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Impact of Learning Motivation and Physical Condition on Physical Education Learning Outcomes in Junior High School Students Aged 13-15 Years: A Analysis studies

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A B S T R A C T

The purpose of the study. to determine and evaluate the relative contributions of physical fitness and learning motivation to the learning outcomes of students in the 7–9 age range.

Materials and methods. The purpose of correlation approaches is to quantitatively ascertain if and to what extent two or more variables are correlated. Data is analyzed using the statistical techniques of correlation and multiple regression utilizing the SPSS (Statistical Product and Service Solution Version 25) software. Before the advent of statistical methods for hypothesis testing. Use the Kolmogorov-Smirnov test (uji K-S) to check for data normality.

Results. The coefficient of correlation for rx12y=0.49 is indicated. The significance correlation coefficient was obtained by F calculated 4.37>t table 3.35, with the distribution t with α=0.05 and k=2 as the numerator and (n–k–1) as the denominator. In other words, there is a positive correlation between the Physical Motivation to Learn and the Penjasorkes Learning Outcomes, which are 0.492x100%, or 0.24 x 100%, or 24%.

Conclusions. Students' willingness and excitement to participate in physical education learning activities will be influenced by their motivation for learning. A learner who understands effective learning motivation would attempt to inspire themself to learn well. Since achieving satisfactory learning outcomes is one of the goals of the processes and activities that take place in the classroom, teachers are crucial in helping students develop motivation for learning and improving their physical fitness.

A R T I C L E I N F O

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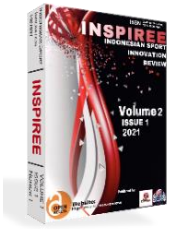

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INTRODUCTION

Physical education learning outcomes are influenced by numerous factors. Student characteristics, such as physical fitness, motivation, intelligence, talents, interests, and nutritional status, are internal factors that originate from the learners

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themselves(The Association Between School-Based Physical Activity, Including Physical Education, and Academic Performance, 2023)(Bălan et al., 2012). Conversely, teaching quality, including instructional methods, available facilities and infrastructure, educators' academic backgrounds, and student-teacher relationships, are external factors that also impact learning outcomes(Burroughs et al., 2019). Additionally, the social, economic, and educational levels of parents, as well as environmental factors, are believed to influence student achievement(Mulhall et al., 2002). This aligns with the classification of factors affecting learning outcomes into two broad categories:(Hein et al., 2013) internal factors within the individual and external factors outside the individual. The internal factors encompass physical, psychological, and fatigue-related components, while the external factors involve family, school, and community-related elements(Panadero, 2017).

Learning motivation is a crucial factor that drives students to engage in their studies with enthusiasm, seriousness, and sincerity(Sudsomboon, 2019). The term "motive" refers to an effort that encourages individuals to take action(Moosa & Aloka, 2022). This can be understood as an internal driving force that compels people to carry out specific activities to achieve their goals(Cheng & Yeh, 2008). These motives can be classified into two categories: physical motives and social motives(Shafi et al., 2015). As explained by psychologists, the various motives in humans or organisms can be grouped into physiological drives and social motives(Dunsmore & Goodson, 2006). Physiological drives are those related to physical needs, such as hunger, thirst, and sexual desire, while social motives are those associated with human relationships in society, such as aesthetic drives and the urge to do good(Tracy, 2006).

Maslow's theory of motivation is rooted in the concept of human needs, which is derived deductively (Maslow, 1943). This theory rests on three fundamental assumptions: individuals are beings with constant desires, but these desires are not always fully satisfied; needs or desires that have been met no longer function as a driving force; and human needs are organized in a hierarchical manner based on their level of importance. In the context of learning activities, motivation can be understood as the overall driving force within a person that generates desire, ensures continuity,

and provides direction to learning endeavors, with the ultimate goal of achieving the desired outcomes(Anderman & Gray, 2015). Motivation encompasses the principles of strengthening, directing, encouraging, and driving behavior, which are closely intertwined with the principles of learning(Bayounes et al., 2022). Learning results are optimal if there is motivation(Cook & Artino, 2016). The more appropriate the motivation given, the more successful the learning will be.With the motivation inherent in students and supported by available learning facilities, it is recognized that they will be able to guide students toward the attainment of their learning objectives(Aisyah et al., 2023).

Learning motivation is a crucial factor that fuels student engagement and diligence in their studies(Papa-Gusho, 2013). Motivation can stem from internal or external sources, and students with higher motivation tend to perform better academically. Similarly, physical fitness also plays a significant role in learning outcomes(Erten, 2014). Good physical condition allows students to participate in learning activities without experiencing excessive fatigue, enabling them to focus on the learning process and absorb the content more effectively(Kohl et al., 2013). Physical fitness encompasses various aspects, such as cardiovascular endurance, muscular strength and endurance, flexibility, and body composition, all of which contribute to overall well-being and learning capacity(Westcott, 1978). Students with optimal physical fitness are better equipped to handle the physical demands of learning and can devote more energy to the cognitive aspects of the educational experience(Keeley & Fox, 2009). The interplay between psychological and physiological factors is crucial in shaping student learning processes and outcomes(Honório et al., 2023). While psychological factors like motivation, intelligence, talent, and interest are essential, they must be supported by physiological factors for the learning process to function optimally(Yamin et al., 2012). A student's physical condition, including the state of the five senses, can significantly impact their susceptibility to illness and, consequently, their learning activities(Knapczyk, 1982). By addressing both the psychological and physiological aspects of student development, educators can foster an environment conducive to effective learning and improved academic performance.

Research has consistently demonstrated the significant impact of learning motivation on academic achievement. Learning motivation encompasses the overall driving force that generates, maintains, and directs a student's learning activities to achieve their desired goals(Urhahne & Wijnia, 2023). Students with higher levels of motivation tend to exhibit greater perseverance, effort, and engagement in their studies, leading to improved learning outcomes (Wardani et al., 2020) . In addition to learning motivation, physical fitness and condition have also been found to be critical factors in the learning process(Roles of Self-Efficacy and Learning Motivation in Learning, 2020). Studies have shown that students with better physical fitness, characterized by higher levels of cardiovascular endurance, muscular strength and endurance, flexibility, and healthy body composition, tend to perform better academically. (Liu et al., 2023) (Kohl et al., 2013) This is because physical fitness allows students to participate in learning activities without experiencing excessive fatigue, enabling them to focus on the cognitive aspects of the learning process.

The relationship between physical activity, fitness, and academic performance has been well-documented. Increased physical activity can lead to improved cardiovascular fitness, which has been associated with enhanced brain function, cognitive abilities, and academic achievement. (Kohl et al., 2013) Furthermore, research has indicated that physically active lessons and physical activity breaks during the school day can improve classroom behavior, attention, and on-task learning, ultimately contributing to better academic outcomes. (Kohl et al., 2013).

MATERIALS AND METHODS

Study participants

The population used in this research is Raudhatul Jannah Junior High School, totaling 180 people with a sample age category of 7-9 years spread across 6 classes.

Study Organization

Quantitative correlation approaches are employed to ascertain the presence and strength of a correlation between two or more variables. Correlation and multiple regression statistical analysis are used in data analysis, and the SPSS (Statistical Product and Service Solution Version 25) application is used for processing. Before, theories

were tested using statistical methods. To verify data normalcy, the Kolmogorov-Smirnov test (K-S test) was used.

Test and measurement procedures

There are three variables in this research, so that the research variables can be measured quantitatively, the variables are defined operationally: 1) Physical fitness test using the TKJI test (Indonesian Physical Fitness Test). TKJI test divided into those taken in this study based on age groups, namely groups aged 13-15 6-9 years. The 5 test items are a 50-meter run, 60 seconds of hanging elbows, 60 seconds of lying down, an upright jump, and an 800-meter run for women and 1000 meters for men. This test is a series of tests so its implementation must not be interrupted but continuous in a series of tests. 2) Test 2. Motivation for Learning Physical Education. This test item uses a questionnaire test which is given to students using a scale Likert as well as with Croanbach's Alpha item analysis. 3) Learning outcomes with indicators of changes in behavior in the form of knowledge, skills, and attitudes which are the result of learning activities determined in the form of numbers or report cards in semester 2.

RESULTS

Regression and correlation analyses were performed on this study's data utilizing parametric statistical formulae. A normally distributed population for the sample data, a linear regression line connecting the independent and dependent variables, and independence of the data between the independent variables are the only prerequisites for conducting analysis using this statistical technique.

Normality test

The Liliefors test was used in this investigation to determine whether the three variables were normal. When using the normality test hypothesis, $\alpha = 0.05$ serves as the threshold of significance that determines whether or not a data distribution is considered normal.

Table 1. When using the normality test hypothesis

No	Variabel	Lo	Lt	Information
1.	Physical Fitness	0,1255	0,1610	Normal
2.	Learning Motivation	0,1590	0,1610	Normal
3.	Learning Results	0,0888	0,1160	Normal

Table 14 indicates that the Lt_{values} are greater than the Lo values derived from the three research variables. In light of the preceding framework for decision-making, Ho is approved. It follows that the three variables originate from a population that is regularly distributed.

Linearity Test

This linearity test was carried out to see whether each independent variable data, namely Physical Fitness (X_1) and Learning Motivation (X_2) had a linear relationship or not with the dependent variable Learning Outcomes (Y). Linearity testing was carried out through the F anava test. The level of significance used as a basis for rejecting or accepting the decision of whether or not the correlation data is linear is α=0.05. The criteria for the linearity test are if $F_{count} < F_{Table}$ means the correlation data is linear, and if $F_{count} < F_{Table}$ it means the correlation data is not linear. This can be seen in the following table:

Table 2. Linearity Test Table

Independent variable	Dependent variable	F_{count}	F_{table}	Information
X_1	Y	3,42	3,65	**Linear**
X_2	Y			

The F table values are greater than the two computed F_{values} derived from the analysis results, as this table demonstrates. The computed F is $3.42 < F_{table}$ 3.65 for the Physical Fitness variable (X_1) with Learning Outcomes (Y). Calculating F for the variable Learning Motivation (X_1) is impossible given Learning Outcomes (Y). Therefore, it can be said that Ho is accepted and Ha is rejected based on the fundamental conclusion stated above. It is evident from accepting this hypothesis that there is a linear relationship between the independent variables (X_1) and (X_2) and the dependent variable (Y).

Statistical analysis to determine the significance of relationships between variables.

An independence test is conducted to ascertain the presence or absence of a correlation between the independent variables, specifically Physical Fitness (X_1) and Learning Motivation (X_2). This entails determining whether the two independent variables are indeed unrelated to each other. The independence test is conducted by employing product moment correlation analysis and assessing significance through the t-distribution test.

Table 3. Summary of Correlation Analysis of the Physical Fitness variable (X1) on Physical Education Learning Outcomes (Y)

Correlation	N	Coefficient correlation (r)	Coefficient determination (r2)	t_{count}	t_{table}	Information
Rx_1y	30	0,40	0,16	2,32	2,04	Significant

The data in table 3 indicates that the correlation coefficient is r=0.16. Conducting a hypothesis test to determine the significance of the correlation coefficient using the t distribution with a significance level (α) of 0.05 and degrees of freedom (dk) equal to n-2. The estimated t-value of 2.32 exceeds the critical t-value of 2.04 from the t-table. This indicates that the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted, specifically suggesting a positive correlation between Physical Fitness and Physical Education Learning Outcomes.

To assess the extent to which Physical Fitness impacts Physical Education Learning Outcomes, we calculate the coefficient of determination (r^2), which is equal to (0.40)2= 0.16. The contribution is determined by multiplying the coefficient of determination by 100%, resulting in a value of 16.10% when the coefficient is 0.40. Subsequently, in order to determine the functional correlation between variables, a regression analysis is conducted, where the score on one variable is utilised to forecast the score on another variable, following the equation Y=a+bX. The equation Y=63.95+1.03X is derived from the analysis results, with the entire calculations provided in attachment 15.

The second hypothesis stated in this research is that "Learning Motivation has a positive correlation with students' Physical Education Learning Outcomes". In the table below, we will examine the correlation between the Learning Motivation variable (X_2) and students' Physical Education Learning Outcomes (Y) to determine if there is a positive association:

Table 4. Summary of Correlation Analysis of Learning Motivation Variables (X2) on Physical Education Learning Outcomes (Y)

Correlation	N	Correlation coefficient (r)	Determination coefficient (r2)	t_{count}	t_{table}	Information
rX_2y	30	0,38	0,15	6,98	2,04	Significant

The calculation results in table 3 indicate that the correlation coefficient, denoted as r, is equal to 0.38. Conducting a hypothesis test to determine the significance of the correlation coefficient using the t distribution with a significance level (α) of 0.05 and degrees of freedom (dk) equal to n-2. The calculated t value is 6.98, which is more than the critical t value of 2.04 obtained from the t table. This indicates that the null

hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted, specifically suggesting a positive correlation between Learning Motivation and Physical Education Learning Outcomes. To determine the extent to which learning motivation contributes to Physical Education Learning Outcomes, calculate the coefficient of determination, which is 0.15 multiplied by 100%, resulting in 15%.

Subsequently, in order to determine the functional correlation between variables where the score on one variable can be utilised to forecast scores on other variables, a straightforward linear regression analysis is conducted employing the regression equation. The equation is represented as Y equals the sum of a and the product of b and X_1. The analytical results yield the equation Y=62.40+0.07X. The third hypothesis in this research states that the combination of physical freshness and learning motivation has a good impact on students' outcomes in physical education. The objective is to determine the beneficial impact of two independent factors, Physical Fitness (X_1) and Learning Motivation (X_2), on the dependent variable, Physical Education Learning Outcomes (Y), for junior high school students.

Table 5. ummary of Correlation Analysis of Physical Fitness Variables (X1) and Learning Motivation (X2) on Physical Education Results (Y).

Correlation	N	Correlation coefficient (r)	Determination coefficient (r2)	t_{count}	t_{table}	Information
$rx_{12}y$	30	0,49	0.24	4,37	3,35	Signifikan

The calculation results in table 19 indicate that the correlation coefficient r_{x12y} is equal to 0.49. The significance of the correlation coefficient was tested using the t distribution. The significance level (α) was set to 0.05, and the degrees of freedom (k) were set to 2 for the numerator and (n – k – 1) for the denominator (dk). The generated F_{count} was 4.37, which was compared to the critical value from the t table, which was 3.35. This indicates that the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted, specifically suggesting a positive correlation between Physical Fitness, Learning Motivation, and Physical Education Learning Outcomes. To ascertain the extent to which learning motivation influences Physical Education Learning Outcomes, examine the coefficient of determination, which is 0.24 when expressed as a percentage is 24%. Next, we will determine the functional relationship

between variables by examining how the scores on two independent variables can be used to predict the scores on another variable.

DISCUSSION

The findings of this study underscore the pivotal role that physical fitness and learning motivation play in shaping the academic achievement of junior high school students aged 13 to 15. Firstly, the correlation analysis revealed a significant positive association between physical fitness and academic performance in physical education(Castelli et al., 2007)(Chen et al., 2012)(Han, 2018). These results corroborate previous research demonstrating the benefits of physical activity and fitness on cognitive function, attention, and academic achievement in adolescents (Chen et al., 2012) (Gustian & Firdaus, 2020). Physical fitness can enhance academic outcomes by improving cardiovascular health, muscular strength, and flexibility, which in turn can lead to better energy levels, focus, and overall well-being. This suggests that promoting physical fitness among students may have far-reaching implications for their academic success(The Association Between School-Based Physical Activity, Including Physical Education, and Academic Performance, 2023)(Kohl et al., 2013). Secondly, the analysis also showed a significant positive correlation between learning motivation and academic achievement in physical education (Suyati et al., 2022)(Iqbal et al., 2022). Students who are more motivated to learn and engage with the subject matter tend to perform better academically(2021). This could be because motivated students are more likely to put in the sustained effort, attend classes regularly, and actively participate in the learning process, all of which are critical factors in academic success(Wang & Degol, 2014). Fostering learning motivation among students, therefore, emerges as a key strategy to boost their physical education outcomes(Manninen & Yli-Piipari, 2021). Lastly, the combined effect of physical fitness and learning motivation on academic achievement in physical education was examined(Gustian & Firdaus, 2020). The results indicate that the synergistic influence of these two factors has a significant positive impact on student outcomes, accounting for 24% of the variance in physical education learning outcomes. This underscores the importance of adopting a holistic approach that addresses both the physical and motivational aspects of student learning in order

to optimize academic achievement in physical education(Γούδας et al., 2001)(Nesbitt et al., 2021).

CONCLUSION

The conclusions of this study underscore the crucial function that physical fitness and academic drive play in shaping the educational attainment of junior high school students aged 13 to 15. The results highlight the considerable positive influence of these two key factors, both individually and in combination, on students' academic performance in physical education. This underscores the importance of adopting a comprehensive approach that addresses both the physical and motivational facets of student learning to optimize academic achievement in physical education.

To foster enhanced physical education outcomes, educational stakeholders should consider implementing targeted interventions that promote physical fitness and bolster learning motivation among junior high school students.

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