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Assessing the Effect of Traditional Games on Manipulative Movements in Elementary School Students Based on Gender

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Abstract

Background. Manipulative movements are essential for children's development, which can be found in traditional games, representing manifestation of local wisdom that has been passed down from generation to generation.

Objectives. This study aimed to examine the effect of traditional games on the manipulative movements of elementary school students based on gender.

Materials and methods. This experimental study comprised two pretest-posttest groups without control variables. Data collection on pretest and posttest was carried out using three types of tests, namely throwing, catching, and kicking. A total of 60 students aged between 9 and 12 years were selected to participate in this study. The sample consisted of 30 male students (height 140.21 ± 6.2 cm, and weight 35.77 ± 5.6 kg), and 30 female students (height 138.4 ± 6.8 cm and weight 34 ± 4.1 kg).

Results. The t-test analysis showed that the test results for male students were as follows: throwing $0.011 < 0.05$, catching $0.007 < 0.05$, and kicking $0.003 < 0.05$. Then, the test results for the female students were: throwing $0.013 < 0.05$, catching $0.017 < 0.05$, and kicking $0.012 < 0.05$. The results of the independent t-test indicated that the throwing, catching, and kicking tests revealed a statistical significance ($p < 0.05$) in both male and female students.

Conclusions. The implementation of traditional games has been found to enhance the manipulative movements of elementary school students, as evidenced by positive changes observed in the pretest and posttest results. The improvement was achieved, among others, through the adaptation of traditional games following the characteristics of students' development. Therefore, the conceptualization of physical learning within the framework of traditional games proved to be applicable and practical.

Keywords: traditional games, manipulative movement, elementary school, children's games.

Introduction

Motor development in elementary school-aged children is an important aspect that influences various aspects of their lives, including learning abilities and social interactions (Samodra et al., 2023). Three types of movements that are important in children's motor development are locomotor movements, non-locomotor movements, and manipulative movements. Locomotor motion refers to physical displacement from one place to another, such as walking, running, jumping, and crawling. In contrast, non-locomotor motion involves changes in body position without significant physical displacement, such as bending, bending, and twisting (Siregar et al., 2021; Sunanto et al., 2022). On the other hand, manipulative motion is concerned with the use of hands and fingers to control, manipulate, and interact with objects or the surrounding environment, such as grasping, throwing, catching, and cutting (Setyawan et al., 2024).

Traditional games have become an integral part of the culture and history of Indonesian society (Maulidiyyah & Purwoko, 2023). However, with technological advancements and lifestyle changes, traditional games are often marginalized by more passive modern games. It raises concerns about the potential impact on children's motor development of

incredibly manipulative movements (Yılmaz & Griffiths, 2023). Games have a significant impact on the development of manipulative movements in children. The results of previous studies have shown that children who engage in varied physical activities, such as throwing and kicking a ball, crawling around a playground, or holding a pencil while colouring, can strengthen the muscles of their hands and fingers, as well as their legs (Samsudin et al., 2022). Traditional games also provide opportunities for children to engage in sensory exploration by touching, smelling, or sensing different objects, so they help increasing their sensory sensitivity and developing the ability to control movement with more precision (Hartanto et al., 2021; Mujriah et al., 2022).

In addition, games often require strategic thinking and fast movements that require the use of manipulative motions, such as sodor carts, fish nets, and balloon racing games (Septianto et al., 2024). The social interactions that occur during play also contribute to the development of manipulative motions, as children learn to share, communicate, and collaborate with peers or family members through activities involving ball, such as sepak tekong (Anggraini et al., 2023; Mensa et al., 2023). Games provide a fun and engaging context for children to practice manipulative movements without feeling like doing a tedious task or exercise, as they can enjoy playtime while learning and developing. Thus, games are a rich and beneficial means for children to practice and develop their manipulative motor skills in a natural and enjoyable way (Rejeki et al., 2022).

The results of further studies show that traditional games have a significant impact on academic achievement through increasing students' manipulative movements (Nasution et al., 2022). Active participation in traditional games allows students to develop their fine motor skills in a fun and natural way (Hafeez, 2022). This ability is essential in performing academic tasks such as writing, drawing, and colouring. Furthermore, traditional games often involve elements of problem-solving strategy. When students engage in such games, they must think of appropriate steps and manipulate objects or situations according to the rules or objectives of the game (Milenia & Nurharini, 2024). These abilities build the cognitive skills necessary to solve academic problems, such as understanding instructions, planning solutions, and evaluating outcomes. Then traditional games also have story elements or cultural contexts. Through these traditional games, students can expand their knowledge of specific cultures, histories, and traditions (Wibowo et al., 2023). This knowledge can increase students' interest and understanding of history, language, or cultural arts.

Although scientific literature has provided sufficient understanding of the importance of manipulative movements on children's development, research examining the direct influence of traditional games on this aspect is limited. Therefore, this study aims to explore in more depth the influence of traditional games in increasing manipulative movements of elementary school students. Through an experimental approach, this study seeks to make a significant contribution to the understanding of the role of traditional games in supporting children's motor development, especially in the context of manipulative movements. The results of this study are expected to provide a more vigorous basis for developing more holistic and sustainable educational strategies for elementary school-age children.

Materials and Methods

Study Participants

The sample of this study were elementary school students from SD Negeri 3 Bantul, SD Negeri 1 Bantul and SD Muhammadiyah Serut. Those students were in grades 4, 5, and 6 with a total of 130 students, but the sample was selected through random sampling. Thus, the selected students were 60 students aged 9-12 years. The characteristics of students were analyzed based on age, height and weight (mean ± SD). The sample consisted of 30 male students (height 140.21±6.2 cm, and weight 35.77±5.6 kg), and 30 female students (height 138.4±6.8 cm and weight 34±4.1 kg). In addition, this study has received approval from parents.

Study Organization

The type of this research is an experiment with two pretest-posttest groups without control variables. Data collection on pretest and posttest was carried out with three types of tests, namely throwing, catching, and kicking (Setyawan et al., 2024). The traditional games done were gobak sodor, fish nets, engklek and balloon racing. The treatment was carried out for six weeks with three weeks of training. Training was conducted on Monday, Wednesday, and Friday from 08.00-09.00, with the duration of one game was 30 minutes. The following is the traditional game treatment program in Table 1.

Statistical Analysis

Analysis of this study was done using a t-test and paired sample t-test with a significance value ($p < 0.05$). The t-test was carried out to test for differences before and after treatment. At the same time, the paired sample t-test was used to test the difference in training results of male and female

Table 1. Traditional games program (FN: Fish Nets, GS: Gobak Sodor, EK: Engklek, BR: Balloon Racing)

1st Week			2nd Week			3rd Week		
Monday	**Wednesday**	**Friday**	**Monday**	**Wednesday**	**Friday**	**Monday**	**Wednesday**	**Friday**
FN	EK	GS	BR	GS	FN	GS	EK	GS
GS	BR	EK	FN	BR	EK	FN	BR	EK
4th Week			**5th Week**			**6th Week**		
Monday	**Wednesday**	**Friday**	**Monday**	**Wednesday**	**Friday**	**Monday**	**Wednesday**	**Friday**
BR	GS	FN	GS	EK	GS	BR	GS	FN
FN	BR	EK	FN	BR	EK	FN	BC	EK

students. Before conducting the t-test and paired sample t-test, it will first pass the normality test and homogeneity test. Data analysis of this study used the help of SPSS 26.

Results

The following is a data analysis based on statistical analysis to test the purpose of this study. The first analysis is to conduct an assumption test through a normality test.

Table 2. Normality test results

Gender	Test	Test Type	Shapiro-Wilk		
			Statistic	df	Sig.
Male	Pretest	Throwing	0.074	29	0.091
		Catching	0.144	29	0.127
		Kicking	0.246	29	0.174
	Posttest	Throwing	0.067	29	0.103
		Catching	0.139	29	0.158
		Kicking	0.253	29	0.131
Female	Pretest	Throwing	0.082	29	0.145
		Catching	0.125	29	0.147
		Kicking	0.239	29	0.112
	Posttest	Throwing	0.073	29	0.186
		Catching	0.129	29	0.181
		Kicking	0.233	29	0.193

Based on the results of Table 2, the normality test using Shapiro-Wilk from the pretest-posttest results on male and female students showed a significance value (> 0.05), meaning that the data were normally distributed. The second analysis is a homogeneity test to test whether the sample comes from the same population.

Table 3. Hypothesis test results

Gender	Test	Test Type	Levene Statistic	df1	df2	Sig.
Male	Pretest-Posttest	Throwing	0.798	1	59	0.379
		Catching	0.867	2	58	0.386
		Kicking	0.394	1	59	0.551
Female	Pretest-Posttest	Throwing	0.582	1	59	0.483
		Catching	0.822	2	58	0.231
		Kicking	0.441	1	59	0.428

Based on the results of Table 3, the homogeneity test of the pretest-posttest results in male and female students came from the same population. Therefore, from the results of the assumption test through the normality test and homogeneity test, the research data is feasible to do t t-test and independent sample t-test.

Based on the results on Table 4, male students showed pretest-posttest results on the throwing test 0.011 < 0.05, the catching test 0.007 < 0.05, and the kicking test 0.003 < 0.05. Then, the female students showed pretest-posttest results on the throwing test 0.013 < 0.05, the catching test 0.017 < 0.05, and the kicking test 0.012 < 0.05. Thus, it can be explained

Table 4. T-test results

Gender	Test	Test Type	t	df	Sig. (2-tailed)
Male	Pretest-Posttest	Throwing	2.605	59	0.011
		Catching	2.932	59	0.007
		Kicking	3.144	59	0.003
Female	Pretest-Posttest	Throwing	2.274	59	0.013
		Catching	2.119	59	0.017
		Kicking	2.645	59	0.012

that traditional games affect the manipulative movements of male and female students at the elementary school level. Subsequent analysis by comparing test results in the male and female student groups aimed to analyze the effect of traditional games on the two groups.

Table 5. Independent sample t-test results

Male – Female Test Differences		t	df	Sig. (2-tailed)
Throwing	Equal variances assumed	1.854	59	0.071
	Equal variances not assumed	1.854	7.867	0.071
Catching	Equal variances assumed	1.770	59	0.083
	Equal variances not assumed	1.770	7.188	0.083
Kicking	Equal variances assumed	1.812	59	0.077
	Equal variances not assumed	1.812	7.312	0.077

Based on the results of Table 5, regarding the throwing test results of the male and female students, the significance value showed 0.071 > 0.05. The results of catching tests of the male and female students showed a significance value of 0.083 > 0.05. The results of the kicking test of the male and female students showed a significance value of 0.077 > 0.05. Based on the results of Table 5, there were no differences in throwing test, catching test, and kicking test of the male and female student groups, so traditional games were effective in improving the manipulative movements of male and female elementary school students.

Discussion

This study aims to explore the effect of traditional games on manipulative movements of elementary school students based on gender. The results showed that traditional games can affect manipulative movements in elementary school students based on gender. It can be seen from the difference in increasing values from pretest and posttest tests. In addition, the results showed a significant increase after being given traditional game materials. The results of this study are supported by previous studies that explain that traditional games can improve body skills and balance and build a fit physique (Kusuma et al., 2021). The increase also occurs because traditional games provide opportunities for children to play in groups, the equipment used is simple, contains cultural values, and is carried out with pleasure without pressure (Suryadi, Nasrulloh, et al., 2024) Other research results also show that traditional games serve as an element of education that encourages the development of fundamental movement skills (Suherman et al., 2019).

Based on this foundation, the movement activities included in the modified traditional games include basic movements. Modification of traditional games in accordance with the principle of development has contributed to the improvement of students' movement skills (Suryadi, Nasrulloh, et al., 2024). The games are arranged in a straightforward manner, ensuring that students can easily engage and understand the gameplay. The game is designed not only to improve and foster students' manipulative movement abilities but also to encourage decision-making during gameplay and encourage students' motor skills. Achieve and advance game goals and align with learning principles.

The result of the research is to improve manipulative movements through traditional games for elementary school students based on gender. In addition, traditional games contribute to improving students' movement skills so as to help students develop their motor skills (Harianto et al., 2023). This statement is reinforced by research that reveals that modified traditional games are able to encourage students' level of understanding and motor skills (Gustian, 2021). Motor skills also improve students' academic achievement because improvements influence their cognitive abilities (Tandon et al., 2016), as well as improving fitness, psychological and mental health (Lobstein et al., 2015).

Throwing is essential because it is a complex movement (Stodden et al., 2006) and will determine the involvement of children's sports (Johnson et al., 2019; Maselli et al., 2019), water polo, javelin throwing (Chi, 2010) as well as handball and baseball. Based on this statement, traditional sports have included aspects of manipulative motion, such as throwing and catching kicks. If throwing skills are not taught well, it can be ascertained that children's involvement in sports and physical activities will not occur well. If the community is not physically active, it can be ascertained that the level of fitness will be low (Mashud et al., 2024; Rubiyatno et al., 2023; Septianto et al., 2024; Suryadi et al., 2023). It will have an impact on a person's physical health–child productivity in learning new things. If the child is fit, it will contribute to academic ability (Hermassi et al., 2021). Mastery of basic throwing movements will develop if learning interventions are carried out.

Furthermore, the ability to catch is also a critical skill stated by (Drost et al., 2015), stating that if the skill of catching is mature, it will have a significant role in other skills in the future of children. It is proven that throwing and catching skills will be the most influential if the child is visually impaired (Wagner, Haibach, and Lieberman 2013). There is an era relationship between throwing ability and catching ability (Dirksen et al. 2016). In another study, it was stated that there was a relationship between motor skills, fitness, and academic skills (Syväoja et al., 2021). Based on this finding, guided motor activities in schools are effective in improving children's motor fitness and competence (Huhtiniemi et al., 2023). In an experiment with children aged 4-5 years regarding one of the skills, which is catching skill, the results show that the scores for boys were higher (Navarro-Patón et al., 2021).

Conclusions

Traditional games increase the manipulative movements of elementary school students, as evidenced by positive changes in the results of the pretest and posttest. The improvement was carried out, among others, through the adaptation of traditional games in accordance with the characteristics of students' development. These games combine a fun approach, tailoring activities to students' movement skills. Furthermore, game modification adheres to the principles and aspects that are conducive to the learning experience of elementary school students. The results contribute valuable insights in the field of physical education for elementary school students. To further enhance the study findings, future researchers may consider or evaluate the appropriateness of different methods of adjusting demographics.

Conflicts of Interest

No conflicts of interest exist.

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Оцінка впливу традиційних ігор на розвиток маніпуляційних рухів учнів початкової школи з урахуванням статевої приналежності

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Авторський вклад: A – дизайн дослідження; B – збір даних; C – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 7 с., 5 табл., 38 джерел.

Історія питання. Маніпуляційні рухи є важливим компонентом в процесі розвитку дітей, які можна зустріти в традиційних іграх, представляючи втілення місцевої мудрості, що передається з покоління в покоління.

Мета дослідження. Метою цього дослідження було вивчення впливу традиційних ігор на розвиток маніпуляційних рухів учнів початкових класів з урахуванням статевої приналежності.

Матеріали та методи. Експериментальне дослідження складалося з двох передтестових і післятестових груп за відсутності контрольних змінних. Збирання даних на етапах передтестового та післятестового дослідження було проведено за допомогою трьох типів тестів, а саме: виконання кидка, ловіння предмета та удару ногою. Для участі в дослідженні було відібрано 60 учнів віком від 9 до 12 років. Вибірка складалася з 30 хлопців (зріст – 140,21 ± 6,2 см, вага – 35,77 ± 5,6 кг) та 30 дівчат (зріст 138,4 ± 6,8 см і вага 34 ± 4,1 кг).

Результати. Аналіз t-критерію показав наступні результати для учнів чоловічої статі: виконання кидка 0,011 < 0,05, ловіння предмета 0,007 < 0,05 і удар ногою 0,003 < 0,05. Тоді як результати тесту для дівчат були представлені наступним чином: виконання кидка 0,013 < 0,05, ловіння предмета 0,017 < 0,05 і удар ногою 0,012 < 0,05. Отримані результати t-критерію для незалежних вибірок свідчать про те, що показники тестів на виконання кидків, ловіння предмета та ударів ногою мають статистичну значущість ($p < 0,05$) як у дітей чоловічої, так і жіночої статі.

Висновки. Встановлено, що впровадження традиційних ігор сприяє підвищенню рівня розвитку маніпуляційних рухів в учнів початкових класів, про що свідчать позитивні зміни, які спостерігаються в результатах передтестового та післятестового етапів дослідження. Покращення показників було досягнуто, зокрема, шляхом адаптації традиційних ігор відповідно до особливостей розвитку учнів. Таким чином, концептуалізація фізичного навчання в рамках застосування традиційних ігор довела свою доцільність і практичну значущість.

Ключові слова: традиційні ігри, маніпуляційні рухи, початкова школа, ігри для дітей.

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