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A Comparison of The Effects Of Triangular And Rectangular Lower Passing Exercises On Passing Accuracy In Extracurricular Futsal At SMPN 1 Wado

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ABSTRACT

This study aims to compare the effect of triangular and quadrilateral pattern lower passing training on passing accuracy in extracurricular futsal activities at SMPN 1 Wado. This study used a quasi-experimental method with a pretest-posttest control group design involving 18 students who were divided into two groups by purposive sampling. The instrument used to measure passing accuracy is the passing accuracy test from Dr Norbert Rogalski and Dr Ernst G. Degel. Data analysis used a normality test, homogeneity test, independent t-test and r-square test to find out how much influence triangular and quadrilateral patterns of lower passing training on passing accuracy. The results of this study can conclude that both training patterns can make a significant contribution to improving students' passing accuracy. The triangular pattern of lower passing training gives an influence of 58.7%, while the rectangular pattern gives an influence of 54.8%. Although the difference in influence is not statistically significant, practically the triangular pattern shows a slight advantage in improving passing accuracy.

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INTRODUCTION

Futsal is the most popular sport and is favoured by people around the world, especially men children, adolescents, and adults Hafizh & Putro, (2022). Evidenced by a large number of people, both in urban and rural areas, futsal is often played by 5 people in a team and is also more popular than other sports. In a futsal game, basic skills are needed that must be possessed by each player, one of which is passing. Passing is one of the basic techniques in a futsal game that is very important for every player to have. This technique is a movement to pass the ball to a teammate to maintain possession of the ball and create opportunities in the game Anjanika dkk., (2023). Deliany & Palmizal, (2024) Given the relatively small futsal field and its flat surface, hard and accurate passing

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becomes indispensable so that the ball can slide well, parallel to the player's heel, and be difficult to cut by the opponent. In addition, according to Santosa & Barokah, (2022) almost throughout the futsal game, players continue to use passing as the main means of building attacks and defences. Therefore, passing practice is one of the fundamental elements in futsal that must be mastered by every player to increase the effectiveness of the game. Ramdani & Permono, (2022) explain that accurate passing allows players to maintain possession of the ball, set the tempo of the game, and create effective attack opportunities.

In the initial observation conducted on September 18, researchers observed basic techniques in futsal games, such as passing, control, and dribbling. In the game, researchers found problems that hindered students, one of which was the lack of mastery of accurate passing techniques. This solution often arises when students try to apply precise passing in matches. One of the causes of this main problem is the lack of variety and systematization in the training patterns applied. Such conditions not only hinder the development of individual students but also affect the game team as a whole. Andrian dkk., (2024) The lack of good passing skills can make it difficult for students to develop futsal games effectively. In addition to mastering basic passing techniques, accuracy is also an important aspect of increasing effectiveness in playing. In extracurricular futsal activities, students have diverse ability backgrounds, so the right training method is needed to optimize their skills in passing accurately.

To overcome these problems, this study will compare the effect of triangular and quadrilateral lower passing training on passing accuracy in extracurricular futsal at SMPN 1 Wado. By applying training methods, this research will provide a clearer picture of the effectiveness of each training pattern. In addition, the results of this study can be the basis for extracurricular coaches in developing a more targeted and effective training program. By choosing the most suitable training method, it is hoped that the passing accuracy of players can increase significantly, thereby improving the quality of the futsal team's game, especially at the school level.

Syahrizal dkk., (2018) Some previous studies have examined the effectiveness of passing training with triangular and quadrilateral patterns in improving passing accuracy, but generally conducted on club players or soccer and futsal academies. For example, research Setya & Raharjo, (2024) and Ceriani, (2023) examined the effect of passing training methods on club players. In contrast to previous research, this study focuses on players in the school environment, especially students who are members of the futsal extracurricular. In addition, this study also compares the effect of the two methods more specifically by taking into account factors such as age, level of experience, and training conditions that differ from the professional club environment. Therefore, this study will fill a research gap that has not been widely discussed in the context of school education.

This research has high urgency because it can make a real contribution to the development of futsal sports at the school level. Passing accuracy is an important aspect of futsal, and finding the most effective training methods can help improve the overall

quality of students' play. In addition, the results of this study can be used as a reference for extracurricular coaches in developing a more structured and evidence-based training program. Thus, this research is not only for students at SMPN 1 Wado but also for other schools who want to improve the quality of their futsal training.

Based on the background, problems, solutions, and research gaps that have been discussed, it can be concluded that this research has a strong relevance in the development of passing techniques in the school environment. By comparing the effectiveness of triangular and quadrilateral pattern lower passing exercises, this research is expected to provide clearer recommendations for coaches and players in improving passing accuracy in futsal games. Therefore, this research is worth doing to answer existing problems and have a positive impact on the world of sports, especially futsal at the school level.

METHODS

In this study, the population taken was futsal extracurricular students of SMPN 1 Wado with a total of 45 people. Researchers chose the population from futsal extracurricular activities at SMPN 1 Wado because the school has an active futsal extracurricular program and is relevant to the research objectives. In addition, researchers also see the ability of some students who are still lacking in performing passing skills, especially in accuracy. This is reinforced by Sugiyono (2014) who states that population is a generalization area consisting of objects, and subjects that have certain characteristics that have been determined by researchers to study and then draw conclusions.

The research sample that will be used in this study is the Purposive Sampling technique. The sampling refers to the opinion of Sugiyono (2014) which states that purposive sampling is a sampling technique with certain considerations. Therefore, the sample determination taken was 18 futsal extracurricular students at SMPN 1 Wado who had the following characteristics: 1) Students who are active in the futsal extracurricular at SMPN 1 Wado. 2) Age 12-14 years. 3) Have participated in the tournament at least 2 times.

In determining the experimental group of triangular pattern lower passing exercises and the control group of quadrilateral pattern lower passing, the researcher took 18 futsal, extracurricular students who matched the characteristics of the sample determination above from a total of 45 students, then the researcher first conducted a pretest on 18 students who became the sample. Then the researchers sorted the pre-test data from the passing accuracy test according to the results obtained, from this data the researchers divided into two experimental groups and a control group, where one group was given treatment with triangular pattern lower passing exercises (experimental group), the other group was given treatment with quadrilateral pattern lower passing exercises (control group).

Dymas Anggara Sutisna[1A-E], Adang Sudrazat[2B-D], Entan Saptani[3B-D]
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The instrument used is a passing accuracy test, which is expected to improve passing accuracy with the target game used. In addition, this instrument is carried out during the initial test and final test. Measurement of the results of passing accuracy research using an assessment of the instrument Dr. Norbert Rogalski and Dr. Ernst G. Degel in Yarobi (2023).

Data analysis in this study used SPSS 26 for Windows. Each test result data that has been carried out through pretest and posttest will later be processed by calculating the average value in the experimental group and control group. After finding the average value, data management and analysis must be carried out which includes a normality test, homogeneity test, hypothesis test and r-square test.

RESULTS AND DISCUSSION

Data analysis in this study used SPSS 26 for Windows. Each test result data that has been carried out through pretest and posttest will later be processed by calculating the average value in the experimental group and control group. After finding the average value, data management and analysis must be carried out which includes a normality test, homogeneity test, hypothesis test and r-square test. The data management and analysis techniques are as follows.

Results

The results of data analysis from the passing accuracy instrument in the pretest and posttest research of the experimental group of triangular pattern lower passing exercises and the control group of quadrilateral pattern lower passing exercises on passing accuracy in extracurricular futsal at SMPN 1 Wado:

Table 1.
Triangular experimental group

	N	St. Dev	Mean	Min	Max
Pretest	9	2,22	2,108	0	7
Posttest	9	5,22	,972	4	7

Based on the table above, it can be seen that the entire sample of 9 people who took the pretest and posttest. With the lowest score on the pretest being 0 while on the posttest 4. For the highest score on the pretest 7 and posttest 7. The average pretest value of 2.22 while the average posttest value is 5.22. Then for Std. Deviation on the pretest was 2.108, while for the Std. Deviation on the posttest was 0.972.

Table 2.
Quadrilateral control group

	N	St. Dev	Mean	Min	Max
Pretest	9	2,22	1,563	0	5
Posttest	9	5,89	1,537	4	8

Based on the table above, it can be seen that the entire sample of 9 people who took the pretest and posttest. With the lowest score on the pretest being 0 while on the posttest 4. For the highest value on the pretest 5 and posttest 8. The average pretest

Dymas Anggara Sutisna[1A-E], Adang Sudrazat[2B-D], Entan Saptani[3B-D]
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value of 2.22 while the average posttest value is 5.89. Then for Std. Deviation on the pretest was 1.563, while for the Std. Deviation on the posttest amounted to 1.537.

Table 3.
Normality Test

Result Pretest	*Shapiro-Wilk*			Description
	Statistics	***df***	***Sig.***	
Group A triangle pretest	,848	9	,070	**Normal**
Group B quadrilateral pretest	,951	9	,701	**Normal**

From the results of the table above, it is known that the data from the results of student passing accuracy in extracurricular futsal at SMPN 1 WADO obtained sig. > 0.05, the data results from the pretest of the triangular experimental group obtained 0.070> 0.05 and the results of the quadrilateral control group pre-test obtained 0.701> 0.05; it can be concluded that the research is normally distributed.

Table 4.
Homogeneity Test

Result Pretest	Levene Statistic	df1	df2	Sig.	Description
Based on Mean	,144	1	16	,709	Homogenous

Based on the results of the homogeneity test, show that the homogeneity of the relationship between the pretest variables of the triangular experimental group and the quadrilateral control group was obtained sig. > 0.05, The data results from the pretest of the triangular experimental group and the quadrilateral control group obtained 0.709> 0.05, it can be concluded that the relationship between the pretest variables of the two groups is homogeneous.

Table 5.
Hypothesis Test.

		t	df	Sig. (2-tailed)
Pair 1	Posttest eksperimen-posttest control	-1,100	16	,288

Hypothesis testing using Independent.Samples. The T-test showed that there was no significant difference between the post-test scores of the experimental group and the control group. The analysis results show a Significance value (Sig. 2-tailed) of 0.288, which is greater than the significance level $\alpha = 0.05$. This indicates that there is no significant difference between the post-test scores of the experimental group and the control group. Thus, the hypothesis H0 is accepted and H1 is rejected. This means that the training given to the triangular experimental group did not show a significant advantage over the training in the rectangular control group in improving students' passing accuracy.

Although the data has met the assumptions of normality and homogeneity, the Independent Sample T Test results show a significance value of 0.288 ($p > 0.05$), which means there is no significant difference between the experimental and control groups. This could be due to the relatively small difference in mean values as well as the limited sample size, making it unable to show a truly statistically different effect. Thus, both

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types of training can be considered to have relatively equal effectiveness in improving students' passing accuracy.

Table 6.
R Square Test Results Triangle experimental group

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.766[a]	.587	.528	1,449

Based on the above value, the determination coefficient (RSquare) value is 0.587, which means that the influence of the independent variable on the dependent variable is rsquare 0.587 x 100 = 58.7%. Thus the effect of the application of triangular pattern lower passing training on passing accuracy in extracurricular futsal at SMPN 1 WADO is 58.7%.

Table 7.
R Square Test Results Square control group

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,740[a]	,548	,483	1,124

Based on the above value, the determination coefficient (RSquare) value is 0.548, which means that the influence of the independent variable on the dependent variable is rsquare 0.548 x 100 = 54.8%. Thus the effect of the application of quadrilateral pattern lower passing training on passing accuracy in extracurricular futsal at SMPN 1 WADO is 54.8%.

Discussion

Based on the results of statistical analysis, the experimental group was given the treatment of triangular pattern lower passing exercises and the control group was given conventional quadrilateral lower passing exercises showing an increase in scores from pre-test to post-test. In the triangle experimental group, the average value increased from 2.22 to 5.22. While in the quadrilateral control group, it increased from 2.22 to 5.89. This means that both training models have a positive influence on improving students' passing accuracy.

However, the results of the independent sample t-test showed that there was no significant difference between the experimental and control groups, with a significance value of p = 0.288 (p > 0.05). Thus, hypothesis H0 which states that there is no significant difference is accepted. This means that although both types of training produced improvements, no training model was statistically proven to be superior between the triangular and quadrilateral patterns of lower passing training.

This suggests that both triangular and quadrilateral passing training patterns are equally effective in improving passing accuracy, but not significantly different from each other. One possible reason for this is the small sample size (only 9 students in each group), which limited the power of statistical analysis.

The results of this study are in line with the basic theory of passing techniques in futsal, according to Norifansyah dkk., (2024) lower passing is the basic technique most

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often used in futsal games because it provides better control of the ball, especially in fast game situations and narrow spaces. Accuracy in passing down is the key to the team's success in maintaining possession of the ball and carrying out the designed game pattern, as confirmed by Noor dkk., (2025) Therefore, passing technique training must not only be done repeatedly but also a systematic and structured pattern, as explained by Santosa & Barokah, (2022) which states that systematically designed training patterns can improve the accuracy and consistency of players in passing.

Underhand passing exercises with a triangle pattern emphasize more on movement rotation and the formation of ideal passing angles. In this pattern, players are encouraged to continue moving and looking for open space after making a pass, which is very effective in forming the habit of moving passes and supporting game transitions. However, the triangle pattern has limitations in the variation of pass directions because it only involves three rotation points. In contrast, underhand passing exercises with a square pattern provide a wider variation of pass directions, because they involve four points with the possibility of straight or cross passes. This pattern trains players to be more prepared to face pressure from various directions, improves their ability to make quick decisions, and adjust their body position according to the direction the ball is coming from.

It can be concluded that the implementation of triangle and square exercises has been proven to increase the accuracy of students' passing in futsal extracurricular activities at SMPN 1 Wado. This finding empirically supports the theories that have been put forward and strengthens the understanding that the effectiveness of basic passing technique training is greatly influenced by the design of the training pattern used, especially in the context of futsal games that prioritize speed, precision, and mastery of space.

Based on the results of data analysis conducted using R Square, it shows that the triangle pattern underhand passing exercise contributes to passing accuracy by 58.7%. Meanwhile, the square pattern underhand passing exercise contributes to 54.8%. From these results, it can be concluded that both exercise patterns have a large influence, but the triangle pattern has a slightly higher influence than the square pattern, with a difference of around 3.9%. However, the results of the statistical test (t-test) state that the difference in influence between the two types of exercise is not statistically significant because the significance value is 0.288> 0.05. This means that there is no difference strong enough to conclude that one of the triangle exercise patterns is better than the square exercise pattern in improving passing accuracy.

However, the difference in R Square numbers still provides important information. The triangle pattern exercise places more emphasis on rotational movements, forming good passing angles, and finding space after passing the ball. This exercise is very effective in developing the habit of moving passes, which is important in fast futsal games. Matitaputty, (2019) stated that the underhand passing technique is the most frequently used in futsal because it provides better ball control, especially in tight spaces. This supports why the triangle pattern has a significant positive impact.

Dymas Anggara Sutisna[1A-E], Adang Sudrazat[2B-D], Entan Saptani[3B-D]
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Meanwhile, the square training pattern provides more variation in passing directions, because it involves four passing points. This pattern trains players to think quickly, adjust their body direction to the direction the ball is coming from, and face pressure from various sides. According to Purnama (2019), accuracy in passing is very important so that the team can maintain ball control and carry out game strategies well.

This finding is also in line with the opinion of Syah et al., (2024)who stated that a structured and systematic training pattern can improve the accuracy and consistency of players' passing. Therefore, although there is no significant difference, both training patterns still have a major contribution to improving passing accuracy. Therefore, both triangle and square patterns have their respective strengths in training passing skills. The triangle pattern is suitable for building teamwork and fast rotation, while the square pattern is more appropriate for honing the variety of passes and player reactions to game pressure. Therefore, in extracurricular futsal activities at SMPN 1 Wado, both training patterns can be used alternately or combined for maximum training results.

CONCLUSION

Based on the results of the research that has been conducted on the comparison of the effect of triangle and square underhand passing exercises on students' passing accuracy in futsal extracurricular activities at SMPN 1 Wado, it can be concluded that both training patterns can provide a significant contribution in improving students' passing accuracy abilities. Triangle underhand passing exercises have an effect of 58.7%, while the square pattern has an effect of 54.8%. Although the difference in effect is not statistically significant, in practice the triangle pattern shows a slight advantage in improving passing accuracy. This shows that training with a structured and systematic pattern can improve students' technical skills, especially in passing. These results are in line with previous theories and findings that emphasize the importance of mastering basic techniques in fast and dynamic futsal games. Therefore, both triangle and square patterns can be used as effective alternative training in learning basic futsal passing techniques.

Based on the results and conclusions of this study, the researcher suggests that coaches or extracurricular futsal coaches can apply both triangle and square underhand passing training patterns in training programs alternately or in combination so that students get more varied technical experience and support the development of optimal passing accuracy. In addition, for further researchers, it is recommended to use a larger sample and a longer training duration so that the results obtained can show more statistically significant differences. Research can also be developed by examining other technical aspects such as dribbling, ball control, or shooting, to provide a more comprehensive understanding of improving futsal playing skills. Finally, schools are expected to continue to support extracurricular sports activities as a means of developing students' potential, character, and skills as a whole.

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