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Efforts to Improve Shooting Accuracy in Futsal Games Through Structured at UKM Futsal UPI Sumedang

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Abstract

This research is motivated by the low shooting accuracy of futsal players, which is generally caused by suboptimal mastery of basic techniques, poor movement coordination, and the lack of structured and sustainable training programs. In futsal, shooting accuracy is a crucial indicator that directly influences the success of scoring goals. Therefore, a systematic training method is needed to improve this ability. This study aims to determine the effect of structured training on improving shooting accuracy among UPI Sumedang futsal UKM players. The method used was a quantitative approach with a one group pretest-posttest experimental design. The sample consisted of 15 players who actively participated in futsal UKM activities. Data were collected through shooting accuracy tests conducted before (pretest) and after (posttest) the implementation of a structured training program. Data analysis was carried out using statistical tests to determine the differences in results before and after treatment. The results showed a significant improvement in shooting accuracy after the implementation of structured training. This improvement was indicated by the difference in the average scores between pretest and posttest, supported by statistical test results showing a significant effect. These findings indicate that systematic, targeted, and repetitive training effectively improves basic shooting techniques. Furthermore, the improvement was influenced by a combination of technical training, target-based methods, drill exercises, and physical components such as leg muscle explosiveness and eye-leg coordination.

Keywords: futsal, shooting accuracy, structured training, drill method, motor coordination

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Author's Contribution: a) Research Design; b) Data Collection; c) Statistical Analysis; d) Manuscript Preparation; e) Fundraising

A. Introduction

Futsal is a form of small-sided football played by two teams consisting of five players each, including a goalkeeper, on a relatively small indoor court Futsal(Idris et al., 2020; Munzir et al., 2021; Nurkadri & Kholil, 2021). The nature of the game, which is fast-paced and played in a limited space, requires players to demonstrate high levels of technical proficiency, quick decision-making, and effective teamwork. One distinctive characteristic of futsal is the use of a low-bounce ball, which demands players to maintain close ball control and execute techniques with precision under pressure (Yiannaki et al., 2026). Consequently, fundamental technical skills such as passing, dribbling, and especially shooting must be performed accurately and efficiently in a short time span.

In the scientific context of sports performance, shooting accuracy is considered one of the most crucial technical indicators in futsal, as it directly determines the effectiveness of goal-scoring opportunities (Musa et al., 2026). However, field observations reveal that many players, particularly at the student level, still experience difficulties in achieving optimal shooting accuracy. This issue is influenced by several factors, including inadequate mastery of basic techniques, poor coordination between visual perception and motor execution (eye foot coordination), and insufficient physical conditioning particularly the explosive power of the leg muscles. Previous studies indicate that even when players possess strong kicking power, the resulting shots are not always accurate due to suboptimal coordination and control during execution (Elsisi, 2021; Huang et al., 2025; Piskin et al., 2024; Williams & Hodges, 2023). This reflects a gap between physical capability and technical precision in actual gameplay situations.

Moreover, the training process implemented in many student-level futsal programs tends to be less structured, inconsistent, and not systematically programmed. Training sessions often emphasize general practice without integrating progressive, targeted, and repetitive drills that specifically address shooting accuracy. As a result, players show low consistency in directing the ball toward the goal, which ultimately affects their performance in competitive situations. This phenomenon highlights the need for a more systematic and well-designed training approach that integrates technical, physical, and coordinative components.

Several previous studies have attempted to address this issue by applying specific training methods to improve shooting accuracy (Musa et al., 2026; Sintoko & Suharjana, 2019). For instance, research on the use of target-based exercises such as target wheels and target darts has shown positive effects in enhancing shooting precision among high school futsal players. Similarly, the application of the massed practice method has been proven to significantly improve shooting accuracy through repetitive training patterns (Musa et al., 2026; Sintoko & Suharjana, 2019)(Fuentes-García et al., 2022). These findings suggest that targeted and repetitive training

methods can contribute to better shooting performance.

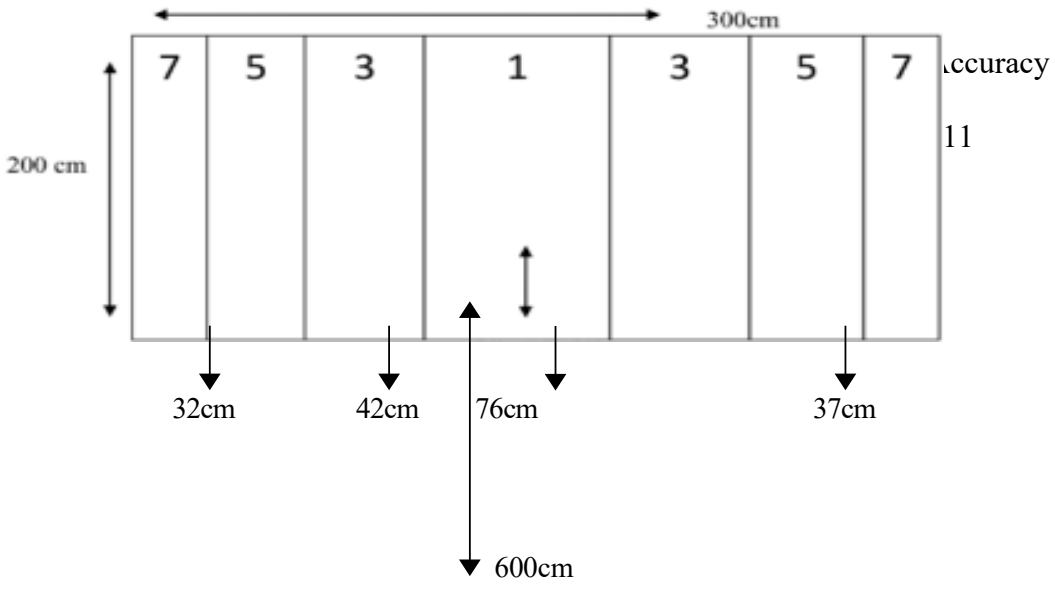
However, despite these contributions, existing studies tend to examine training methods in isolation and within short-term experimental settings. Most of them focus on a single type of exercise without integrating various training components into a comprehensive and structured training program based on established training principles. As a result, these studies have not fully captured the long-term effectiveness of systematic training interventions in improving shooting accuracy.

Therefore, a research gap remains regarding how a structured, integrated, and continuous training program combining technical drills, physical conditioning, and coordinative exercises can influence the improvement of futsal shooting accuracy, particularly among student players. Addressing this gap is essential to develop a more effective training model that not only improves accuracy but also ensures consistency and sustainability of performance in real game situations.

B. Methods

This study uses a quantitative approach with an experimental method that aims to test the effect of a treatment on increasing the accuracy of futsal shooting. The research design applied is One Group Pretest-Posttest Design, which involves only one group that is given treatment without a comparison group. The population in this study is students who are members of the UPI Futsal UKM Sumedang Campus, with a sample of 15 players who actively participate in the activity. This study involved two main variables, namely the free variable as the treatment given and the bound variable in the form of shooting accuracy ability. The data collection technique is carried out through three stages, namely pretest to determine initial ability, treatment, and posttest to measure the improvement of ability after treatment is given.

This study uses a useful skill test instrument to measure shooting ability in students. The drawings for the shooting accuracy test are as follows:



Implementation instructions :

1. Students are 3 meters behind the cones that have been provided preparing to kick with the right or left foot, depending on the player's preference, 6 meters away from the goal or goal.
2. Furthermore, there is no hint from the researcher, the researcher becomes an observer whether the kick technique is legal or not, students kick the ball using any shooting technique.
3. The implementation was carried out with students not kicking past the cones.
4. An opportunity is given to students 3x kicks.

Execution is considered invalid:

1. The ball comes out of the target area.
2. Kick distance under 10 meters.
3. Shooting through the cones.
4. Not shooting according to the implementation instructions.

Score :

1. The number of scores on the target 3 times.
2. If the ball from the kick hits the score separator on the target, the result is the largest score.

Data analysis in this study was carried out quantitatively to determine the effect of the structured training program on improving futsal shooting accuracy. The data obtained from the pretest and posttest were first analyzed descriptively to determine the mean, minimum score, maximum score, and standard deviation, so that an overview of students' initial and final abilities could be identified. Furthermore, prerequisite tests were conducted, including the normality test using the Shapiro Wilk test due to the small sample size ($n < 50$), and the homogeneity test using Levene's Test to ensure data consistency.

Hypothesis testing was then carried out using the paired sample t-test to determine whether there was a significant difference between pretest and posttest scores. The decision-making criterion was based on the significance value (Sig.), where Sig. < 0.05 indicates a significant effect of the treatment, while Sig. ≥ 0.05 indicates no significant effect. In addition, to determine the magnitude of the treatment effect, effect size analysis was conducted using Cohen's d, with interpretation criteria of 0.2 (small), 0.5 (medium), and 0.8 (large effect).

To further measure the level of improvement in shooting accuracy, gain score analysis was also employed using the N-Gain formula:

$$N\text{-}Gain = \frac{\text{Posttest} - \text{Pretest}}{\text{Maximum Score} - \text{Pretest}}$$

The N-Gain results were interpreted into three categories, namely high (≥ 0.70), moderate (0.30–0.69), and low (< 0.30). Through these stages of analysis, it is expected that the effectiveness of the structured training program in improving futsal shooting accuracy can be identified comprehensively and objectively

C. Result and Discussion

Results

The results of this study present the analysis of data obtained from measuring futsal shooting ability before (*pretest*) and after (*posttest*) the implementation of a structured training program. The analysis was conducted in several stages,

including descriptive statistics, prerequisite testing (normality), and hypothesis testing using a paired sample t-test. These stages aim to provide a comprehensive overview of changes in shooting ability and to determine the significance of improvement after the treatment was applied.

Table 1. Description of Shooting Abiliy Data

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Pretest shooting	17	1	13	121	7.12	3.604
Posttest shooting	17	7	15	177	10.41	2.425
Valid N (listwise)	17					

Based on Table 1, the descriptive statistical analysis shows that the mean score of shooting ability in the pretest was 7.12 with a standard deviation of 3.604**,** while in the posttest it increased to 10.41 with a standard deviation of 2.425**.** The minimum and maximum scores also improved, from a range of 1–13 in the pretest to 7–15 in the posttest. This increase in the mean score indicates a positive improvement in shooting ability after the implementation of the structured training program. Furthermore, the decrease in the standard deviation in the posttest suggests that the players' shooting performance became more consistent compared to before the treatment.

Table 2. Normality of Shooting Abiliy Data

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest shooting	.192	17	.095	.942	17	.343
Posttest shooting	.190	17	.103	.920	17	.147

a. Lilliefors Significance Correction

Based on Table 2, the results of the normality test using the Shapiro–Wilk test show that the significance values (Sig.) for the pretest and posttest are 0.343 and 0.147, respectively. Since both values are greater than 0.05, it can be concluded that the data are normally distributed. Thus, the assumption of normality is fulfilled, and parametric statistical analysis can be applied in the next stage.

Table 3. Paired Samples Test

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pretest shooting - Posttest shooting	-3.294	2.173	.527	-4.411	-2.177	-6.251	16	.000

Based on Table 3, the paired sample t-test results show a significance value (Sig. 2-tailed) of 0.000, which is less than 0.05. This indicates that there is a statistically significant difference between the pretest and posttest scores. The mean difference value of -3.294 indicates an improvement in shooting ability after the treatment was applied. Therefore, it can be concluded that the structured training program has a significant effect on improving shooting accuracy in futsal. The overall findings of this study can be summarized in a systematic flow as follows:

a. Descriptive analysis shows an increase in the mean shooting score from pretest to posttest.
b. The normality test confirms that the data are normally distributed, meeting the assumptions for parametric testing.
c. The paired sample t-test proves that the improvement is statistically significant.
d. Therefore, the structured training program is effective in improving futsal shooting accuracy.

Discussion

The findings of this study indicate that the implementation of a structured training program has a significant effect on improving futsal shooting accuracy. This result directly answers the first research question, which examines whether structured training influences shooting accuracy. The statistical results, particularly the paired sample t-test showing a significance value of 0.000 (<0.05), confirm that the improvement observed between pretest and posttest scores is statistically significant. This suggests that a systematically designed training program can effectively enhance players' ability to perform accurate shots.

In relation to the second research question, which focuses on how structured training integrating technical, physical, and coordination aspects improves shooting performance, the results demonstrate that the observed improvement is not solely due to repetitive practice, but also due to the integration of multiple training components. Structured training allows players to develop better control of movement, improve eye–foot coordination, and optimize the use of leg muscle power during shooting execution. This aligns with previous findings by Alwan 'Alauddin et al. (2024), which state that programmed and systematic exercises can enhance focus, concentration, and technical precision, ultimately leading to better shooting accuracy.

Furthermore, the findings of this study are consistent with prior research emphasizing the effectiveness of specific training methods, such as target-based exercises and drill methods. Target-oriented training encourages players to focus on accuracy and decision-making, while drill-based training

enhances repetition and movement automation. Studies by Anwari et al. (2022) and other related research show that such methods significantly improve shooting accuracy, as evidenced by increased performance scores. In this study, the increase in the mean score from 7.12 to 10.41 further supports the effectiveness of combining these methods within a structured training framework.

Addressing the third research question regarding performance differences, although this study did not involve a control group, the significant improvement between pretest and posttest scores indicates that structured training provides meaningful progress compared to initial conditions. This finding strengthens the argument that training programs lacking structure and systematic progression may limit the development of shooting accuracy.

From a physical perspective, the improvement in shooting accuracy is also closely related to the contribution of leg muscle explosive power and eye–foot coordination. Previous studies (Perdana et al.; Septiani Putri et al., 2022) highlight that these factors play a crucial role in producing accurate and well-directed shots. Additionally, physical exercises such as lunges have been shown to significantly support shooting performance by enhancing balance and lower-body strength. Therefore, structured training that incorporates both technical and physical components contributes to a more comprehensive improvement in shooting ability.

Overall, the results of this study demonstrate that the improvement in shooting accuracy is influenced by the integration of structured technical training, appropriate training methods (such as target and drill exercises), and enhanced physical conditioning. These findings reinforce the notion that a structured and systematic training approach is more effective than conventional, unstructured methods in improving fundamental futsal skills, particularly shooting accuracy. Moreover, this study contributes to filling the existing research gap by providing empirical evidence on the effectiveness of an integrated and continuous training program rather than isolated training methods.

This study offers a novel contribution to the field of futsal training by developing and empirically testing a structured and integrated training program that simultaneously combines technical drills, physical conditioning, and coordination exercises to improve shooting accuracy. Previous studies have generally examined the effectiveness of isolated training methods, such as target-based exercises, drill methods, or massed practice, in improving shooting performance. However, these approaches tend to be partial and short-term, focusing on single training components without integrating them into a comprehensive training framework.

The novelty of this research lies in its holistic and systematic approach, where shooting accuracy is not only treated as a technical skill but also as an outcome of the interaction between motor coordination, physical capacity (particularly leg muscle explosive power), and repetitive, structured practice. In addition, this study applies a continuous and programmed training model within a real student-athlete context, providing more ecologically valid evidence

compared to previous experimental studies that are often limited in duration and scope.

Furthermore, this study contributes to bridging the existing research gap by demonstrating that an integrated structured training program yields significant improvements in both accuracy and performance consistency, rather than merely enhancing isolated aspects of shooting ability. Therefore, this research not only confirms previous findings but also extends them by proposing a more comprehensive training model that can be practically implemented in futsal coaching programs at the student level.

D. Conclusion

This study concludes that the implementation of a structured training program has a significant effect on improving futsal shooting accuracy among student players. The findings show a clear increase in shooting performance, as indicated by the higher posttest mean score compared to the pretest, and supported by the results of the paired sample t-test, which revealed a statistically significant difference. provides empirical support that skill performance is the result of the interaction between multiple components, rather than a single isolated factor. Practically, this study offers guidance for coaches, physical education teachers, and futsal practitioners to design more effective training programs by implementing structured, systematic, and continuous training methods. The use of target-based exercises, repetitive drills, and physical conditioning should be combined in a progressive manner to enhance both accuracy and The improvement in shooting accuracy is the result of an integrated training approach that combines technical exercises, physical conditioning, and coordination development. This indicates that shooting accuracy is not solely influenced by technique, but also by supporting physical factors such as leg muscle explosive power and eye–foot coordination, which are effectively enhanced through structured and continuous training. Thus, this study confirms that a systematic and well-programmed training model is more effective in improving both the accuracy and consistency of shooting performance compared to non-structured training approaches. The findings of this study have important implications for both theoretical development and practical application in futsal training. Theoretically, this study strengthens the concept that improving technical skills, particularly shooting accuracy, should be approached through an integrated training model that combines technical exercises, physical conditioning, and coordination development. It consistency of performance. In addition, regular evaluation using measurable indicators, such as shooting accuracy tests, is recommended to monitor player development. Furthermore, this study suggests that future research should expand the scope by involving larger samples, applying control group designs, and examining long-term training effects, as well as incorporating additional variables such as psychological and tactical aspects to obtain more comprehensive findings.

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F. Conflict of Interest

There is no conflict of interest.

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