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Effects of Paired Training and Rotation Methods on the Underhand Passing Ability of Male Volleyball Players on Team Jeldi B

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Abstract

Objectives: This study aimed to examine the effects of paired training and rotation training methods on the underhand passing ability of male volleyball players on Team Jeldi B and to identify the more effective method for improving this skill.

Materials and Methods: This study employed a quantitative approach with an experimental design. The participants were 20 male volleyball players from Team Jeldi B, who were divided into two groups of 10 players each. One group received paired training, while the other received rotation training. The study focused on comparing the effectiveness of the two training methods in improving underhand passing ability. Data were analyzed using SPSS version 27. Before hypothesis testing, the data were subjected to tests of normality and homogeneity. The effectiveness of each training method was then examined using the paired-sample t-test.

Results: The results showed that both training methods significantly improved the underhand passing ability of the players. In the paired training group, the significance value was 0.001, which was lower than 0.05. In the rotation training group, the significance value was 0.000, which was also lower than 0.05. These findings indicate that both methods had a significant effect on underhand passing performance. However, the rotation method produced a stronger statistical effect, as reflected by the t-value of 6.708, compared with 2.905 for the paired training method.

Conclusions: Both paired training and rotation training were effective in improving the underhand passing ability of male volleyball players on Team Jeldi B. However, the rotation training method was found to be more effective than the paired training method. These findings suggest that rotation-based drills may be more beneficial for coaches seeking to improve players' underhand passing performance in volleyball training programs.

Keywords: Paired Training; Rotation Training; Underhand Passing; Volleyball Players; Training Methods

Introduction

Volleyball is one of the most widely played sports across different age groups and social settings. Its popularity continues to grow because the game is accessible, competitive, and strongly emphasizes teamwork(Al-Dabbagh, 2022; AL-Zuhairi, 2023). In Indonesia, volleyball has developed rapidly, as reflected in the increasing number of school teams, village clubs, community-based teams, and institutional competitions (Amiri et al., 2025;

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Bachtiar et al., 2024). As a team sport played by two opposing sides, each consisting of six players, volleyball requires not only physical readiness but also technical proficiency and effective cooperation among players.

One of the fundamental techniques in volleyball is underhand passing. This skill plays a central role in ball control, serve reception, defensive play, and the initial organization of attack. A well-executed underhand pass allows the team to maintain possession and build a more structured offensive sequence. By contrast, inaccurate passing often disrupts attacking patterns and reduces the overall effectiveness of team performance(Al-Sharifi, 2021; Bf et al., 2020; Birrer & Morgan, 2010). Therefore, underhand passing is not merely a basic skill, but a technical foundation that strongly influences the continuity and quality of play.

Improving underhand passing ability requires systematic and appropriate training. In volleyball practice, the selection of training methods is an important factor because different methods may produce different learning effects and skill adaptations. Among the training methods commonly applied to improve passing skills are paired training and rotation training. Paired training emphasizes repeated interaction between two players, allowing athletes to focus on control, coordination, and consistency through direct repetition with a partner. Rotation training, on the other hand, involves continuous movement, repeated passing actions, and positional changes that may better simulate game-like situations and increase players' responsiveness during practice. Both methods have practical value, but their relative effectiveness in improving underhand passing ability still requires empirical examination (@ Charles et al., 2017).

The present study focuses on the Jeldi B men's volleyball team, a community-based team established to support young players in Nunfutu in developing their volleyball potential and competitive performance. Based on field observations, several players on Team Jeldi B still showed weaknesses in executing underhand passing during matches. These weaknesses were reflected in inaccurate ball direction, imperfect ball contact, unstable arm positioning, and inefficient passing mechanics, all of which affected the quality of play. Although Team Jeldi B has participated in various competitions, its performance has not yet reached the expected level. Compared with Team Jeldi A, which has achieved better results in several championships, Team Jeldi B still appears to require more effective technical training, particularly in the area of underhand passing.

This condition indicates the need for a training-based investigation to identify which method is more effective for improving players' underhand passing ability. Previous studies have often discussed volleyball basic techniques in a general sense, but fewer have directly

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compared specific training methods for underhand passing, particularly in the context of amateur club-level athletes. For this reason, this study offers a more focused contribution by comparing paired training and rotation training through an experimental approach. In addition to its practical importance for coaches and athletes, this study is also expected to enrich the literature on technique development in volleyball training.

The novelty of this study lies in the direct comparison of paired and rotation training methods in improving underhand passing ability among male volleyball players on Team Jeldi B. By examining the effects of these two methods in a real training context, this study seeks to provide empirical evidence regarding which method is more effective as a basis for improving technical performance. Therefore, this study aimed to analyze the effects of paired training and rotation methods on the underhand passing ability of male volleyball players on Team Jeldi B

Materials and Methods

Study Participants

This study employed a quantitative approach with an experimental design(Sugiyono, 2012). The participants were 20 male volleyball players from Team Jeldi B. All participants were actively involved in the team training program and were selected as the research sample. To compare the effectiveness of the two training methods, the participants were divided into two groups, each consisting of 10 players. The first group received paired training, while the second group received rotation training. The study focused on examining the improvement in underhand passing ability following the application of the two training methods.

Study Organization

This study used a pretest–posttest experimental design with two treatment groups. Before the intervention, all participants completed an initial test to measure their baseline underhand passing ability. After the pretest, the first group was treated using the paired training method, while the second group received the rotation training method. At the end of the treatment period, all participants completed a posttest using the same underhand passing test instrument. This design was intended to identify changes in passing ability after each training method had been applied.

The treatment program was conducted for several weeks, with training sessions scheduled three times per week, namely on Tuesdays, Thursdays, and Saturdays. Each session lasted 60 minutes. During the training period, the players performed structured drills

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according to the method assigned to their group. The paired training method emphasized repeated underhand passing practice with a partner, whereas the rotation training method involved continuous passing drills combined with movement rotation during practice. These activities were designed to improve the players' technical execution and consistency in underhand passing.

Underhand passing ability was measured using a performance test administered before and after the intervention. The test results were used to determine the extent to which each training method contributed to the improvement of the players' passing performance.

Statistical Analysis

The data were analyzed using SPSS version 27. Descriptive statistics were first used to summarize the pretest and posttest scores, including the minimum score, maximum score, mean, and standard deviation for each group. Before hypothesis testing, prerequisite tests were conducted to examine the normality and homogeneity of the data. After the assumptions had been met, the paired-sample t-test was applied to determine whether there was a significant difference between the pretest and posttest scores within each training group. The level of significance was set at 0.05.

Results

Hypothesis Testing Using the Paired-Sample *t*-Test

Hypothesis testing was conducted to determine whether the paired training method and the rotation training method significantly improved the underhand passing ability of male volleyball players on Team Jeldi B. The hypotheses of this study were formulated as follows:

Null hypothesis (H_0): The paired training method and the rotation training method do not have a significant effect on improving the underhand passing ability of male volleyball players on Team Jeldi B.

Alternative hypothesis (H_1): The paired training method and the rotation training method have a significant effect on improving the underhand passing ability of male volleyball players on Team Jeldi B.

The decision-making criteria were based on the significance value (*Sig.* 2-tailed). If the significance value was greater than 0.05, the null hypothesis was accepted and the alternative hypothesis was rejected. Conversely, if the significance value was less than 0.05, the null hypothesis was rejected and the alternative hypothesis was accepted.

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Effect of the Paired Training Method

The results of the paired-sample *t*-test for the paired training method are presented in Table 1.

Table 1. Paired-Sample *t*-Test Results for the Paired Training Method

Comparison	Mean Difference	Std. Deviation	Std. Error Mean	95% CI Lower	95% CI Upper	*t*	*df*	Sig. (2-tailed)
Posttest – Pretest	1.100	1.197	0.379	0.244	1.956	2.905	9	0.001

Based on Table 1, the significance value obtained for the paired training method was 0.001, which was lower than 0.05. This result indicates that the paired training method had a statistically significant effect on improving the underhand passing ability of male volleyball players on Team Jeldi B. In other words, the players showed better underhand passing performance after receiving training through the paired method.

Effect of the Rotation Training Method

The results of the paired-sample *t*-test for the rotation training method are presented in Table 2.

Table 2. Paired-Sample *t*-Test Results for the Rotation Training Method

Comparison	Mean Difference	Std. Deviation	Std. Error Mean	95% CI Lower	95% CI Upper	*t*	*df*	Sig. (2-tailed)
Posttest – Pretest	1.000	0.471	0.149	0.663	1.337	6.708	9	0.000

Based on Table 2, the significance value obtained for the rotation training method was 0.000, which was also lower than 0.05. This finding shows that the rotation training method had a statistically significant effect on improving the underhand passing ability of male volleyball players on Team Jeldi B. Thus, the players demonstrated a significant improvement in passing ability after receiving training through the rotation method.

Summary of Findings

Overall, the results indicate that both the paired training method and the rotation training method significantly improved the underhand passing ability of male volleyball players on Team Jeldi B. However, the rotation training method produced a higher *t* value ($t = 6.708$) than the paired training method ($t = 2.905$), indicating a stronger improvement effect in the rotation group. These findings suggest that although both methods were effective, the rotation training method was more effective in enhancing underhand passing ability.

Discussion

The findings of this study demonstrate that both the paired training method and the rotation training method significantly improved the underhand passing ability of male volleyball players on

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Team Jeldi B. This indicates that structured and repetitive training plays an important role in developing basic volleyball techniques, particularly underhand passing, which is essential for ball control, serve reception, and the organization of attack. Since underhand passing is one of the key technical foundations in volleyball, improvement in this skill is likely to contribute positively to the overall quality of team play.

The significant effect of the paired training method suggests that direct and repeated practice with a partner can help players improve coordination, control, and passing accuracy. Through paired drills, players are able to focus more consistently on ball contact, arm position, and movement execution. This kind of practice creates a stable training environment in which athletes can repeat the same movement pattern continuously, allowing them to refine their basic technique. For players who still experience technical inconsistency, such repetition is important because it strengthens motor learning and improves confidence in performing underhand passing during actual play.

The results also show that the rotation training method had a significant effect on underhand passing ability, and this effect was stronger than that produced by the paired training method. This can be seen from the higher *t* value obtained in the rotation group. A possible explanation is that the rotation method provides a more dynamic training structure, requiring players not only to execute underhand passing repeatedly, but also to move, reposition, and respond to changing practice situations. Such conditions may better reflect the real demands of volleyball matches, in which players must perform technical skills under conditions of movement, timing, and tactical adjustment. Therefore, the rotation method may offer a more comprehensive training stimulus than simple paired repetition.

From a training perspective, the superiority of the rotation method may be associated with the principle of game-related practice. Volleyball is not played in a static context, and technical performance is often influenced by how well players can coordinate movement with skill execution. The rotation method appears to encourage this integration more effectively because players are trained to maintain passing quality while simultaneously adapting to positional transitions. As a result, players may become more responsive, better prepared, and more technically efficient in situations that resemble actual competition.

Another important point is that both methods were able to improve performance from pretest to posttest. This means that each method has practical value and may still be useful depending on the objectives of the training session and the level of the athletes. The paired method may be more suitable for reinforcing the fundamentals of underhand passing, especially for players who need to improve basic mechanics and consistency. In contrast, the

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rotation method may be more beneficial when the training goal is to combine technical development with movement readiness and more active playing situations. Thus, the selection of training methods should consider not only statistical effectiveness, but also the specific training needs of the athletes.

The findings of this study are particularly relevant to Team Jeldi B, whose players were observed to have weaknesses in underhand passing during competition. Inaccurate passing, inefficient ball contact, and unstable arm position had previously limited the team's performance in matches. The results of the present study suggest that targeted technical training can help address these weaknesses. More specifically, the rotation training method may provide coaches with a more effective approach for improving passing ability and, in turn, supporting better team performance in future competitions.

Despite these important findings, the study should still be interpreted with caution. The number of participants was limited to 20 players, with 10 players in each treatment group. Although this was sufficient for the experimental comparison conducted in this study, a larger sample would provide stronger evidence and improve the generalizability of the results. In addition, this study focused only on underhand passing ability and did not examine other volleyball skills that may also influence team performance. For this reason, future studies are encouraged to involve larger participant groups, longer intervention periods, and additional performance variables so that the effectiveness of training methods can be examined more comprehensively.

Overall, the findings confirm that both paired training and rotation training are effective methods for improving underhand passing ability in male volleyball players on Team Jeldi B. However, the rotation training method was shown to produce a stronger effect, indicating that it may be the more suitable approach for developing underhand passing skills in this training context. These results provide both practical guidance for coaches and additional empirical support for the application of structured training methods in volleyball skill development.

Conclusions

This study concludes that both the paired training method and the rotation training method were effective in improving the underhand passing ability of male volleyball players on Team Jeldi B. The statistical results showed significant improvements in both groups after the treatment period, indicating that structured training programs can contribute positively to the development of basic volleyball techniques.

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However, the rotation training method demonstrated a stronger effect than the paired training method, as reflected in the higher *t* value obtained in the hypothesis testing. This finding suggests that the rotation method provides a more effective training stimulus for improving underhand passing ability, particularly because it combines technical execution with movement adaptation in a more dynamic practice setting.

These findings imply that coaches may consider using the rotation training method as a primary approach for improving underhand passing performance, while the paired training method may still be used to strengthen basic technical consistency. Future studies are recommended to involve larger samples, longer intervention periods, and additional volleyball skill variables in order to provide a more comprehensive understanding of training effectiveness in volleyball performance development.

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Conflict of interest

If the authors have any conflicts of interest to declare.

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