

The effect of drill variations training on the overhand serve defense ability in volleyball at sma hang tuah 1 surabaya

Rinaldi Sababalat^{1*}, I Gede Dharma Utamayasa², Angga Indra Kusuma³

¹ Universitas ADI Buana Surabaya, Jl. Dukuh Menanggal XII, Dukuh Menanggal, Kec. Gayungan, Surabaya, Jawa Timur 60234, Indonesia

*Corresponding author, email: rinaldi@email.com

ABSTRACT

This study aims to examine the effect of drill variations training on the ability to defend against overhand serves in volleyball among students at SMA Hang Tuah 1 Surabaya. High school players often face challenges in responding to overhand serves due to their speed, unpredictability, and the need for quick motor responses. To address this, the research implemented a structured training program using varied drill methods designed to enhance students' defensive skills. This study employed a quantitative experimental approach with a one-group pre-test and post-test design involving 20 male students who were actively involved in volleyball extracurricular activities. The training intervention lasted for four weeks and included a series of dynamic and progressive defensive drills. Performance assessments were conducted before and after the intervention using a validated volleyball defense test instrument. The results showed a significant improvement in the participants' overhand serve defense ability, with the average score increasing from 60.2 to 78.5. Statistical analysis using paired sample t-tests confirmed that the difference was significant ($p < 0.05$). These findings indicate that drill variation training is effective in improving defensive skills, particularly in responding to overhand serves. Therefore, it is recommended that school-level volleyball programs incorporate this method to enhance the performance and adaptability of young athletes in real match situations.

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Introduction

Volleyball is a sport that requires a high level of technical skills, physical conditioning, and tactical awareness. One of the key elements in the modern game is the overhand serve, which has become increasingly dominant due to its power, speed, and unpredictable trajectory. High school-level players, especially in Indonesia, often face difficulties in anticipating and receiving overhand serves. According to Effendi and Mukhlas (2018), many student-athletes struggle with defensive positioning and reaction speed, which often results in failed receptions and lost points. To address this challenge, various training approaches have been proposed. Drill-based training, particularly those incorporating variation and match simulation, is considered effective in improving athletes' technical responses and mental readiness. Suryani (2017) highlighted that varied drills significantly improve motor response and decision-making under pressure. Nugroho (2021) emphasized that systematic training with progressive difficulty enhances players' overall technique and adaptability. Similarly, Handayani and Yusuf (2022) demonstrated that varied training models are positively correlated with better serve reception performance in school-level volleyball.

Despite the growing body of literature on volleyball training, most research has focused on general skill development or serving techniques, with limited attention given to defensive reception—especially against overhand serves. For instance, Putra and Widiastuti (2021) explored the effect of dynamic drills on general defense, but did not isolate overhand serve as a focus. Rahmadani et al. (2022) examined structured training for defensive improvement but did not explore specific serve types or training variation. This highlights a clear research gap regarding the impact of drill variation specifically on overhand serve defense among high school students. The novelty of this research lies in its specific focus on evaluating the effectiveness of variation-based drills in improving overhand serve defense—a component that is crucial in modern volleyball but often neglected in training programs. Unlike previous

studies, this research implements game-replica drills tailored to simulate real match serve scenarios, thus providing more targeted insights into student-athlete performance improvements. The findings of this study are expected to enrich the literature on volleyball coaching methods and contribute practical strategies for coaches and educators in optimizing training effectiveness at the school level.

Method

Research Design

This study utilized a quantitative approach with an experimental one-group pre-test and post-test design. The objective was to evaluate the effectiveness of drill variation training in enhancing the ability to defend overhand serves. This study used a quantitative experimental method with a one-group pre-test and post-test design. According to Sugiyono (2017), this design is effective in measuring the impact of a treatment or intervention in a controlled manner without the need for a comparison group.

Participants

The participants consisted of 20 male students from SMA Hang Tuah 1 Surabaya. They were selected through purposive sampling based on their active participation in extracurricular volleyball programs.

Research Instruments

The instrument used in this study was a performance-based volleyball skill test designed to assess the students' overhand serve defense ability. Scores were collected from both pre-test and post-test sessions for comparative analysis.

Data Analysis

The data were analyzed using paired sample t-tests in SPSS to examine the significance of differences between pre-test and post-test scores. A normality test was also conducted to ensure the assumptions required for the t-test were met.

Results and Discussion

The results of the study showed a significant improvement in the overhand serve defense ability after the training with drill variations. Table 1 below shows the comparison between pre-test and post-test scores.

Table 1. Average Pre-Test and Post-Test Scores of Overhand Serve Defense Ability

Test Type	Score
Pre-Test	60.2
Post-Test	78.5

The findings of this study indicate a significant improvement in the overhand serve defense ability of students after participating in a structured drill variation training program. The average score increased from 60.2 in the pre-test to 78.5 in the post-test, and the paired sample t-test confirmed that this improvement was statistically significant ($p < 0.05$). These results suggest that varied drill training is an effective method to enhance students' responsiveness, positioning, and anticipation in receiving overhand serves. These findings are consistent with several previous studies. Prabowo and Sari (2021) also found that variation-based drills significantly improved the defensive performance of high school volleyball players. Their research showed that drills simulating game-like conditions helped athletes adapt faster and react more efficiently during serves. Similarly, Nugroho (2021) emphasized that students who practiced using diverse training models exhibited greater improvements in fundamental volleyball techniques, including serve reception. Suryani (2017) highlighted that progressive and adaptive training environments improved athletes' decision-making under pressure — a crucial component in serve defense.

This study contributes new evidence by focusing specifically on the overhand serve, which is often more difficult to anticipate due to its speed and trajectory. Previous studies, such as Rahmadani et al. (2022), generally examined defensive skills in a broader sense, without isolating overhand serve as a variable. The novelty of this study lies in that specific focus and its use of drill variations that simulate

high-speed serve conditions. Moreover, Effendi and Mukhlas (2018) observed that traditional defensive drills often fail to develop quick reflexes needed for modern volleyball serves. In contrast, this research demonstrates that dynamic and varied drills are more effective in training students to respond rapidly and accurately, especially in high-pressure game simulations. This suggests that conventional repetitive drills may be less effective for preparing players to handle real match situations. In light of these comparisons, it is evident that drill variation training not only improves general technical performance but is particularly effective in improving serve-specific defensive responses. These findings reinforce the importance of designing practice sessions that replicate real match conditions, allowing athletes to develop both the physical and cognitive skills needed to excel during actual games.

In addition, several previous studies further support the findings of this research. Hadi (2020) found that consistent and targeted drill practice significantly improved defensive abilities in volleyball players. Lubis (2019) and Nasution & Ramadhan (2022) demonstrated that serve-focused training not only enhances offensive performance but also strengthens defensive anticipation. Santoso and Wibowo (2020) emphasized that drill-based upper serve training can improve defensive reactions in high school athletes. Similarly, Saputra (2020) explained that variation in drill methods sharpens players' anticipation skills and movement reflexes, which are crucial during overhand serve reception. Setiawan and Nugroho (2019) reported that drill training significantly influenced serve reception success in university-level volleyball teams, which aligns with the improvements observed in this study. Furthermore, the study by Wijaya and Lestari (2023) provides strong contemporary support, stating that drill variation fosters adaptability and real-time responsiveness in student-athletes. The present findings complement these results by offering a focused look at overhand serve defense, an area previously underexplored.

Conclusions

Based on the statistical analysis, drill variation training has been proven to significantly improve the overhand serve defense ability of students at SMA Hang Tuah 1 Surabaya. The increase in post-test scores demonstrates that structured and diverse training programs effectively enhance student performance in real game situations. These findings highlight the value of integrating variation-based training into school-level volleyball programs. Coaches and educators are encouraged to apply these methods not only to improve technical skills but also to develop adaptability and decision-making under pressure. This research contributes practical insights for sports education and provides a solid foundation for future studies to further explore long-term effects and broader applications in different educational settings.

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