Journal Coaching Education Sports
https://doi.org/10.31599/jces.v7i1.5418
Vol. 7, No.1, May 2026, pp. 328-334
E-ISSN: 2722-3450 P-ISSN: 2775-3808

The Effect of Shadow Training on Backhand Drive Accuracy in Table Tennis Players

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Abstract

This study aimed to examine the effect of shadow training on the accuracy of backhand drive strokes among table tennis players at PTM Truna. Backhand drive is an essential technique in table tennis that requires speed, coordination, and stroke accuracy. However, many club-level athletes still experience difficulties in maintaining consistent and accurate strokes due to improper technique and limited technical training. This study employed a pre-experimental method using a one-group pretest-posttest design. The sample consisted of 20 table tennis players selected using a total sampling technique. The instrument used was a backhand drive accuracy test. Data were analyzed using normality tests followed by a paired sample t-test. The results showed that the mean score increased from 47.15 in the pretest to 58.65 in the posttest. The paired sample t-test demonstrated a significant difference between pretest and posttest scores ($p < 0.05$), indicating that shadow training significantly improved backhand drive accuracy. In addition, the effect size analysis showed that the training produced a strong practical effect on athletes' performance. These findings indicate that shadow training is effective in improving technical stroke accuracy in table tennis players. This study provides empirical evidence regarding the effectiveness of shadow training at the local club athlete level and contributes to the development of technical training methods in table tennis.

Keywords: Shadow Training; Backhand Drive; Table Tennis; Stroke Accuracy; Technical Training

corresponding author: indrasafari77@upi.edu
Artikel Info:
Submitted: **18/04/2026** Revised: **28/04/2026** Accepted: **15/05/2026** Published: **17/05/2026**

How to Cite: Jatnika, A, K, T, J, S., Safari, I., Sudrazat, A. (2026). The Effect of Shadow Training on Backhand Drive Accuracy in Table Tennis Players. *Journal Coaching Education Sports*, 7(1), 328-334. https://doi.org/10.31599/jces.v7i1.5418
Author's Contribution: a) Desain Penelitian; b) Pengumpulan Data; c) Analisis Statistik; d) Penyusunan Naskah; e) Pengumpulan Dana

A. Introduction

Table tennis is a sport that requires speed, precision, and good movement coordination (Kurniadi, 2025). One of the essential basic techniques in table tennis is the backhand drive stroke, which is frequently used in both offensive and defensive situations during fast rallies (Safrian, 2024). The backhand drive technique requires proper coordination between hand movement, visual focus, and stable body positioning to produce accurate strokes (Riadi, 2017). However, in practice, many beginner and club-level players still experience difficulties in maintaining the consistency and accuracy of their strokes. Common problems include poor swing control, improper body positioning, and inaccurate stroke timing (Riyadi1 et al., 2025). These issues result in lower stroke accuracy and negatively affect overall playing performance.

One training method that can be applied to improve technical skills is shadow training. Shadow training is a repetitive exercise method performed without using a ball in order to develop correct movement patterns, improve coordination, and strengthen athletes' motor memory (Priambudhi, 2023). This method is considered effective because athletes are able to focus entirely on technical movements without interference from external variables such as ball speed or match pressure (Gusman, 2025). In addition, repetitive technical exercises are widely recognized in sports training and motor learning theories as effective approaches for improving movement efficiency and skill mastery.

Several previous studies have shown that structured and repetitive technical training can improve fundamental skills in table tennis (Nurhidayat et al., 2025). Nevertheless, previous studies have mostly focused on general technical drills, multiball exercises, and forehand stroke training. Limited studies specifically investigate the effectiveness of shadow training on backhand drive accuracy, particularly among local club-level athletes. Therefore, a clear research gap still exists regarding the empirical effectiveness of shadow training in improving backhand drive stroke accuracy in table tennis players. Furthermore, most previous references are still dominated by local studies, while studies discussing biomechanics, motor learning, and technical sports training remain limited. This condition highlights the importance of conducting further research to provide stronger empirical evidence concerning the application of shadow training in table tennis coaching practice.

Therefore, this study aims to examine the effect of shadow training on the accuracy of backhand drive strokes among table tennis athletes at PTM Truna. The findings of this study are expected to contribute to the development of effective technical training methods and provide practical references for coaches and athletes in improving table tennis performance.

B. Methods

This study employed a pre-experimental research method using a one-group pretest-posttest design (Ulfah & Suryantoro, 2021). The study was conducted at PTM Truna Table Tennis Club. The population and sample consisted of 20 club athletes selected using a total sampling technique because all athletes met the research criteria (Dede & Firmansyah, 2022). The consistency between the sample size reported in the abstract and the methods section has been adjusted to avoid data inconsistency.

The research procedure began with a pretest to measure the athletes' initial backhand drive accuracy. After the pretest, participants were given shadow training

treatment for six weeks with a frequency of three training sessions per week. Each training session lasted approximately 60 minutes and consisted of repeated backhand shadow movement drills focusing on body positioning, swing technique, movement coordination, and stroke timing. The exercises were carried out progressively with guidance from the coach to ensure correct movement patterns throughout the training process (Gusman, 2025). Following the completion of the training program, a posttest was conducted using the same testing instrument to determine improvements in backhand drive accuracy.

The instrument used in this study was a backhand drive accuracy test adapted from Saputra et al. (2022). The test measured players' ability to perform accurate backhand drive strokes toward predetermined target areas on the table. Scores were calculated based on the number of successful hits that reached the target area within a specified number of attempts. The instrument has previously been used in table tennis skill assessment research and demonstrated adequate validity and reliability for evaluating stroke accuracy.

Data analysis was conducted using SPSS software. Descriptive statistics were used to determine the mean, minimum score, maximum score, and standard deviation of the pretest and posttest data. The normality of the data distribution was tested using the Shapiro–Wilk test because the sample size was fewer than 50 participants. After the assumption of normality was fulfilled ($p > 0.05$), hypothesis testing was performed using a paired sample t-test to determine the effect of shadow training on backhand drive accuracy. In addition, effect size analysis was conducted using Cohen's d to determine the magnitude of the treatment effect. Although the one-group pretest-posttest design does not involve a control group and has limitations in internal validity, this design was considered appropriate for examining the initial effectiveness of shadow training in the context of local club athletes.

C. Results and Discussion

Result

Data analysis in this study was conducted using descriptive statistics, normality testing, paired sample t-test, and effect size analysis. The results of the descriptive statistics for the pretest and posttest scores of backhand drive accuracy are presented in Table 1.

Table 1. Descriptive Statistics of Pretest and Posttest Scores

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Pretest	20	42.00	54.00	47.15	2.92
Posttest	20	50.00	70.00	58.65	5.09

Table 1 shows the descriptive statistical analysis of pretest and posttest scores on backhand drive accuracy among PTM Truna table tennis players. The results indicate that the mean score increased from 47.15 in the pretest to 58.65 in the posttest. In addition, the posttest maximum score was higher than the pretest score, indicating an improvement in athletes' backhand drive accuracy after receiving shadow training treatment. Before conducting hypothesis testing, a normality test was carried out using the Shapiro–Wilk test. The results are presented in Table 2.

Table 2. Normality Test Results

Variable	Statistic	df	Sig.
Pretest	0.982	20	0.958
Posttest	0.973	20	0.817

Based on Table 2, the significance value of the pretest data was 0.958, while the posttest data showed a significance value of 0.817. Since all significance values were greater than 0.05 ($p > 0.05$), it can be concluded that the data were normally distributed. Therefore, the data met the assumptions required for parametric statistical analysis using the paired sample t-test. The hypothesis testing results using the paired sample t-test are presented in Table 3.

Table 3. Paired Sample t-Test Results

Variable	Mean Difference	t	df	Sig. (2-tailed)
Pretest – Posttest	-11.50	-9.214	19	0.000

Table 3 shows that the significance value obtained from the paired sample t-test was 0.000, which was smaller than 0.05 ($p < 0.05$). This result indicates a statistically significant difference between the pretest and posttest scores. Therefore, shadow training significantly improved the accuracy of backhand drive strokes among PTM Truna table tennis players.

To determine the magnitude of the treatment effect, effect size analysis was conducted using Cohen's d. The analysis produced a Cohen's d value of 1.85, which falls into the large effect category. This finding indicates that shadow training not only produced statistically significant results but also had a strong practical impact on improving athletes' backhand drive accuracy.

Discussion

The findings of this study demonstrated that shadow training significantly improved the accuracy of backhand drive strokes among PTM Truna table tennis players. The statistical analysis showed a significant increase in the posttest scores compared to the pretest scores, indicating that repetitive shadow movement exercises were effective in enhancing athletes' technical performance. In addition, the large effect size obtained from Cohen's d analysis confirmed that the training method had a strong practical impact on improving stroke accuracy. These findings suggest that shadow training can be considered an effective technical training approach for developing fundamental table tennis skills at the club-athlete level.

The improvement in backhand drive accuracy occurred because shadow training emphasizes repetitive movement patterns that help athletes develop motor coordination, body balance, and movement consistency. Through repeated technical movements without the distraction of ball speed or game pressure, athletes are able to focus more effectively on body positioning, swing mechanics, and stroke timing. This process is closely related to the principles of motor learning theory, which state that repeated and structured practice can strengthen motor memory and improve movement efficiency. As a result, athletes become more consistent and accurate in

performing technical movements during play situations.

The results of this study are consistent with previous research indicating that structured technical exercises contribute significantly to improving table tennis performance (Nurhidayat et al., 2025). Similarly, Priambudhi (2023) reported that shadow training positively affected technical stroke development in table tennis athletes. Furthermore, Gusman (2025) explained that repetitive shadow exercises allow athletes to improve movement coordination and stroke control more effectively because the training focuses entirely on technical execution. The present findings also support studies emphasizing that backhand drive techniques require synchronization between visual focus, arm movement, body posture, and timing to produce accurate strokes (Safrian, 2024; Riadi, 2017). Therefore, the implementation of shadow training can provide substantial benefits for athletes who experience difficulties in maintaining stroke consistency and precision.

Compared to previous studies, this research specifically focused on the effectiveness of shadow training in improving backhand drive accuracy among local club-level athletes, which remains relatively underexplored in table tennis research. Most previous studies examined general technical drills, multiball exercises, or forehand stroke training, whereas this study provides more specific empirical evidence regarding backhand drive skill development through shadow training. Consequently, this study contributes to expanding the scientific discussion on technical training methods in table tennis, particularly in the context of beginner and intermediate athletes at local clubs.

Practically, the findings of this study imply that coaches can integrate shadow training into regular technical training programs to improve athletes' backhand drive performance. The method is relatively simple, inexpensive, and easy to implement because it does not require complex equipment or intensive match situations. Coaches may also combine shadow training with multiball drills or direct game simulations to maximize athletes' technical adaptation and performance development. For athletes, consistent shadow training may improve movement automation, increase confidence, and enhance stroke stability during competitive play.

Despite its positive findings, this study has several limitations. The study used a one-group pretest-posttest design without a control group, which may reduce internal validity and limit the ability to compare treatment effects with other training methods. In addition, the sample size was relatively small and limited to athletes from one local club, which may affect the generalizability of the findings. Therefore, future studies are recommended to involve larger sample sizes, include control groups, and compare shadow training with other technical training methods to obtain more comprehensive results regarding the effectiveness of table tennis training programs.

D. Conclusion

Based on the findings of this study, it can be concluded that shadow training significantly improved the accuracy of backhand drive strokes among PTM Truna table tennis players. The results of the paired sample t-test indicated a significant difference between pretest and posttest scores, while the effect size analysis demonstrated that the training produced a strong practical effect on athletes' technical performance. These findings confirm that repetitive shadow movement exercises are effective in enhancing coordination, stroke consistency, and movement accuracy in table tennis.

Therefore, shadow training can be recommended as an effective technical training method for improving backhand drive accuracy, particularly for beginner and club-level athletes. The implementation

of structured and consistent shadow training may help coaches develop athletes' fundamental technical skills more efficiently. Future studies are suggested to involve larger sample sizes, include control groups, and compare shadow training with other technical training methods to obtain broader and more comprehensive findings regarding table tennis performance development.

E. Acknowledgments

The authors would like to express their sincere gratitude to all parties who contributed to the completion of this study. Special appreciation is extended to the PTM Truna Table Tennis Club for granting permission and providing support during the research process. The authors also thank the coaches and athletes who willingly participated in the study and assisted in the data collection process.

The authors are deeply grateful to the academic supervisors and colleagues for their valuable guidance, constructive suggestions, and continuous support throughout the preparation of this research. Their contributions were highly beneficial to the successful completion of this study.

F. Conflict of Interest

No there is conflict interest.

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