

**Physical Literacy on Physical Activity Levels and Physical Fitness Among
Adolescents**Fauzi Maulana^{1*} Dedi Supriadi² Vicky Ahmad Karisman³¹²³Pasundan College of Teacher Training and Education, Bandung, Indonesia**Keywords**

Physical literacy ;
physical activity ;
physical fitness ;
physical education ;
adolescents

Abstract

Low levels of physical activity among adolescents remain a major global public health concern. One of the factors that may influence adolescents' engagement in physical activity and their physical fitness is physical literacy. Therefore, this study aimed to examine the effect of physical literacy on the level of physical activity and physical fitness among adolescents. This research employed a quantitative approach with a cross-sectional explanatory design. The participants of this study were 132 high school students aged 15–17 years from Advent High School Bandung using total sampling. Data were collected using the Perceived Physical Literacy Instrument (PPLI) to measure physical literacy, the International Physical Activity Questionnaire (IPAQ) to measure physical activity, and the Indonesian Physical Fitness Test (TKJI) to measure physical fitness. Data analysis was conducted using descriptive statistics, Pearson correlation, and simple linear regression analysis with the assistance of SPSS version 25. The results showed that physical literacy had a significant positive relationship with physical activity ($r = .818$, $p < .001$) and physical fitness ($r = .904$, $p < .001$). Regression analysis indicated that physical literacy significantly predicted physical activity ($\beta = .818$, $t = 16.209$, $p < .001$) with a coefficient of determination of $R^2 = .669$. In addition, physical literacy also significantly predicted physical fitness ($\beta = .904$, $t = 24.178$, $p < .001$) with a coefficient of determination of $R^2 = .818$. These findings indicate that adolescents with higher levels of physical literacy tend to have higher levels of physical activity and better physical fitness. Therefore, the development of physical literacy through physical education programs is essential to promote active lifestyles and improve physical fitness among adolescents.

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INTRODUCTION

Low physical activity is currently still a major problem in public health worldwide. Based on the results of research involving more than 1.6 million adolescents from 146 countries, it was found that approximately 81% of adolescents do not meet the recommended physical activity, which is at least 60 minutes per day with moderate to vigorous intensity (Guthold et al., 2020). In addition, a survey conducted by Marques et al., (2020) on 520,000 adolescents from 105 countries, found that only 57.1% of adolescents participate in physical activity for 3 days per week, and some are not physically active when entering adolescence. Then, the results of another study conducted in Latin America and the Caribbean found that adolescents who were less active in physical activity reached 67.7% (Bernabe-Ortiz & Carrillo-Larco, 2022), in Vietnam 71.1% of adolescents were physically inactive (Ha Van Anh et al., 2020), in Southern Brazil 70.5% of adolescents were found not to have sufficient activity (Filho et al., 2018), and in Indonesia itself 63.1% of adolescents experienced a decrease in physical activity in 2022 (Koa et al., 2022), in 2023 as many as 58% of adolescents were physically inactive (Kasmiati, 2023), and in 2025 as many as 50.4% of adolescents were physically inactive with an age range of 15–19 years (P. Harsuno et al., 2025). Therefore, this shows that most adolescents are physically inactive and are at risk of experiencing long-term health problems including increased obesity, metabolic disorders, cardiovascular disorders, and a decline in overall physical fitness.

The high prevalence of sedentary behavior among adolescents is based on a cross-country study which found that 56.9% of adolescents have levels of physical activity that are lower than those recommended by the World Health Organization (WHO), which is 300 minutes per week. Therefore, they have a risk of non-communicable diseases such as obesity, diabetes, and heart disease (de Moraes et al., 2009). In Indonesia itself, the prevalence of overweight among adolescents aged 13–15 years reaches 50.1% (Ferdina et al., 2024). Furthermore, cases of diabetes among adolescents reach 28.19% per 100 million population (Clara Devina Damayanti, 2024). In addition, the prevalence of cardiovascular disease among adolescents reaches 11.39% with prehypertension reaching 17.53% (Andrianto et al., 2024). This condition is associated with low physical activity among adolescents.

Based on the results of a study conducted in secondary schools, it shows a significant positive relationship between physical activity and fitness components among students (Lukács et al., 2020). Therefore, this indicates that the higher the frequency and intensity of physical activity, the better the physical fitness status of adolescents. However, in its implementation, the level of physical activity among adolescents cannot be separated from their ability to understand the concepts, benefits, and motivation to perform physical activity in daily life. Understanding physical activity or physical literacy is not only a motor ability, but also a cognitive ability that provides an understanding of the importance of physical activity for health (Cairney et al., 2019; Lee et al., 2019; Cornish et al., 2020). It also provides motivation to convince oneself to continue participating consistently in physical activities (Ying et al., 2025). There are empirical studies that show a positive relationship between physical literacy and the level of physical activity among adolescents (Öztürk et al., 2023). Furthermore, there is also a systematic review study of 45 studies which found that physical literacy is significantly correlated with physical activity, motivation, and general health among adolescents (Carl et al., 2022). In addition, other studies show that perceived physical literacy has a close relationship with the level of physical activity and fitness parameters such as cardiovascular fitness and body composition among adolescents (Nezondet et al., 2023; Jiang et al., 2025).

Although physical literacy has not been widely explored as a determinant variable influencing both the level of physical activity and physical fitness among adolescents, particularly in the context of physical education in Indonesia. This gap provides an important opportunity for scientific research to fill this gap in order to examine the extent to which physical literacy influences behavior and fitness status among adolescents. Based on the prevalence data of physical activity that is still low among adolescents and its relationship with fitness levels, as well as initial evidence that physical literacy is associated with better physical activity practices, this study aims to empirically examine the effect of physical literacy on the level of physical activity and physical fitness among adolescents. The results of this study are expected to provide strategic recommendations to improve physical education

programs, health policies within the school environment, and interventions for promoting an active lifestyle.

METHODS

Research Design

This study uses a quantitative approach with an explanatory design through a cross-sectional method. This design was chosen because the study aims to examine the effect of physical literacy on the level of physical activity and physical fitness among adolescents at one measurement time without any intervention. This approach allows researchers to analyze predictive relationships between variables empirically in the natural context of the school environment.

The conceptual model of the study places physical literacy as the independent variable, physical activity as the mediator variable, and physical fitness as the dependent variable. Theoretically, this model assumes that adolescents with higher levels of physical literacy tend to have better engagement in physical activity, which ultimately contributes to the improvement of physical fitness.

Participants

The population in this study was all high school students aged 15–17 years at Advent High School Bandung, totaling 132 students. The sampling technique used in this study was total sampling, so the sample in this study was the entire population (Fraenkel et al., 2012). This technique was chosen because the population size was relatively limited, allowing the researchers to involve all students who met the research criteria. By using total sampling, the study is expected to provide a more comprehensive description of the level of physical literacy toward the level of physical activity and physical fitness in the studied population.

Instrument

The data collection technique in this study used a combination of questionnaires and physical fitness tests. The measurement of physical literacy used the Perceived Physical Literacy Instrument (PPLI) questionnaire which consists of 9 statement items with a Likert scale that measures aspects of motivation, confidence, and individual understanding of physical activity. Then physical activity was measured using the International Physical Activity Questionnaire (IPAQ) with 7 question items to identify the frequency and duration of physical activity performed by respondents during the last week. The physical activity data were then converted into MET units according to the IPAQ calculation. Furthermore, the measurement of physical fitness among students used the Indonesian Physical Fitness Test (TKJI) which consists of five test components, namely the 60-meter run, pull up, sit up, vertical jump, and 1200 meter run. The scores from each test component were then summed to obtain the overall physical fitness score.

Procedure

Data This study was conducted through several systematic stages, starting from the preparation stage to data analysis. In the initial stage, the researcher conducted a literature review related to the concepts of physical literacy, physical activity, and physical fitness among adolescents to strengthen the theoretical foundation of the study. Subsequently, the researcher developed the research design using a quantitative approach with a cross-sectional design. After the research design was completed, the researcher coordinated with and obtained permission from the school where the study was conducted, and prepared the research instruments to be used in the data collection process. The instruments used included the Perceived Physical Literacy Instrument (PPLI) questionnaire to measure the level of physical literacy, the International Physical Activity Questionnaire (IPAQ) to measure the level of physical activity, and the Tes Kebugaran Jasmani Indonesia (TKJI) to measure students' physical fitness.

Data collection was conducted at SMA Advent Bandung by involving all students aged 15–17 years, totaling 132 participants, who were selected using a total sampling technique. Before the data collection process began, the researcher first provided an explanation to the respondents regarding the purpose and procedures of the study. The respondents were then asked to complete the PPLI and IPAQ questionnaires to obtain information about their level of physical literacy and the physical activity they had performed during the previous week. After completing the questionnaires, the respondents participated in the physical fitness test using the Indonesian Physical Fitness Test (TKJI), which consists of five test components: 60-meter sprint, push-up, sit-up, vertical jump, and beep test. The scores from each test component were then summed to obtain the overall physical fitness score. The collected data were subsequently analyzed using SPSS version 25 through descriptive statistical analysis and simple linear regression analysis to determine the effect of physical literacy on the level of physical activity and physical fitness, with a significance level of $p < 0.05$.

Data Analysis

Data analysis in this study was conducted using Statistical Package for the Social Sciences (SPSS) version 25. Data analysis was carried out using descriptive statistics to describe the characteristics of the research data including the mean value, standard deviation, minimum value, and maximum value of each research variable, namely physical literacy, physical activity, and physical fitness. Then classical assumption tests were conducted including normality test, linearity test, multicollinearity test, and heteroscedasticity test to ensure that the data met the requirements for regression analysis. Furthermore, hypothesis testing was conducted using simple linear regression analysis to determine the effect of physical literacy on physical activity as well as the effect of physical literacy and physical activity on physical fitness. All hypothesis testing in this study used a significance level of $p < 0.05$.

RESULTS AND DISCUSSION

Based on the results of data processing in this study from a total of 132 respondents who participated in the research, the classification results of each variable were found as follows:

Table 1. Data Description

	N	Minimum	Maximum	Mean	Std. Deviation
Physical literacy	132	2	5	03.23	.649
PA	132	459	3500	2332.24	682.133
Physical fitness	132	11	22	16.46	2.355
Valid N (listwise)	132				

Based on the results of the descriptive statistical analysis that has been conducted, the number of data analyzed in this study was 132 respondents. The physical literacy variable had a minimum value of 2 and a maximum value of 5, with a mean value of 3.23 and a standard deviation of 0.649. Furthermore, the physical activity variable obtained a minimum value of 459 and a maximum value of 3500, with a mean value of 2332.24 and a standard deviation of 682.133. Meanwhile, the physical fitness variable had a minimum value of 11 and a maximum value of 22, with a mean value of 16.46 and a standard deviation of 2.355. Therefore, the total valid data used in the analysis were 132 respondents. These results provide a general description of the data distribution for each variable studied. After that, the data were analyzed using normality, multicollinearity, and heteroscedasticity tests, and the results of the analysis showed that the regression assumptions were met. Furthermore, the data analysis in this study used simple linear regression to determine the effect of physical literacy on the level of physical activity and physical fitness among adolescents.

Table 2. Pearson Correlation

		Physical Literacy	Physical Activity	Physical Fitness
Physical Literacy	Pearson Correlation	1	.818**	.904
	Sig. (2-tailed)		.000	.000
	N	132	132	132
Physical Activity	Pearson Correlation	.818**	1	.819**
	Sig. (2-tailed)	.000		.000
	N	132	132	132
Physical Fitness	Pearson Correlation	.904	.819**	1
	Sig. (2-tailed)	.000	.000	
	N	132	132	132

Based on the results of the Pearson correlation test, it was found that there was a significant relationship between the variables studied. Physical literacy had a very strong relationship with physical activity with a correlation coefficient value of $r = 0.818$ and a significance value of $p = 0.000$ ($p < 0.05$). This indicates that the higher the level of physical literacy possessed by students, the higher the level of physical activity of the students.

In addition, physical literacy also shows a very strong relationship with physical fitness with a correlation coefficient value of $r = 0.904$ and a significance value of $p = 0.000$ ($p < 0.05$). These results indicate that an increase in physical literacy tends to be followed by an increase in physical fitness. Furthermore, the relationship between physical activity and physical fitness also shows a significant correlation with a value of $r = 0.819$ and a p -value = 0.000, which is smaller than $p = 0.05$. Therefore, overall, the results of this correlation analysis show that the three variables have a positive and significant relationship.

Table 3. Simple Linear Regression

Dependent Variable	Predictor Variables	B	β	t	r	R ²
Physical Activity	Physical Literacy	859.644	0,818	16.209	<0.001	0.669
Physical Fitness	Physical Literacy	3.283	0.904	24.178	<0.001	0.818

Simple linear regression analysis was conducted to determine whether physical literacy significantly predicts physical activity. The results of this analysis show that the model used is statistically significant with a value of $p < 0.001$. The coefficient of determination (R^2) value is 0.669, which indicates that physical literacy is able to explain 66.9% of the variation in physical activity. The regression coefficient for physical literacy shows a significant result ($\beta = 0.818$, $t = 16.209$, and $p < 0.001$), which indicates that physical literacy is a strong predictor of physical activity. These results indicate that individuals with higher levels of physical literacy tend to be more active in performing physical activity.

In addition, another regression analysis was conducted to examine the effect of physical literacy on physical fitness. The results of this analysis show that the regression model is statistically significant with a value of $p < 0.001$. The coefficient of determination (R^2) value is 0.818, which means that 81.8% of the variation in physical fitness can be explained by physical literacy. The regression coefficient shows that physical literacy significantly predicts physical fitness ($\beta = 0.904$, $t = 24.178$, and $p < 0.001$). These findings indicate that there is a very strong relationship between physical literacy and physical fitness.

The findings of this study indicate that physical literacy plays a very important role in influencing physical activity and physical fitness. The results of the correlation analysis show a strong relationship between all the variables studied, especially between physical literacy and physical fitness ($r = 0.904$). This indicates that individuals with higher levels of physical

literacy tend to have better physical fitness levels. Physical literacy includes motivation, confidence, physical competence, knowledge, and understanding to maintain physical activity throughout life. Therefore, individuals with higher levels of physical literacy are more likely to adopt an active lifestyle that contributes to improved physical fitness.

The results of the regression analysis also confirm that physical literacy significantly predicts physical activity, with a contribution of 66.9% to the variation in physical activity. This indicates that the higher the level of physical literacy possessed by an individual, the higher the level of physical activity performed. Therefore, physical literacy becomes one of the main factors influencing an individual's involvement in physical activity.

These findings are consistent with previous studies which state that individuals with higher levels of physical literacy have greater motivation and confidence to participate in physical activity (Choi et al., 2021; Carl et al., 2022; Öztürk et al., 2023).

In addition, this study also found that physical literacy explains 81.8% of the variation in physical fitness, indicating that both variables show a very strong predictive relationship. This finding is consistent with previous studies which state that physical literacy can improve overall physical fitness, such as enhancing cardiorespiratory fitness (Jiang et al., 2025), maintaining healthy body composition to prevent obesity (Domínguez-Martín et al., 2024), and improving psychological well-being, which can influence adolescents' willingness to continue participating in physical activity (Blain et al., 2021; Öztürk et al., 2023).

These findings reinforce the view that physical literacy is an important factor in supporting an active lifestyle among adolescents. Through the development of physical literacy, adolescents can gain better understanding, skills, and motivation to participate in physical activity on a sustained basis. Therefore, efforts to improve physical literacy through physical education programs in schools are essential. A study conducted by Muhamad & Fitri, (2025) suggests that physical education plays a crucial role in providing students with an understanding of an active lifestyle. In addition, sports activities within the community should continue to be developed to support the improvement of physical activity and physical fitness among adolescents.

However, this study still has several limitations. First, this study used a cross-sectional design, so the relationships found only indicate statistical associations between variables and cannot yet explain causal relationships. Second, this study used a sample that only involved respondents from a single region, so the results may not be fully generalizable to a broader population. In addition, during the data collection process, respondents still experienced difficulties in identifying their level of physical activity over the past week, including the frequency, duration, and intensity of the activities performed. This may have influenced the results of the study. Therefore, future research is recommended to involve a larger and more diverse sample, consider other variables that may influence physical activity and physical fitness, and use more accurate instruments to measure frequency, duration, and intensity of physical activity, such as ActiGraph.

CONCLUSIONS

Based on the results of the study, it can be concluded that physical literacy has a significant influence on physical activity and physical fitness among adolescents. The results of the regression analysis show that physical literacy contributes significantly to increasing the level of physical activity among respondents. In addition, physical literacy is also proven to have a significant effect on physical fitness. These findings indicate that the better the level of physical literacy possessed by adolescents, the higher their levels of physical activity and physical fitness. Therefore, physical literacy becomes an important factor that needs to be considered in efforts to increase participation in physical activity and improve physical fitness among adolescents. Thus, the development of physical literacy through physical education activities in schools as well as other physical activity programs needs to be continuously improved to support the creation of an active lifestyle among adolescents.

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