



The Effect Of Shuttle Run And Zig-Zag Drill Exercises On Soccer Dribbling Agilityon SSB Duta Fortuna U-13

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Keywords

Shuttle Run; Zig-zag
Drill; Kelincahan
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Abstract

This quasi-experiment-based quantitative research with a pretest-posttest design of two groups aims to analyze and compare the effect of shuttle run and zig-zag drill exercises on ball dribbling agility in SSB DUTA FORTUNA U-13 players. The research sample amounted to 20 players who were taken using saturated sampling techniques, then divided evenly into two groups to undergo a 3-week training program with a frequency of 3 times per week. Dribbling agility is measured using the dribbling agility test in seconds. The results of the Paired Samples T-Test analysis showed that both training methods had a significant influence on the improvement of dribbling agility ($p < 0.001$), where the shuttle run group experienced a decrease in average travel time by 0.634 seconds and the zig-zag drill group by 0.639 seconds. Based on the effect size analysis, both treatments were in the very large effect category, but the zig-zag drill showed slightly stronger values (Cohen's $d = 21.582$) than the shuttle run exercise (Cohen's $d = 30.693$). It can be concluded that both training methods effectively improve the dribbling agility of early age players, with the zig-zag drill making a slightly higher contribution due to its complex movement characteristics more resembling real situations in the game of soccer.

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INTRODUCTION

Football is a popular sport as well as a lifestyle (Muzaffar, 2021). Football is a sport played by two teams, each consisting of eleven players. Football is the most popular sport worldwide, as shown by the discovery of the oldest record in China from the Tsincañang Dynasty. These texts show the belief that the game has been around for 5,000 years and has been transmitted from generation to generation (Farhan et al., 2024). Football is the most popular sport and is very popular in various parts of the world, especially in Indonesia. Football seems to have become a language of unity for various nations in the world with diverse historical and cultural backgrounds. Football is also considered a tool to unite the world that is able to transcend the boundaries of political, ethnic and religious differences so that football is considered the most multicultural sport among other sports. Indonesian football under the auspices of PSSI (Indonesian Football Association) was founded by an engineer named Soeratin Sosrosoegondo. Soeratin sees football as the best forum to sow nationalism as an act against the Netherlands (Tri Laksana, 2020).

Dribbling seems easy, but many soccer players often lose control of dribbling (Bakti, 2021). A player is considered skilled in football if he is proficient in various techniques of the sport. Although dribbling may seem simple, many soccer players often lose control of the ball while performing this skill (Assakinah et al., 2025). Besides that, dribbling is also a rescue strategy when the ball cannot be passed as soon as possible (Prayoga et al., 2022). Good dribbling skills allow players to get past opponents, defend the ball, and create scoring opportunities. Therefore, improving dribbling skills is a major focus in youth coaching in football schools (SSB) (A. Rizal & Nurulita, 2025). Meanwhile, agility is the ability of players to move quickly and flexibly, both in dribbling and avoiding opponents (Mappaompo, 2024).

Agility refers to a rapid change in the direction or position of the body that is carried out in conjunction with other movements and agility has an important role in achieving the ability to perform well to have, maintain and maintain agility skills as one with other physical abilities (Shabih, 2021). This research is important in developing football at a basic level. With dribbling techniques, soccer players can be more confident in dribbling and excel in the game of soccer. In addition, this research is expected to make a valuable contribution to the development of more effective and structured training programs, particularly in improving the dribbling skills of football players. Thus, this article not only aims to uncover the influence of zig-zag dribbling and shuttle run dribbling exercises on dribbling speed, but also seeks to make a practical contribution in the form of training program recommendations that can be implemented by football coaches. The findings of this study are expected to be a reference for future research and help in improving the quality of sports learning in football (Deng et al., 2025).

Shuttle Run exercises that can improve speed abilities in soccer players due to practice. The form of Shuttle Run training or running back and forth as quickly as possible starts from one point to another covering a certain distance (Tiara & Wada, 2024). Shuttle run exercises are designed to increase agility by running back and forth quickly starting at one point and then running at another point within a predetermined distance (Hidayat et al., 2021).

Zig-zag dribbling drill is a fast twisting activity in overcoming obstacles so it can be an excellent style to promote dribbling skills. Zig-zag run is one of the running sports models that adheres to the zig-zag runway and is often used as a way to increase agility because this activity compartment is hidden in the zig-zag run (Wijaya, 2021). The benefits of this zig-zag dribble exercise are to improve dribbling skills in soccer. This form of exercise is useful for dribbling with tight control, players must control the ball by being able to in a situation of limited movement space because in dribbling players must move zig-zag to pass the existing milestone (Rio et al., 2021). Zig-zag training is a form of training in which players are required to run or dribble over obstacles (such as poles or cones/cones) which is installed in a twist with a zig-zag pattern (Rogo et al., 2022).

In the practice of early childhood football coaching, especially in football schools (SSB), the implementation of training programs that specifically aim to increase dribbling agility is still not carried out optimally. Based on the results of initial observations made on SSB DUTA FORTUNA U-13 players in Tanjunganom Village, players' dribbling skills still need to be

improved, especially in terms of dribbling speed and the ability to change direction when passing obstacles or facing opponents. Some players still have difficulty in maintaining ball control when changing direction quickly so that the effectiveness of dribbling in the game becomes less optimal. This condition shows that a proper and effective form of training is needed to increase the agility as well as the player's dribbling ability.

Previous studies have consistently reported that both shuttle run and zig-zag drill training improve football dribbling performance and agility. For example, Arpansyah et al., (2022) reported a significant difference between zig-zag run and shuttle run training in improving dribbling ability among senior high school football players. Similarly, Apraja et al., (2023) found that both shuttle-run and zig-zag exercises significantly enhanced ball dribbling ability in junior high school students. Saputra et al., (2024) also demonstrated that shuttle run and zig-zag training significantly improved soccer dribbling skills among high school extracurricular players. More recently, M. C. Rizal et al., (2026) confirmed that the combination of zig-zag run and

shuttle run training effectively increased dribbling agility in youth football school (SSB) athletes. However, these studies were conducted in different populations and training environments, and their findings cannot be directly generalized to younger football school players, particularly those at the U-13 developmental stage. Furthermore, evidence regarding the comparative effectiveness of these two training methods in SSB DUTA FORTUNA U-13 players remains unavailable. Therefore, this study aims to fill this empirical and contextual gap by analyzing and comparing the effects of shuttle run and zig-zag drill training on ball dribbling agility among SSB DUTA FORTUNA U-13 players in 2026. More specifically, this study aims to determine the effect of shuttle run training on ball dribbling agility, determine the effect of zig-zag drill on ball dribbling agility, and find out the difference in the influence between the two forms of training on the player's dribbling agility. The results of this study are expected to make a theoretical contribution to the development of sports coaching science, especially related to agility training in football, as well as provide practical benefits for coaches in designing more effective training programs to improve the dribbling skills of early age players.

METHODS

This thesis proposal uses a quantitative research approach to investigate the effects of exercise *shuttle run* and *zig-zag Drill* To improve dribbling agility ability in SSB DUTA FORTUNA players. This research method is an experiment with the aim of revealing the effect of shuttle run training and zig-zag run training on dribbling skills (Hidayat et al., 2021). This research is based on a quasi experiment by conducting a pretest and posttest of two group design. Before and after the implementation of the training program in each group was measured for agility using the agility T-test. The sampling technique used was saturated sampling with a sample of 20 people who were players of SSB DUTA FORTUNA. Then it was divided into two treatment groups that were given an exercise program for 3 weeks with a frequency of 3 times a week. Group I shuttle run exercise was carried out by running back and forth for 10 meters between two points, 6–8 repetitions or for 20 seconds and group II zig-zag run exercise ran through a cone arrangement that formed a zig-zag pattern with a distance between cones of 2 meters along a 10-meter track (Faricha et al., 2025).

The instrument used in this study is the dribbling agility test. Based on the study conducted by (Qowiyyuridho, 2021), the instrument demonstrated high validity and reliability. The content validity ranged from 0.87 to 1.00 based on Aiken's V analysis, the empirical validity coefficient (Pearson Product Moment) was 0.991, and the reliability coefficient (Cronbach's Alpha) was 0.995. These findings indicate that the instrument is highly valid and reliable for measuring players' agility performance. This test is used to measure a player's ability to dribble quickly while making a change of direction. The equipment used in this test includes a soccer ball, a cone or obstacle, a stopwatch, and a soccer field. The implementation of the test is carried out by having the player dribble through several cones that have been arranged in a row with a certain distance until they reach the finish line. Players start the test from the starting line while carrying the ball, then dribble through each obstacle to the finish line. The player's travel time from start to finish is measured using a stopwatch and recorded in seconds. The faster the time a player gets, the better his dribbling agility ability.

The data analysis used in this study is the analysis of the t-test (t-test). To test the validity of the sample, it is necessary to carry out a normality test and a homogeneity test. The data analysis technique in this study uses the T-Test to determine whether the data is normal or not. If the data is abnormal, then a non-parametric test is required, besides that it is also necessary to carry out a homogeneity test to test whether the data is homogeneous or not

RESULTS AND DISCUSSION

This study was conducted to determine the effect of *shuttle run* and *zig-zag drill* exercises on the agility of *dribbling* balls and to find out which training methods have a significant influence on increasing the *dribbling* agility of SSB DUTA FORTUNA U-13 students. The data analysis carried out in this study was a non-parametric test analysis. To test the validity of the sample, it is necessary to carry out a normality test and a homogeneity test.

The researcher will explain the effect of *shuttle run* training and *zig-zag drill* training on the *dribbling* agility of SSB DUTA FORTUNA U-13 students. This research was conducted from May 6, 2026 to May 27, 2026, the subjects of this study were 20 active students of SSB DUTA FORTUNA U-13. The data obtained in this study was by using the *Pretest-posttest control group design experimental method*. The following are the results of research data conducted at SSB DUTA FORTUNA U-13:

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest Shuttle run	10	572	615	593,10	14,888
Posttest Shuttle run	10	508	552	529,70	15,571
Pretest Zig-zag drill	10	568	610	587,50	14,759
Posttest Zig-zag drill	10	502	545	523,60	14,691
Valid N (listwise)	10				

Source : Research 2025

The table above shows that before receiving treatment in the *shuttle run group*, the *dribbling* agility test had an average score of 5.9310 with a standard deviation of 14.888, with a highest score of 6.15 and a lowest score of 5.72. After being given *shuttle run training*, the *maximum* *dribbling* agility test score is 5.52 and the lowest score is 5.08. The standard deviation is 15.571 and the average is 52970.

In the *zig-zag run group*, before being given the *dribbling* agility training treatment, the *highest* *zig-zag run* precision test score was 6.10 and the lowest score was 5.68, while the average score was 5.8750 with a standard deviation of 14759. After being given *zig-zag run* exercises, the *highest* *dribbling* agility test score was 5.45 and the lowest score was 5.02. The standard deviation is 14691 and the average is 5.2360.

Table 2. Test of normality of shuttle run and zig-zag drill exercises

One-Sample Kolmogorov-Smirnov Test					
		Pretest Shuttle run	Posttest Shuttle run	Pretest Zig-zag drill	Posttest Zig-zag drill
	N	10	10	10	10
Normal Parameters ^{a,b}	Mean	593,1	529,7	587,5	523,6
	Std. Deviation	14,888	15,571	14,759	14,691
Most Extreme Differences	Absolute	0,142	0,167	0,145	0,168
	Positive	0,134	0,143	0,145	0,123
	Negative	-0,142	-0,167	-0,101	-0,168
Test Statistic		0,142	0,167	0,145	0,168
Asymp. Sig. (2-tailed) ^c		,200d	,200d	,200d	,200d

Monte Carlo Sig. (2- tailed) ^e	Say.		0,825	0,598	0,795	0,58
	99% Confi- dence In- terval	Lower Bound	0,815	0,585	0,785	0,568
		Upper Bound	0,834	0,61	0,805	0,593

Source : Research 2025

The pretest and posttest in shuttle run exercises have normal values according to the Kolmogorov-Smirnov normality test. The pretest and posttest in the zig-zag run exercise are also categorized as normal. In this case, a parametric test can be performed because all data is said to be normal. Unless there is abnormal data, nonparametric tests cannot be performed. All four data groups (Pretest Shuttle run, Posttest Shuttle run, Pretest Zig-zag drill, and Posttest Zig-zag drill) had a significance value (Asymp. Sig.) of 0.200, which is greater than 0.05. Thus, it can be concluded that all such data are normally distributed and are eligible for use in parametric statistical analysis (such as the Paired Sample T-Test or the Independent Sample T-Test).

Table 3. Results of the Variance Homogeneity Test (Dribbling Agility Pretest)

Analysis Method	Levene Statistic	df1	df2	Significance (Sig.)	Conclusion
Based on Mean	0,014	1	18	0,907	Homogen
Based on Median	0,014	1	18	0,907	Homogen
Based on Median and with adjusted df	0,014	1	17,468	0,907	Homogen
Based on Median and with adjusted df	0,015	1	18	0,905	Homogen

Based on the analysis in **Table 3**, the Levene Statistic coefficient (calculated based on the mean) is 0.014, with degrees of freedom of df1 = 1 and df2 = 18, and a significance value (Asymp. Sig.) of 0.907. Since this significance value is substantially higher than the established error level of α ($0.907 > 0.05$), it is statistically determined that the variances of the initial scores for the shuttle run group and the zig-zag drill group are equal (homogeneous). This finding of homogeneity confirms that the 20 SSB DUTA FORTUNA U-13 athlete subjects—selected via saturated sampling—possessed comparable baseline dribbling agility capabilities prior to the commencement of the three-week training program.

The fulfillment of these two data analysis prerequisites—namely, normally distributed data and homogeneous inter-group variances—provides a valid and robust statistical foundation for the researcher to proceed with testing the primary comparative hypothesis. To evaluate the reliability and significance of changes in mean scores within each group resulting from the training intervention, the researcher subsequently employed a Paired Samples T-Test.

Table 4 Paired sample test

		Mean	Std. Deviation	Paired Differences Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper	t	df	Significance One-Sided p	Two Sided p
Pair 1	Pretest Shuttle run	63,4	2,066	0,653	61,922	64,88	97,06	9	<,001	<,001
	Posttest Shuttle run									
Pair 2	Pretest Shuttle run	63,9	2,293	0,936	61,782	66,02	68,25	9	<,001	<,001
	Posttest Shuttle run									

Based on the results of the paired sample t-test analysis, the results of the comparison between the pretest and posttest scores in each exercise group were obtained.

In the shuttle run training group (Pair 1), a *mean difference* of 0.634 seconds was obtained, which indicates a decrease in dribbling travel time after being given the training treatment. The t-value is calculated as 97.061 with a degree of freedom (df) = 9 and a significance value (Sig. 2-tailed) of 0.001. Because the significance value was less than 0.05, it can be concluded that there was a significant difference between the pretest and posttest results in the shuttle run training group. This shows that shuttle run training has a significant influence on the improvement of the dribbling agility of football players.

Meanwhile, in the zig-zag drill (Pair 2) training group, an average difference value of 0.639 seconds was obtained, which also showed an increase in dribbling ability after the training treatment. The t-value is calculated as 68.247 with df = 9 and a significance value of 0.001, which means it is smaller than 0.05. Thus, it can be concluded that the zig-zag drill also has a significant influence on the increase of the dribbling agility of football players. In addition, the 95% confidence interval in both groups did not pass zero, namely 0.61922–0.64878 in the shuttle run group and 0.61782–0.66018 in the zig-zag drill group. This further strengthens that there is a real difference between the pretest and posttest scores after being given the exercise treatment.

Overall, the results of this analysis show that both training methods, namely shuttle run and zig-zag drill are effective in increasing the dribbling agility of soccer players.

Table 5 Paired Samples Effect Sizes

			Standard- izera	Point Esti- mate	95% Confidence Interval	
			Lower	Upper	Lower	Upper
Pair 1	Pretest Shuttle run - Posttest Shuttle run	Cohen's d	2,066	30,693	16,797	44,636
		Hedges' corrction	2,260	28,050	15,350	40,791
Pair 2	Pretest Zig-zag drill - Posttest Zig-zag drill	Cohen's d	2,961	21,582	11,799	31,394
		Hedges' corrction	3,240	19,723	10,783	28,690

Based on the results of the effect size analysis using Cohen's d and Hedges' correction, a value was obtained that showed how much the effect of exercise treatment on the improvement of the dribbling agility of football players. In the shuttle run exercise group (Pair 1), Cohen's d value was 30.693 with a 95% confidence interval between 16.797 and 44.636. The calculation results using Hedges' correction showed a value of 28.050 with a confidence interval between 15.350 to 40.791. The effect size value is included in the very large effect category, which shows that *shuttle run* practice has a very strong influence on increasing the dribbling agility of soccer players.

In the zig-zag run exercise group (Pair 2), Cohen's d value was 21.582 with a 95% confidence interval between 11.799 to 31.394, while Hedges' correction value was 19.723 with a confidence interval between 10.783 to 28.690. The value of the effect size is also included in the very large category, which shows that *the zig-zag drill* practice has a very strong influence on the improvement of the player's dribbling agility. When compared between the two groups, the effect size value in *the zig-zag drill* exercise was greater than the shuttle run exercise, so it can be indicated that *the zig-zag drill* had a slightly stronger influence in increasing the dribbling agility of football players. This can happen because *zig-zag drills* involve more complex movement changes of direction so that they more closely resemble the dribbling movement situation in a football game. Overall, the results of the effect size analysis showed that both training methods had a very strong influence on improving the dribbling agility of soccer players, so they could be used as an effective training method in youth soccer player coaching programs. The results of this study are in line with previous research conducted by , which stated that agility training involving changes in direction movements can improve the agility

ability of soccer players. This is because zig-zag drill and shuttle run exercises require players to perform rapid movements, changes in direction, and body control, which are important components in soccer dribbling skills. The findings of this study support previous research that structured agility training can improve the ability of young soccer players to perform dribbling movements effectively (Qowiyyuridho, 2021)

CONCLUSION

Based on the results of research and data analysis regarding the effect of shuttle run and zig-zag drill exercises on ball dribbling agility in SSB DUTA FORTUNA U-13 players, it can be concluded that the two training methods have a significant influence on increasing the player's dribbling agility. The results of the paired sample t-test analysis showed a marked decrease in travel time (meaning increased speed and agility) after being given a 3-week training program in each treatment group. The effect size of these two exercise methods is in the very large effect category. However, when the two methods are compared, the zig-zag drill practice is shown to have a slightly stronger influence in improving the dribbling agility of players compared to the shuttle run practice. This is due to the characteristics of the zig-zag training model that involves a more complex change of direction, so that the movement pattern is much more similar to the real situation when dribbling to outwit the opponent in a football match. Therefore, these two training methods are highly recommended for coaches to be applied in a structured manner in early childhood football coaching programs.

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