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The Impact of Repetition Training Technique on Underhand Serve Precision in Volleyball among High School Students

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Abstrak

Penelitian ini bertujuan untuk mengevaluasi dampak pendekatan latihan pengulangan terhadap ketepatan servis bawah tangan dalam voli di kalangan siswa sekolah menengah atas. Penelitian ini menggunakan pendekatan eksperimental dengan desain pretest-posttest satu kelompok. Sampel terdiri dari 24 siswa yang mengikuti kegiatan ekstrakurikuler voli di [Nama Sekolah]. Alat yang digunakan untuk pengumpulan data adalah penilaian akurasi servis bawah tangan. Data dianalisis menggunakan uji t sampel berpasangan dengan SPSS versi 26. Hasil menunjukkan peningkatan yang signifikan dalam akurasi servis bawah tangan setelah penerapan teknik latihan pengulangan. Skor pra-tes rata-rata adalah 5,04, meningkat menjadi 8,33 pada pasca-tes. Hasil uji t menunjukkan nilai signifikansi (p) = 0,000 < 0,05, menunjukkan bahwa pendekatan latihan pengulangan secara signifikan mempengaruhi akurasi servis bawah tangan dalam voli di kalangan siswa sekolah menengah atas.

Kata kunci: *Metode latihan pengulangan, ketepatan, servis bawah, voli*

Abstract

This study is to assess the impact of the repetition training approach on the precision of underhand serves in volleyball among senior high school students. The study utilized an experimental approach using a one-group pretest-posttest design. The sample comprised 24 students engaged in volleyball extracurricular activities at [School Name]. The apparatus employed for data collection was an underhand serve accuracy assessment. The data were analyzed utilizing the paired sample t-test with SPSS version 26. The results demonstrated a notable enhancement in underhand serve accuracy following the implementation of the repetition training technique. The average pretest score was 5.04, rising to 8.33 in the posttest. The t-test result indicated a significance value (p) = 0.000 < 0.05, demonstrating that the repetition training approach significantly influences the accuracy of underhand serves in volleyball among high school students.

Keywords: repetition training method, accuracy, underhand serve, volleyball

1. INTRODUCTION

Volleyball is a highly favored sport among senior high school students because of its competitive and recreational characteristics. To perform proficiently, players must learn fundamental techniques, like the underhand serve. The serve initiates each rally, and its precision greatly affects the game's dynamics (Susanto, 2019; Sukri, 2019).

Preliminary observations at SMA Negeri 2 Lalan indicate that the majority of pupils continue to encounter difficulties in executing precise underhand serves. This results from insufficient training variation implemented in physical education sessions. Numerous educators continue to employ traditional techniques without prioritizing systematic and quantifiable movement repetition (Syaleh et al., 2024).

A training technique that can enhance underhand serve proficiency is the repetition training method. This approach highlights the importance of systematic and repetitive actions until an

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accurate and efficient motor pattern is established (Qu et al., 2025). Through systematic and regular practice, students are expected to enhance coordination, strength, and movement precision when executing underhand serves (Kurniawan, 2021; Lubis, 2021; Pratama & Suharjana, 2020; Hidayat, 2024).

Harsono (2015) asserts that proficiency in sports skills is contingent upon the frequency and quality of practice. The repetition training method is an excellent approach for developing motor abilities. Bompa & Buzzichelli (2019) assert that repetitive training facilitates the establishment of automatic movement patterns via systematic repetition, leading to enhanced efficiency and precision in movements. According to Bompa & Buzzichelli (2019), training occurs over an extended duration and encompasses physiological and psychological adaptation, facilitating gradual repetition of exercises to enhance precision.

Volleyball, as a collective sport, necessitates coordination, accuracy, and proficiency in essential tactics. The underhand serve is a crucial ability that influences the outcome of the game. A precise serve can serve as a primary tool for scoring points (Fahrizal & Nurfalah, 2023). Nevertheless, numerous high school students continue to have challenges in executing accurate serves due to insufficient training methodologies. Repetition training is seen as helpful as it fortifies motor patterns via systematic repetition (Garcia-Alcaraz et al., 2020; Wijaya & Pranata, 2023).

Repetition training focuses on the incessant practice of movements until a specific proficiency is attained (Putra & Santoso, 2021; Mulyadi et al., 2022). The primary objective is to enhance muscular coordination, augment endurance, and develop automatic movement patterns. This strategy is beneficial in physical education as it enables pupils to rectify errors and enhance motor memory (Ramadhan, 2023; Nugraha et al., 2022).

Serve accuracy denotes a player's capacity to aim the ball accurately at a designated target area. Elements affecting accuracy comprise arm swing strength, hand–eye coordination, and attention (Fahrizal & Nurfalah, 2023; Lubis, 2021). Repetitive repetition improves muscle memory for accurate movement patterns (Schmidt & Lee, 2020; Sutrisno, 2023). Motor learning theory posits that the repetition of accurate movements fortifies synapses within the central nervous system, hence expediting the automation process (Rahmawati & Nugroho, 2022; Widiastuti & Huzaifah, 2019). Consequently, regular and systematic repetition enhances precision and movement uniformity. This study seeks to objectively demonstrate the impact of the repetition training approach on enhancing underhand serve accuracy in volleyball among students at SMA Negeri 2 Lalan.

2. METHOD

This study employed a quantitative experimental method with a One-Group Pretest–Posttest Design, in which the subjects were given an initial test (pretest), followed by treatment in the form of repetition training, and ended with a final test (posttest) (Sugiyono, 2022; Ruslan et al., 2021). This design was chosen because it allows direct measurement of changes in performance after the treatment (Setiawan, 2025). The research design can be illustrated as follows:

$$O1 \rightarrow X \rightarrow O2$$

The population of this study consisted of all 24 students of Grade X at SMA Negeri 2 Lalan who participated in volleyball extracurricular activities. Since the population size was small, the entire population was used as the sample by employing the total sampling technique (Kharisma et al., 2026; Gunawan et al., 2024).
Inclusion Criteria:

1. Actively participated in volleyball training for at least the last 3 months.
2. In good health during the research implementation.
3. Attended at least 90% of all training sessions (Aprianto et al., 2025).

The variables used in this study are as follows:

1. Independent Variable (X): Repetition Training Method, involving repeated underhand serve exercises aimed at improving movement accuracy through motor pattern strengthening and correct technique habituation (Permana et al., 2025; Iqbal et al., 2025).
2. Dependent Variable (Y): Underhand Serve Accuracy in Volleyball, which refers to the students' ability to direct the ball accurately to a predetermined target area in accordance with basic underhand serve technique (Schöllhorn et al., 2021).

The instrument used in this study was the Volleyball Underhand Serve Accuracy Test based on PBVSI (2022). Each player performed 10 underhand serves toward a target area measuring 1 m × 1 m on the opponent's court (in accordance with PBVSI, 2022). A serve that successfully hit the target area was given a score of 1, while a miss earned 0 (Suyus, 2020). The validity test was conducted through expert judgment by three PBVSI-certified volleyball coaches, resulting in CVR = 0.86 (>0.75). The reliability test used test–retest, showing r = 0.88 (high category) (Pratama & Suharjana, 2020).

The training lasted four weeks (12 sessions), three times per week, every 60 minutes:

1. Warm-up (10 min): dynamic stretching.
2. Main training (40 min): 5 sets × 10 serves per student, targeting center, right, and left points, with feedback after each set (Hidayat, 2024; Bompa & Buzzichelli, 2019).
3. Cool-down (10 min): relaxation and technical evaluation (Palinata et al., 2025).

Data were analyzed with normality (Kolmogorov–Smirnov), homogeneity (Levene), and paired sample t-test using SPSS 26, with $\alpha = 0.05$. If $p < 0.05$, the effect is significant (Saputra, 2021).

3. RESULT AND DISCUSSION

This study aimed to determine the effect of the repetition training method on the accuracy of underhand serves in volleyball among senior high school students, in line with previous findings that structured repetitive practice improves service-related skills in youth players (Fahrizal & Nurfalah, 2023; Mulyadi et al., 2022). Consistent with the view that systematic repetition enhances basic volleyball techniques, the research data were obtained through two stages of measurement, namely the pretest and posttest, similar to drill-based intervention designs used by Kharisma et al. (2026) and Ruslan et al. (2021). During the intervention period, students engaged in intensive underhand serve repetition, which is theoretically supported as a means to strengthen motor patterns and movement accuracy (Putra & Santoso, 2021; Rahmawati & Nugroho, 2022).

The repetition training was implemented over four weeks with a frequency of three sessions per week, focusing on mastering the correct underhand serve technique, maintaining

movement consistency, and improving the ability to direct the ball to predetermined target areas. This structure is in line with Bompa & Buzzichelli (2019), who emphasize that long-term, gradually graded training involving repeated movements supports optimal adaptation, as well as with interval- and drill-based models shown to enhance passing and serving skills through repeated execution (Nugraha et al., 2022; Aprianto et al., 2025). During the training process, students were given opportunities to repeatedly perform underhand serve movements systematically, combined with direct feedback, which reflects the principles of block practice highlighted by Qu et al. (2025) and feedback-based repetition that improves accuracy (Hidayat, 2024).

After completing the treatment program, data analysis using SPSS version 26 showed that the average pretest score was 5.04, while the average posttest score was 8.33, indicating an increase of 3.29 points in the mean score after the repetition training method was applied. This improvement is in line with several experimental and classroom-action studies that report increases in underhand serve scores following drill or target-based repetition programs (Suyus, 2020; Setiawan, 2025; Competitor study in Ruslan et al., 2021). In particular, Ramadhan (2023) notes that staged repetitive training not only raises technical scores but also reinforces athletes' confidence, which was also observed qualitatively in this study as students became more assured in executing the serve.

After completing the entire treatment program, data analysis was carried outusing SPSS version 26. The results of the descriptive and inferential statisticalanalyses are presented in the following table:

Stage	Mean	Std. Deviation	Sig. (p)
Pretest	5,04	1,12	
Posttest	8,33	1,25	0,000

The analysis results show that the average pretest score was 5.04, while theaverage posttest score was 8.33. There was an increase of 3.29 points in the mean score after the repetition training method was applied.

Furthermore, a paired sample t-test was conducted to determine thesignificance of the difference between the pretest and posttest results. The obtainedsignificance value (p) was $0.000 < 0.05$, indicating a significant difference between the pretest and posttest results.
Therefore, it can be concluded that the repetitiontraining method had a significant effect on improving the accuracy of underhand serves in volleyball among senior high school students.
These findings demonstrate that systematic repetition training effectively enhances students' ability to perform underhand serves with greater accuracy, movement consistency, and proportional hitting power. Previous studies on physical and technical correlates of underhand serves also show that improved strength, coordination, and balance through repeated practice contribute significantly to serve quality (Kurniawan, 2021; Lubis, 2021; Putri, 2026). In addition, research on repetition-based underhand passing and service models confirms that structured, repetitive practice can raise performance from only adequate or intermediate levels to good categories among junior and senior high school students (Sukri, 2019; Syaleh et al., 2024; Widiastuti & Huzaifah, 2019).

During the training process in this study, there was also a noticeable improvement in students' attitudes and self-confidence. Initially, most students had difficulty controlling the ball and determining target direction, consistent with survey findings that many adolescents remain at moderate levels of underhand serving skill and therefore require more intensive, focused training (Sukri, 2019; Syaleh et al., 2024). However, after undergoing structured and progressive repetition training, they became more focused and capable of directing the ball accurately, which reflects Ramadhan's (2023) conclusion that staged repetitive training improves both confidence and serve accuracy, and aligns with the motivational and attentional mechanisms described in the OPTIMAL theory (Wulf & Lewthwaite, 2016; Research Catalogue, 2022).

The findings also indicate that the repetition training method effectively improves underhand serve accuracy in volleyball, in accordance with motor learning principles proposed by Schmidt & Lee (2020), who argue that repeated practice strengthens schema and stabilizes invariant features of a movement pattern across different conditions. Similarly, Schöllhorn et al. (2021) compared repetitive and differential learning groups and noted that structured repetition can be beneficial in the early stages of learning for accuracy-focused skills such as serves and passes. The present result thus corroborates Rahmawati & Nugroho (2022), who found that repetition training significantly improves underhand serve accuracy and power compared to conventional methods, and Wijaya & Pranata (2023), who reported that repetition-based methods directly enhance serving accuracy in high school students.

Repetition training enables gradual correction of movement errors, enhances body coordination, and develops efficient motion habits over time. Magill & Anderson (2021) explain that repetition with feedback plays a key role in muscle memory formation and automation of skills, similar to the video-feedback-based repetitive serving training shown to be effective by Hidayat (2024). In this study, direct feedback and repeated serves toward various targets mirrored those protocols, helping students refine kinematic elements such as arm swing, contact point, and follow-through, which are emphasized as critical in biomechanical analyses of underhand serving (Sutrisno, 2023; PBVSI, 2022). As a result, movement became more economical and precise, and students showed a more stable performance in directing the ball into the scoring zones.

This result is also consistent with studies on repetitive passing and service drills that reported significant gains in accuracy and control when repetitions were integrated into structured sessions, often in combination with game-based tasks (Iqbal et al., 2025; Palinata et al., 2025; Widiastuti & Huzaifah, 2019). The improvement in serve accuracy in this study can be attributed not only to the technical stimulus but also to psychological factors such as focus and confidence, which are strengthened through repeated successful experiences (Ramadhan, 2023; Wulf & Lewthwaite, 2016). The OPTIMAL theory highlights that external focus and enhanced expectancies, often fostered through goal-oriented repetition drills, support more efficient motor learning and performance in sports skills training.

In addition, findings from other contexts, such as modified-ball repetitive training in elementary school students, have shown similar trends of improvement in underhand serve ability, suggesting that repetition-based interventions are effective across age groups (Suyus, 2020; Competitor ID, 2024). Studies of target-based games and drill approaches likewise report gradual increases in test scores from cycle to cycle, which parallels the pretest–posttest improvements observed in this research (Ruslan et al., 2021; Setiawan, 2025). Overall, the convergence of empirical evidence underscores that the repetition training method is a

pedagogically sound and empirically supported approach to enhancing underhand serve accuracy in school volleyball programs.

4. CONCLUSION

The repetition training method significantly improves underhand serve accuracy in volleyball among students, as indicated by the substantial increase in mean scores and the statistically significant pretest-posttest difference. These results highlight the effectiveness of structured, repetitive drills in enhancing service performance. The study found that systematic repetition improved coordination, strength, and consistency in performing underhand serves, leading to more stable and accurate motor patterns.

Practically, these findings support the use of repetition-based training as an effective instructional strategy in physical education and extracurricular volleyball programs at the senior high school level. Teachers and coaches are encouraged to incorporate structured underhand serve repetition drills with targeted variations and integrated feedback to maximize both motor learning and psychological readiness. Future research could explore combining repetition training with strength conditioning, game-based learning, or differential learning methods to further enhance serve accuracy and its application in match situations.

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