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The Effect of Rubber Ball Pair Drills on Volleyball Underhand Passing Skills of Fifth Grade Students

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Abstract

This study aims to determine the effect of the paired training method using a rubber ball on the underhand passing skills in volleyball in 5th grade students of Tanjungharjo Elementary School. The method used is a quasi-experimental design with a One Group Pretest-Posttest Design, where students are given training in underhand passing using a rubber ball and their abilities are measured before and after treatment through a 60-second performance test. This study used a sample of 15 fifth grade students. The results showed a significant increase in underhand passing skills, with an average value increasing from 20.27 to 32.87. Based on the normality test, the data were normally distributed ($p>0.05$) so that data analysis was carried out using the parametric statistical analysis. Data were analyzed using descriptive statistics and a paired sample T-Test, which produced a significance value (p-value) of 0.000 (<0.05) so that the null hypothesis was rejected and a significant effect was proven. The rubber ball media provides a sense of security and comfort for students, thereby increasing their courage to practice, while the paired training method strengthens the formation of motor memory through systematic repetition of movements. In conclusion, the use of rubber balls with the pair training method significantly improves students' underhand passing skills and is recommended as an effective learning approach in elementary schools.

How to Cite

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INTRODUCTION

Physical Education (PE) at the elementary school level plays a fundamental role in character building, motor development, and students' social skills (Salahudin et al., 2024). Physical Education (PJOK) not only teaches children sportsmanship but also the importance of a healthy lifestyle and teamwork (Priadana et al., 2018). Through these various activities, they can build positive interactions with their peers and develop self-confidence in a fun learning environment (Da'i & Apriyanto, 2025). Furthermore, Physical Education (PE) is an effective medium for training students' physical coordination and agility (Da'i et al., 2023). One of the sports studied in this subject is volleyball.

Volleyball is a sport played by two teams of six players each. The goal of the game is to pass the ball over the net so that it lands on the opponent's court, earning points (Piranda et al., 2025). In order to master the game of volleyball well, students need to understand and master various basic techniques, such as serving, passing, smashing and blocking. According to Asmizal et al., (2024) mastering these techniques not only improves physical abilities but also teaches the importance of strategy, team cohesion, and decision making while on the field.

One of the basic volleyball techniques that is difficult to master is the underhand pass (Yono & Sodikin, 2020a). According to (Apriyanto et al., 2023) underhand passing is the skill of receiving the ball from an opponent, whether serving or attacking, by bringing both arms together underneath. Mastering underhand passing is crucial because it determines the quality of the ball passed to the setter. Therefore, underhand passing is not only about receiving the ball but also a determining factor in the flow of play (Piranda et al., 2025).

Correctly executing an underhand pass requires mastery of several important steps. According to (Pieter Pelamonia et al., 2021) explained that the first step is to stabilize the body with the feet shoulder-width apart and the knees slightly bent to form a strong base for receiving the ball. Both arms are extended forward between the thighs and contact with the ball is made at the forearm, namely between the wrist and elbow (Apriyanto & Adi, 2022). This technique helps to minimize pain and maximize the bounce of the ball in the desired direction (Apriyanto et al., 2023). Mastering the underhand pass is very important because it improves the player's physical abilities, body coordination, and accuracy in reading the direction of the ball (Nurhidayat et al., 2024). Teaching the underhand pass technique to elementary school students often faces significant challenges.(Martini et al., 2024).

Based on initial observations and interviews with the Physical Education (PE) teacher at Tanjungharjo IV Public Elementary School, it was found that fifth-grade students' mastery of underhand passing skills is still suboptimal. The teacher stated that elementary school students often experience difficulty, fear, or even pain when faced with a large, heavy, and hard standard volleyball. As many as 75% of fifth-grade students still show a lack of mastery of underhand passing techniques. This is evident in the ball's frequently missed bounce and incorrect arm position.

Based on the description of the problem, it appears that there is a fairly large gap in the existing literature review. Previous research on underhand passing skills by (Martini et al., 2024) Studies focusing on play methods involving rule modifications have demonstrated the importance of adaptive approaches. However, there is still little research specifically and in-depth examining the effectiveness of learning using a simple and accessible tool, namely a rubber ball. This gap indicates that although student difficulties have been identified, practical and empirically tested solutions using specific tools such as rubber balls have not been widely reported in the Indonesian educational context, particularly in elementary schools.

This research references several relevant studies. The Journal of Physical Education and Sports Research by (Yono & Sodikin, 2020) which describes modifications to sports learning media to increase learning motivation. Furthermore, research conducted by (Martini et al., 2024) shows that using equipment tailored to students' physical characteristics can accelerate the mastery of basic motor skills. These studies provide a strong basis for researchers that innovative approaches using learning media such as rubber balls have great potential to overcome difficulties experienced by students. By using lighter and softer balls, students are expected to feel more comfortable and confident during training, making the learning process more effective and enjoyable (Pradana et al., 2025). This aligns with the principles of physical education (PE), which focus on holistic student development.

Previous research on elementary school students' underhand passing skills, such as that conducted by (Dai et al., 2021), has generally focused only on playing methods with modified rules. This indicates a significant gap in the literature, particularly regarding the use of simple tools such as rubber balls combined with paired drills.

This gap indicates that although student difficulties have been identified, practical and empirically tested solutions using specialized tools such as rubber balls have not been widely researched in the Indonesian educational context, particularly in elementary schools (Aliriad et al., 2023).

The urgency of this research is very high, especially for schools with limited sports facilities and infrastructure, such as Tanjunghardjo State Elementary School. The use of rubber balls offers a cost-effective, safe solution that can be quickly implemented by physical education teachers. The novelty of this study lies in its attempt to fill this gap by providing concrete empirical data on the effectiveness of a combination of equipment (rubber balls) and methods (pair drills), which has not been widely studied. By measuring its effectiveness, this study will provide concrete data that can serve as a basis for teachers to choose the most appropriate learning methods and tools. Thus, the learning process will not only be more effective in achieving the goal of mastering techniques but also more enjoyable for students, which can ultimately increase their participation and love for volleyball (Apriyanto et al., 2025)

Based on the previously explained background, problem identification, and urgency that have been explained, this study aims to measure the effect of the use of rubber balls in the paired drill method on volleyball underhand passing skills in fifth grade students of Tanjungharjo IV State Elementary School . The results of this study are expected to provide a real contribution to the development of more innovative, directed, and appropriate Physical Education (PE) learning methods according to the psychomotor characteristics of elementary school students, as well as become a practical reference for PE teachers in Indonesia.

METHODS

This study used a quantitative method with a quasi-experimental design. The quantitative approach was chosen because its main objective was to test established hypotheses and analyze numerical data (scores) to draw general conclusions (Cahyani et al., 2019). This type of research aimed to find a causal relationship, namely to determine the effect of a particular treatment (the use of a rubber ball) on the results of underhand passing skills. Specifically, the design used was a One Group Pretest-Posttest Design, where only one sample group was given the treatment and measurements were taken twice.

The selected research design is a one group pretest-posttest design. According to (Ayasy et al., 2023), this type of design is a research method without a control or comparison group. This method only focuses on assessing one group, namely the experimental group (Solehudin et al., 2025). This design is a type of quasi-experiment that is most suitable for application in field conditions in schools. The reason is that sampling cannot be done purely randomly, and we focus on measuring changes that occur in one group after receiving treatment (William & Hita, 2019). Through this design, we can measure students' initial abilities (Pre-test) and re-measure their final abilities (Post-test). The comparison between these two measurement results will be the basis for proving the extent of the effect of the rubber ball media modification (Aliriad et al., 2023). The research design is as **Table 1.**

Table 1. Research Design

Group	Pre-test	Treatment (x)	Post-test
Experiment (E)	O1	X (Rubber ball)	O2

Source: (Sugiyono, 2023)

The population in this study were all fifth-grade students of Tanjungharjo IV State Elementary School who were taking Physical Education (PE) subjects Totaling 15 students. To determine the sample, the researcher used the Purposive Sampling technique. This technique was chosen due to limitations in the field which required the researcher to use an established class. The researcher chose fifth-grade students of Tanjungharjo IV State Elementary School to be the Single Experimental Group. The independent variable of this study was the Rubber Ball Media which was defined as the use of a rubber ball (soft touch ball) as the main tool in underhand passing exercises to reduce students' fear and increase their interest. Meanwhile, Volleyball Underhand Passing Skills was the dependent variable measured through quantitative scores.

The main instrument used in data collection was a 60-second volleyball underhand passing skills test. This test is a performance test suitable for the characteristics of elementary school students. Data were collected through three phases: First, a pre-test (O1) was conducted to measure students' initial abilities. Second, a treatment (intervention) was conducted, consisting of three to four sessions of underhand passing learning using a rubber ball. This treatment aimed to make the learning process more effective, engaging, and enjoyable. Finally, a post-test (O2) was conducted using the same instrument to record students' final abilities after the treatment (Yulianingsih & Hadi Saputra, 2022)

Data analysis using SPSS (statistical pro-

duct and service solutions) version 22. Data will be processed and analyzed using non-parametric statistics with the Wilcoxon-Rank Test method. If a significant value is obtained p value <0.05 then the Alternative Hypothesis (Ha) is accepted and the Null Hypothesis (H0) is rejected, indicating a significant influence of the use of rubber ball media on improving students' underhand passing skills.

RESULTS AND DISCUSSION

This research seeks to examine the influence of the paired drill method, utilizing a rubber ball as a medium, on the volleyball underhand passing skills of fifth-grade students at Tanjungharjo IV State Elementary School. Data collection was conducted through two tests, namely a pretest and a posttest, with the underhand passing skill test instrument lasting 60 seconds. The test was conducted to map students' abilities before and after treatment. The pretest results describe students' initial abilities in underhand passing, while the posttest results show the development of skills after being given training using a rubber ball as the medium with the pair drill method. The measurement data are displayed in the following **Table 2.**

Table 2. Descriptive statistics of pretest-posttest

Variabel	N	Pretest		Posttest	
		Min Value	Max Value	Min Value	Max Value
Pretest (X1)	15	12	26	-	-
Posttest(Y)	15	-	-	23	51
Mean		20,27		32,87	

The increase in the average score from 20.27 to 32.87 indicates a significant change in students' abilities. The average difference of 12.6 points indicates that the paired drill using rubber balls had a positive impact on improving underhand passing skills. The minimum and maximum scores also showed significant shifts, indicating that almost all participants experienced consistent improvement in their abilities after the treatment. These results provide an initial indication that the treatment successfully improved students' basic skills.

Before conducting the hypothesis test, a normality test was first performed on the pretest and posttest data using the Shapiro–Wilk test, as the sample size was less than 50 students. The results of the normality test are presented in the following **Table 3.**

Based on the **Table 3** above, the significance value for the pretest was 0.451 and the posttest was 0.124, both greater than 0.05. This indicates that the data is normally distributed, allowing for further analysis using the Paired Sample T-Test. By meeting the assumption of normality, the inferential analysis results are statistically reliable.

Table 3. Normality Test Result

Variabel	Statistic	df	Sig.	Information
Pretest (X1)	0,945	15	0,451	Normal
Posttest (Y)	0,908	15	0,124	Normal

Table 4. Paired T-Test Results

Test	Mean Difference	Std. Deviation	t-count	Sig.	Information
Paired T-Test	-12,600	4,405	-11,079	0,000	Signifikan

The results of the **Table 4.** Paired Sample T-Test showed a significance value of 0.000 < 0.05, indicating a significant difference between the pretest and posttest scores. These results confirm that the use of rubber balls in the paired drill method significantly improved students' underhand passing skills. Statistically, these findings indicate that the improvement was not a coincidence, but rather a direct result of the learning intervention.



Figure 1. Rubber ball media

The rubber ball used in this study is lighter and softer than a standard volleyball. These characteristics provide a sense of security to students. This sense of safety and comfort makes students more motivated to practice repeatedly without worrying about injury. Thus, learning activities become more enjoyable and effective. This finding aligns with the opinion of Purwantoro et al. (2023) who emphasized that the use of modified media can reduce anxiety levels, increase student engagement, and accelerate mastery of basic skills. The significant increase in posttest scores demonstrates that rubber balls can create a supportive learning environment for elementary school students.

The paired drill method has also proven effective in improving students' underhand pass-

ing skills. The repetitive practice pattern in this method helps students correct technical errors through direct feedback from their partners. With continuous practice, students are able to develop better motor memory and strengthen coordination of hand movements and body position. This approach also creates more active learning, where students act as both participants and observers during the practice process. These findings align with those of (Riksandi et al., 2024) who stated that the drill method is the most efficient method for improving motor skill accuracy in elementary school-aged children. The results of this study reinforce these findings. The nearly twofold increase in the average score from pretest to posttest indicates that a well-planned practice pattern contributes significantly to students' technical development. Therefore, the effectiveness of the paired drill method is greatly influenced by the level of consistency and quality of its implementation.

The combination of using a rubber ball and pair drills creates a complementary and mutually reinforcing learning process. The rubber ball can reduce students' fear or psychological barriers, while the pair drills reinforce repeated and more focused technique mastery. The success of this approach is evident in the significant increase in the average posttest score. This approach also strengthens interaction and cooperation among students, increases focus during training activities, and creates a positive learning environment. A similar study by Piranda et al. (2025), showed that cooperative training can accelerate mastery of basic volleyball skills, thus strengthening the agreement with the results of this study.

In addition to improving technical skills, the implementation of this learning model also had a positive impact on students' attitudes and motivation to learn. They appeared more enthusiastic, confident, and active during the activity. The use of simple, modified tools such as rubber balls demonstrates that learning innovation does not always require expensive equipment. Instead, teachers' creativity in adapting media to students' conditions and needs is key to success. This aligns with research by Yono & Sodikin (2020) which showed that using plastic balls as aids can improve basic underhand passing skills in elementary school students. This research adds to the evidence that the combination of rubber balls and the paired drill method can produce more effective results because they support each other in the training process. Physical Education teachers play a crucial role in the learning process because they interact directly with students. Through this approach, learning activities are not only safer and more enjoyable but also help students learn correct techniques gradually. This method is a concrete step in developing more creative, engaging, and student-centered physical education learning.

However, this research has certain limitations that should be acknowledged. Firstly, it employed a One-Group Pretest-Posttest design that did not include a control group, so it cannot be fully confirmed that the improvement in ability was solely due to the treatment. Second, the sample size was relatively small, namely only 15 students from one class, so the results cannot be generalized to a wider population. Third, the short training duration means that the long-term effects of the treatment cannot be fully measured. Therefore, further research is recommended to involve a comparison group, a larger sample size, and a longer training period to obtain more representative and in-depth results.

CONCLUSION

This study proves that the use of rubber balls through the paired drill method has a effectively enhances effect on improving the volleyball underhand passing skills of fifth-grade students at Tanjungharjo IV State Elementary School. Overall, the findings indicate that students volleyball underhand passing skills improved after the implementation of the paired drill method using rubber ball media demonstrating the effectiveness of this learning approach in supporting skill development in elementary school Physical Education (PE). . The rubber ball can reduce students' fear or psychological barriers, while the pair drills reinforce repeated and more focused technique mastery. This learning model is recommended for use by physical education (PE) teachers as an innovative, affordable, and enjoyable way to practice underhand passing skills in volleyball.

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