



The Effect of Traditional Games on the Physical Fitness of Students at Elementary School

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Abstract

This research was motivated by children's preference for screen-based games that involve minimal physical activity over games that involve direct physical movement. This condition has contributed to a decline in the physical fitness levels of elementary school aged children. This study aims to assess the effect of traditional games on the physical health of sixth-grade students at Wates 02 Public Elementary School in Semarang City. A one-group pretest-posttest pre-experimental design was employed in a quantitative study. 28 sixth-grade pupils that were chosen using a saturation sample technique made up the research subjects. The Indonesian Physical Fitness Test (TKJI) was employed as the research instrument for ages 10 to 12 years. The data were examined descriptively and inferentially using normality, homogeneity, Wilcoxon, and r-square tests. The average physical fitness score of pupils increased from 15.29 in the pretest to 21.89 in the posttest, according to the results. The results of the Wilcoxon test indicated a significant difference between the pretest and post-test results following the installation of traditional games, with a significance value of 0.000 ($p < 0.05$). Furthermore, the outcomes of the R-squared test suggested that traditional games enhanced students' physical fitness by 50.4%. Based on these results, it can be claimed that the installation of traditional games has a major influence on boosting the physical fitness of sixth-grade students at Wates 02 Public Elementary School in Semarang City.

How to Cite

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INTRODUCTION

Physical fitness is an important aspect of supporting the growth and development of elementary school children. Children who are physically fit tend to have stronger immune systems, better motor coordination, and optimal concentration in learning activities (Bireuen et al., 2025). However, in recent years, there has been a decline in physical activity among children due to increasingly sedentary lifestyles of children. Children spend more time using gadgets than engaging in outdoor physical activities. This condition increases the risk of fatigue, obesity, and low physical fitness at an early age. Therefore, improving children's physical fitness has become an important concern in primary education.

Physical education in elementary schools plays a strategic role in shaping active and healthy lifestyle habits from an early age. Through physical education, students are not only trained in physical abilities but also instilled with the values of discipline, cooperation, and sportsmanship (Sari et al., 2025). The physical education curriculum emphasizes the importance of physical activities that are appropriate for children's developmental characteristics. However, monotonous and unvaried learning often makes students less enthusiastic about participating in class activities. This results in suboptimal physical activity intensities among students. Therefore, a learning approach that can increase overall student participation is needed.

One effective approach to physical education is through play. Playing is a natural activity for children that can simultaneously increase physical and psychological engagement. In play activities, students move without feeling burdened by the demands of formal exercises. According to Sindi et al. (2023), game-based learning is a learning method that can attract students' attention by presenting interesting visuals, thereby increasing their ability to think critically and actively.

Students' motivation and the amount of time they spend exercising can both be increased via game-based learning. In addition, games assist children master basic motor skills in a more enjoyable manner. According to a study by Bile et al. (2021), game-based learning can enhance students' motor abilities and physical health. Thus, games have significant potential for enhancing the physical fitness of elementary school kids.

Traditional games are a form of play that has been passed down from generation to

generation and is rich in active movements (Dike et al., 2023). Traditional games such as sack races, block races, bentengan, and egrang batok involve running, jumping, maintaining balance, and cooperation among players. These activities directly train physical fitness components, such as endurance, agility, strength, and coordination. In addition to physical aspects, traditional games also contain social and cultural values that are important for building character in children. Unfortunately, traditional games are becoming increasingly rare in the daily lives of children. These games are relevant for application in physical education in elementary schools.

Technological developments and the rise of digital games have caused children to increasingly abandon traditional games. Children prefer screen-based games that require minimal physical activity over games that involve direct physical movement. This condition contributes to a decline in the physical fitness of school-aged children. Therefore, a learning approach that can increase student engagement is needed, such as traditional game-based learning (Handayani & Wulandari, 2021). Traditional games offer intense physical activity that is enjoyable. Revitalizing traditional games is important so that children become active again and do not depend on digital games. Schools have a strategic role in reviving traditional games through physical education.

In general, the physical fitness of elementary school students shows considerable variation. Some students have good fitness levels, but many tire easily when participating in physical activities (Said, 2023). Low physical fitness is often associated with a lack of structured and sustained activities. In physical education classes, students often do not receive activities that are sufficiently challenging or interesting. Consequently, the learning objectives of improving physical fitness have not been optimally achieved. This calls for innovation in teaching methods that are more contextual and tailored to students' needs.

Wates 02 Public Elementary School in Semarang City is one of the elementary schools that implements physical education in accordance with the curriculum. Based on initial observations, students' physical activities in learning are still dominated by conventional exercises. Students appear to lack enthusiasm and tire quickly when they participate in certain activities. On the other hand, schools have the potential to develop traditional game-based learning. The supportive school environment and students' enjoyment of play activities present opportunities that can be utilized. Therefore, the application of traditional

games is considered relevant for implementation in this school.

Previous studies have shown that traditional games positively affect the physical fitness of elementary school students. For example, an experimental study by (Riyandi & Sulaiman, 2021) found that sack races, block races, and stilts significantly affected the physical fitness of fifth and sixth grade students at Sukagumiwang III Elementary School in Indramayu, with pretest-posttest results showing an increase in students' physical fitness scores after traditional games were introduced. Furthermore, a systematic study by (Suryadi & Ivanov, 2025) found that traditional games consistently encourage active student involvement and correlate with increased physical fitness in various studies in Indonesia. However, most of these studies were conducted in different schools and regions of the country. Therefore, the difference between this study and previous research lies in the types of traditional games used, as well as the time and location of implementation. This study used sack races, block races, and coconut stilts as interventions, while previous studies used gobak sodor, fish nets, balloon races, and forts. Furthermore, this study was conducted at a different time and location than previous studies, thus providing different contexts and subject characteristics. Thus, these differences indicate variations in the treatment and research conditions, which are both distinguishing and contribute to the novelty of this study.

Game-based learning can boost students' motivation and the amount of time they spend working out. In addition, games enable toddlers grasp basic motor skills in a more enjoyable method. A study by Bile et al. (2021) found that game-based learning can improve students' physical health and motor skills. Therefore, games offer a great deal of potential to improve elementary school students' physical health. Based on the previous description, the aim of this study was to assess the influence of traditional games on the physical health of sixth grade students.

METHOD

The method used in this research is a quantitative experimental method. The experimental method is a research approach that aims to determine the causal relationship between one or more variables through the administration of a specific treatment. This study used a pre-experimental design with a one-group pretest-posttest model. Research design, also known as a research plan,

is a systematic plan formulated to answer the researcher's stated questions.

The implementation of this design aligns with the researcher's goal, which is to improve the physical fitness of sixth-grade students at Wates 02 Elementary School, Semarang City, through the implementation of traditional games. In planning this research, the researcher only involved one group, where all students were given treatment in the form of traditional game activities. Physical fitness levels were measured before the treatment (pretest) and after the treatment (posttest) to determine the effects of the treatment.

This study was conducted at Wates 02 Public Elementary School in Semarang City. This location was quite strategic for the researcher because it was close to the campus. In conducting this study, the researcher chose sixth-grade students at Wates 02 Public Elementary School in Semarang City as the population because the researcher found a problem, namely the lack of physical fitness among students, which affected their processes and activities in elementary school. The sampling technique used to collect samples was saturation sampling. Saturated sampling is used when the sample consists of all members of the population (Sugiyono, 2019). The sample for this study consisted of sixth-grade students at Wates 02 Public Elementary School in Semarang City, both male and female, with a total of 28 students, comprising 14 boys and 14 girls. In this study, the Indonesian Physical Fitness Test (TKJI) was used. This study aimed to determine the level of physical fitness in children aged 10-12 years. According to (Iii & Penelitian, 2019), in their study, they mentioned that the TKJI 2010 was used for the physical fitness test for children aged 10-12 years because this test is commonly used and applicable throughout Indonesia.

Table 1. Classification of Physical Fitness

Value	Classification
22-25	Very Good
18-21	Good
14-17	Moderate
10-13	Poor
≤ 12	Very Poor

A quantitative descriptive analysis was used in this investigation. The measurements of each physical fitness test item, which were still in raw data form, provided the source of the data. The Indonesian Physical Fitness Test (TKJI) evaluation table for children aged 10–12 was then

used to process the raw data by translating each test item's results into scores.

The scores obtained from the five TKJI test items were accumulated to obtain a total physical fitness score. This total score was used as a basis for determining the students' physical fitness level category based on the Indonesian Physical Fitness Test (TKJI) norm table contained in official documents and standardized.

SPSS version 26 for Windows was used to test the gathered data in order to examine the effect of traditional games on enhancing students' physical fitness. In order to process and interpret quantitative data and derive findings pertinent to the study's goals, this analysis was carried out. The paired sample t-test, r-square test, homogeneity test, and normality test were employed by the researchers.

RESULTS AND DISCUSSION

The researchers also involved other people to help record the data-collection scores. This study aimed to determine the extent to which traditional games influence the physical fitness of students at Wates 02 Public Elementary School in Semarang City. Good physical fitness is essential to support the smooth running and effectiveness of students in the learning process.

Table 2. Descriptive Analysis

	N	Min	Max	Mean	Std. Deviation
Pre Test	28	11.00	20.00	15.2857	2.29100
Post Test	28	18.00	24.00	21.8929	1.74991

Based on the results of the **Table 2.** Descriptive Statistical Analysis of the Indonesian Physical Fitness Test (TKJI), 28 respondents were included in this study. In the TKJI pre-test results, the minimum score obtained by participants was 11 and the maximum score was 20, with an average of 15.29 and a standard deviation of 2.29. In the TKJI post-test results, the minimum score increased to 18, and the maximum score reached 24, with an average value of 21.89 and a standard deviation of 1.75. This increase in the average value indicates an increase in the participants' physical fitness levels after participating in the training program or treatment provided.

Based on the **Table 3.** Shapiro-Wilk test results, which are recommended for sample sizes of less than 50, a significance value of 0.077 ($p > 0.05$) was obtained for the TKJI pre-test. These results indicate that the TKJI pre-test data were normally distributed. The TKJI post-test data had

a significance value of 0.003 ($p < 0.05$), indicating that the data were not normally distributed. The Kolmogorov-Smirnov test results showed significance values of 0.050 in the pre-test and 0.000 in the post-test. In line with the Shapiro-Wilk results, the pre-test data still met the normality assumption, while the post-test data did not meet the normality assumption.

Table 3. Normality Test

Kolmogorov-Smirnova			Shapiro-Wilk		
Statistic	df	Sig.	Statistic	df	Sig.
.165	28	.050	.934	28	.077
.272	28	.000	.873	28	.003
Significance Correction					

Table 4. Homogeneity Test

		Levene Statistic	df1	df2	Sig.	Description
Results of TKJI	Based on Mean	4.536	5	20	.006	Not homogeneous
	Based on Median	2.639	5	20	.055	Homogeneous variance
	Based on Median and with adjusted df	2.639	5	14.742	.067	Homogeneous variance
	Based on trimmed mean	4.395	5	20	.007	Not homogeneous

Based on the results of the homogeneity test, the pre- and post-test values in this study had a sig. The value of $0.006 < 0.05$, indicating that the data were heterogeneous.

Based on the results of the normality and homogeneity tests, the data in this study did not meet the requirements of normal distribution and homogeneity; therefore, it needed to be tested using an alternative analysis, namely, non-parametric analysis. The Wilcoxon test was used as an alternative to the paired t-test.

The Wilcoxon signed-rank test was used to determine the difference between the pre- and post-test results of the Indonesian Physical Fitness Test (TKJI) because the data were not completely normally distributed. Based on the test results, a statistical value of $Z = -4.660$ was obtained, with a significance value of Asymp. Sig. (2-tailed) = 0.000. This significance value is smaller than the significance level of 0.05 ($p < 0.05$); therefore, H_0 is rejected and H_1 is accepted. This indicates a significant difference between the pre-test and post-test TKJI scores after the treatment or exercise program.

The magnitude of the effect between the pre- and post-tests was $0.504 \times 100\% = 50.4\%$. This indicates that each participant was able to show an improvement of 50.4% from the pretest to the posttest results. This means that the treat-

ment improved the physical fitness of each participant by 50.4%.

Based on the results of the research that has been completed, the use of traditional games has been demonstrated to have a favorable effect on increasing the physical fitness of sixth grade students at Wates 02 Public Elementary School in Semarang City. This can be observed from the findings of the descriptive statistical analysis, which reveals an increase in the average physical fitness score of students from 15.29 in the pre-test to 21.89 in the post-test. This rise demonstrates that the pupils' physical condition significantly improved after receiving traditional games as treatment.

Running, jumping, maintaining balance, and other fundamental motions are all part of traditional games, which are a type of physical exercise. and coordinating movements. These movements are performed repeatedly during the learning process, thus providing sufficient exercise stimuli for students' bodies. Consistent and structured physical activity can increase the working capacity of organs, especially the cardiovascular and muscular systems, which are crucial to physical fitness. Therefore, the improvement in students' physical fitness scores after engaging in traditional games suggests that this learning method is helpful in training students' physical condition (Amira et al., 2023).

In addition, traditional games have the advantage of being played in a fun and exciting atmosphere. Students tend to be more enthusiastic about participating in physical education lessons that are packaged in the form of games rather than conventional physical exercises. Joy and high interest encourage students to move more actively without feeling burdened. This causes the duration of students' physical activity to be longer, and the intensity of movement to increase naturally. These conditions are supportive of achieving the objectives of physical education, particularly in improving students' physical fitness.

The findings of this study are consistent with those of (Pramudyanto et al., 2023), who claimed that traditional games can greatly increase primary school pupils' physical fitness. In this study, students that participated in conventional game-based learning exhibited an improvement in physical fitness scores compared to before the treatment. This demonstrates that, given the developmental traits of elementary school pupils, traditional games can be a useful substitute for physical education instruction.

In addition to their impact on physical as-

pects, traditional games have social and psychological values that support student engagement in learning. In traditional games, students are required to work together, obey the rules, and interact with their peers. This social interaction can increase students' confidence and motivation to actively participate in learning activities. According to Nugraha et al. (2025), increased student motivation and involvement in physical activities play an important role in improving physical fitness, as students are encouraged to perform physical activities to the fullest.

The difference in students' physical fitness before and after the treatment was also confirmed through the results of the Wilcoxon Signed Ranks Test. The test findings indicated a substantial difference in students' physical fitness between the pre-test and post-test, with a significance value of 0.000 ($p < 0.05$). As a result, the null hypothesis was rejected and the alternative hypothesis was accepted. These findings show that the treatment provided in the form of traditional games was the reason for the increase in students' physical fitness.

The Wilcoxon test was appropriate in this study because the research data did not fully meet the assumptions of normality and homogeneity. This non-parametric test can provide accurate analysis results when testing the differences between two paired datasets. The results of this test further reinforce the finding that traditional games have a real effect on students' physical fitness. In other words, traditional games not only descriptively improve physical fitness scores but are also statistically significant.

The extent of the influence of traditional games on improving students' physical fitness can also be seen from the R-squared test results, which show a value of 0.504 or 50.4%. This indicates that traditional games contribute 50.4% to the improvement in students' physical fitness. This percentage is quite large, so it can be said that traditional games are a major factor influencing the improvement in students' physical fitness in this study. Meanwhile, the remaining percentage of influence is influenced by other factors outside the study, such as students' physical activity outside school, health conditions, and daily lifestyle.

These results are consistent with those of (Sumantri et al., 2024), who claimed that because traditional games like hopscotch and jump rope require frequent, moderate-to-intense physical exercise, they are beneficial for enhancing physical fitness. Traditional games can also progressively develop endurance and muscle strength.

Additionally, Putri et al. (2024) noted that traditional games can be employed as an effective physical education learning technique since they can retain students' attention and enthusiasm throughout the learning process while also improving physical fitness

CONCLUSION

Based on the results of the research conducted, it can be concluded that the implementation of traditional games has a real and meaningful impact on improving the physical health of elementary school students. Structured and continuous traditional game activities have been proven to improve the physical fitness levels of sixth-grade students at Wates 02 Elementary School in Semarang City. This is demonstrated by the clear difference between the results of physical fitness tests before (pretest) and after (posttest) the treatment, where students' physical fitness scores increased after participating in a series of traditional games involving active body movement. This improvement reflects that traditional games have a positive contribution to developing various components of physical fitness, such as strength, agility, speed, endurance, and motor coordination. Therefore, traditional games serve not only as a recreational tool but also have educational and functional value as learning media that can encourage students to be more active in the physical education learning process. Furthermore, student involvement in traditional games has the potential to reduce the tendency for sedentary behavior caused by the use of digital-based games that involve minimal physical activity.

Traditional games can be used as an alternative, innovative, effective, and applicable learning strategy to improve the physical fitness of elementary school students. The implementation of traditional games in physical education learning activities is expected to create a fun learning environment while supporting optimal student physical health development. The results of this study also recommend that traditional games be systematically integrated into the physical education curriculum and serve as a reference for further research to develop more varied and contextual physical activity-based learning models.

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