



Improving dribbling performance through ladder drill training in youth football players

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Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

Info article	Abstract
<p>Filed in: 2026-03-17 Accepted: 2026-05-25 Published: 2026-05-31</p> <p>Keyword: <i>ladder drill training, dribbling performance, agility, youth football, motor coordination</i></p>	<p>This study aimed to examine the effect of ladder drill training on dribbling performance in youth football players. A pre-experimental one-group pretest–posttest design was employed involving 20 players from SSB Untag Rosita Surabaya. Dribbling performance was assessed using a cone-based dribbling test in which players completed a timed course. The intervention consisted of structured ladder drill training integrated into regular training sessions over a three-month period. Data were analyzed using descriptive statistics and a paired sample t-test at a significance level of $p < 0.05$. The results showed a significant improvement in dribbling performance following the intervention. The mean dribbling time decreased from 18.54 seconds in the pretest to 15.61 seconds in the posttest, with an average improvement of 2.93 seconds. Statistical analysis confirmed a significant difference between pretest and posttest scores ($p < 0.05$). The findings indicate that ladder drill training effectively enhances agility, coordination, and movement control, which contribute to improved dribbling performance. In conclusion, ladder drill training represents a practical and effective method for improving dribbling performance in youth football players and can be integrated into regular training programs to support technical development.</p>

1. INTRODUCTION

Football is one of the most popular sports worldwide and continues to grow rapidly at the youth development level. In modern football, technical ability, physical

conditioning, tactical understanding, and psychological readiness are essential components of performance (Komarudin & Nyoman Wali, 2022). Among the fundamental technical skills, dribbling plays a crucial role in offensive play, as it allows players to maintain ball possession, bypass opponents, create space, and generate scoring opportunities (Kurniawan et al., 2024). Effective dribbling requires not only technical mastery but also agility, coordination, speed, and balance.

Dribbling performance in youth football players is often influenced by their physical development, particularly agility and lower-body coordination (Sridadi et al., 2021). Young athletes frequently struggle with controlling the ball while moving at speed or changing direction under pressure. This limitation can reduce their effectiveness during match situations (Veron et al., 2023). Therefore, structured training programs that specifically target agility and foot coordination are essential to enhance dribbling performance.

Agility is defined as the ability to rapidly change direction or body position efficiently while maintaining balance and control (Yogaswara, 2021). In football, agility enables players to react quickly to opponents' movements, accelerate and decelerate effectively, and maneuver in tight spaces. Previous studies have highlighted the importance of agility training in improving technical performance in football, particularly dribbling ability (Batalipu et al., 2025a). Training programs that integrate neuromuscular coordination and speed development have shown positive effects on skill execution among youth players.

One training method widely used to improve agility and coordination is ladder drill training. Ladder drills involve performing quick foot movements through a ground-based agility ladder with various movement patterns, such as single-leg hops, lateral steps, and high-speed in-and-out footwork (Indra Siregar et al., 2024). This type of training stimulates neuromuscular adaptation, enhances foot speed, and improves motor coordination. Moreover, ladder drills are practical, cost-effective, and suitable for youth training environments.

Several studies have reported that ladder drill exercises can significantly improve agility, speed, and lower-limb coordination (Labib Siena Ar Rasyid et al., 2023). However, research specifically examining the direct effect of ladder drill training on dribbling performance in youth football players remains limited, particularly within grassroots football schools (Ilmiah et al., n.d.). Understanding the effectiveness of this training method is important for coaches in designing efficient and evidence-based training programs.

At SSB Untag Rosita Surabaya, preliminary observations indicated that many youth players demonstrated inconsistent dribbling control, especially when required to change direction quickly. This issue suggests the need for targeted agility-based interventions. Therefore, this study aims to examine whether ladder drill training can significantly improve dribbling performance among youth football players.

It is hypothesized that ladder drill training will produce a significant improvement in dribbling performance, as measured by completion time in a cone-based dribbling test. The findings of this study are expected to provide practical contributions to youth football coaching programs by offering an effective training model to enhance technical performance.

2. METHOD

This study employed a pre-experimental design using a one-group pretest–posttest approach. The purpose of this design was to examine the effect of ladder drill training on dribbling performance in youth football players by comparing performance before and after the intervention. All participants underwent an initial dribbling test (pretest), followed by a structured ladder drill training program, and finally completed a posttest using the same dribbling assessment protocol.

Participants

The participants consisted of 20 youth football players from SSB Untag Rosita Surabaya. The initial population included 30 players, and 20 participants were selected

using random sampling. All participants were actively involved in regular training sessions and had similar training backgrounds. Prior to data collection, players and guardians were informed about the study procedures, and participation was voluntary.

Training Protocol

The intervention consisted of ladder drill training designed to improve agility, foot speed, and coordination. The training program was implemented as part of the regular training schedule. The ladder drill exercises included variations such as single-step and double-step movements, lateral in-and-out steps, high-knee quick steps, one-foot hops, and alternating foot patterns (Febrian & Perwira Bakti, 2016.).

Each session emphasized quick foot movement, balance control, and coordination while maintaining proper technique (Batalipu et al., 2025b). The exercises were progressively adjusted to increase intensity and complexity throughout the training period.

Instruments and Data Collection

Dribbling performance was measured using a cone-based dribbling test. Players were required to dribble the ball through six cones placed one meter apart. The total time to complete the course was recorded in seconds using a stopwatch.

Each participant performed the test under standardized conditions: the ball had to remain under control throughout the course, players were required to follow the designated cone path, faster completion time indicated better dribbling performance. The same testing procedure was applied during both pretest and posttest to ensure consistency (De França Bahia Loureiro & De Freitas, 2016).

Statistical Analysis

Data were analyzed using statistical software. Descriptive statistics were calculated to determine the mean, minimum, maximum, and standard deviation of pretest and posttest scores (Rachman et al., 2024).

Before hypothesis testing, data normality was assessed using the Shapiro–Wilk test, and homogeneity of variance was evaluated using Levene’s test. To determine

whether there was a significant difference between pretest and posttest scores, a paired sample t-test was conducted. The level of significance was set at $p < 0.05$.

3. RESULTS AND DISCUSSION

Descriptive Statistics

A total of 20 youth football players participated in this study. Descriptive statistics of dribbling performance before and after the ladder drill training intervention are presented in Table 1.

Table 1. Dribbling Performance

Test	N	Minimum (s)	Maximum (s)	Mean (s)	SD
Pretest	20	13.2	25.4	18.54	3.21
Posttest	20	11.4	20.8	15.61	2.50

The results show a decrease in mean completion time from 18.54 seconds in the pretest to 15.61 seconds in the posttest, indicating an improvement of 2.93 seconds following the ladder drill training program. The reduction in standard deviation suggests improved consistency among participants after the intervention.

The Shapiro–Wilk normality test indicated that both pretest and posttest data were normally distributed ($p > 0.05$). Levene’s test confirmed that the variances were homogeneous ($p > 0.05$), fulfilling the assumptions for parametric testing.

A paired sample t-test was conducted to determine whether there was a significant difference between pretest and posttest scores. The results are presented in Table 2.

Table 2. Paired Sample t-Test Results

Variable Comparison	Mean Difference (s)	Sig. (2-tailed)	Interpretation
Pretest – Posttest	2.93	< 0.05	Significant

The paired sample t-test revealed a statistically significant difference between pretest and posttest scores ($p < 0.05$). Therefore, ladder drill training significantly improved dribbling performance in youth football players.

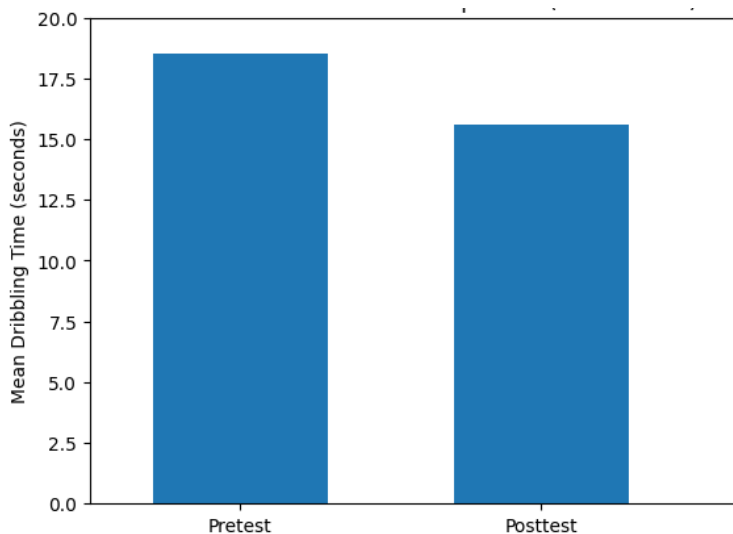


Figure 1. Comparison of Test Results

Bar chart illustrating the significant decrease in mean dribbling time after the ladder drill training intervention, indicating improved performance among youth football players.

The present study aimed to examine whether ladder drill training could significantly improve dribbling performance in youth football players. The findings clearly demonstrate a statistically significant improvement following the intervention. The mean dribbling time decreased from 18.54 seconds in the pretest to 15.61 seconds in the posttest, with an average improvement of 2.93 seconds. Since dribbling performance was measured based on completion time, a lower time indicates better performance efficiency. Therefore, the reduction in mean time strongly suggests that ladder drill training positively influenced the players' dribbling ability.

The improvement observed in this study can be primarily attributed to enhanced agility and neuromuscular coordination. Dribbling in football is a complex motor skill

that requires simultaneous execution of technical control and rapid movement adjustments (Prabowo, n.d.). Players must maintain ball contact while accelerating, decelerating, and changing direction in response to spatial constraints. Ladder drill training emphasizes rapid foot placement, rhythm control, and dynamic balance. Through repetitive and structured movement patterns, the neuromuscular system adapts to execute movements more efficiently. These adaptations likely improved the players' ability to coordinate lower-limb actions during dribbling tasks (Wasono Aji et al., n.d.).

One important aspect of the findings is the consistency improvement indicated by the reduction in standard deviation from 3.21 in the pretest to 2.50 in the posttest. This reduction suggests that performance variability among players decreased after the intervention. In other words, not only did the average performance improve, but the players' dribbling execution also became more uniform and controlled. This consistency is particularly important in youth development programs, as stable technical performance forms the foundation for advanced tactical application.

From a physiological perspective, ladder drill exercises stimulate fast-twitch muscle fibers and enhance motor unit synchronization. Agility training has been shown to improve reaction time, foot speed, and change-of-direction ability (Anversha et al., 2024). In the context of this study, the ladder drills likely enhanced the players' ability to perform quick, controlled foot movements when navigating through cones. Since the dribbling test required players to maneuver through six cones spaced one meter apart, agility and precise foot coordination were essential components of success. The structured ladder patterns used in the training sessions appear to have directly translated into improved performance during the dribbling assessment.

The findings of this study align with previous research indicating that agility-based training improves technical football performance (Iqbal et al., 2019). Earlier studies have reported that ladder drills contribute to enhanced coordination, speed, and lower-body control in youth athletes. However, while many studies focus primarily on

general agility improvements, this research specifically demonstrates the measurable impact of ladder drill training on a football specific technical skill dribbling. This strengthens the practical relevance of ladder drills within youth football training programs (Atiq et al., n.d.).

Another important consideration is the developmental stage of the participants. Youth athletes are in a critical period of motor learning and neuromuscular development. Training interventions at this stage can produce substantial improvements in coordination and movement efficiency (Sumarsono & Anisa, 2019). Ladder drill exercises, which combine speed, rhythm, and directional control, provide an effective stimulus for motor skill refinement. The significant improvement observed in this study supports the idea that youth players respond positively to structured agility-based training.

In addition to physical benefits, ladder drill training may also enhance cognitive-motor integration. Dribbling requires continuous visual processing and decision-making while maintaining ball control. The quick and patterned movements in ladder drills demand concentration and timing, which may indirectly improve players' focus during technical tasks (Fahima et al., 2025). Although cognitive variables were not directly measured in this study, the overall performance enhancement suggests possible improvements in motor planning and movement anticipation (Reis et al., 2019).

Despite the significant findings, certain limitations should be acknowledged. The study employed a one-group pretest–posttest design without a control group. Although the paired sample t-test confirmed statistical significance, the absence of a comparison group limits the ability to completely rule out external factors such as regular training effects (Mohammad Hasan Basri & Noer Wahid Riqzal Firdaus, 2020). Furthermore, the sample size was relatively small and limited to a single football school, which may affect the generalizability of the results. Future research should incorporate randomized controlled designs and larger participant samples to strengthen causal conclusions.

Overall, the results of this study provide strong evidence that ladder drill training is an effective intervention for improving dribbling performance in youth football players. The significant reduction in dribbling time, combined with improved performance consistency, indicates that agility-focused training can meaningfully enhance technical execution. These findings support the integration of ladder drills into youth football training programs as a practical and evidence-based method for developing dribbling skills.

Acknowledgments

The authors would like to express their sincere gratitude to the management, coaches, and players of SSB Untag Rosita Surabaya for their cooperation and active participation in this study. Special appreciation is extended to the youth athletes who committed their time and effort throughout the training and testing sessions.

4. CONCLUSION

The results suggest that ladder drill training effectively enhances agility, foot coordination, and movement control, which are essential components of dribbling performance in football. In addition to improving average performance, the reduction in variability among players indicates increased consistency in skill execution. These findings highlight the importance of agility-based training in supporting technical development during youth stages of athletic growth. Although the study demonstrated positive results, future research should employ randomized controlled designs with larger sample sizes to strengthen causal conclusions and explore long-term performance outcomes. Overall, ladder drill training represents an effective and practical method for improving dribbling performance in youth football players.

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