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Improving Agility Through Traditional Games in Fourth Grade Students at Elementary School 76 Muaro Jambi

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ABSTRACT

This study aimed to investigate the effect of traditional games (hadang and benteng-bentengan) on improving agility in fourth-grade students at Elementary School 76 Muaro Jambi. This research employed an experimental method with a "One Group Pretest-Posttest Design". The population consisted of all fourth-grade students at Elementary School 76 Muaro Jambi, totalling 60 students. The sample was selected using a purposive sampling technique, specifically male students from class IV A, totalling 14 students. The research instrument used the Illinois Agility Run test to measure students' agility. Data were analyzed using the Shapiro-Wilk normality test, homogeneity test, and hypothesis testing with a t-test using SPSS version 27. The research results showed that traditional games, hadang and benteng-bentengan, proved effective in improving students' agility. There was a decrease in average completion time from 19.37 seconds in the pre-test to 16.61 seconds in the post-test, indicating an agility improvement of 2.76 seconds. The hypothesis test results showed a significance value of 0.001 (< 0.05), meaning there was a significant difference between students' agility before and after being given traditional games treatment. Traditional games provide dual benefits: improving students' physical abilities and helping preserve local cultural heritage. This research proves that learning approaches combining traditional cultural elements with physical development goals can provide optimal results in elementary school physical education.

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INTRODUCTION

Physical education plays a crucial role in students' overall development, particularly in elementary schools where foundational movement skills are established (Matulessy & Muhid, 2022). The Law No. 20 of 2003 Article 1 Paragraph 1 states that education is a deliberate and planned effort in the form of creating an environment and active learning process for students to develop their potential, including spiritual strength, self-control, intellectual intelligence, noble character, and talents that can be utilized in the context of nation, state, and society.

Elementary education serves as the foundation for subsequent educational levels, often referred to as elementary school (Erwanda & Sutapa, 2023). Every elementary

school student receives various information through various subjects. Elementary school subjects are designed to develop children's mental and physical strength as well as their spiritual soul. Among the subjects taught to elementary school students are physical education, sports, and health (Kustari & Mahendra, 2020).

Physical education, sometimes referred to as sports and health, is a teaching method through exercise aimed at improving physical fitness (Sholikin et al., 2022). Students' movement agility increases along with their level of activity or movement. Agility is defined as the ability to combine several movements quickly to change body posture or direction. The ability to change body position direction quickly and precisely without losing balance is called agility (Hidayat, 2020).

Agility is an important factor in sports and physical activities that can affect students' performance in traditional games. This is a component that not only includes movement speed but also essential elements such as dynamic balance, muscle strength, flexibility, and reaction speed. All of these work together to enable efficient movement in various directions. Currently, traditional games are rarely played because of the emergence of digital technology, such as gadgets that make children less interested in traditional games (Maulana, 2023). Traditional games show hereditary knowledge and have various functions or messages behind them. Basically, these games can be played by all enthusiasts, both children and adults (Kurniawan, 2019). Traditional games are interactive media aimed at improving children's psychological aspects as preparation for the adult world.

According to Kurniawan (2019), traditional games can be categorized into: games for playing (recreation), games for competing (competition), and educational games. Observations conducted at Elementary School 76 Muaro Jambi, especially in fourth grade, show that there are many problems with students' agility in physical education learning. Initial observation results showed that most students have a low level of agility, demonstrated by their ability to perform movements requiring rapid direction changes.

This condition is evident when students participate in sports activities such as playing basketball. This is caused by several interrelated factors, one of which is students' tendency to spend more time with gadgets and a lack of physical activity. This is reinforced by data from the Central Statistics Agency (BPS) 2023, which recorded that children aged 0-18 years dominate the online game market with a percentage of 46.2%, causing them to be lazy to exercise.

METHODS

This research used an experimental methodology. The design used in this study was "One Group Pretest-Posttest Design." The following is a description of the research design:

$$T_1 \rightarrow Y \rightarrow T_2$$

The population of this study was all fourth-grade students at Elementary School 76 Muaro Jambi, totalling 60 students. The sample was selected using a purposive sampling technique, specifically male students from class IV A, totalling 14 students, due to constraints of time, energy, and finance that hindered researchers from collecting samples in large numbers.

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The research instrument used the Illinois Agility Run test to measure students' agility. The instrument assessment was as follows (Wala, 2025):

Table 1.
Instrument assessment

Category	Time (seconds)
Excellent	< 15.2
Good	15.2 – 16.1
Fair	16.2 – 18.1
Poor	18.2 – 19.3
Very Poor	> 19.3

Data were analysed using the SPSS version 27 program with a normality test using Shapiro-Wilk, a homogeneity test, and hypothesis testing using a t-test at a 95% confidence level or $\alpha = 0.05$.

RESULTS AND DISCUSSION

The following table shows the descriptive statistics of the research results:

Table 2.
Descriptive Statistics

Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test	14	18.15	21.40	19.3771	0.98414
Post-test	14	15.20	18.30	16.6107	0.98915

The table above shows that the mean for pre-test was 19.3771 with a standard deviation of 0.98414, while the maximum score was 21.40 seconds and the minimum score was 18.15 seconds. For the post-test, the mean was 16.6107 with a standard deviation of 0.98915, while the minimum score was 15.20 seconds and the maximum score was 18.30 seconds.

Table 3.
Pre-test Results

No	Interval	Frequency (N)	Percentage (%)	Category
1	<15.2	0	0%	Excellent
2	15.2 – 16.1	0	0%	Good
3	16.2 – 18.1	1	7%	Fair
4	18.2 – 19.3	6	43%	Poor
5	>19.3	7	50%	Very Poor
Total		**14**	**100%**	

Table 4.
Post-test Results

No	Interval	Frequency (N)	Percentage (%)	Category
1	<15.2	0	0%	Excellent
2	15.2 – 16.1	4	29%	Good
3	16.2 – 18.1	8	57%	Fair
4	18.2 – 19.3	2	14%	Poor
5	>19.3	0	0%	Very Poor
Total		**14**	**100%**	

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Table 5.
Normality Test Results

Test	Statistic	df	Sig.
Pre-test	0.938	14	0.389
Post-test	0.948	14	0.531

The normality test results using Shapiro-Wilk showed significance values > 0.05, indicating that the data were normally distributed.

The homogeneity test results showed a significance value of 0.921 > 0.05, indicating that the data had homogeneous variance.

Table 6.
Hypothesis Test Results

Test	t	df	Sig. (2-tailed)	Mean Difference
Pre-test vs Post-test	73.671	13	<0.001	19.37714

The hypothesis test results showed a significance value of 0.001 < 0.05, indicating a significant difference between students' agility before and after traditional games treatment.

Discussion

Effectiveness of Traditional Games in Improving Agility

The research results demonstrate that traditional games hadang and benteng-bentengan effectively improved students' agility, showing a significant improvement of 2.76 seconds from pre-test to post-test. This improvement aligns with previous research by (Pratama et al., 2021), who found that traditional games significantly enhanced speed and agility in students. The effectiveness of these traditional games can be attributed to their inherent movement patterns that closely mirror agility training components.

In hadang games, students engage in multi-directional movements including running, dodging, and rapid direction changes while attempting to pass through defenders. These movement patterns stimulate the neuromuscular system in ways that directly translate to improved agility performance. The game requires players to accelerate, decelerate, and change direction quickly while maintaining body control - all fundamental components of agility as defined by biomechanical principles (Bompa, 2016).

Benteng-bentengan games complement hadang by emphasizing strategic movement, quick decision-making, and reactive agility. Players must continuously assess threats, plan escape routes, and execute rapid movements to capture opponents' bases while avoiding being caught. This cognitive-physical integration enhances not only physical agility but also perceptual-motor skills, which are crucial for sports performance (Harsono, 2016).

Neuromotor Adaptations and Learning Transfer

The significant improvement observed can be explained through neuromotor adaptation theory. Traditional games provide variable practice conditions that promote motor learning transfer. Unlike repetitive drill-based training, traditional games present constantly changing scenarios that require adaptive responses. This variability enhances the development of generalized motor programs, leading to improved agility performance across different contexts (Sukadiyanto, 2016).

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The games also engage multiple biomotor components simultaneously (Nurlaily et al., 2024). While agility was the primary outcome measured, the activities inherently develop coordination, balance, reaction time, and spatial awareness. This holistic approach to physical development is particularly beneficial for elementary school students who are in critical periods of motor development.

Cultural and Educational Implications

Beyond physical benefits, the integration of traditional games addresses the cultural preservation aspect of education. The research demonstrates that educational goals can be achieved while maintaining cultural identity. This dual benefit addresses concerns raised by educators about the declining interest in traditional activities among digital-native students.

The motivational aspect of traditional games proved crucial to the program's success. Unlike monotonous agility drills, these games maintained student engagement through their inherent fun factor and social interaction components. This aligns with contemporary physical education pedagogy that emphasizes enjoyment and intrinsic motivation as key factors in long-term physical activity participation (Suharjana, 2016)

The research findings address a critical concern in contemporary elementary education: the decline in students' physical competence due to sedentary lifestyles and excessive screen time. The pre-test results, showing 50% of students in the "very poor" agility category, reflect broader trends observed in Indonesian elementary schools where physical fitness levels have declined over the past decade. The traditional games approach offers a practical solution that schools can implement with minimal equipment and cost. Unlike many modern fitness interventions that require specialized equipment or facilities, hadang and benteng-bentengan can be conducted in any open space with simple materials, making them accessible to schools with limited resources.

The 14.2% improvement in agility performance (from 19.37 to 16.61 seconds) represents substantial physiological adaptation. This improvement likely resulted from enhanced intermuscular coordination, improved proprioception, and increased muscle fiber recruitment efficiency. The multi-planar movements inherent in traditional games stimulate diverse movement patterns that translate to improved functional movement capacity (Handoko & Gumantan, 2021). The games also provide interval training benefits through their start-stop nature, improving both aerobic and anaerobic energy systems. This metabolic conditioning contributes to overall physical fitness while specifically enhancing the energy systems required for agility performance.

Limitations and Future Directions

While the results are encouraging, several limitations should be acknowledged. The study's four-week duration, though sufficient to demonstrate significant improvement, may not reflect long-term retention of benefits. Future research should investigate the durability of these improvements and optimal training frequencies for sustained benefits.

The sample size of 14 students, while appropriate for this preliminary investigation, limits generalizability. Future studies should include larger, more diverse samples across different schools and regions to establish broader applicability. Additionally, the

exclusive focus on male students limits understanding of how traditional games might affect female students' agility development.

The research also focused primarily on quantitative measures of agility improvement. Future investigations could explore qualitative aspects such as student enjoyment, social skill development, and cultural knowledge acquisition that occur through traditional games participation.

CONCLUSION

Based on the research results and data analysis conducted on improving agility through traditional games in fourth-grade students at Elementary School 76 Muaro Jambi, it can be concluded that traditional games, hadang and benteng-bentengan, proved effective in improving students' agility. This is evidenced by the decrease in average completion time from 19.37 seconds in pre-test to 16.61 seconds in post-test, showing an agility improvement of 2.76 seconds.

Traditional games provide dual benefits: improving students' physical abilities and helping preserve local cultural heritage. The movement characteristics in games involving running, dodging, and direction changes provide an appropriate stimulus for developing students' agility. This research proves that learning approaches combining traditional cultural elements with physical development goals can provide optimal results in elementary school physical education.

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