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# The Effect of Ladder Drill Training on Agility Stepping Age Learn to Train Taekwondo Sports

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## Abstract

This study aims to determine the effect of ladder drill training on stepping agility in learn-to-train taekwondo athletes. Agility training is very important in taekwondo because technical movements such as attacks and dodges require the ability to change direction and high speed of movement. This study used an experimental method with a one-group pretest-posttest design, involving 12 taekwondo athletes aged 9–12 years from Dojang Dozen, Cimahi City. The instrument used was a validated taekwondo agility test. The treatment in the form of a ladder drill training program was given 16 times for 5 weeks, with movement variations such as 2 shifts in and out, 2 switches in and out, in and out 2 sifts sideways, hop forward back and switch. After the ladder drill treatment and posttest, the posttest data was obtained with a good category agility value (agile movement) is 26.85 and the less agile category agility is 29.20, and the average pretest percentage is 28.88 and the average posttest percentage is 28.15, with an increase between the pretest and posttest of 2.5%. The results of the paired sample test showed that there was a significant increase in the post-test score compared to the pre-test, with a significance value of 0.000 (2-tailed) < 0.05. These findings prove that ladder drill is effective in improving stepping agility in young athletes, and can be used as an alternative training method in taekwondo coaching programs.

## How to Cite

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## INTRODUCTION

The martial art of taekwondo requires excellent physical condition due to the high intensity of movements performed in each taekwondo technique. Physical training is essential for improving an athlete›s technical skills, strength, speed, flexibility, agility, and endurance.(Setiawan, 2023)Taekwondo involves many movements that require coordination, muscular strength, and physical endurance. Agility is one of the physical skills required. This type of movement requires a person to move quickly, change direction, and be agile. (Mappaompo et al., 2015). This is confirmed in the book Bompa & Buzzichelli, (2019) Agility is the ability to respond to external stimuli with rapid movement, followed by changes in direction and reacceleration. Agility is also the ability to change direction quickly. Agile or agile athletes are individuals who move steadily or with strong balance and a good understanding of their body position. As explained, agility is key to achieving achievement and success in movement techniques.

In line with the statement above, all sports are required to have these physical condition components, including taekwondo, to improve agility. The agility of taekwondo athletes is evident in the way they perform stepping movements. This is supported by research.Kharis Fajar, (2022)»Logically, people who kick, dodge, or step will experience increased strength, agility, speed, and flexibility in the sport of taekwondo.» In taekwondo competitions, stepping agility is essential, especially when counterattacking or changing steps and reacting to avoid an opponent›s attack. Athletes find it difficult to anticipate an opponent›s attack if they lack stepping agility. According to (Harsono, 1988) This section describes the physical components that need to be considered, such as endurance, stamina, flexibility, agility, strength, power, and muscular endurance. Therefore, these components must be accompanied by ongoing, planned, and structured agility training to develop an athlete›s ability to achieve adequate condition or good performance.(Rahayu et al., 2022).

Based on a survey by researchers, stepping agility at the learn-to-train age (9-12 years) is still lacking and needs to be trained. This is also reinforced byGrandmaster Kee Ha & President, (2008) At the learn to train stage, around the age of 10-12 years for men and 9-11 years for women, the development of motor skills such as agility, balance, coordination, speed, and dexterity must be emphasized. The problem of insufficient stepping agility at the learn to train age results in difficulties in avoiding and attacking opponents during matches. Therefore, the training method or treatment used by researchers was chosen systematically. Researchers hope that this training method will be a guideline for improving the stepping agility of learn to train age students with ladder drills in the sport of taekwondo. Because when it occurs in the field, there are still not many training methods that specifically train stepping movements with ladder drills compared to other taekwondo clubs (Styasih et al., 2023).

To improve a person›s agility, ladder drills have many variations, including ladder speed runs, one feet per square, ladder stride runs, two feet per square, icky shuffle, zigzag crossover shuffle, in-out shuffle and side right-in.(Tafakkur & Widodo, 2016). The diverse forms of agility training prompted the author to delve deeper into agility training related to stepping. Currently, training using equipment such as ladder drills is widely used in the sport of Taekwondo. Dewi Permana et al., (2016) disclose Ladder drilltraining various foot movement patterns through exercises and being able to change positions at high speed. In taekwondo.

Previous research by Kharis Fajar, (2022) showed that ladder drill training significantly increased agility by 5.35% in college-level taekwondo athletes. However, this study did not target younger age groups and did not focus on the elements ofsteppingspecifically. Thus, it can be seen that there isresearch gap, namely there has been no study that directly examines the effectiveness of ladder drill on stepping agility in the learn to train age group in the sport of taekwondo Jung, (2020).

Building on this research gap, this study aims to provide a scientific and practical contribution in the form of a specific training method capable of improving stepping agility in children aged 9–12 years. This research also offers novelties in terms of target age, a specific training approach to stepping movements, and integration with a long-term athlete development model. (Long Term Athlete Development - LTAD).

With this research, it is hoped that it can be an alternative reference in compiling training programs for the early age category, especially in improving the stepping agility component which is very essential in the sport of taekwondo. The aim of this study was to examine the effect of ladder drill training on improving stepping agility in learn-to-train taekwondo athletes.

## METHOD

This study used an experimental method with a one-group pretest-posttest design (Sugiyono, 2018), aimed to determine the effect of ladder drill training on stepping agility in learn-to-train taekwondo athletes (9–12 years old). The research subjects consisted of 12 beginner athletes who are members of the Dojang Dozen Taekwondo Cimahi City. The sampling technique was total sampling, due to the relatively small population and in accordance with the characteristics of the study. The instrument used to measure agility was the taekwondo agility test developed by Samsi, (2016), with a validity of 0.93 and a reliability of 0.92. This test consists of a multi-motion directional track that requires athletes to perform a combination of rapid movements, changing direction, stepping, and turning according to the cue. The test was conducted twice, namely before (pretest) and after (posttest) the treatment, with time taken as a performance indicator.

After the pretest, the athletes were given a treatment in the form of a ladder drill training program for 16 meetings held over five weeks with a frequency of three times a week. Each training session lasted 30–45 minutes and consisted of a warm-up, core training, and cool-down. The ladder drill training program focused on improving agility and footwork coordination through various variations such as 2 shifts in and out, 2 switches in and out, in and out 2 sifts sideways, hop forward back and switch, which were designed to resemble stepping movements in taekwondo.

At the 8th meeting, a shadow test was conducted as a mid-term evaluation. The posttest was conducted at the 16th meeting using the same instrument as the pretest. The pretest and posttest data were then analyzed using the Shapiro-Wilk normality test and paired sample t-test with the help of SPSS software version 26 (Fadluloh et al., 2024), to see the significance of the differences before and after treatment with a significance level of 0.05.

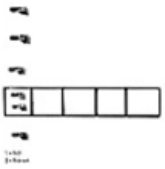
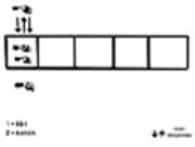
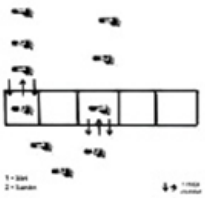
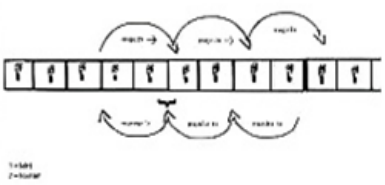
| Form of Exercise | picture | description |
|---|---|---|
| 2 shifts in,2 shifts out |  | The sample passes through the ladder drill, then steps forward and backward. This helps train coordination and agility, especially in stepping. |
| 2 switches,in & out |  | |
| in &out,2 shifts sideways,miss one,repeat |  | |
| hop forward x2,hop back&switch |  | |

**Figure 1.** ladder drill exercise for stepping agility

## RESULTS AND DISCUSSION

**Table 1.** Descriptive analysis

| Sample name | Pre-test (seconds) | Post-test (seconds) | Difference (seconds) | Percentage increase |
|---|---|---|---|---|
| DAV | 28.50 | 27.85 | 1.35 | 2.3% |
| KEY | 29.32 | 28.89 | 1.57 | 1.4% |
| AZK | 28.33 | 27.70 | 1.37 | 2.2% |
| NAY | 28.62 | 27.65 | 1.3 | 3.5% |
| IND | 29.56 | 29.00 | 0.56 | 1.9% |
| NAT | 29.31 | 28.80 | 1.49 | 1.7% |
| ANI | 28.58 | 27.36 | 1.22 | 4.4% |
| RIZ | 29.50 | 29.20 | 0.30 | 1.0% |
| ALV | 29.61 | 28.40 | 1.21 | 4.2% |
| AKB | 28.36 | 27.30 | 1.6 | 3.8% |
| NAZ | 29.36 | 28.85 | 1.49 | 1.7% |
| BAG | 27.51 | 26.85 | 1.34 | 2.4% |
| Average | 28.88 | 28.15 | 0.73 | 2.5% |
| Percentage of improvement (pretest-posttest): posttest | | | | |

Based on the **Table 1**, there is data obtained from the pretest results with a good category agility value (agile movement) is 27.51 and the less agile movement category agility is 29.61. After the ladder drill treatment and posttest, the posttest data was obtained with a good category agility value (agile movement) is 26.85 and the less agile category agility is 29.20, and the average pretest percentage is 28.88 and the average posttest percentage is 28.15, with an increase between the pretest and posttest of 2.5%.

The significance value of the pretest is 0.112 and the posttest is 0.259 > 0.05, so H0 is accepted. It can be concluded that both data are "Normally Distributed". Based on the results of the data obtained, which are normally distributed in the table above, the next step is to use a parametric test, namely the paired sample t-test.

The initial test (pre-test) and final test (post-test) of ladder drill training on stepping agility in the learn to train age group showed a significant value of 0.000 (2-tailed) <0.05, so H0 was rejected. It can be seen from the results above that stair drills have an effect on improving footwork agility in the learning-training age in taekwondo.

Ladder drill is a fitness tool consisting of stairs, where they run, jump and leap with fast foot movements over the stairs.(Fatchurrahman et al., 2019). Ladder drills are a type of exercise that focuses on quick movements and reactions. The goal of ladder drills is to train the legs and entire body to move from one position to another at high speed.(Dewi Permana et al., 2016) Ladder drill is a type of exercise used to improve agility. (Kharis Fajar, 2022).

This ladder drill training program uses various movements tailored to the needs of each sport. The movements performed in this research program are continuous, or do not stop mid-movement when passing the ladder, thus encouraging athletes to move quickly and change direction (Sidik et al., 2019). The type of movement in this ladder drill training program is adapted to the sport of taekwondo, namely stepping. Therefore, with repeated and consistent practice using ladder drills with stepping movements, which are the benchmark for improving stepping agility at the age of learn to train taekwondo.

From the results of the pretest and posttest of the experimental group of learn-to-train taekwondo athletes from Dojang Dozen in Cimahi City, with ladder drill treatment, showed an increase in agility. Judging from the results of statistical data processing, there was a significant effect of ladder drills on stepping agility in the learn-to-train age group.

In addition, this finding is consistent with the findings of previous authors conducted by-Puspasari, (2024)with the results of his research showing a significant influence of ladder drill training on stepping agility with a sig value (2-tailed) of 0.04. And besides that, the findings of other authors conducted byKharis Fajar, (2022)which discusses The Effect of Plyometric Exercise and Ladder Drill on Power, Agility, and Resting Pulse in Taekwondo Athletes at State Colleges. The results of the study showed that ladder drill training had a significant effect on increasing agility by 5.35%.

Referring to the distribution of respondents based on gender. In this study, the sample consisted of 12 people, with 7 males (58%) and 5 females (42%) in the ladder drill group. The results of the stepping agility scores of male athletes with an average post-test of 27.85 seconds and females with an average of 28.58 seconds.

## CONCLUSION

The results of this study indicate that ladder drill training with a paired sample test, significantly improved stepping agility in learn-to-train taekwondo athletes. This finding indicates that ladder drill can be an effective alternative training method for developing agility in young athletes.

The implications of this study are expected to serve as a reference for coaches and practitioners of martial arts, particularly taekwondo, in developing structured training programs. It is recommended that ladder drill training be used routinely and developed with more specific movement variations. Future research is recommended to involve a larger sample and consider factors such as gender, age category, and body composition to obtain more comprehensive results.

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