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Effects of Agility Training on Dribbling Performance among High School Futsal Players: An Experimental Study

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Abstrac: This study aimed to determine the effect of agility training on the dribbling ability of futsal extracurricular students at SMA Negeri 1 Lubuk Sikaping. The study was motivated by students' low dribbling skills, including poor ball control and difficulty changing direction during play. A quasi-experimental method with a Two-Group Pretest–Posttest Design was used. The population consisted of 28 male students who participated in the futsal extracurricular program during the 2026/2027 academic year. Using total sampling, the students were divided into an experimental group and a control group, each consisting of 14 students. Data were collected using the Bobby Charlton Zig-Zag Dribbling Test and analyzed using t-tests with SPSS 26. The results showed that agility training significantly improved dribbling ability ($t = 7.177$; $p < 0.05$). The experimental group's mean score improved from 20.30 seconds to 17.22 seconds. It was concluded that agility training effectively improves students' dribbling ability.

Keyword: Agility Training, Dribbling Ability, Futsal, Extracurricular Students

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INTRODUCTION

Physical education is an important part of education that aims not only to improve students' fitness and physical abilities but also to develop their cognitive, affective, and psychomotor skills (Adinda & Lestari, 2024). Through physical activities conducted individually or in groups, physical education plays a role in maintaining health, strengthening muscles, providing recreation, and improving quality of life. In physical education, sports are not limited to structured physical training but also encompass recreational activities, exploration, and social interaction that support the holistic development of character. In Indonesia, the organization of sports is regulated by Law No. 11 of 2022 on Sports, which emphasizes the improvement of human resources and guarantees the right of every citizen, including people with disabilities, to access sports services on an equal basis. Sports development for people with disabilities is carried out continuously through education, training, and competitions tailored to the specific type of disability. Furthermore, sports serve as a means of instilling positive values such as sportsmanship, honesty, discipline, and responsibility, thereby contributing to the development of healthy, well-rounded individuals capable of interacting harmoniously within society (Imelda et al., 2023).

Sports are activities that can be enjoyed by people from all walks of life, regardless of age, religion, or social status. In addition to serving as a form of recreation, sports are also an essential need that must be practiced regularly to maintain fitness, improve health, and support productivity in daily life. In practice, sports are influenced by various factors, such as physical condition, technical skills, tactical application, and mental readiness, which are interrelated in supporting the achievement of performance goals (Umar, 2007). With the advancement of science and technology, sports activities increasingly prioritize a scientific, planned, and measurable approach so that their benefits can be optimally realized, whether for educational, recreational, or competitive purposes. Therefore, sports can be understood as physical activities performed consciously, regularly, and continuously to improve physical ability and health quality, as well as to maximize the development of an individual's physical and psychological potential through a systematic training process (Alexandra Martín-Rodríguez et al., 2024;Denay, 2019).

Futsal is a ball sport played by two teams, each consisting of five players on the field. Futsal is known as a popular sport with a fast pace of play, requiring players to master basic techniques and maintain good physical condition. In this game, teamwork and individual skills are crucial due to the relatively confined playing area. The main objective of futsal is to score as many goals as possible against the opponent while defending one's own goal to prevent conceding (Sujadesman, 2025). Therefore, players must be able to make quick decisions, execute accurate passes, and possess high agility and mobility to create scoring opportunities and support the team's success in the match (Silva et al., 2020)

Agility is one of the biomechanical components that plays a crucial role in supporting a futsal player's technical skills, particularly when dribbling (Selin et al., 2024). Players with good agility can move, change direction, and maneuver quickly while maintaining balance and body control. This ability is supported by good coordination between the nervous and muscular systems, allowing players to respond effectively to game situations. Therefore, agility is a key factor in improving ball control and the ability to get past opponents on the field (Sari & Abdullah, 2023). Dribbling itself is a fundamental technique in futsal performed by moving the ball with the feet in a controlled manner to keep it within the player's reach. This skill is essential for maintaining ball control, bypassing opponents, setting the pace of the game, and creating scoring opportunities before making a pass or shot on goal. In addition to requiring technical mastery, dribbling also demands good coordination between vision and foot movement, as well as the ability to use various parts of the foot, such as the inside, outside, and instep. With good dribbling skills, players can create more space and support the effective implementation of game strategies (Rozikin et al., 2025).

Based on the results of the observations conducted, the dribbling skills of students participating in the futsal extracurricular program at SMA Negeri 1 Lubuk Sikaping are still relatively poor. This was evident during practice, where some students still struggled to control the ball while moving quickly, frequently lost possession when facing opponents, and were

unable to change direction quickly and accurately. This situation indicates that the students' dribbling skills still need improvement. One of the causes is a lack of mastery of basic techniques, such as ball control, footwork coordination, and body balance. Additionally, physical condition also impacts dribbling ability. Some students appeared less agile in their movements and were slow to change direction while dribbling. Mental factors also posed a challenge, as some students still lacked confidence, became easily nervous, and rushed while carrying the ball, resulting in unstable ball control.

Previous studies have reported that agility training can improve dribbling performance. Sandewa et al. (2023) found that agility training significantly enhanced futsal players' dribbling ability. Similarly, Saputra et al. (2023) reported that agility exercises improved dribbling skills among youth football players, while Angela and Sumantri (2025) demonstrated that shuttle run training positively affected students' dribbling performance in futsal. Although these studies confirmed the importance of agility in developing dribbling skills, most were conducted in football schools, sports clubs, or different educational settings.

However, limited research has specifically examined the effect of agility training on the dribbling ability of futsal extracurricular students at the senior high school level, particularly at SMA Negeri 1 Lubuk Sikaping. Furthermore, previous studies generally focused on athletes or club players, whereas extracurricular participants may have different training characteristics and skill levels. Therefore, this study fills this gap by investigating the effectiveness of a structured agility training program on the dribbling ability of high school futsal extracurricular students. The novelty of this research lies in its focus on extracurricular futsal participants and the use of a Two-Group Pretest–Posttest Design to compare the effectiveness of agility training with regular training activities.

In addition to technical, physical, and mental factors, students' dribbling skills are also influenced by suboptimal training practices. The training program currently in place does not fully focus on developing dribbling techniques and agility, while irregular training intensity and a lack of variety in training methods have slowed the improvement of students' skills. In fact, well-planned and regular training can help improve ball control and enable faster movement on the field. Furthermore, the condition of training facilities and infrastructure is also a crucial supporting factor. Poor, slippery, or uneven field surfaces, along with limited training facilities, can hinder the full implementation of training, resulting in students' dribbling skills failing to reach the expected level of development.

METHOD

Research Design

This study employed a quasi-experimental method using a two-group pretest-posttest design to examine the effect of agility training on the dribbling ability of students participating in the futsal extracurricular program at SMA Negeri 1 Lubuk Sikaping. The use of experimental designs in futsal research has been widely applied to evaluate the effectiveness of training programs on athletes' physical performance and sports skills (Supriyanto & Billiandri, 2026).

Participants

The population consisted of all male students participating in the futsal extracurricular program during the 2026/2027 academic year, totaling 28 students. The sampling technique used was total sampling, meaning that all members of the population were included as research participants (Pratama & Indrayana, 2021). The participants were divided into two groups, namely an experimental group consisting of 14 students who received agility training and a control group consisting of 14 students who continued their regular training program.

Instruments

The instrument used to measure dribbling ability was the Bobby Charlton Zig-Zag Dribbling Test, which measures the time required to complete a zig-zag dribbling course through a series of cones. Performance was recorded in seconds, with lower scores indicating better dribbling ability (Doewes et al., 2022).

Data Analysis

Data collection was conducted through a pretest administered before the intervention and a posttest conducted after the intervention period. The experimental group participated in an agility training program for 16 training sessions, while the control group followed routine futsal training activities. The collected data were analyzed using descriptive and inferential statistics. Descriptive statistics included the mean, standard deviation, minimum score, and maximum score. Prior to hypothesis testing, normality and homogeneity tests were performed to ensure that the data met the assumptions for parametric analysis. Hypothesis testing was then conducted using a t-test at a significance level of 0.05 with the assistance of SPSS version 26 to determine the effect of agility training on students' dribbling ability.

RESULT

Pre-Test and Post-Test of Dribbling Skills for the Experimental Group

The results showed an improvement in dribbling ability after the intervention. In the pre-test, the mean score was 20.30 seconds, with scores ranging from 18.20 to 22.53 seconds. After the intervention, the post-test mean improved to 17.22 seconds, with scores ranging from 15.20 to 18.78 seconds. The distribution of dribbling ability categories also shifted positively, indicating better performance after the agility training program. A detailed comparison of the pre-test and post-test dribbling skill categories is presented in Table 1.

Table 1. Pretest & Posttest Dribbling Ability Standard Experimental Group

No	Internal Group	Category	Pre Test		Post Test	
			Absolute (Fa)	Relative (%)	Absolute (Fa)	Relative (%)
1.	< 15,32 seconds	Very good	0	0,00%	1	7,14%
2.	15,35 - 18,50 seconds	Good	1	7,14%	11	78,57%
3.	18,53 - 21,71 seconds	Average	11	78,57%	2	14,29%
4.	21,74 - 24, 89 seconds	Poor	2	14,29%	0	0,00%
5.	> 24,92 seconds	Very poor	0	0,00%	0	0,00%
	TOTAL		**14**	**100.0%**	**14**	**100.0%**

Based on Table 1, the distribution of dribbling skill categories showed an improvement from the pre-test to the post-test. In the pre-test, most students were classified in the average category (78.57%), followed by the poor category (14.29%) and the good category (7.14%), while no students were categorized as very good or very poor. After the intervention, the post-test results indicated that 78.57% of students were in the good category, 7.14% reached the very good category, and 14.29% remained in the average category. No students were classified as poor or very poor in the post-test, indicating an overall improvement in dribbling ability.

Pre-Test and Post-Test of Dribbling Skills for the Control Group

The descriptive results of the control group showed a slight improvement in dribbling ability from the pre-test to the post-test. In the pre-test, the mean score was 19.46 seconds, with scores ranging from 18.20 to 21.03 seconds. The median score was 19.29 seconds, and the standard deviation was 0.785. In the post-test, the mean score improved to 17.95 seconds, with scores ranging from 16.18 to 19.21 seconds. The median score was 18.07 seconds, and the standard deviation was 0.869. A comparison of the pre-test and post-test dribbling skill categories for the control group is presented in Table 2.

Table 2. Pre-Test and Post-Test of Dribbling Skills for the Control Group

No	Internal Group	Category	Pre Test		Post Test	
			Absolute (Fa)	Relative (%)	Absolute (Fa)	Relative (%)
1.	< 15,32 seconds	Very good	0	0,00%	0	0,00%
2.	15,35 - 18,50 seconds	Good	2	14,29%	11	78,57%
3.	18,53 - 21,71 seconds	Average	12	85,71%	3	21,24%

4.	21,74 - 24, 89 seconds	Poor	0	0,00%	0	0,00%
5.	> 24,92 seconds	Very poor	0	0,00%	0	0,00%
TOTAL			**14**	**100.0%**	**14**	**100.0%**

Based on Table 2, the distribution of dribbling skill categories in the control group also showed some improvement from the pre-test to the post-test. In the pre-test, 14.29% of students were classified in the good category and 85.71% in the average category, while no students were categorized as very good, poor, or very poor. In the post-test, the proportion of students in the good category increased to 78.57%, while 21.43% remained in the average category. No students were classified as very good, poor, or very poor in either test. These results indicate a moderate improvement in dribbling ability among students in the control group.

Normality Test

Normality testing was conducted using the Shapiro–Wilk test with SPSS 26 to determine whether the data were normally distributed. Data were considered normal if the significance value was greater than 0.05 ($p > 0.05$), while a significance value less than 0.05 ($p < 0.05$) indicated that the data were not normally distributed.

Table 3. Normality Test of Dribbling Ability Data Experimental Group & Control Group

Group	Shapiro-Wilk			Description
	Statistic	df	Sig.	
Experimental Pretest	966	14	820	Normal
Experimental Posttest	952	14	599	Normal
Control Pretets	944	14	466	Normal
Control Posttest	942	14	440	Normal

Table 3 shows that all pretest and posttest data in both the experimental and control groups had significance values greater than 0.05 ($p > 0.05$), indicating that the dribbling ability data were normally distributed.

Homogenity Test

The homogeneity test was conducted to determine whether the sample variances were homogeneous. Data were considered homogeneous if the significance value was greater than 0.05 ($p > 0.05$). The results of the homogeneity test are presented in the following table.

Table 4. Homogeneity Test Results for Pretest and Posttest Data

Data	Levene Statistic	df1	df2	Sig.	Description
Pretest	3.960	1	26	0.057	Homogeneous
Posttest	0.091	1	26	0.765	Homogeneous

The homogeneity test results showed significance values of 0.057 for the pretest and 0.765 for the posttest, both greater than 0.05 ($p > 0.05$). Therefore, the variances of the experimental and control groups were considered homogeneous.

Hypothesis Test

Hypothesis testing was performed using a t-test at a significance level of 0.05 with the assistance of SPSS to determine whether the proposed hypothesis was accepted or rejected. The results are presented below:

Table 5. Summary of Hypothesis Testing Results

Group	Test	Mean	N	t-value	t-table	Description
Experimental	Pretest	20.30	14	7.177	2.056	Significant
	Posttest	17.22	14			
Control	Pretest	19.46	14	4.810	2.056	Significant
	Posttest	17.95	14			

The hypothesis testing results showed that both groups experienced significant improvements in dribbling ability. The experimental group improved from a mean score of 20.30 to 17.22 ($t = 7.177$, $p < 0.05$), while the control group improved from 19.46 to 17.95 ($t = 4.810$, $p < 0.05$). The greater t-value in the experimental group indicates that agility training was more effective in improving dribbling ability.

Table 6. Differences in Posttest Scores Between the Experimental and Control Groups

Variable	Group	N	Mean	t-statistic	Description
Posttest Results	Experimental	14	17.22	-2.100	Significant
Posttest Results	Control	14	17.95	-2.100	Significant

The Independent Samples Test showed that the posttest mean score of the experimental group (17.23) was lower than that of the control group (17.95). The t-test result indicated a significant difference between the two groups ($t = -2.100$, $p = 0.046 < 0.05$), suggesting that agility training had a significant effect on dribbling ability.

DISCUSSION

The results of this study indicate that the agility training program implemented for more than one month contributed to improving the dribbling skills of students at SMA Negeri 1 Lubuk Sikaping. The research process consisted of a pretest, a training intervention period, and a posttest. Dribbling ability was measured twice, before and after the intervention, using the Bobby Charlton Zig-Zag Dribbling Test. This study employed a Two-Group Pretest–Posttest Design to examine the effect of agility training on the dribbling performance of futsal extracurricular students. Data analysis was conducted using SPSS version 26, and the results are presented as follows:

Dribbling Skills of Students in the Experimental Group Before and After Agility Training

Based on the results of the study conducted on the experimental group, it was found that there was an improvement in dribbling ability following the implementation of agility training. The pretest results showed that the students' average dribbling time was 20.30 seconds, with the majority of students falling into the moderate category (78.57%). After undergoing an agility training program consisting of 16 sessions, the average dribbling ability improved to 17.22 seconds. In addition, most students were in the good (78.57%) and very good (7.14%) categories. This improvement indicates that agility training can enhance students' ability to dribble a ball. Agility is a person's ability to change direction and body position quickly and accurately without losing balance.

In futsal, this skill is essential because players are required to move quickly, get past opponents, and maintain ball control in tight spaces. As agility improves, students' dribbling skills also improve. These findings align with the theory that agility training through shuttle runs, zig-zag runs, side shuffles, and agility ladder drills can improve motor coordination, balance, and the ability to change direction quickly, thereby supporting dribbling skills in futsal. These findings are further supported by the research of Bayangna et al. (2025), which states that structured agility training can improve motor efficiency and dribbling skills in futsal players. Additionally, the study by Rizal & Nurulita (2025) demonstrates that agility plays a crucial role in enhancing ball control while moving and a player's ability to outmaneuver opponents. Similar results were also found by Purnomo & Irawan (2021), who concluded that the higher a player's agility level, the better their dribbling ability. Thus, the results of this study reinforce previous findings that agility training is an effective training method for improving students' dribbling skills in futsal.

Dribbling Skills of Students in the Control Group

The results of the study on the control group showed an improvement in dribbling ability, although the improvement was not as significant as that observed in the experimental group. The average dribbling ability score increased from 19.46 seconds on the pretest to 17.95 seconds on the posttest. Additionally, the majority of students on the posttest fell into the "good" category

(78.57%). This improvement is believed to have occurred because the students continued to participate in regular practice sessions throughout the study, leading to the development of their dribbling skills.

However, the improvement observed in the control group was still lower than that of the experimental group, which received a specialized agility training program. These results indicate that routine training alone is insufficient to optimally improve dribbling ability without targeted and specific training. These findings align with the views of Ren et al. (2025), who state that structured agility training leads to greater improvements in motor skills compared to regular training. Additionally, Angela & Sumantri (2025) explain that agility plays a crucial role in supporting the effectiveness of movements during ball dribbling, as it helps players change direction and body position quickly without losing balance. The results of the study by Asmara et al. (2023) also indicate that dribbling ability is influenced by a player's level of agility. Therefore, the implementation of a well-planned, measurable training program tailored to the characteristics of futsal is essential to maximize the improvement of dribbling skills.

The Effect of Agility Training on the Dribbling Skills of Students in the Futsal Extracurricular Activity

Based on the research findings, agility training was shown to have a significant effect on improving the dribbling skills of students in the futsal extracurricular program at SMA Negeri 1 Lubuk Sikaping. This was evident from the greater average improvement in dribbling skills observed in the experimental group compared to the control group. The experimental group showed an improvement of 3.08 seconds, while the control group showed an improvement of only 1.51 seconds. These results indicate that agility training can improve students' ability to control the ball, change direction quickly, and maintain balance while dribbling. This improvement occurs because agility training enhances motor coordination, reaction speed, and the ability to change direction effectively all of which are crucial components of dribbling technique.

In futsal, a game characterized by a fast pace and limited space, agility is one of the physical fitness components essential for successful dribbling. The findings of this study align with the research by Arwandi & Firdaus (2021), which states that agility plays a crucial role in improving ball control while moving and a player's ability to get past opponents, also indicates that players with higher agility levels tend to possess superior dribbling skills. Additionally, Dwi & Adi (2025) found that structured agility training can improve movement efficiency and technical skills in futsal players, particularly their ball-handling ability. These findings are further supported by Jamiludin et al. (2026), who explain that agility helps players move more effectively, maintain balance, and change direction quickly while in possession of the ball. Thus, agility training can be recommended as an effective training method to improve the dribbling skills of futsal players, particularly among the extracurricular students at SMA Negeri 1 Lubuk Sikaping.

Despite the positive findings, this study has several limitations. First, the sample size was relatively small and limited to students from a single school, which may restrict the generalizability of the findings to other populations. Second, the intervention period was limited to 16 training sessions, making it difficult to determine the long-term effects of agility training on dribbling performance. Third, this study focused only on agility as the independent variable, while other factors that may influence dribbling ability, such as speed, coordination, balance, muscle strength, and psychological factors, were not examined. Therefore, future research should involve larger and more diverse samples, extend the duration of the training program, and investigate the combined effects of agility training with other physical and technical training methods. Further studies may also explore the impact of agility training on other futsal skills, such as passing, shooting, and ball control, to provide a more comprehensive understanding of player development.

CONCLUSION

This study demonstrates that agility training is more effective than routine training in improving the dribbling performance of high school students participating in the futsal

extracurricular program at SMA Negeri 1 Lubuk Sikaping. The structured agility training program enhanced students' ability to control the ball, change direction efficiently, and maintain body balance while dribbling, indicating that agility is a fundamental physical component supporting successful dribbling performance in futsal. These findings highlight the importance of incorporating structured agility exercises into school-based futsal training programs to optimize the development of technical skills. The results also provide practical evidence for coaches and physical education teachers that agility-oriented training can be used as an effective strategy to improve students' game performance. Future studies are recommended to involve larger and more diverse samples, longer intervention periods, and additional physical and technical variables to provide a more comprehensive understanding of factors influencing futsal performance.

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