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THE EFFECTS OF ZIG-ZAG RUN AND SHUTTLE RUN TRAINING ON DRIBBLING AGILITY AMONG FOOTBALL EXTRACURRICULAR STUDENTS AT SMP NEGERI 1 JEJAWI

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Agility, Dribbling, Football, Shuttle Run, Zig-Zag Run

Abstract

(1) This study aimed to examine the effects of zig-zag run and shuttle run training on dribbling agility among football extracurricular students at SMP Negeri 1 Jejawi and to compare the effectiveness of both training methods. (2) This study used a quasi-experimental method with a two-group pretest–posttest design. The participants were 20 male students who joined the football extracurricular program at SMP Negeri 1 Jejawi. Total sampling was used, and the participants were divided into two groups through ordinal pairing: 10 students in the zig-zag run training group and 10 students in the shuttle run training group. The research instrument was a 15-meter football dribbling agility test using a zig-zag track. The intervention was conducted through structured training sessions, and the data were analyzed using descriptive statistics, the Shapiro–Wilk normality test, Levene’s homogeneity test, paired sample t-test, and independent sample t-test. (3) The zig-zag run group improved from a pretest mean of 27.04 seconds to a posttest mean of 23.71 seconds. The shuttle run group improved from a pretest mean of 27.05 seconds to a posttest mean of 25.52 seconds. The normality test showed that the data were normally distributed, with significance values of 0.355 for the zig-zag run group and 0.228 for the shuttle run group. The homogeneity test showed a significance value of 0.989, indicating homogeneous variance. The paired sample t-test showed that both zig-zag run training and shuttle run training significantly improved students’ dribbling agility. The independent sample t-test showed a significant difference between the two groups, with zig-zag run training producing better improvement than shuttle run training. (4) Zig-zag run and shuttle run training both had significant effects on improving football dribbling agility among extracurricular students at SMP Negeri 1 Jejawi. However, zig-zag run training was more effective because its movement pattern was more specific to football dribbling, which requires rapid changes of direction while maintaining ball control.

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INTRODUCTION

Football requires the mastery of several basic technical skills, including passing, shooting, controlling, heading, and dribbling. Kuswoyo (2020) explained that football is a sport that requires players to understand and master basic techniques in order to perform effectively in game situations. Therefore, football training in school extracurricular programs should not only emphasize game play, but also develop the basic technical and physical components that support students' performance.

Dribbling is one of the most essential football skills because it allows players to maintain ball possession, move past opponents, create attacking opportunities, and support team play. In real match situations, dribbling is rarely performed in a straight line. Players must often change direction, accelerate, decelerate, avoid opponents, and control the ball under pressure. For this reason, dribbling performance is strongly influenced by agility and change-of-direction ability. Sheppard & Young (2006) define agility as rapid whole-body movement involving changes in velocity or direction in response to a stimulus. Kuswoyo & Betaubun (2019) found a very strong relationship between speed and football dribbling skills, indicating that better movement speed supports more effective ball control during movement. This finding strengthens the argument that agility-based training is needed to improve dribbling performance in youth football players. This definition is highly relevant to football because players must constantly respond to opponents, teammates, ball movement, and space during the game.

Agility is a complex motor ability involving acceleration, deceleration, balance, coordination, reaction, and body control. In team sports, agility performance is influenced by physical, technical, and perceptual factors, including foot placement, reaction accuracy, body posture, and movement control (Paul et al., 2016). Change-of-direction ability is also considered essential in sports requiring frequent sprinting, stopping, turning, and re-acceleration (Brughelli et al., 2008). In football, these actions are directly connected to dribbling because players must move quickly while keeping the ball close to their feet.

Several training methods can be used to improve agility and dribbling performance. Zig-zag run training is a form of agility training that requires athletes to run through a series of cones arranged in a changing-direction pattern. This type of training develops body control, coordination, dynamic balance, and directional movement. More importantly, the movement pattern of zig-zag run training is close to the movement demands of football dribbling because players must move through angled paths and control their body direction repeatedly. Suryadi et al. (2023) reported that agility variation training combined with football-based activities can significantly improve dribbling skills.

Shuttle run training is another common training method used to improve speed, agility, acceleration, and deceleration. This exercise requires athletes to run back and forth between two points as quickly as possible. Shuttle run training is useful for improving the ability to stop, turn, and re-accelerate. Previous research has shown that shuttle run training can improve agility among soccer players and can be used as a practical training method in youth football settings (Primasoni et al., 2022). Apraja et al. (2023) also found that shuttle-run and zig-zag exercises affected ball dribbling ability among junior high school students.

Based on the initial observation at SMP Negeri 1 Jejawi, several students in the football extracurricular program were still less optimal in dribbling agility. Some students had difficulty controlling the ball when changing direction, moved slowly when facing opponents, and often lost ball possession during game-based practice. Training activities were still dominated by straight dribbling and general play, while specific agility exercises such as zig-zag run and shuttle run had not been implemented systematically. Therefore, this study was conducted to determine the effects of zig-zag run and shuttle run training on students' dribbling agility and to identify which method was more effective.

METHOD

This study used a quantitative quasi-experimental method with a two-group pretest–posttest design. Two groups were measured before and after the intervention. The first group received zig-zag run training, while the second group received shuttle run training. This design was used to examine the effect of each training method and to compare the effectiveness of the two methods in improving football dribbling agility.

The participants were 20 male students who joined the football extracurricular program at SMP Negeri 1 Jejawi. The sampling technique used was total sampling because all members of the population were included as research participants. The participants were divided into two groups, with 10 students in the zig-zag run group and 10 students in the shuttle run group. The grouping process used ordinal pairing based on pretest results so that the initial ability of both groups was relatively balanced.

The instrument used in this study was a 15-meter football dribbling agility test using a zig-zag track. The test required students to dribble the ball through six cones arranged in a zig-zag pattern. The students started behind the starting line with the ball and began dribbling after the signal. They had to pass all cones in sequence and continue until both the student and the ball crossed the finish line. Each participant was given two attempts, and the best time was recorded as the final score. The score was measured in seconds, and a lower score indicated better dribbling agility.

The research procedure consisted of three stages: pretest, treatment, and posttest. First, all participants completed the football dribbling agility pretest to

determine their initial ability. Second, the participants received training according to their assigned group. The zig-zag run group performed repeated runs through cone-based zig-zag patterns, while the shuttle run group performed repeated back-and-forth running patterns. The training was conducted systematically and progressively through 12 sessions over four weeks. Third, after the treatment period, all participants completed a posttest using the same dribbling agility test.

The data were analyzed using descriptive statistics, including mean, minimum, maximum, and standard deviation. The Shapiro–Wilk test was used to examine the normality of the data because the sample size in each group was less than 50. Levene’s test was used to examine the homogeneity of variance between groups. A paired sample t-test was used to determine the improvement within each group from pretest to posttest. An independent sample t-test was used to compare the posttest results between the zig-zag run and shuttle run groups. The significance level was set at $p < 0.05$.

RESULTS

The descriptive results showed that both training groups experienced improvement after the intervention. Because the test score was measured in seconds, a lower posttest score indicated better dribbling agility. The zig-zag run group decreased its mean time from 27.04 seconds to 23.71 seconds. The shuttle run group decreased its mean time from 27.05 seconds to 25.52 seconds.

Table 1.
Descriptive Statistics of Dribbling Agility

Group	Test	N	Mean Time (seconds)	Interpretation
Zig-zag run	Pretest	10	27.04	Initial ability before training
Zig-zag run	Posttest	10	23.71	Improved after training
Shuttle run	Pretest	10	27.05	Initial ability before training
Shuttle run	Posttest	10	25.52	Improved after training

Table 2.
Mean Improvement of Dribbling Agility

Group	Pretest Mean	Posttest Mean	Mean Improvement
Zig-zag run	27.04	23.71	3.33 seconds
Shuttle run	27.05	25.52	1.53 seconds

The improvement in the zig-zag run group was greater than that in the shuttle run group. This indicates that zig-zag run training produced a larger reduction in dribbling completion time. The Shapiro–Wilk normality test showed that the data were normally distributed. The significance value was 0.355 for the zig-zag run group and 0.228 for the shuttle run group. Since both values were greater than 0.05, the data met the assumption of normality.

Table 3.
Shapiro–Wilk Normality Test

Group	N	Sig.	Decision
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Zig-zag run	10	0.355	Normal
Shuttle run	10	0.228	Normal

The homogeneity test showed a significance value of 0.989. Since the value was greater than 0.05, the variance between the two groups was considered homogeneous.

Table 4.
Shapiro–Wilk Normality Test

Variable	Sig.	Decision
Dribbling agility	0.989	Homogeneous

The paired sample t-test showed that both training methods significantly improved students' dribbling agility. The zig-zag run group obtained a t-value of 8.759, while the shuttle run group obtained a t-value of 14.520. Both values were higher than the t-table value of 1.833, indicating that both treatments had a significant effect.

Table 5.
Shapiro–Wilk Normality Test

Group	t-count	df	t-table	Decision
Zig-zag run	8.759	9	1.833	Significant effect
Shuttle run	14.520	9	1.833	Significant effect

The independent sample t-test was used to examine the difference between the zig-zag run and shuttle run groups. The result showed a t-value of 2.378, which was higher than the t-table value of 1.734. This means that there was a significant difference between the two training methods.

Table 6.
Shapiro–Wilk Normality Test

Comparison	t-count	df	t-table	Decision
Zig-zag run vs. shuttle run	2.378	18	1.734	Significant difference

DISCUSSION

The results of this study showed that zig-zag run training significantly improved the dribbling agility of football extracurricular students at SMP Negeri 1 Jejawi. The mean dribbling time decreased from 27.04 seconds in the pretest to 23.71 seconds in the posttest. This improvement indicates that zig-zag run training can improve students' ability to change direction quickly while maintaining movement control. In football, agility is not only about running fast but also about changing direction efficiently without losing balance or ball control. This is consistent with the concept that agility involves rapid whole-body movement with changes in direction or velocity (Sheppard & Young, 2006).

The improvement in the zig-zag run group can be explained by the specific movement characteristics of the exercise. Zig-zag run training requires students to move through angled paths and repeatedly change body direction. These movement

demands are similar to football dribbling, where players must avoid opponents and move through limited spaces. Therefore, the transfer between zig-zag run training and dribbling agility is relatively strong. This finding is supported by Suryadi et al. (2023), who found that agility variation exercises involving zig-zag movement contributed to improved football dribbling skills. Apraja et al. (2023) also reported that zig-zag exercise affected ball dribbling ability among junior high school students.

The results also showed that shuttle run training significantly improved students' dribbling agility. The mean time decreased from 27.05 seconds in the pretest to 25.52 seconds in the posttest. Shuttle run training develops acceleration, deceleration, stopping ability, and turning speed. These components are important in football because players frequently stop, turn, and accelerate again during match play. Previous research by Primasoni et al., (2022) showed that shuttle run training significantly improved agility among soccer academy players. This supports the present finding that shuttle run training can be used as an effective method to improve movement speed and agility.

However, the comparison between the two groups showed that zig-zag run training produced better improvement than shuttle run training. The zig-zag run group improved by 3.33 seconds, while the shuttle run group improved by 1.53 seconds. This difference suggests that zig-zag run training may be more specific to dribbling agility because it involves multidirectional movement patterns that resemble the actual demands of football dribbling. Shuttle run training mainly emphasizes linear back-and-forth movement, while zig-zag run training requires more frequent directional changes and body control. In football, this pattern is closer to the movement used when players dribble past opponents.

This result is also aligned with the principle of training specificity. Training methods that closely resemble the movement pattern of the target skill tend to produce better performance transfer. Since dribbling agility requires coordinated changes of direction with body control, zig-zag run training may provide a more relevant stimulus than shuttle run training. Brughelli et al. (2008) explained that change-of-direction performance is influenced by braking force, body position, leg strength, and technique. These components are repeatedly trained during zig-zag run exercises.

The findings also support the view that agility in team sports is multidimensional. Paul et al. (2016) stated that agility is influenced by reaction, movement accuracy, foot placement, and physical qualities. Although the present study used planned agility exercises rather than reactive agility tasks, the improvements suggest that structured change-of-direction training can still provide meaningful benefits for young football players. For school-level extracurricular programs, zig-zag run and shuttle run exercises are practical because they require

simple equipment, are easy to organize, and can be integrated into regular football practice.

Despite these findings, this study has several limitations. First, the sample size was relatively small and involved only 20 students from one school. Second, the study focused only on dribbling agility and did not measure other football performance variables such as passing accuracy, shooting ability, tactical decision-making, or match performance. Third, the intervention period was relatively short. Future studies should involve a larger sample, longer training duration, and additional performance indicators. Researchers may also combine zig-zag run training with ball-based drills to make the intervention more specific to football performance.

CONCLUSION

Zig-zag run training and shuttle run training both had significant effects on improving dribbling agility among football extracurricular students at SMP Negeri 1 Jejawi. The zig-zag run group improved from 27.04 seconds to 23.71 seconds, while the shuttle run group improved from 27.05 seconds to 25.52 seconds. The comparison between groups showed a significant difference, indicating that zig-zag run training was more effective than shuttle run training. Therefore, zig-zag run training can be recommended as a practical and effective training method for improving football dribbling agility among junior high school extracurricular students.

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