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The Effect of Variations in Drill Training Methods on Jump Serves in Female Volleyball Club Athletes in 2025

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ABSTRACT

The objective of this research is to ascertain the impact of variations in the drill method training on the jump serve ability of athletes from the Bina Putri Volleyball Club in 2025. The research method employed is quantitative, characterised by a one-group pre-test and post-test design. The subjects of this study are female athletes who actively participate in training at the club, with a total of 18 training sessions over a period of six weeks. The research instrument employed is a validated jump serve skill test, with measurements obtained through five trials in both the pre-test and post-test phases. The drill training provided includes variations in starting techniques, jumps, hits, and landings, which are practised repetitively and in a structured manner. The collected data is then subjected to a series of statistical tests, specifically paired t-tests, to ascertain the disparities between the outcomes observed in the preliminary and subsequent assessments. The analysis results indicate that the calculated t value of 4.46 is greater than the table t value of 1.83. This finding suggests that there is a significant effect of the variation of the drill method training on the improvement of jump serve ability. The present study offers empirical evidence that systematic and progressive drill training can enhance the fundamental technical skills in volleyball, particularly concerning the jumping serve.

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A. Conception and design of the study;
B. Acquisition of data;
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D. Manuscript preparation;
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INTRODUCTION

Sports are an important activity in human life that plays a significant role in maintaining and improving both physical and mental health. Through regular and consistent sports activities, individuals can enhance physical fitness, strengthen endurance, and maintain mental well-being. According to Salahudin and Rusdin (2020), sports are physical and mental activities that are beneficial for maintaining and improving an individual's health quality. Therefore, sports are one of the most valuable assets that cannot be replaced and are the most effective way to maintain quality of life.

One of the most popular and widely enjoyed sports across various demographics is volleyball. Volleyball not only requires physical strength but also technical skills, game strategy, and teamwork among players. As explained by Keswando et al. (2022), volleyball is a

team sport that demands solid teamwork to achieve victory. To achieve optimal performance in this game, each player is required to master basic techniques and good game tactics.

In a global context, volleyball faces several complex challenges. Masillamany (2016) identified a gender gap in volleyball development, where female athletes often receive less support than male athletes. Additionally, according to the Volleyball report (2014), limited funding and commercialization also impact the growth of this sport in various countries, particularly in developing nations. Kessel (2005) also highlights the importance of structured youth development, which is still seen as a weakness in the development of athletes' technical and mental skills from a young age.

One of the basic techniques in volleyball that plays an important role is the serve. The serve is the start of every game and can determine the direction of the game. Sari and Guntur (2017) state that the serve is the first step that every player must master before participating in a full game. One of the most commonly used serving techniques in modern games is the jump serve. This technique combines jumping power, movement coordination, speed, and accuracy of the hit, resulting in a strong, fast, and difficult-to-receive serve for the opponent.

The advantage of the jump serve lies not only in the strength and speed of the ball but also in the psychological pressure it exerts on the opponent. However, this technique also has a high level of difficulty and requires intensive training and precise mastery of movements. Common mistakes often made when executing the jump serve include incorrect body position, improper timing, errors when tossing the ball, and inadequate stroke technique.

Based on interviews with coaches at the Bina Putri club, it was found that the athletes' low ability to perform jump serves was due to the lack of variety in the training provided. Field observations also showed that many athletes had difficulty performing jump serves, such as the ball not crossing the net, the ball going out of bounds, and the ball not being placed accurately.

Given these conditions, a training method that can effectively improve jump serve skills is needed. One relevant training method is the drill method. Faridhatunnisa and Pratama (2021) explain that the drill method is a teaching method that focuses on continuously repeating certain movements to achieve agility and movement automation. This is reinforced by Yuni (2017), who states that the drill method emphasizes mastery of technique through structured repetitive practice according to instructions.

In this study, the researcher applied variations of the drill method specifically to the jump serve technique, which includes movement components such as the approach, jump, ball toss, strike, and landing. The primary focus of this study is to evaluate the effect of drill method exercise variations on improving jump serve ability in athletes of the Bina Putri Voli Club. Therefore, this study is titled: "The Effect of Drill Method Exercise Variations on Jump Serve in Athletes of the Bina Putri Voli Club in 2025."

METHODS

The method used in this study was an experimental method with a "one-group pre-test-post-test design." The population in this study consisted of 17 junior athletes from the Bina Putri

Volleyball Club, selected using purposive sampling, who met the following criteria: 1) female gender. 2) junior athletes, 3) members of the Bina Putri Voli Club. The instrument used was a jump serve skill test with a validity of 0.609 and reliability of 0.798. The test was conducted on a volleyball court marked with scoring zones, where each athlete performed five jump serves, and evaluations were based on the accuracy of the target and technical execution. Data obtained from pre-test and post-test results were analyzed using descriptive and inferential statistics, including normality tests using the Lilliefors method, homogeneity tests using Fisher's formula, and hypothesis tests using paired sample t-tests. The decision-making criteria were based on the comparison of the calculated t-value and the table t-value at a significance level of 5%, with the calculation formulas including the mean, standard deviation, mean difference, and t-test in accordance with the theory proposed by Sudjana (2023).

RESULTS AND DISCUSSION

Research Results

Table 1.
Jump Serve Normality Test Results

Variabel	Mean and Standard Deviation	L_{count}	L_{table}	α	Description
Data Pre-Test Jump Serve	X = 112 S = 2,57	0,215	0,258	0,05	Normal
Data Post-Test Jump Serve	X = 137 S = 1,49	0,238	0,258	0,05	Normal

From the results of the pre-test calculations in the appendix, $L_{count} = 0.215$ was obtained. At the $\alpha = 0.05$ level and $L_{table} = 0.258$, $L_{count} = 0.215 < L_{table} = 0.258$. It can therefore be concluded that the data distribution is normal. From the results of the post-test calculations in the appendix, Lo = 0.238 was obtained. At the $\alpha = 0.05$ level, $L_{table} = 0.258$ was obtained. Thus, $L_{count} = 0.238 < L_{table} = 0.258$. It can be concluded that the data distribution is normal.

Table 2.
Jump Serve Homogeneity Test Results

Homogeneity Test	F_{count}	F_{table}	α	df(n-1)	Description
Varians *Pre-Test* Dan *Post-Test Jump Serve*	1,75	3,18	0,05	9	Homogen

Homogeneity testing for each treatment was accompanied by a change test at a significance level of $\alpha = 0.05$ between the pre-test and post-test jump serve for the homogeneity test results between the pre-test and post-test jump serve data. The F_{-table} value for $\alpha = 0.05$ was obtained as $F_{table} = 3.18$. And $F_{count} = 1.95$. This means that $F_{count} < F_{table}$ (1.95) < (3.18). Therefore, it can be concluded that the pre-test and post-test jump serve data are homogeneous.

Table 3.
t-test results

Variabel	Pre-Test Jump Serve	Post-Test Jump Serve	Difference	dk(n-1)	t_{value}	t_{table}
N		10				
Total	112	137	25	9	4,46	1,83
Average	11,2	13,7	2,5			
SB	2,57	1,49	1,77			

Based on the results of the calculations, the hypothesis t_{value} = 4.46 was obtained, which was then compared with dk = (10-1=9) at a significance level of α=0.05, which is 1.83. Thus, $t_{value} > t_{table}$ (4.46 > 1.83). Therefore, it can be concluded that there is a significant effect of variations in drill method training on the jump serve of athletes at the Bina Putri Voli Club in 2025.

Discussion

This study aims to determine the effect of variations in drill training methods on the jump serve ability of athletes at the Bina Putri Volleyball Club in 2025. The research process was conducted systematically through the stages of pre-test, treatment, post-test, and data analysis. The pre-test results showed the athletes' initial ability in performing jump serves, which then became the basis for the implementation of the training program over six weeks, consisting of 18 sessions. The training program consisted of variations in drill methods focused on the technical elements of the jump serve, such as the approach, push-off, ball contact, and target of the hit, designed to improve speed, accuracy, and movement control. Based on the post-test results analyzed using statistical tests, a t-value of 4.46 was obtained, which is greater than the t-table value of 1.83, indicating a significant effect of the drill method training on improving jump serve ability. These results are supported by previous theories stating that drill methods are effective in building muscle memory, technical efficiency, and improving athletes' mental readiness (Bompa & Buzzichelli, 2021; Jeffreys & Moody, 2021). Additionally, the success of the training was supported by an appropriate training periodization design and controlled intensity, as suggested by Gabbett et al. (2016). This study aligns with previous research by Muhammad Teguh, Nainggolan & Sinulingga (2021) and Massa (2019), which showed that drill-based training significantly improves serving skills in volleyball. However, these results differ from Rahayu's (2018) study, which stated that game-based training is more effective than drill methods in improving jump serves. These differences are likely influenced by the characteristics of the subjects and the training approaches used. Therefore, it can be concluded that variations in drill-based training methods significantly contribute to the improvement of jump serve skills, especially when applied in a structured and consistent manner, following scientific training principles that consider the physiological, psychological, and neuromotor aspects of athletes.

CONCLUSION

Based on the results of the research conducted, it can be concluded that variations in drill training methods have a significant effect on improving jump serve skills among athletes at the Bina Putri Voli Club in 2025. This is evidenced by the results of the t-test analysis, which showed that the calculated t-value was greater than the table t-value, namely 4.46 > 1.83 at a significance level of 5%. The structured, systematic, and repetitive drill training conducted over six weeks has proven effective in improving technical aspects such as the

approach, push-off, ball contact, and serving accuracy. Therefore, drill methods that vary according to athletes' needs can be used as an appropriate training strategy to develop basic skills, particularly jump serve technique in volleyball.

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