**Jurnal Bima: Pusat Publikasi Ilmu Pendidikan bahasa dan Sastra**
**Volume 3, Nomor 3, September 2025**
E-ISSN: 3021-7768-P-ISSN: 3021-7741, Hal. 01-09
DOI: https://doi.org/10.61132/bima.v3i3.1828
*Online Available at:* https://journal.aripi.or.id/index.php/Bima

# Effect of Using Agility Ladder Drills on Developing Certain Types of Speed and Skill Performance of the Close-to-the-Net Setup Skill in Volleyball

**Ali Hameed Ali Al-Zubaidi**
Iraqi Ministry of Education, General Directorate of Education in Najaf Al-Ashraf, Al kut University College

*Coresspondence: Alihameed1.us@gmail.com*

***Abstract.*** *This study aimed to identify the impact of designing agility ladder drills and their role in developing types of speed and improving the skill performance of the setup skill in volleyball. The researcher adopted an experimental method using pre- and post-tests over an 8-week training program, with a sample of 10 players from Al-Sahaf Al-Oula Intermediate School in Najaf Al-Ashraf. Statistical analysis (SPSS) revealed that the agility ladder drills contributed to developing specific types of speed among the research sample. Additionally, improvements were observed in speed test results and in the volleyball setup skill performance. The researcher recommends implementing the designed agility ladder exercises for their effectiveness in enhancing agility, flexibility, and coordination, as well as diversifying training methods to develop physical attributes.*

***Keywords:*** *Running exercises, agility ladder drills, types of speed, setup skill, volleyball.*

## 1. INTRODUCTION

### Research Background and Significance

Sports training is a planned and purposeful educational process that integrates scientific theories from natural and human sciences to holistically prepare athletes through structured training loads, aiming for peak performance. As emphasized by Essam El-Din Abdel Khaleq (2009), sports training is pivotal in elevating motor performance, particularly when predicting the impact of training processes on skill development. Imad El-Din Abbas Abou Zeid (2009) highlights that technical performance in sports relies on specific physical capacities, which form the foundation for achieving high athletic levels.

Ali Fahmi Al-Bayk et al. (2009) note that sports training induces physiological, biochemical, and morphological adaptations in athletes. Fathi Ahmed Ibrahim (2003) adds that training tools enhance physical and technical performance while improving neuromuscular coordination and movement rhythm.

Volleyball, an Olympic sport, demands mastery of fundamental skills. This study emphasizes the importance of innovative training methods, such as agility ladder drills, to enhance speed and skill execution in the setup—a critical skill requiring rapid movement near the net.

*Received April 15, 2025; Revised April 29, 2025; Accepted Mei 12, 2025; Available Online Mei 14, 2025*

**Research Problem**

Through observing physical education classes, the researcher identified deficiencies in students' transitional and maximum speed, leading to weak performance in the volleyball setup skill, which requires quick physical responses to maintain scoring opportunities.

**Research Objectives**

- Design agility ladder drills.
- Investigate the impact of agility ladder drills on developing types of speed.
- Assess their effect on improving the setup skill in volleyball.

**Hypotheses**

- Statistically significant differences exist between pre- and post-tests in speed development using agility ladder drills.
- Statistically significant differences exist between pre- and post-tests in setup skill performance.

**Research Scope**

- Human: Students of Al-Sahaf Al-Oula Intermediate School in Najaf Al-Ashraf.
- Timeframe: February 9, 2025 – April 20, 2025.
- Location: School volleyball court.

## 2. RESEARCH METHODOLOGY AND FIELD PROCEDURES

**Research Methodology**

The researcher adopted the experimental method due to its suitability for addressing the problem through practical intervention. This approach is widely recognized for solving sports-related issues systematically.

**Research Population and Sample**

The research sample was purposively selected and consisted of 10 second-grade students from Al-Sahaf Al-Oula Intermediate School in Najaf Al-Ashraf.

**Tools Used in the Research**

- A 30-meter measuring tape.
- School stairs.
- plastic cones 6.
- volleyballs 4.
- A whistle.
- plastic agility ladders for drills 2.
- Elastic ropes.
- Colored chalk for marking test areas during pre- and post-tests .

**Tests Used in the Research**

**Meter Sprint Test from a Stationary Start 30**

- Purpose: Measure players' acceleration .
- Tools: Whistle, stopwatch, measuring tape .
- Procedure: The player starts from a stationary position at the starting line and sprints as fast as possible upon hearing the whistle .
- Scoring: Time taken to complete the distance (in seconds and fractions).

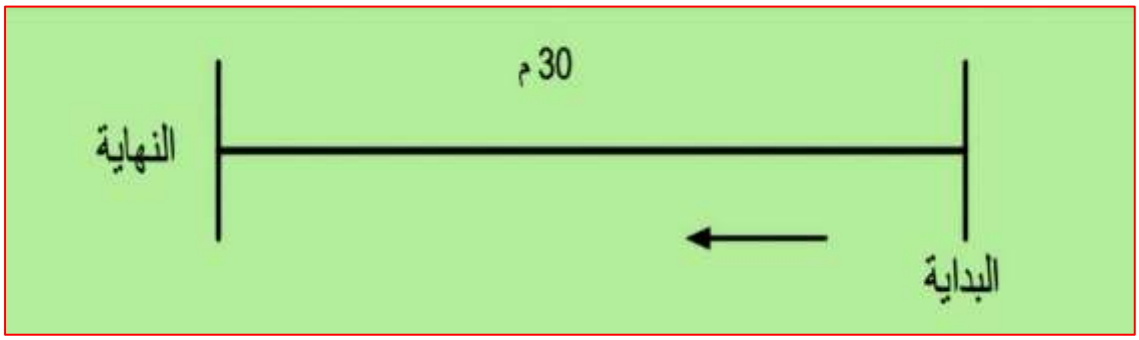


**Figure 1:** Illustration of the 30-meter sprint test**.**

**Meter Flying Start Test30**

- Purpose: Measure maximum speed .
- Tools: Whistle, stopwatch, measuring tape .
- Procedure: The player accelerates to maximum speed by point B and maintains it until point C .
- Scoring: Time taken to cover the distance between B and C (in seconds and fractions) .

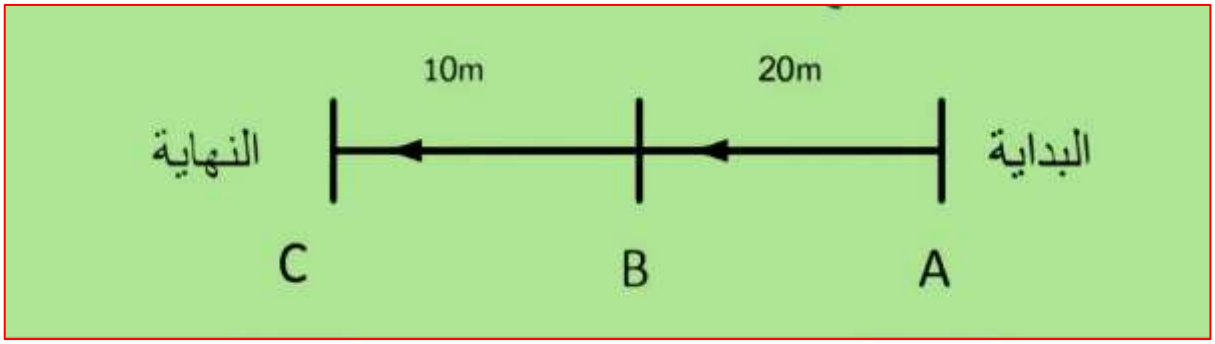


**Figure 2:** Illustration of the flying start test**.**

**Zigzag Running Test**

- Purpose: Measure agility .
- Tools: Whistle, stopwatch, 5 cones .
- Procedure: The player starts at point A, weaves through the cones, and returns to A as quickly as possible .
- Scoring: Total time (in seconds) for the round trip .

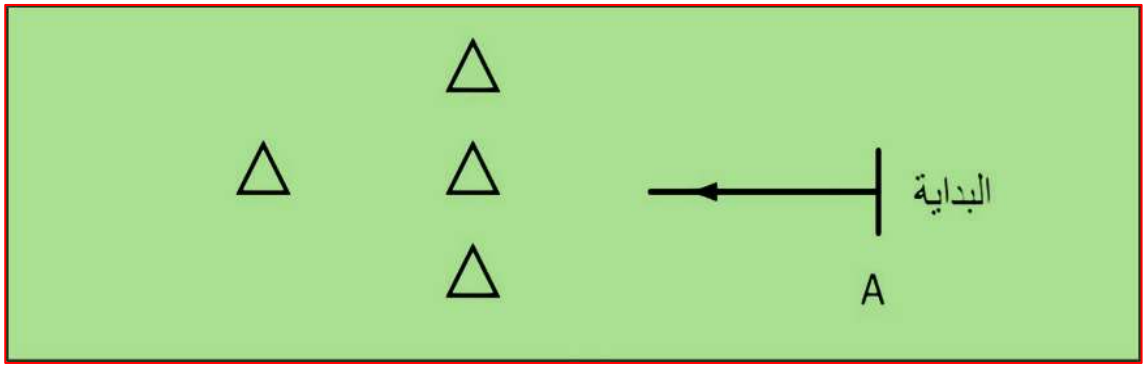


**Figure 3:** Illustration of the zigzag running test**.**

**Volleyball Setup Skill Test**

- Purpose: Assess accuracy in close-to-the-net setups .
- Tools: Volleyball court divided into target zones (see Figure 4), measuring tape, 4 volleyballs .
- Procedure: The coach tosses the ball to the player, who sets it toward Zone A (central target) .
- Scoring :
- attempts; 3 maximum score = 12 points .

- Zone A: 4 points per successful attempt .
- Zone B: 3 points .
- Zone C: 2 points .
- Zone D: 1 point .
- points if the ball lands outside these zones .
- If the ball lands on a shared line, the higher zone's points are awarded .
- Attempts with rule violations are canceled (Marwan Abdul Majeed, 2001, p. 22) .

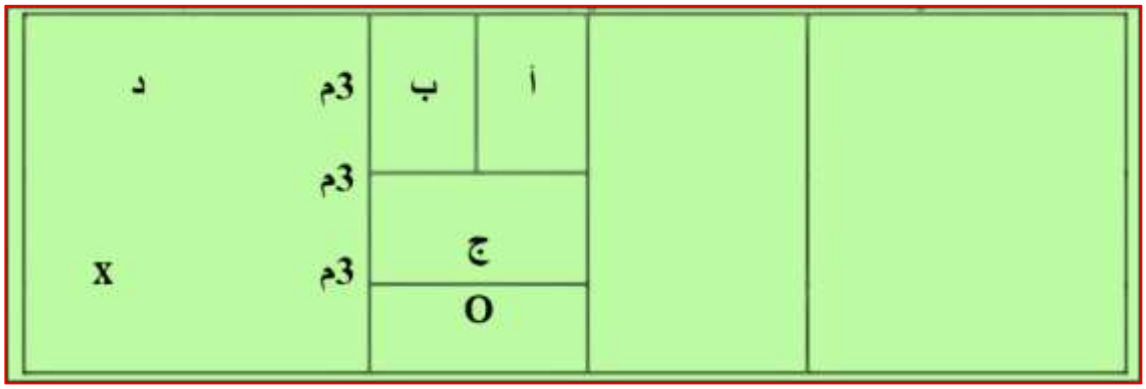


**Figure 4:** Illustration of the setup skill test**.**

**Pilot Study**

A pilot study was conducted on 6 students outside the research sample to identify potential challenges in test implementation, timing, and team coordination .

**Scientific Validity and Reliability of Tests**

**Test Validity**

Validity refers to "the test's ability to measure what it was designed to measure, whether physical, skill-based, psychological, or personality traits" (Luay Ghani Al-Samarrai et al., 2012, p. 102). Validity was confirmed using self-consistency methods .

**Test Reliability**

Reliability means "consistent results when a test is repeated under identical conditions" (Mustafa Hussein Bahi, 1999, p. 5). The test-retest method was used to establish reliability .

**Pre-Tests**

Pre-tests (physical and skill-based) were conducted on February 10, 2025, at the school's volleyball court .

**Main Experiment**

The main experiment began on February 11, 2025, using school stairs for speed drills (ascending/descending), elastic ropes for rotational drills, and light resistance exercises. Agility ladder drills were integrated into the training program's main section after warm-ups and skill-building.

The 8-week program included :

3-weekly sessions (45 minutes each) .

- Session structure :
- Warm-up: 10 minutes .
- Main drills: 25 minutes .
- Cool-down: 5 minutes .

The drills fostered competition, coordination, and enjoyment among participants, reducing monotony .

**Post-Tests**

Post-tests were conducted on April 13, 2025, under the same conditions as pre-tests .

**Statistical Methods**

Data were analyzed using SPSS (Statistical Package for the Social Sciences).

## 3. RESULTS, ANALYSIS, AND DISCUSSION

### Presentation and Discussion of Pre- and Post-Test Results for Speed

**Table (1)**

| Variables | Unit of Measurement | Pre-test | | Post-test | | t-value | Significance |
|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | | |
| 30m sprint from standstill | Seconds | 2.64 | 0.238 | 3.36 | 0.24 | 4.37 | Significant |
| 30m flying start sprint | Seconds | 2.412 | 0.09 | 3.07 | 0.28 | 4.44 | |
| Zigzag running | Seconds | 2.123 | 0.10 | 3.014 | 0.15 | 4.29 | Significant |

Significance level of 0.05 and degrees of freedom (9) .

**Presentation and Discussion of Pre- and Post-Test Results for the Close-to-the-Net Setup Skill**

**Table (2)**

| Variables | Measurement Unit | Pre-test | | Post-test | | Calculated t-value | Significance |
|---|---|---|---|---|---|---|---|
| Close-to-net setup skill test | Score | Mean | SD | Mean | SD | 17.14 | Significant |
| | | 3.25 | 0.34 | 7.54 | 0.56 | | |

## 4. DISCUSSION OF RESULTS

The researcher attributes the improvements in physical and skill test results (shown in Tables 1 and 2) to the agility ladder drills, which positively impacted the sample group. The variety of drills—each demanding different movements—enhanced neuromuscular coordination and rapid muscle contractions. These exercises focused on repetitive training, a proven method for developing physical attributes in the phosphagen energy system (short-term, high-intensity efforts with full recovery). The progressive overload principle was applied, ensuring gradual adaptation and stabilization. As Al-Ta'i (2001, p. 48) notes, "Coaches must adhere to the principle of progressive training, the cornerstone of developing physical, technical, or tactical skills ".

The agility ladder drills stimulated neural signaling, engaging a higher number of motor units and improving reaction times. The competitive and enjoyable nature of the drills also reduced monotony, fostering enthusiasm among players .

The development of speed is linked to exercises requiring knee lifts, lateral footwork, and explosive leg power. Brian (2009) emphasizes that agility drills cannot be performed slowly, as speed enhances explosive power and movement efficiency. Similarly, improvements in transitional speed stem from strengthening leg muscles through multidirectional drills, which correlate with increased force production .

Agility improvements resulted from the drills' demand for sudden directional changes and precise footwork, enhancing neuromuscular coordination between limbs and the core. Flexibility gains arose from the dynamic range of motion in the legs during rapid contractions and extensions. Brown (2005, pp. 112–113) highlights that agility ladder drills improve joint mobility and muscle elasticity, particularly in the knees, ankles, and hips .

These findings align with Mahmoud Mowafi (2010, p. 84), who stresses that volleyball players require progressive agility training to integrate skills seamlessly, and Hanfi Mahmoud (1994, p. 60), who underscores the need for agility and coordination to adapt to

rapid changes in speed and direction. The study also supports Ali Salloum's (2004, p. 146) observation that beginners often struggle with coordination, leading to errors in skill execution.

## 5. CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

- The agility ladder drills significantly developed specific types of speed in the research sample.
- Notable improvements were observed in speed test results.
- The volleyball setup skill test results showed marked enhancement.
- The drills fostered perseverance, enjoyment, and motivation among players.

### Recommendations

- Implement the researcher-designed agility ladder drills to enhance agility, flexibility, and coordination .
- Incorporate diverse training tools to develop physical attributes .
- Integrate agility ladder exercises into school physical education curricula.

## DAFTAR REFERENSI

Abdel Khaleq, E. E. (2009). Sports training: Theories and applications (13th ed.). Dar Al-Maaref.

Abu Zaid, I. A. A. (2005). Planning and scientific foundations for building and preparing teams in team sports: Theories and applications. Al-Maaref Establishment.

Al-Bayk, A. F. (2009). Methods and approaches for developing anaerobic and aerobic capacities. In Modern trends in sports training: Theories and applications (1st ed.). Al-Maaref Establishment.

Al-Samarrai, L. G., et al. (2012). Statistics and testing in sports (1st ed.). Erbil.

Al-Ta'i, M. Y. D. (2001). The effect of two training programs using compound exercises and play exercises on physical and skill attributes in football (Unpublished doctoral dissertation). College of Physical Education, University of Mosul.

Bahi, M. H. (1999). Scientific coefficients between theory and application (reliability, validity, objectivity, standards). Al-Kitab Center for Publishing.

Brown, L., & Fewignó, V. (2005). Training for speed, agility, and quickness (2nd ed.).

Edlbeck, B. (2009). Pioneers strength and conditioning. Carroll University.

Fahmi, A. S. J. (2004). Tests, measurement, and statistics in sports. Al-Qadisiyah University.

Hassanein, M. S. (1985). Model of physical fitness (1st ed.). Dar Al-Fikr Al-Arabi.

Ibrahim, F. A. (2003). Principles and scientific foundations of physical exercises and sports demonstrations (1st year). Faculty of Physical Education for Men, Alexandria University.

Ibrahim, M. A. M. (2001). Scientific encyclopedia of volleyball (skills, tactics, physical and skill tests, body measurements, selection, disability, refereeing) (1st ed.). Al-Warraq Publishing and Distribution.

Mahmoud, G. S. (2011). Football: Concepts and training (1st ed.). Arab Community Library.

Mokhtar, H. M. (1994). Scientific foundations of training. Dar Al-Fikr Al-Arabi.

Mowafi, M. (2010). Football science and training methods development (Vol. 1). Al-Kitab Center for Publishing.

Zaid, N. A. (2008). Fundamentals of motor learning (1st ed.). Al-Diyaa Printing and Design House.