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The Effect of Slice Service Training on The Accuracy of Tennis Service Hit

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Abstract

This study aims to evaluate the effect of slice service training on the accuracy of tennis service strokes. Slice service is a technique that produces a lateral spin, creating a curved ball trajectory that is difficult to anticipate and return, especially for intermediate players. Despite its tactical advantages, this technique is rarely given specific attention in tennis training programs. This research employed a quasi-experimental design with a one-group pretest–posttest approach involving 16 athletes from Caringin Tennis Club aged 18–23 years. The instrument used was the validated Hewitt's Tennis Achievement Test. The results showed a significant increase in service accuracy, with the mean score rising from 17.88 (pretest) to 44.00 (posttest). Paired sample t-test analysis confirmed a statistically significant improvement (p = 0.000). The data met the assumption of normality based on the Shapiro-Wilk test. These findings indicate that structured slice service training effectively improves stroke precision, motor coordination, and confidence during service execution. The study supports the importance of integrating specific technique-based training in tennis coaching, especially during the skill development phase.

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INTRODUCTION

Sports play an important role in shaping healthy, productive, and competitive human characters. Among competitive sports, tennis requires integration of physical strength, complex techniques, strategic intelligence, and high mental toughness (Chu, 2015). This game is unique because it is inclusive it can be played by people of all ages, genders, and physical conditions and continues to evolve along with innovations in training methods and biomechanical approaches.

The serve is one of the most crucial elements in tennis. This shot is the starting point of every rally, and if executed well, can provide a tactical advantage from the start of the game. An optimal serve relies not only on power, but also on speed, precision, rhythm of the shot, and subtle variations in technique (Fernando, 2021). Unfortunately, at the beginner to intermediate level, inconsistency and lack of accuracy in serving are still major problems. This leads to an increase in unforced errors and provides a psychological advantage and immediate score for the opponent.

To answer these challenges, the slice serve technique emerged as a stroke strategy that is not only safe but also tactically effective. The slice serve produces a curved ball trajectory due to the sideways spin (sidespin), which causes the ball to deviate laterally after bouncing. This effect creates its own difficulties for the receiver because the direction of the ball becomes more difficult to predict and control (Fikri, 2021). This technique also opens up opportunities to attack unguarded court zones and force opponents out of ideal positions.

However, in training practices at clubs or schools, slice service training is often not the main focus. Training programs are generally still general and equate service stroke techniques without distinguishing the characteristics of each variation. A number of previous studies such as by (Hakim, 2020a) and (Mursalin et al., 2019) have indeed discussed the relationship between muscle strength and service quality, but tend to ignore specific technical approaches such as slices. This creates a gap in the scientific literature and coaching practice.

A study by (Siagian et al., 2021) confirmed that the slice technique has better potential in terms of control compared to flat serve, especially for players who have not yet mastered full power in serving. This concept is reinforced by the variability of practice approach in motor learning theory, which states that training with a variety of conditions is proven to be more effective in improving precision and adaptability of movement (Hernández Davó et al., 2014). The slice technique with various angles and directions of strokes provides rich motor stimuli to improve athlete control and accuracy.

From a biomechanical perspective, a recent study by (Chow et al., 2023) showed that although the racket speed between flat and slice serves did not differ significantly, the slice allowed for more precise lateral control, thus providing a strategic maneuvering advantage. Another study by (Jiang et al., 2021) revealed that shoulder joint stability and internal-external rotation ability had a strong influence on the success of the slice technique. Meanwhile, (Menayo Antúnez et al., 2012) found that controlled motor variability through specific training could improve serve efficiency compared to unstructured variations.

In discussion forums between coaches and athletes (Costa et al., 2021), the importance of technical elements such as pronation, shoulder rotation, and the use of external cues such as cones and visual targets are often discussed as ways to improve slice precision. This suggests a practical consensus that slice training does require a more specific and systematic approach to be effective, especially at the beginning coaching level.

Based on these conditions, this study was designed to empirically evaluate the effect of slice service technique training on improving service accuracy in tennis athletes. The study was conducted with a quasi-experimental approach using a one-group pretest–posttest design, involving 16 athletes from the Caringin Tennis Club with an age range of 18–23 years and a minimum of six months of training experience. The instrument used was the Hewitt's Tennis Achievement Test, which has been validated to measure the accuracy of tennis service objectively.

The novelty of this study lies in the explicit focus on the slice technique, which until now has rarely been studied in the context of club-level training. Most studies have focused more on the physical or general technique aspects, while exploration of the slice technique as a specific intervention is still limited.

By inserting slice training systematically and structured, it is expected that athletes can improve service accuracy, enrich the variety of game strategies, and build better mental readiness in facing competitive matches. This study also supports a paradigm shift in tennis training—from mere repetition to specific and adaptive functional technique-based learning.

METHODS

This study uses a quantitative approach with a quasi-experimental method, which aims to determine the effect of slice service training on the accuracy of service strokes in tennis. The research design used is a one group pretest-posttest design, where the research subjects are given an initial test (pretest), then undergo treatment in the form of slice service technique training for several meetings, and then a final test (posttest) is carried out to see the changes that occur after the training intervention is given.

The subjects of this study were 16 athletes from Caringin Tennis Club who were selected using purposive sampling technique. The inclusion criteria used included: (1) minimum training attendance of 75%, (2) age range 18–23 years, (3) consisting of 7 males and 9 females, and (4) having a minimum of six months of regular tennis training experience. Participants had given their consent to be involved in the study and followed all stages of training and measurement in full.

The instrument used to measure service accuracy is the Hewitt's Tennis Achievement Test, which has been widely used in measuring tennis skills. This test has a validity of 0.72 and a reliability of 0.94. In its implementation, athletes are asked to make 20 service hits (10 from the right side and 10 from the left side) to a predetermined target area, with scores given based on where the ball falls in the target zone. Before the test, all participants warmed up for 10 minutes and were given two service attempts as a trial.

The research procedure began with the implementation of a pretest using the instrument to obtain data on the initial abilities of each athlete. Furthermore, treatment was given in the form of a slice service technique training program that was carried out systematically according to the weekly training plan. After the training cycle was completed, a posttest was conducted with the same procedure to evaluate the improvement in service stroke accuracy performance.

Data analysis was performed using SPSS software version 21 (Fadluloh et al., 2024). The analysis stages include data normality test using the Kolmogorov–Smirnov method, followed by homogeneity test to ensure equality of variance, and difference test (Paired Sample t-Test) to determine the significance of the difference between the pretest and posttest results. The entire analysis process was carried out with a significance level of 5% ($\alpha = 0.05$). Interpretation of statistical test results is used as a basis for answering the problem formulation and testing the hypothesis in this study.

RESULTS AND DISCUSSION

Table 1. Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
Pre-Test	16	11	31	17.88	5.123
Post-Test	16	31	53	44.00	5,574
Valid N (listwise)	16				

The results of descriptive statistics show that the number of subjects in this study was 16 people. In the pre-test data, the minimum value was 11 and the maximum was 31, with an average (mean) of 17.88 and a standard deviation of 5.123. While in the post-test data, the minimum value was 31 and the maximum was 53, with an average of 44.00 and a standard deviation of 5.574. These results indicate a significant increase in scores from the pre-test to the post-test after the treatment was given.

Normality tests were conducted using Kolmogorov-Smirnov and Shapiro-Wilk. The results of the Shapiro-Wilk test showed that the pre-test significance value was 0.250 and the post-test was 0.871, both of which were greater than 0.05. This indicates that the data were normally distributed in both the pre-test and post-test, so that the normality assumption was met and parametric tests could be conducted.

The results of the paired sample t-test showed a significant difference between the pre-test and post-test scores. The resulting t-value was -13.630 with a degree of freedom (df) of 15 and a significance value (p-value) of 0.000 ($p < 0.05$). This indicates that there was a statistically significant increase after the treatment was given. The average difference is within the 95% confidence interval range between -22.040 and -13.630.

Based on the results of data analysis in this study, it is known that there is a significant increase in the accuracy of the service stroke after being given treatment in the form of slice service technique training. This is indicated by the results of the descriptive statistical test, where the average pretest value of 17.88 increased to 44.00 in the posttest. This increase is also supported by the results of the paired sample t-test which shows a significance value of 0.000 ($p < 0.05$), indicating that the difference between the results before and after treatment is statistically significant. This means that systematic slice technique training can make a positive contribution to increasing service accuracy in tennis athletes.

These results support the argument in previous studies stating that specific technique

training, if done in a structured and consistent manner, can significantly improve athletes' motor skills and technical performance (Wahyudi et al., 2023). In the context of tennis, the slice serve is one of the techniques that has advantages in terms of control and direction of the shot due to the resulting sidespin(Fikri, 2021). When this technique is trained intensively, athletes become more accustomed to complex motor coordination, including body position, racket swing, and ball contact point, all of which contribute to increased shot precision.

The normal distribution of data in the pretest and posttest (Shapiro-Wilk test significance values of 0.250 and 0.871, respectively) also strengthens the validity of the results, as it allows the use of more sensitive parametric tests in detecting differences. The normality of the data reflects the consistency of the training results across participants, indicating that the slice training program applied had an even effect among group members.

This finding also fills the gap in previous studies that have focused more on the aspect of muscle strength on service quality in general, without considering the influence of variations in certain service techniques (Hakim, 2020b; Mursalin et al., 2019). By focusing the intervention on one specific technique, namely the slice serve, this study strengthens the modern training approach based on technique segmentation to achieve more targeted results (Angraini & Fardi, 2020).

From a practical perspective, coaches and club trainers can use the results of this study as a basis for developing a more structured slice serve technique training program. In addition to being effective in increasing accuracy, the slice serve is also considered easier for players to control during the coaching stage, and has a lower risk of unforced errors compared to the flat serve (Siagian et al., 2021). Slice technique training can be the first step to expanding the variety of serves that athletes have, before introducing more complex techniques such as kick or topspin serves.

Thus, improving service accuracy through slice technique training not only improves the technical aspects of the game but also gives athletes more confidence in starting rallies. This confidence is very important in competitive matches, where serving is a key moment that can determine the dominance of the game from the start (Fernando, 2021).

Overall, the results of this study support the importance of a specific technique-based training approach in developing sports skills, especially in tennis. Slice service training has been shown to be effective in improving service accuracy, and can be used as an applicable training strategy for coaches at the club and school levels.

CONCLUSION

Based on the results of data analysis and discussion that have been done, it can be concluded that the slice service technique training has a significant effect on increasing the accuracy of service strokes in tennis. This is proven by the increase in the average value from pretest to posttest, as well as the results of the paired sample t-test which showed a significance value of 0.000 ($p < 0.05$). The slice training program that is carried out systematically has been proven to be able to improve motor coordination, stroke control, and accuracy of ball placement to the intended target.

This study strengthens the specific technique training approach in sports coaching, especially in tennis. By training one type of technique in a focused manner, athletes can achieve significant performance improvements, even in a relatively short training time. Therefore, coaches are advised to integrate slice technique training into the coaching curriculum, especially at the basic and intermediate skill development stages.

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