factors such as for overweight and obesity [15]. People with obesity would have a benefit from reduced screen time and doing moderate/vigorous physical activity [16].

Physical activity has less harmful effects on health status and well-being. Physical activity plays a role in maintaining, preventing chronic diseases [17], lowering the mortality risk, coronary heart disease, type 2 diabetes, and hypertension. Physical activity also has some positive effects on brain health, bone health, weight status, cancer incidence, and physical function [18].

Based on the theory above, this article aims to find out the relationship between screen time and student physical activity levels during the COVID-19 pandemic.

Methods

Quantitative research with a case-control study design was conducted from May until August 2020. The population in this study were 160 students of the Faculty of Sports Sciences, Universitas Negeri Surabaya. The inclusion criteria sample was students majoring in physical education and sports in the 2019-2020 school year, healthy, have no symptoms of COVID-19 (fever, cough, and). The sample in this study numbered 114 people determined from the Slovin.

This study used structured questionnaires that have tested validity and reliability. Data collected includes characteristic data of research

subjects, screen time, and physical activity. The questionnaire was divided into three sections; the first part contains six basic questions about identity, weight, and height. The second section had 18 questions about the duration of use of the screen device. The majority of adults did screen time > 2 hours in one day (Schoeppe et al., 2016). At the same time, this was not the screen time recommendations for adolescents and adults (≤ 2 hours /day) [19]. Therefore the screen time variables in this study were divided into ≤ 2 hours and > 2 hours a day. Physical activity levels were obtained through International Physical Activity Questionnaire (IPAQ). IPAQ was used to steam up physical activity related to a person's health. This study used a short version of IPAQ containing seven questions that have been validated and used around the world. The International Physical Activity Questionnaire - Short Form (IPAQ-SF) has been recommended as a cost-effective method to assess physical activity [20]. IPAQ could estimate physical activity and sedentary behavior for adults aged 15–69 years, across a range of socio-economic settings [21]

The data were analyzed with SPSS version 16. The statistical analysis used in this study was the Spearman correlation test and cross-tabulation test. After that, the results of the research were explained in the discussion.

Results

Frequency and Percentage of Gender, Screen Device Most Commonly Used, Physical Activity Level, and Body Mass Index

Based on the data, table 1 shows that the percentage of samples that are male (80.7%) more than women (19.3%). The screen device most often used by respondents is a mobile phone (96.5%). The majority of respondents' activity levels are in the high category (53.5%). A total of 81.6% of respondents had a normal body mass index of between 18-25. The majority of respondents do activity in front of the screen for >2 hours in 1 day.

Table 1. Frequency and Percentage of Gender, Screen Device Most Commonly Used, Physical Activity Level, and Body Mass Index

| | Percentage | Frequency |
|--|------------|-----------|
| Gender | | |
| Male | 80,7% | 92 |
| Women | 19,3 % | 22 |
| Most frequently used screen devices | | |
| Mobile | 96,5% | 110 |
| Laptop | 2,6% | 3 |
| TV | 0,9% | 1 |
| Physical Activity Level | | |
| Low | 12,3% | 14 |
| Moderate | 34,2% | 39 |
| High | 53,5% | 61 |
| Body Mass Index | | |
| Underweight | 18,4% | 21 |
| Normal | 81,6% | 93 |
| Overweight | - | - |
| Obese | - | - |
| Screen time | | |
| ≤ 2 hours | 10,5% | 12 |
| > 2 hours | 89,5% | 102 |

The relationship between Screen time, Gender, Screen device most commonly used, and Body Mass Index

Based on the table below, the data shows as many as 84 male respondents have screen time duration > 2 hours. A total of 18 women have a screen time duration of > 2 hours. There are just four peoples who have a ≤ 2 hours screen time. There is no relationship between gender and screen time (0.193).

The most frequently used screen device by respondents is the mobile phone. A total of 98 respondents used > 2 hours in one day to interact with mobile phones. There is no relationship between screen device type selection and screen time duration (0.784).

The majority of students have a normal body mass index and have >2 hours of screen time (82). This result proves that although they have high screen time, students still maintain health by

having a normal body mass index. No relationship between body mass index and screen time (0,345).

Table 2. Cross Tabulation Results between Screen Time and Gender and Screen Device Most Commonly Used

| | Screentime | | Chi-Square Value | Sig |
|--|------------|-----------|------------------|-------|
| | ≤ 2 hours | > 2 hours | | |
| Gender | | | | |
| Male | 8 | 84 | 1,696* | 0,193 |
| Women | 4 | 18 | | |
| Most Frequently Used Screen Devices | | | | |
| Mobile phone | 12 | 98 | 0,488* | 0,784 |
| Laptop | - | 3 | | |
| TV | - | 1 | | |
| Body Mass Index | | | | |
| Underweight | 1 | 11 | -0,089 | 0,345 |
| Normal | 11 | 82 | | |
| Overweight | - | - | | |
| Obesity | - | - | | |

The Relationship between Physical Activity, Body Mass Index, and Screen time

Based on table 3, none of the respondents had an overweight and obese body mass index. There are 50 respondents with high physical activity having a normal body mass index, and 11 respondents having an underweight body mass index with high physical activity. The coefficient correlation indicates a negative relationship (-0.003) between body mass index and physical activity levels. There is no link between body mass index and physical activity level (0.977).

The majority of respondents had screen time >2 hours in one day. Respondents who had screen time >2 hours were in the categories of high (56), moderate (33), and low physical activity (13). While respondents who had screen time ≤2 hours were included in the categories of high (5), moderate (6), and low physical activity (1). A coefficient correlation indicates a positive relationship (0.057) between screen time duration

and physical activity level. There is no relationship between screen time duration and physical activity level (0.550).

Table 3. Correlation between Physical Activity Level and BMI, Screenshot Duration

| | Physical Activity Level | | | Coefficient Correlation | Sig |
|-------------------|-------------------------|-----|------|-------------------------|-------|
| | Low | Mod | High | | |
| BMI | | | | | |
| Underweight | 2 | 8 | 11 | - | 0,977 |
| Normal | 12 | 31 | 50 | 0,003 | |
| Overweight | - | - | - | | |
| Obese | - | - | - | | |
| Screenshot | | | | | |
| ≤2 hours | 1 | 6 | 5 | 0,057 | 0,550 |
| >2 hours | 13 | 33 | 56 | 7 | 0 |

Discussion

Indonesia immediately adjusts the conditions to minimize the spread of COVID-19. Schools and universities change learning activities towards distance learning systems [22]. This research aims to explore the duration of student screen time during the COVID-19 pandemic. At this time, the government implemented a policy of learning from home. Thus the activity while on campus is done virtually. During the pandemic, students often used screen devices such as mobile phones and laptops and televisions every day. The use of screen devices has become a standard in modern life. Research has shown that screen devices can be used strategically as tools, either for childcare or for educational support [23]. Based on the results of this study, students interact with screen devices for > 2 hours in one day. The screen device most often used by them is the mobile phone. Most students have a normal body mass index.

The students interact with screen devices for >2 hours in one day. If the screen device is used for along time, it will interfere with the health of the eyes. People who use the screen device within

1 hour before sleeping in light and darkroom will impair their sleep quality and health-related quality of life [24]. The screen device can emit high energy visible (blue light), which results in a health problem such as visual fatigue. The research mentions that the main factor causing vision fatigue is reading on screen devices with font sizes that are too small [25]. Screenshot is associated with increased cases of myopia. This case is due to improved indoor activity and a high duration of using a smartphone [26]. More than half the population in China has myopia. Therefore, the education minister of China insulted a policy to limit online teaching hours to no more than 30% and ban the use of mobile phones and tablets in the classroom. Students must rest their eyes for 10 minutes after 40 minutes of online lectures. Screen time with entertainment needs should only 15 minutes, and the accumulation is <1 hour per day [27]. A recommendation to prevent myopia is to do outdoor activities. Outdoor activities for 40 minutes a day can reduce the 23% risk of developing myopia [25].

High screen time is associated with health hazards for children and adults. Examples include the increasing number of fatty cells in the body, unhealthy diets, symptoms of depression, and declining quality of life [28]. Lower screen time and more physical activity can improve the sleep quality of adolescents. They are encouraging adolescents to an active lifestyle. Limiting screen time is essential to achieve maximum sleep quality [29]. Also, screen time in >4 hours per day decreased psychological health, including lack of curiosity, self-control, low, difficulty getting along, stable emotions, and low ability to complete tasks [30].

In addition to interfering with eye health and psychological condition, the use of a screen device with a long duration results in a person being lazy to engage. Thus resulting in the low physical activity carried out every day. A study shows a link between screenshot for >2 hours with the incidence of obesity [31]. The main factors in the increase in type 2 diabetes, obesity,

and mental health disorders are low physical activity, high screen time, and poor sleep quality [32]. Excessive screen time among students can be prevented by the role of parents in limiting their child's screen time. This role is made to avoid the occurrence of excess weight in students in China [33]. The relationship between screen time and increased body mass index is caused by excessive energy intake, especially from carbohydrate consumption. It is possible that reducing screen time can help reduce food intake and help promote dietary adherence. It is necessary for weight setting in obese adolescents [34]. Based on the results of this study, although students have high screen time, the majority of students have a normal body mass index. Although screen time is associated with sedentary behavior and snacking, which may promote obesity, screen time does not have to be inactive. On the other hand, screen time can promote physical activity, such as online physical activity classes and exercise applications [35]. Smartphones have more functions, in addition to communication and entertainment. Some applications, such as activity monitors and fitness applications, have the potential to promote physical activity [36].

There is no relationship between screen time and student physical activity. This result indicates that students have full awareness of the importance of physical activity, especially during pandemics. Achieving adequate amounts of daily physical activity and limiting exposure screen time are both critical in maintaining a body mass index [37]. Although the screentime of respondents >2 hours in one day, they have a normal body mass index, and their level of physical activity is high. Awareness to increase physical activity can help to change the lifestyle to be healthier. Besides, awareness of physical activity has a positive effect on a person's health status. [38]. It is important to have a high level of physical awareness to be able to influence the student's lifestyle. The respondents in this study were sports faculty students. The high value they placed on their identity as sports faculty students

drove their actions to increase their physical awareness. The factor that causes physical awareness of students is emphasizing the value of health and increasing physical performance. For the respondent, their ability to continue to perform and maintain their identity as sports faculty students through their performance led them to increase their physical awareness. However, they have > 2-hour screentime/day [39]. Campaigns to raise physical awareness need to be supported to change the physically active behavior [40]. Awareness and knowledge are insufficient for the promotion and maintenance of long-term behavioral change [41].

Conclusion

Screen time does not affect students to do physical activity. The high screen time is directly proportional to the high physical activity level. This result happens because of a student's awareness of staying healthy. Nevertheless, student screen time should still be restricted to prevent various health problems. The recommendation to do screen time is ≤ 2 hours/day. There needs to be further research on the assessment of physical activity awareness and the dangers of excessive screen time.

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