

The Risk Factors of Physical Activity Behavior in Junior High School Students During the Covid-19 Pandemic

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ABSTRACT

Background: The COVID-19 pandemic has indirectly limited the student's space and physical activities which increases insufficiency of physically active or sedentary behaviors. Meanwhile, low physical activity is a major risk factor for health problems. This study aimed to determine the physical activity behavior of students in junior high school. **Method:** This research used a cross-sectional survey; the sample was school children in 34 provinces in Indonesia and was collected through the Physical Activity Questioner Children (PAQ-C) and ASAFA scale. The questionnaire was distributed through Google Forms to 138 junior high school students aged 12-15 years as the age range. A sample size was taken by simple random sampling and 136 valid questionnaires were then analyzed for the relationship between variables by using Kendall's tau test. **Results:** The results showed that 31.6% of 136 students had insufficient physical activity or sedentary levels, and 14.7% had an active level dominated by female students (13.2%). Based on analysis data, it is found that there is a strong relationship between social support ($p= 0.006$, $r=0.006$, $r=0.93$; 95% CI), nutritional status ($p=0.001$ $r=0.89$; 95% CI), and age ($p=0.014$ $r= 0.38$; 95% CI) with physical activity. On the other hand, the gender ($p=0.091$, $r=0.27$; 95% CI) and school category ($p=0.172$ $r=0.03$; 95% CI) do not affect physical activity. **Conclusion:** The schools should provide students' physical activity guidance in collaboration with parents which can be trained at home to reduce the sedentary behavior among students during the Covid pandemic.



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Introduction

The COVID-19 pandemic has become one of the risk factors in reducing activities outdoor. Some options that the government offered to adopt in this recent situation are by applying Work Form Home and online learning [1]. However, one of the possible impacts of this policy is a decrease in physical activity, both for children and adults. This happens because of the high intensity of screen exposure as a risk from work and school assignments that must be completed at home online [2].

Physical activity is a body movement produced by skeletal muscles that require energy [3]. Several types of physical activity that can be done in leisure time with moderate to high intensity are aimed to improve our body's health and fitness. According to WHO, the global prevalence of physical activity shows that more than a quarter of the world's child and adult population has insufficiently active activity; 1 in 3 women and 1 in 4 men have less physical activity [4]. The rate of physical

activity decline is also seen to be two times higher in developed countries than in developing countries in the percentage of 81% of teenagers (aged 11-17 years old) being less active; 85% of females and 78% of male students do less physical activity. In addition, data in Australia shows that in the age range of 13-17 years old, 1 in 5 children (20%) have less active physical activity (AIHW, 2019). In 2018, an increase in less active behavior in the Indonesian population within ten years (33.5%) when compared to data in 2013 (26.1%) [5].

According to the Australian Institute of Health and Welfare (AIHW), the risks that may arise as a result of a decrease in someone's physical activity are the increased risk of non-communicable diseases such as type 2 diabetes mellitus, cardiorespiratory and cardiovascular diseases, and decreased muscle and bone strength; so susceptible to osteoporosis more quickly [6]. The vast majority of children and teenagers do not achieve the recommended 60 minutes of physical activity per day according to WHO recommendations; this shows that there is a decrease in physical activity in terms of duration and intensity. After the pandemic period, the WHO also recommends continuing or carrying out more physical activities that can be done independently at home during self-isolation activities: (1) doing physical activity for 150 minutes of moderate intensity or 70 minutes, (2) 300 minutes of moderate intensity, and (3) 150 minutes of high intensity. The WHO recommended duration also aims to increase cardiovascular muscle strength, [7] which is a major concern in keeping the immune system up. Outside activities are still accepted as long as we are paying attention to several things, such as maintaining a distance to break the chain of the spread of COVID-19 [8].

Physical activity behavior can be influenced by several internal factors (age, gender, nutritional status, and diet) and external factors (infrastructure advice, social support, and other factors such as technological progress, economy, and environment) [9]. The accumulation of students' study hours for state junior high school in Indonesia is 5-6 hours per day which is carried out online (distance schooling) due to the Covid-19 pandemic condition. In this case, students have had sedentary physical activity behavior for a long time. Physical activity in students massively affects their emotional perception, and intellectual intelligence, and physical activity behavior from an early age will also provide good behavior in the future [10]. In addition, it is also beneficial to know the risk factors for physical activity behavior in junior high school students during the COVID-19 pandemic to promote health by increasing active physical activity behavior.

Materials and Method

This study uses an analytical survey with a cross-sectional time approach. The population was all junior high school students from all over Indonesia, with the final research sample being 136 students. Sampling was done by using the purposive sampling technique through PAQ-C and ASAFA scale questionnaires. Physical activity has defined by five criteria which are very sedentary (not doing anything); sedentary (<30 minutes/day); moderately active (30-60 minutes/day); active (60-90 minutes/day); and very active (>90 min/day). Meanwhile, for the ASAFA scale questionnaire, the researchers used the criteria for social support from parents and social support from friends.

The collected data were measured in 2019 and 2021, and in addition, a questionnaire was filled out by using the google form link. Analysis data has been done by using the Kendall tau correlation test in SPSS version 22.0. As for ethically proper information in this research was embodied in an ethically proper decision issued by the ethical commission of Aisyiyah University Yogyakarta No.133/KEPUNISA/VIII/2020.

Results and Discussion

Results

The results showed that most respondents who took part in the survey were female, which showed 91 students (66.9%), and 76 (55.8%) of them were in the age range of 14-15 years old. The majority of respondents which showed 82 students (60.2%), came from private schools; the nutritional status of the majority of respondents, namely 63 students (46.3%), was classified as normal, and from the 136 respondents, most of them came from East Kalimantan (65 students or 47.7%). More details can be seen in [Table 1](#).

Based on Table 2 related to the student's physical activity behavior, 25.7% aged 14-15 years old were in the moderately active, and in the sedentary category were 23 students (16.9%). In general, male students seem to be quite more active compared to female students (25.7%). Students with normal nutritional status have normal physical activity behavior 20 students (14.7%), and then those who were classified as quite active were 25 students (18.3%), and indeed 49 students (36%) who attend private schools. Based on the analysis data, this study finds out that there was a relationship between age ($p = -0.14$ with $r = 0.38$; 95% CI), nutritional status ($p = 0.1$, $r = 0.89$; 95% CI), and social support ($p = -0.006$, $r = 0.93$; 95% CI) with the physical activity behavior of junior high school students in Indonesia. Furthermore, there was no significant relationship between gender ($p = 0.091$, $r = 0.27$; 95% CI) and school category ($p = 0.172$, $r = 0.03$; 95% CI).

Table 1. Respondent Characteristics

| Variables | N | % |
|--------------------|----|-------|
| Gender | | |
| Male | 45 | 33.08 |
| Female | 91 | 66.9 |
| Age | | |
| 12-13 years old | 60 | 44.1 |
| 14-15 years old | 76 | 55.8 |
| School Category | | |
| Public School | 54 | 39.7 |
| Private School | 82 | 60.2 |
| Nutritional Status | | |
| Underweight | 20 | 14.7 |
| Normal | 63 | 46.3 |
| Overweight | 25 | 18.3 |
| Obesity | 28 | 20.5 |
| Origin | | |
| East Kalimantan | 65 | 47.7 |
| DI Yogyakarta | 25 | 18.3 |
| Central Java | 13 | 9.5 |
| East Java | 10 | 7.3 |
| West Java | 3 | 2.2 |
| Lampung | 4 | 2.9 |
| Jambi | 2 | 1.4 |
| Papua | 2 | 1.4 |
| Bangka Belitung | 2 | 1.4 |
| Central Sulawesi | 3 | 2.2 |
| West Nusa Tenggara | 4 | 2.9 |
| North Sumatera | 3 | 2.2 |

Table 2. Bivariate Analysis Result of Physical Activity Behaviour

| Students' Characteristics | Actively sedentary | | Sedentary | | Quite Active | | Active | | Very active | | R | P (CI 95%) |
|---------------------------|--------------------|-----|-----------|------|--------------|------|--------|------|-------------|-----|------|------------------------------|
| | F | % | F | % | F | % | F | % | F | % | | |
| Age (years) | | | | | | | | | | | | |
| 12-13 | 2 | 1.4 | 20 | 14.7 | 25 | 18.3 | 10 | 7.3 | 1 | 0.7 | 0.38 | 0.014* (0.79-0.97) |
| 14-15 | 4 | 2.9 | 23 | 16.9 | 35 | 25.7 | 15 | 11 | 1 | 0.7 | | |
| Gender | | | | | | | | | | | 0.27 | 0.091 (0.55-0.60) |
| Male | 1 | 0.7 | 18 | 13.2 | 35 | 25.7 | 8 | 5.8 | 4 | 2.9 | | |
| Female | 2 | 1.4 | 24 | 17.6 | 30 | 22 | 18 | 13.2 | 5 | 3.6 | | |
| Nutritional Status | | | | | | | | | | | 0.89 | 0.001* (0.71-0.90) |
| Underweight | 2 | 1.4 | 7 | 5.1 | 6 | 4.4 | 2 | 1.4 | 1 | 0.7 | | |
| Normal | 1 | 0.7 | 20 | 14.7 | 25 | 18.3 | 15 | 11 | 2 | 1.4 | | |
| Overweight | 1 | 0.7 | 13 | 9.5 | 9 | 6.6 | 6 | 4.4 | 1 | 0.7 | | |
| Obesity | 2 | 1.4 | 10 | 7.3 | 9 | 6.6 | 2 | 1.4 | 2 | 1.4 | | |
| School Category | | | | | | | | | | | 0.03 | 0.172 (0.53-0.59) |
| Public School | 1 | 1.4 | 15 | 11.4 | 25 | 18.3 | 5 | 3.6 | 0 | 0 | | |
| Private School | 0 | 0 | 20 | 14.7 | 49 | 36.0 | 20 | 14.7 | 1 | 0.7 | | |
| Social Support | | | | | | | | | | | 0.93 | 0.006* (0.91-0.99) |
| Parents | 3 | 2.2 | 25 | 18.3 | 30 | 22 | 15 | 11 | 0 | 0 | | |
| Friends | 4 | 2.9 | 6 | 4.4 | 25 | 18.3 | 5 | 3.6 | 0 | 0 | | |
| Both | 0 | 0 | 7 | 5.1 | 13 | 9.5 | 2 | 1.4 | 1 | 0.7 | | |

Discussion

Children aged from 6 to 12 years old already have good development in many aspects such as physical, cognitive, emotionally, mentally, and social. At this age, children tend to be more active in moving, for instance bouncing, running, climbing, and playing catch up with their peers as a form of physical activity. In connection with the advanced technological developments and the current pandemic conditions, the tendency of teenagers to have sedentary behavior is increasing. This is happening due to the social restrictions that require us to minimize meetings with many people which indirectly makes children spend most of their time only at home [11]. Usually, children are doing several activities at home that is not far from gadgets (playing online games, watching videos, etc.), then maybe reading books, or doing tasks that took more than 5 hours per day. Research in Canada shows that only 13.2% of teenagers (12-17 years) have physical activity behavior following the provisions during the Covid-19 pandemic [12].

In 2020, the global data showed that 5.190 billion (67%) of the population use smartphones and 4.540 billion (59%) of the population use internet services. While in Indonesia, smartphone users are calculated as many as 338.2 million and internet users 175.4 million with an average duration of internet use of 7 hours 59 minutes/day, using social media 3 hours 26 minutes/day, watching television 3 hours 4 minutes/day, listening to music for 1 hour 30 minutes/day and playing games for 1 hour 23 minutes/day [13]. One study in Indonesia also shows that the high intensity of using social media makes the habit of physical activity in the form of sports low, which is 44.4% [14]. Another reason is the prevalence of the use of private transportation leads to the lack of access to walking or using public transportation to school [15].

Women spend more of their free time doing sedentary activities with a duration of 5-6 hours, for instance reading books, chatting with friends, helping with homework, and watching cartoons. Meanwhile, men prefer to play soccer, swim, run around, and play online games [16,17]. This phenomenon causes energy expenditure to occur more in men who carry out physical activities such as exercising compared to women with sedentary behavior or a sedentary lifestyle.

The National Health And Nutrition Examination Survey [NHNES, 2017] in the United States stated that the percentage of nutrition in boys is higher, from 14% to 18%, while in girls it is only 13.8% to 16% [18]. The physical activity behavior of boys was greater than girls in Nepal. 50.1% of boys and 43.6% of girls do physical activities such as cycling, dancing, walking, and other exercises [19]. In India, female students have obstacles in carrying out physical activities due to social barriers in the form of stereotypical gender [6]. Stereotypical gender is the traits possessed by men and women in the individual, where men are seen as individuals who have traits such as freedom, independence, objectivity, and competitiveness. Meanwhile, women are seen as individuals who have traits such as warmth, expressiveness, subtlety, and awareness of the feelings of others. This difference is what makes the perception of gender stereotypes in each individual [20].

The high and low levels of students' physical activity behavior are also related to school categories where they have differences regarding the learning system and policies in schools. The low level of physical activity behavior of teenagers who attend private schools is caused by several things, one of which is the implementation of a full-day system with more learning duration in schools, which is about 5-6 hours/day. A study in Nepal found that students who are attending private schools had low levels of teenage physical activity [21]. is because the intensity of sitting is longer than those teenagers who attend public schools, and private schools prioritize them to improve academic achievement rather than paying attention to facilities to carry out some physical activities and youth recreational activities [22]. Research in Brazil found that 69.9% of teenagers who attend private schools have a sedentary level of physical activity behavior compared to those who attend public schools [23].

Despite being caused by the differences in school categories, students' physical behavior is also might cause by physical distancing regulation. This is influential because the restrictions on activities outside the home are one of the causes of the lack of access to playgrounds that involve physical activity in children during the pandemic. The lack of clarity on the duration of the implementation of physical distancing indirectly forces children to spend time at home by utilizing their spare time to do sedentary physical activities such as watching TV, playing games, playing social media, and doing

school assignments. Those are the reason for the high number of sedentary lifestyles during the COVID-19 pandemic [24]. By having sedentary physical activities, children's lack of physical activity causes the number of calories burned to be less than the number of intake calories from the food consumed, causing excess fat accumulation in the body, and resulting in an increase in children's weight obesity [25].

Social support is also becoming an indirect factor that can affect a person's health condition, in this case, a person's physical activity behavior. Social support can be in the form of emotional support that can be expressed in the form of attention, affection, and sympathy [26]. In addition, social support can also be shown in the form of appreciation support that can be given through awards or positive assessments to individuals, encouragement, and encouragement to move forward. Another form of social support is instrumental support, which is in the form of direct assistance such as lending money or carrying out tasks. Furthermore, information support is also a part of social support which aimed to give advice or feedback to other people in need. Hence, support through the involvement of certain social groups with the same interest is also a form of social support, namely social network support [27].

Social support can be one of the efforts to increase the attractiveness of teenagers in carrying out physical activity regularly and under the recommendations. Research in Los Angeles, California found that students who did a physical activity with parental support 31.7%, and with social support from friends 17.8% [28,29]. According to Eskiler & Kucukibis [2019], the perception of social support obtained from parents and friends can be a crucial motivator for teenagers' involvement in physical activity [30].

Conclusion

Physical activity in teenagers tends to experience a very significant decline, especially in the current pandemic conditions. Therefore, the importance of the parent's role in collaborating with educational institutions to design a learning curriculum on physical education for students, as well as playing an active role in modifying the physical activity tasks given to children needs to be improved.

Declaration

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Conflicts of Interest: There were no problems while conducting this research.

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