



The relationship between physical activity and academic performance of elementary students

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ABSTRACT

While physical activity can be one of the daily supports for good health that can help the educational process, the present study aims to determine the relationship between physical activity and academic achievement. It was quantitative correlational research involving 1045 students from 21 elementary schools (ESs) selected through proportional random sampling. Physical activity was measured by using the Assessment of Physical Activity Levels Questionnaire (APALQ), and academic achievement was investigated through the average scores of the previous semester's report card. The study revealed three categories of physical activity, namely 'very active', 'moderately active', and 'inactive'. Less than 30 ES students (3%) were reported 'very active', 460 students (44%) were 'moderately active', and more than half (53%) were 'inactive'. With a percentage of 33%, the overall average result of physical activity gained was 348, meaning that the average increase fell within the moderate range. While having a sig. value greater than 0.05 (0.529), the study suggests that there is no significant correlation between physical activity and academic performance. The study's weak correlation coefficient of 0.020 involves drawing the inference that there is no discernable relationship between physical activity and academic achievement on elementary school students.

Keywords: physical activity, academic achievement, students

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INTRODUCTION

The world has been shocked since the beginning of 2020 by the Corona Virus Disease (Covid-19) pandemic, which has spread so quickly throughout the world (Rulandari, 2020). On March 11, 2020, the World Health Organization declared a global emergency due to Covid-19. Cases of Covid-19 have spread rapidly throughout the world, infecting millions of people (Auliya & Wulandari, 2021). According to the World Health Organization, Covid-19 is a respiratory infection that has spread worldwide, including in Indonesia (Tifany, 2020). To date, 1,558,145 Covid-19 cases have been confirmed in Indonesia. The government is attempting to break the chain of transmission as much as possible by implementing various policies such as PPKM, 5 M (wearing masks, washing hands with soap, and flowing water, maintaining distance, staying away from crowds, limiting mobilization and interaction), Work from Home (WFH), and Learning from Home (LFH). The LFH model is used to improve innovation and the quality of the learning process that has been experienced, rather than to ensure the level of achievement or the importance of grades (assigning grades) (Hariyani, 2020). Students must study from home, and teachers must prepare learning tools that enable students to study from home. Because of this condition, teachers must modify their teaching and learning strategies. The use of

appropriate teaching methods, as well as teachers' behavior and attitudes in managing the teaching and learning process, is critical in learning during the BDR program. During the Covid-19 emergency period, all of this is done to provide students with access to learning that is not limited by space or time (Handayani et al., 2020; Kurniasari, 2020; Pradana & Ni'mah, 2021).

Policies relating to the learning process at home can have both positive and negative effects on students, such as reducing physical activity that is normally done at school. A decrease in physical activity can have an impact on students' health and fitness, as we can observe that currently many students spend their time with less or even no physical activities playing or working with their gadgets. So, they must substitute their sedentary time with physical activity of any intensity (including light intensity) to improve their health advantages (WHO, 2010).

Fitness activity is one component of physical fitness, which is a component of national education aimed at developing physically and mentally healthy humans (Yuliandra & Fahrizqi, 2019). Physical activity is associated with cardiorespiratory fitness in both children and adolescents (WHO, 2010). Their physical condition is, of course, always in good shape. And continue to participate in activities and sports even at home. With the hope that they can achieve their goals and maintain their physical condition so that they can stay fit whenever and wherever they want, while avoiding Covid-19 and remaining disease-free.

Quality human resources are the foundation for the Indonesian nation's development in order to survive and keep up with the times. Education is one method for increasing the potential or quality of human resources. Humans can develop their potential through education in order to be useful to life and the environment. (Omachar, 2016) defines education as "an organized order that aims to channel various knowledge, skills, understanding, and attitudes required for daily activities." All of a person's potential will be developed through education because competence will be managed with the goal of implementing education in order to create individuals with quality abilities and noble behavior or character. According to (Widodo, 2016), the quality of an education influences the process of developing students' hidden potential. According to (Prasetya, 2017), several factors contribute to Indonesia's low educational quality, including: (1) educators or teachers; (2) the government and education system; (3) facilities and infrastructure; (4) education costs; (5) parents and society; and (6) students.

Physical education subjects allow for the most interaction among students, such as sharing space and materials, competing in games and competitions, and so on (Fernández-Río et al., 2012). Students can learn about ethical codes of behavior, group cohesion, respect for others, and social behavior through physical education. (Chu & Zhang, 2018) argue that physical education is beneficial to students by providing opportunities to participate in sports directly, thereby creating new experiences that are more beneficial to students. There is a measure of student depression and anxiety in general called as mental health. It is not only anxiety about the subjects shown, but also anxiety related to achievement, for example, students who are anxious and depressed may not have good performance in school because their cognitive resources are directed towards emotional stress. Students with below performance expectations at school may become anxious and depressed (Stankov et al., 2014). Physical Education, Sports, and Health are all aimed at potential aspects of student development, with the physical education process emphasizing the development of students' social emotional side, cognitive reflective side, student movement skills, and psychological side (Stephani, 2016). According to (Bandi, 2011), physical education is an effort made to create a learning environment that can influence students' potential to develop positive behavior through physical activity. Physical activity is defined as any body movement produced by the contraction of multiple muscles that increases energy requirements above the resting metabolic rate and is distinguished by its modality, frequency, intensity, duration, and context of practice (Thivel et al., 2018). Academic achievement can be influenced by psychological, economic, social, individual, and environmental factors, and these factors can be influenced by student health (Mardjikoén & Zaki, 2017). Physical activity can be one of the daily supports for good health that can help the educational process and have a positive impact on academic achievement. According to (Komara, 2016) one of the achievements to measure learning outcomes for each student is learning achievement. Students who perform well on average are self-confident. This is

demonstrated by students' attitudes, alertness, and readiness as modeling or pilot students in their class. According to (Arday et al., 2014) research, there is a link between physical activity and cognitive domains and academic achievement in children and adolescents because neurocognitive physical activity in children and adolescents has important implications for public health and education. Physical Education is included in the school curriculum.

Physical activity, in addition to improving physical health, can also improve cognitive, social, emotional, and academic performance. However, schools are finding it increasingly difficult to allocate time for sports and physical activity during the school year. Many schools strive to increase the amount of time students spend studying math, language, and science subjects in order to improve academic scores or standards-based tests. As a result, time for exercise, rest, and other extracurricular sporting activities can frequently be reduced or eliminated during the school year. Not to mention technological advancements that make activities more convenient for students, as well as lifestyle changes that cause a decrease in the quantity and quality of physical activity in daily life. Based on this, researchers want to dig deeper into the relationship between physical activity and learning achievement in students in Yogyakarta.

METHOD

This study was conducted in Yogyakarta, this research involved elementary school students in Yogyakarta. Methods of data collection and analysis are described below.

The purpose of this study is to describe the relationship between physical activity and learning achievement in elementary school students from the Special Region of Yogyakarta. This type of study is included correlational research. Correlational research aims to find out whether there is a relationship and if there is, how close the relationship is and whether the relationship is meaningful. The survey method with quantitative approaches was used in this study.

The data is quantitative in nature. With a total of 1045 students, the population in this study was elementary school students aged 9-12 years old in Yogyakarta. In this study, the sample was determined using proportional random sampling. There were 577 male students and 468 female students in the samples.

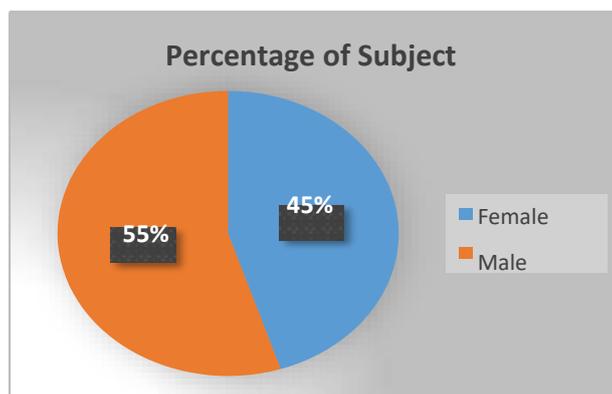


Figure 1. Percentage of Research Subject

The research involved 1045 research subjects with 468 female and 577 male participants, with a percentage of 45% female and 55% male.

A physical activity level questionnaire was used as the research instrument for comparing physical activity and learning achievement for students in Yogyakarta. The data analysis technique used in this study was descriptive percentage data analysis. Instruments of physical activity and student achievement were assessed using the Physical Activity Level Assessment Questionnaire (APALQ). The APALQ instrument measures physical activity, and the average value of the last semester report card measures learning achievement. To ensure that the instrument used has accurate validity, a double check procedure is used. The questionnaire

contains five questions, with four specific choices for each 4-point scale, as for the questionnaire containing the following (1) Do you take part in organized sports, (2) Do you take part in sports that are not organized, (3) In Education subjects Physically, how many times a week do you take part in sports or physical activity for at least 20 minutes, (4) How many hours a week do you usually do physical activities until you are short of breath or sweating, (5) Do you take part in competitive sports? Answers are coded on a 4-point scale where 1 is the lowest and 4 is the highest. To measure the activity level of children, the physical activity index (PAI) with a maximum score of 20 points (sum of the maximum score for each APALQ question).

Following the collection of data, the relationship between physical activity and student achievement will be examined. Reliability was assessed using the intra-class coefficient (ICC). APALQ was administered on two separate occasions, the t-test was used to determine whether there was a significant difference between physical activity and academic achievement. Interpretation of values based on system classification. The validity of the questionnaire criteria was evaluated using an accelerometer which had previously been validated as an instrument for measuring physical activity. Accelerometers are precise measurement measures for validation of physical activity questionnaires. The collected data were then processed using the SPSS 24.0 for Windows program. The Kolmogorov-Smirnov method was used to determine the normality of the data distribution. The Pearson correlation test was used if the data is normally distributed, but the Spearman-Rank correlation test was used if the data were not normally distributed.

FINDING AND DISCUSSION

Finding

Based on the Table 1, it can be explained that the acquisition of physical activity is divided into three categories. Very active as many as 28 students, with a percentage of 3%, medium as many as 460 with a percentage of 44%, and permanent as many as 557 with a percentage of 53%. From the overall results obtained an average physical activity of 348 with a percentage of 33%. This shows that the average acquisition of physical activity is in the medium category (Table 2).

Table 1. Distribution of physical activities

Category	Frequency	Percentage
Very Active	28	3%
Medium	460	44%
Permanent	557	53%
Average	348	33%
Total	1045	100%

Table 2. Description on the data of academic achievement

Respondent	Frequency	Average
Male	577	85
Female	468	85
Total	1045	85

Table 3. Comparison on the physical activities and academic achievement

	Sum of Squares	df	Mean Square	F	Significance	Status
Regression	3,971	1	3,971	0,188	0.665	Normal

The data obtained were tested for normality. The normality test used the Kolmogorov-Smirnov method on the unstandardized residual value (RES_1) for the regression equation for the comparison of physical activity to academic achievement. The Kolmogorov Smirnov test results show that the data is normally distributed. The normality test is not normal with sig (2-tailed) $0.000 < 0.05$ as shown in the Table 3.

Table 4. Normality test

<i>p</i>	Significance	Status
0	0,05	Not Normal

The correlation test in this study used Spearman with the results of the relationship between X and Y variables being uncorrelated, namely $0.529 > 0.05$ (Table 4). The level of strength of the relationship is very weak, namely 0.020. The direction of the relationship between the variables x and y leads to a positive correlation, at 0.020.

Table 5. Correlation test

			Academic Achievement	Physical Activities
<i>Spearman's rho</i>	Academic Achievement	Correlation Coefficient	1,000	0,020
		Sig. (2-tailed)		0,529
		N	1045	1045
	Physical Activities	Correlation Coefficient	0,020	1,000
		Sig. (2-tailed)	0,529	
		N	1045	1045

Based on the Table 5, the value of Sig. (2-tailed) is at 0.529 because the value of Sig (2-tailed) $>$ of 0.05, it can be concluded that there is no significant relationship between physical activity and academic achievement. It has been obtained that the correlation coefficient of 0.020 means that the level of strength of the correlation or the relationship is weak. The correlation coefficient figure above is positive, which is 0.020, so the direction of the variable relationship is positive.

Discussion

The purpose of this research is to determine the relationship between physical activity and academic achievement in elementary school students. Its relationship can have impact or correlation for students. (Li & Zhang, 2022) claim that Physical activities promote the success rate of academic achievements including extra-curricular activities. In this research, the Spearman test revealed no significant relationship between physical activity and academic achievement. Based on the data obtained and the known value of Sig. (2-tailed) of 0.529, it can be stated that there is no significant relationship between physical activity and academic achievement. A correlation coefficient of 0.020 has been obtained, indicating that the correlation/relationship is weak. The correlation coefficient figure above is positive (0.020), indicating that the variable relationship is positive.

This differs from previous research, namely (Arday et al., 2014)'s study of the relationship between physical activity and cognitive domains and academic achievement in children and adolescents, which has important implications for public health and education that can be obtained through Physical Education in school curriculum. This can occur due to differences in the methods used to measure physical activity and academic achievement, sample size differences, and differences in the characteristics and backgrounds of research subjects. Due to time constraints, this research was limited to the data of Yogyakarta elementary school students, and the overall research with Murcia was not completed. Furthermore, there are no additional observations regarding the factors that influence academic achievement.

According to research conducted by (Amatriain-Fernández et al., 2020) revealed that physical activity/physical exercise can help people reduce the impact of the pandemic. The same thing is reinforced by the opinion that regular physical activity contributes to maintaining and improving health, and is important for human development throughout a person's lifespan (Miko et al., 2020). Physical activity is not only important for adolescents' physical health, but also plays an important role in their mental well-being (van Woudenberg et al., 2020). Physical

activity has significant benefits for brain health and this may have benefits for learning (Papasideris et al., 2021). Several studies have shown that physical activity and physical fitness are positively related to academic achievement, from 80% of studies, the association is considered strong. The component of physical fitness that is most often associated with academic achievement is cardiorespiratory fitness (Rodriguez et al., 2020). Meanwhile, according to the opinion carried out by (Donnelly & Lambourne, 2011) that class-based physical activity provides a feasible approach to improve fitness, body mass index (BMI), cognitive function, and ultimately academic achievement. Increasing physical activity and aerobic fitness is often proposed as a way to improve children's health, physical fitness, and academic achievement, but there are some inconsistencies in various studies regarding the relationship between physical activity, physical fitness, and academic achievement (Shah & Diwan, 2019). Physical activity that uses games must also be adapted to the characteristics of sports education, which include situation, location, competition, activity, assessment and rewards (Irmansyah et al., 2020).

Individuals tend to experience metabolic disorders and other chronic diseases, due to poor conduction of physical activity. Meanwhile, high levels of physical activity have a positive impact on quality of life (Sunardi et al., 2021). Social distancing conditions caused by COVID-19 can affect health behavior in general (Castañeda-Babarro et al., 2020). According to research, someone who actively spends more time doing physical activities outdoors has lower anxiety than those who spend time doing physical activities outdoors during the COVID-19 pandemic (Nienhuis & Lesser, 2020). This is in line with the opinion that physical activity is positively related to quality of life in general, but little is known about how changes in physical activity can be associated with changes in certain aspects of quality of life (Robertson et al., 2019). Regular physical activity contributes to maintaining and improving health, and is important for human development throughout a person's lifespan. There is strong evidence for the beneficial effects of physical activity on health, in the areas of all causes of death, cancer, cardiovascular health, musculoskeletal health, metabolic health, and neurocognitive health (Miko et al., 2020). Physical activity includes any form of movement in which contraction of the skeletal muscles results in an increase in energy consumption. It is measured and controlled through frequency, duration, intensity, and weekly rate. Any form of movement that promotes health and where the risk of injury is low is defined as health-promoting physical activity. Recommendations for health-promoting physical activity include endurance-oriented movements, plus strength and coordination exercises. Exercises are aimed at starting the adaptation process, at increasing functionality. Therefore, it must be adapted to different levels of individual performance ability, activity level, and age, and must be carried out according to certain principles (Miko et al., 2020). The WHO Global Plan of Action on Physical Activity (GAPPA), as well as a more systemic approach is needed to promote physical activity and a healthy lifestyle. High level multi-stakeholder collaboration is required to continue expanding and strengthening research capacities (Khoo et al., 2020).

In response to the COVID-19 pandemic, physical distancing measures have been implemented globally. Citizens are instructed to stay at home, which is likely to result in significant changes in their physical activity, using data from a national physical activity tracking application (PAC application), the study aims to determine the level of physical activity measured by the device immediately before and after the implementation of measures physical distancing measures in Canada to provide evidence for the development of physical activity recommendations for future pandemics (Di Sebastiano et al., 2020). Childhood is an important period for developing thinking maturity. A body of evidence points to a link between physical activity and cognitive function. Although intellectual intelligence and emotional intelligence have been reported to be related to physical activity, there are a number of published studies regarding the relationship between physical activity and cognitive functioning in children and adolescents. With respect to creativity, an essential skill for the twenty-first century, there is little evidence of the promotion of creative intelligence in childhood. Therefore, this study was designed to explore the correlation between physical activity and creativity (Piya-Amornphan et al., 2020). Research shows that children's social skills cannot be created instantly. It takes

time and a continuous learning process. One approach that can be used in developing children's social skills is sports games (Irmansyah et al., 2020).

Although physical activity does not improve lung function, it does produce positive physiological and psychological effects. Physical activity reduces shortness of breath symptoms, increases functional exercise capacity and improves quality of life (Karamarković Lazarušić, 2019). The same thing was expressed by (Vaquero-Solís et al., 2020) research showing that there is a significant relationship between physical activity, level of self-determination and interpersonal, dimensions of adaptability and mood of emotional intelligence. The benefits of physical activity for an individual's physical health are well documented. Little is known about the benefits of physical activity for mental health (Molcho et al., 2021). Goal setting is a widely used and accepted strategy for promoting physical activity. Locke and Latham's goal setting theory is the principal theoretical framework for goal setting in psychology and plays an important role in the promotion of physical activity (Swann et al., 2021). According to research conducted by (Babenko & Mosewich, 2017) revealed that students who engage in physical activity/sports at a higher level of engagement have lower academic fatigue scores and support maladaptive achievement goals at lower levels. Exercise has significant benefits for brain health and this may have downstream learning benefits for young people. However, existing studies looking at the relationship between physical activity and academic achievement are limited by relatively small sample sizes and/or cross-sectional designs (Papasideris et al., 2021). Physical activity (PA) is essential for preventing childhood obesity and contributing to a child's overall physical and cognitive health, yet less than half of all children achieve activity (Wright et al., 2016). An emerging area of research suggests that physical activity can benefit cognitive function and academic achievement in children. However, little is known about how academic achievement may benefit from certain types of motor activity (for example, fine and gross) integrated into learning activities (Beck et al., 2016). The same thing was expressed by (Mavilidi et al., 2019) that the current and declining level of children's physical activity is a global concern. Integrating physical activity into the school curriculum may be an effective way not only to increase children's physical activity levels but also improve educational outcomes. This was also expressed by (Kall, L. B., Nilsson, M. and Linden, 2014) although there are many studies on the potential of physical activity to improve learning and academic achievement, conclusive evidence regarding the effect of physical activity on academic achievement is still lacking.

CONCLUSION

According with our data, we can conclude that there is no significant relationship between physical activity and academic achievement. The correlation/relationship is very weak, but the number of correlation coefficients is positive, indicating that the variables' relationships are positive. Physical activity is an activity to move the limbs to be healthier. Physical activity really needs to be done by the community, because doing physical activity can minimize the occurrence of disease. However, currently there are still many people who are not aware of the importance of physical activity for health. Seeing the importance of physical activity for health is very necessary. Low levels of physical activity, if left unchecked, will become a problem that must be addressed immediately.

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