JUMORA: JURNAL MODERASI OLAHRAGA
E-ISSN: 2797-8761
Volume 2, No. 2, December 2022
DOI: 10.53863/mor.v2i2.512
Department of Sports Education, Universitas Ma'arif Nahdlatul Ulama Kebumen

Original Article Research

The Effect of Agility Drill Training on Agility Dribbling Techniques of Young Female Football Players

Fatoni Yanuar Akhmad Budi Sunaryo [1]*, Sugiyanto Sugiyanto[2], Hanik Liskustyawati [3], Slamet Riyadi [4]

[1]Postgraduate of Sports Faculty, Sebelas Maret University, Surakarta, Indonesia

[2,3,4] Sports Faculty, Sebelas Maret University, Surakarta, Indonesia

*email corresponding author: fatoniyanuar@student.uns.ac.id

Received: 20/09/2022 *Revised: 22/11/2022* *Accepted: 26/11/2022*

Abstract

This study aims to examine the differences in the impact of variations in agility drills with ladders and wickets on agility dribbling techniques in young women's soccer players. Thirty-six people act as the research population who are young female soccer athletes aged 13-18 years and living in Surakarta. This study uses random sampling to determine the research sample of 32 people. Meanwhile, the research design used was experimental research with a 2x2 factorial design. Researchers apply a treatment combined with pre-test and post-test to obtain research data. In addition, the Illinois Agility Test with Ball is the research instrument used in this study. This study uses ANOVA as a data analysis technique. According to the study findings, there is a finding that the effect of the hurdles agility training method is higher when compared to the ladder drill agility training method. This finding is evidenced by the results obtained from the ANOVA test that there is a significant difference in the effect because the significance value of p is 0.005 <0.05, and the F value is 9.498. Thus, the researcher concludes that there is a significant difference in the impact of variations in goal agility training methods and ladder drill agility on the agility of the dribbling technique of young women's soccer players. Researchers hope that the findings of this study can help players and coaches improve training methods so players can develop their agility dribbling techniques optimally.

Keywords: Agility dribbling technique, Agility drill training, Young female football players.

How to cite:

Sunaryo, F. Y. A. B., Sugiyanto, S., Liskustyawati, H., & Riyadi, S. (2022). The Effect of Agility Drill Training on Agility Dribbling Techniques of Young Female Football Players. *JUMORA: Jurnal Moderasi Olahraga*, 2(2), 174-187. https://doi.org/10.53863/mor.v2i2.512

JUMORA: JURNAL MODERASI OLAHRAGA
E-ISSN: 2797-8761
Volume 2, No. 2, December 2022
DOI: 10.53863/mor.v2i2.512
Department of Sports Education, Universitas Ma'arif Nahdlatul Ulama Kebumen

1. INTRODUCTION

Sport today is an activity that cannot be separated from the scope of human life. "Mensana in corporesano" means there is a strong soul in a healthy body, which is a familiar thing in the world of sports. Health is the most important thing for the body. All activities in the body will develop optimally. Thus all learning, working, and thinking activities will be realized quickly and accurately, and activities to build the nation and state will be carried out well and smoothly. One of the most popular sports activities today is football. The world community and Indonesia mostly do sports. Football is a sport loved by everyone and is the most popular in the world. The development and progress of football from time to time has experienced a significant increase in various parts of the world, both among children, adolescents, adults, even parents, men, and females.

Football is a team game that uses a football ball and is played by two opposing teams. Eleven players from each team, and there is a goalkeeper in both teams. Every football player must use their feet to play this game, except for the goalkeeper, who can use his hand to keep the goal from conceding (Sucipto, 2000). The game is played on flat rectangular grass, 64-75 meters wide and 100-110 meters long. On the two-width lines in the middle of each, set up a goal opposite each other (Sukatamsi, 2001). Football is not only done by men. Football has also been widely practiced and even played by a female who likes football. It is proven by professional female football leagues and clubs in Indonesia. Many female football clubs exist in every region, district, and city.

Excellent physical condition supports a player's appearance in football because players constantly move and sometimes require sudden acceleration of movement. The athletes need high physical performance to play this sport. Moreover, fatigue is a bad impact that can be got by football athletes the high intensity of football games (Riffai et al., 2018), meanwhile, the degree of player performance is related to fatigue (Parwata, 2015; Widiyono & Mudiono, 2021). Furthermore, the condition of football players must be good because fatigue can interfere with their performance. A football player must have good agility, especially when doing dribbling techniques. One of the characteristics of the dominant physical condition component of football is agility. Agility is a person's ability to move and change direction of moving quickly in various directions to open space and avoid the opponent's guard.

Furthermore, argues that agility is a complex set of skills that meet each other for athletes to respond to external stimuli with rapid deceleration, change of direction, and reacceleration (Bompa, 2009). Football players need high agility to be good athletes because they can avoid opponents while dribbling or breaking through the opponent's defense to score goals. Football players very much need the ability of body agility to outwit opponents. Based on the previous, it is necessary to apply appropriate training methods to improve the athlete's agility. In principle, football players must exercise to improve their ability in many aspects, such as the psychological quality of trained children, the functional ability of body equipment, and physical quality (Sukadiyanto, 2011).

One form of exercise to improve agility is the agility ladder drill. Description Agility ladder drill is a footwork exercise using rope obstacles such as ladders designed to improve leg power, agility, and coordination. This agility ladder drill training method allows athletes to move quickly, change directions, and pass the ladder rope as various obstacles. The agility hurdle drill method is a varied and innovative power and coordination training modified using

simple tools. Plyometric hurdles can also develop leg muscle strength because this exercise relies on leg strength, in which the legs must continue to jump over the obstacles in front of them in succession with several repetitions.

Dribbling is the ability of a player who has good control of the ball and can carry the ball past his enemy. Dribbling is rolling or moving the ball from one place to another using the feet while running. To provide the ability to move faster, football players need good agility and physical condition to dribble faster and effectively in the match and training. Dribbling agility can be trained through agility training. Agility training can collaborate with other techniques. When dribbling, you must be able to do other techniques, such as passing the ball. So football players must also hone other technical skills. They also can improve their passing accuracy in the match through training in passing the ball with their partner (Sibarani & Manurung, 2021). Some important skills include coordination, ball control, and shooting that they must have to set up and manage the game during matches (Burhaein et al., 2020); (LH et al., 2016). Dribbling is a technique that plays an important role in the match. Therefore, football observers, in particular, say that a player's prowess can be seen in how a player dribbles. Techniques such as strength, speed, flexibility, agility, and so on must be trained to improve dribbling skills. Now many coaches ignore or consider it unimportant. Dribbling or dribbling is not only trained with one foot but with both left and right. The purpose of the dribbling technique is to get past the opponent, look for opportunities to pass friends, and hold the ball to keep it in control. The movement of dribbling requires a complex series of movements.

Women also like and play football, so it's not only men who like and play it. The existence of women's football clubs from cities and districts, even participating in the national league, proves that women are also fond of football. Moreover, they are some supporting factors for developing women's clubs to win the competition, such as funding, parents, athletes, coaches, organization, facilities, and infrastructure (Widiyono et al., 2022). Thus, there is an increasingly competitive and intense competition to enter the Indonesian Women's Football National Team selection due to the massive development of women's football clubs in this country. Thus, this requires support with funding, good organization, quality coaches, supporting infrastructure, and quality player materials. Unlike men's football, women's football differs in training management and athlete coaching. This condition occurs because the coaching and training of women's football are much more difficult than that of men, even though the training program is not much different from that of men.

According to the observation in this current study, many women's football club players still have physical abilities, especially agility, which need improvement. This can be observed in matches where there is difficulty in getting past enemy defenses because players seem inflexible to dribble. It is still very visible that the players are still afraid and are not good at ball possession and dribbling, so the ball can be lost and captured easily by the opponents. The ability to attack by opening empty spaces and dribbling by players looks still less flexible, so their movements do not help to dominate the game. In addition, when the team is in the transition position, there is a delay experienced by the player in closing the opponent's movement and anticipating the opponent's ball. There is a lack of intensive training to improve players' agility as part of the physical training that football players must do.

In agility training, the methods of training variations are many and varied. This current research employed an agility hurdle drill and agility ladder drill to improve the players' physical

condition. This study found that the movement patterns are almost identical, but the height differs. The ladder drill training pattern has a flat jump area in the form of an agility ladder. While in practice, the hurdle drill pattern has a high obstacle, by lifting both legs and higher to get through the obstacle. This is a similar pattern of motion that is believed to increase agility and leg muscle strength. By using various simple movement patterns, it is hoped that the coach will improve the athlete's agility and leg muscle strength so that the agility of the player's dribbling technique can increase. Agility ladder drill and agility hurdle drill training used researchers wanted to find out whether training with the agility ladder drill and agility hurdle drill method could improve the agility quality of dribbling techniques in young female football players. Moreover, the finding can contribute to football players so they can practice effectively with the agility ladder drill and agility hurdle drill method that can be employed as an efficient practice activity in agility training as an exercise choice for agility dribbling techniques in young female football players.

2. METHOD

2.1 Participants

The population is the number of subjects or objects used as research respondents whose characteristics and quantities are to be identified and explored for a drawn conclusion (Siyoto & Sodik, 2015). All young female football athletes who were 13-18 years old in Surakarta are the population in this research. There were 36 players in the population in this study. Sampling is carried out in such a way that samples are obtained that can truly represent and can describe the actual state of the population. The sample is part of the character and number controlled by the population (Sugiyono, 2013). The researchers could not explore everything in the population if the population is largely because of the limited time, workforce, and funds. Therefore, the researchers employed samples for conducting this research. This current study used a random sampling technique to determine 32 people as the research sample. This study does not include the entire population involved in experimental research because it relates to random sampling analysis techniques.

Referring to the results of the Slovin formula used, a minimum sample of 30 people is obtained if using an accuracy rate of 95%. Anticipating data loss or samples falling in the study and facilitating group division, the sample was added by 2 people so that the total sample was 32 people. Then based on the sum of the results from the formula, the results of the sum were divided into two treatment groups for the training method. Furthermore, an analysis using ordinal pairing techniques was carried out to identify the experimental group so that the number of each player was treated with agility ladder drill training and the agility hurdle drill methods. All research subjects were treated objectively through this division of the group. Furthermore, all objects had the same opportunity to enter each group. After the researchers divided them into two groups, they conducted a pretest using the Illinois agility test with a ball test instrument before giving treatment.

2.2 Research Design

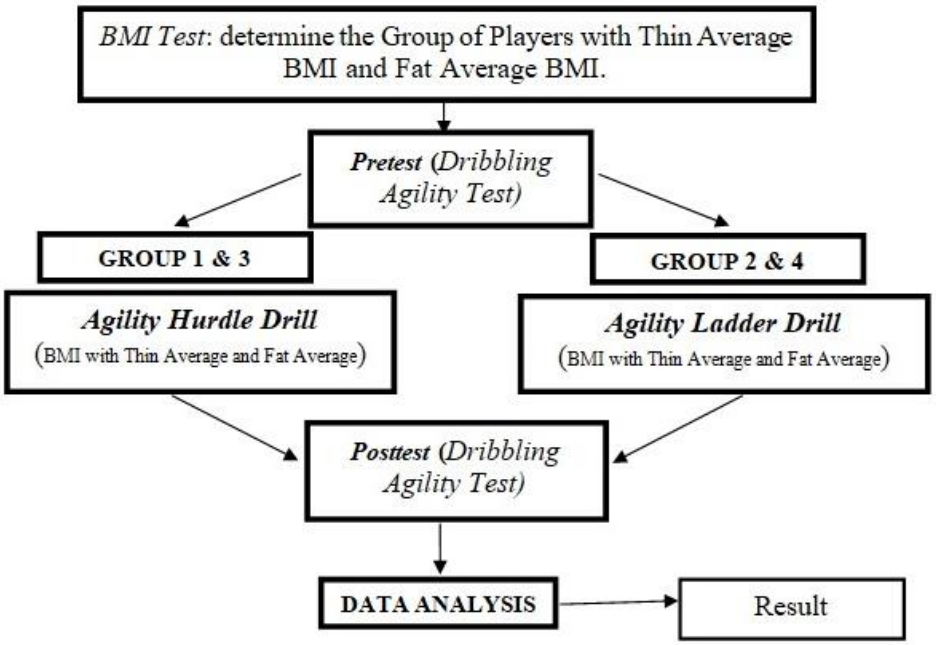
The researchers utilized a quantitative approach to conduct this study, while this present research employed the experimental method as the research design. Moreover, the research type of this study was a 2x2 factorial design. The 2 x 2 factorial design was used because the experimental method in this study involved two independent variables (agility hurdle drill

training method and agility ladder drill training method), each of which each consisting of two independent attributive variables based on body mass index (divided only into thin average and fat average). A factorial experiment is a design that analyzes two independent variables in giving an impact/influence on the dependent variable simultaneously or partially and discusses the interaction of research variables (Sudjana & Ibrahim, 2012). The researchers collaborate with the coach to implement two treatments in two groups in this experimental study to know the effectiveness of the agility ladder drill and agility hurdle drill to the agility of the dribbling technique of young female football players.

Hypothesis testing in this study includes several steps. The steps for testing the hypothesis are as follows:

Figure.1.

Research Flowchart



ANOVA of Factorial Design of 2x2

1) Method of AB for two-factor ANOVA calculation

Table. 1

Summary of ANOVA Experimental 2x2 Factorial

Source Variance	Dk	JK	RJK	Fo
Treatment average	1	Ry	R	
A	a-1	Ay	A	A/E
B	b-1	By	B	B/E
AB	(a-1) (b-1)	ABy	AB	AB/E
Error	ab (n-1)	Ey	E	

Explicative :

A = factorial level A ; B = factorial level B ; N = sample quantity

JUMORA: JURNAL MODERASI OLAHRAGA
E-ISSN: 2797-8761
Volume 2, No. 2, December 2022
DOI: 10.53863/mor.v2i2.512
Department of Sports Education, Universitas Ma'arif Nahdlatul Ulama Kebumen

The calculation steps are as follows :

a) $\sum Y^2 = \sum_{i-1}^{a} \sum_{j-1}^{b} Y_{ij}^2$

b) $R_y = \frac{\sum_{i-1}^{a} \sum_{j-1}^{b}}{abn}$

c) $Jab = \sum_{i-1}^{a} \sum_{j-1}^{b} \left(J_{ij}^2\right) - R_y$

d) $A_y = \sum_{i-1}^{a} \left(A_i^2 / bn\right) - R_y$

e) $B_y = \sum_{j-1}^{b} \left(B_i^2 / an\right) - R_y$

f) $Ab_y = J_{ab} - A_y - B_y$

g) $E_y = Y^2 - R_y - A_y - (B_y + AB_y)$

2) Hypothesis Testing Criteria

This study rejected the null hypothesis if $F \geq F\ (1-\alpha)\ (V1-V2)$

This study rejected the null hypothesis if $F < F\ (1-\alpha)\ (V1-V2)$

with: dk of numerator V1 (K−1) and; dk of denominator V2 = (n1+.....nk−k) α = significant level for hypothesis testing.

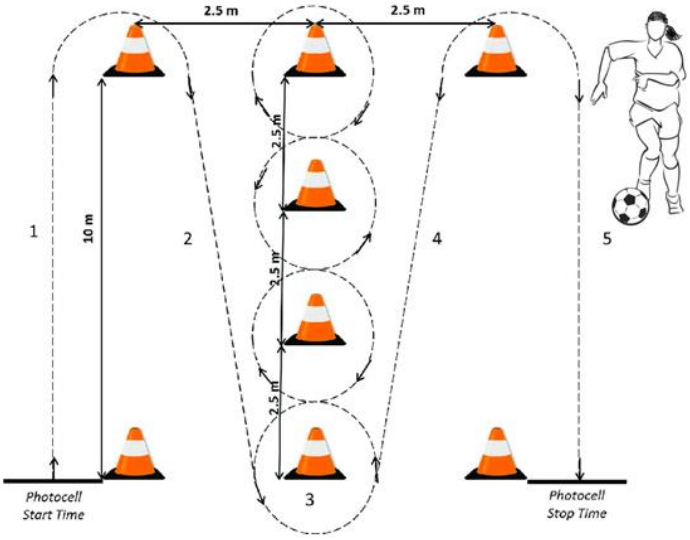
2.3 Instruments

The instrument measures the research variable (Sugiyono, 2013). Moreover, Arikunto defined an instrument as a facility or tool employed by the researcher for collecting data (Arikunto, 2010). This present research employed the *Illinois Agility Test with Ball / IATB* as the instrument for collecting the data from the dribbling skills and agility test (Reina et al., 2017). Therefore, football and agility dribbling skills from the football player were identified through the implementation of the data collection technique.

The procedure for carrying out the test is that the length of the test area is 60 meters (the distance from the start point to the finish), and the width is 5 meters. Several cones are used as a start sign, then at a distance of 10 meters, there is a turning point, passing 4 cones each 2.5 meters from the starting point forward to the very end cone. The test by passing each cone, and after that, it goes to the next point as the turning point used to get to the finish. The time stopwatch runs after receiving a signal, and the subject dribbles as quickly as possible and then changes the direction of movement according to the path shown in the image below without bumping or bumping the existing cones to the finish. The test can be done 2 times in the same or different directions (right and left), then the fastest time is taken between the 2 tests.

Figure.2.

Illinois Agility Test with Ball / IATB (Reina et al., 2017)



2.4 Procedures

There were two independent variables in this current research: agility ladder drill training methods and agility hurdle drills. The agility hurdle drill is an exercise for a football player to increase sports technique, foot coordination, agility, speed, and power. Hurdles can be adjusted and varied according to the athlete's needs. An agility ladder drill is a footwork exercise using obstacles like agility ladder ropes designed to increase leg power. This agility ladder drill training method is designed for how athletes can move quickly and change directions and pass through boxes as various obstacles. Then the dependent variable is agility and dribbling skills. Agility and dribbling skills are the ability to change direction quickly and effectively while moving/running and dribbling at almost full speed.

Meanwhile, measurements and tests were two techniques used to collect the research data. Before measuring the pre-test and post-test, the sample was measured by body mass index (BMI) to determine the upper average level and lower average level. Implementation of the initial test (pretest). Moreover, the researchers conducted a pre-test to collect the research subject's initial data on dribbling skills and agility. The instrument in this study was the *Illinois agility test with ball* test. The pretest aims to obtain initial information about agility and dribbling skills before being given training or treatment. The treatment exercise or treatment is carried out based on the training program.

On the other hand, the experts had validated the exercise program before being used in this study. The process in the study was carried out 16 times face-to-face, outside the time for conducting pre-test and post-test. There were no differences in conducting pre and post-test, which consisted of the *Illinois agility test with a ball* test instrument. Posttest aims to obtain information on the difference in the final score of agility and dribbling skills after being given training or treatment. The researchers tried to compare values before and after the treatment as the goal of this test.

2.5 Data Analysis

This present research employed the *Illinois Agility Test with a ball* as the research instrument for collecting the research data. The researchers decided to analyze the data after finishing the data collection. Moreover, this current study used ANOVA as the type of data analysis. SPSS 20 is the program version the researchers used for analyzing the data, using ANOVA with a significance level of $\alpha = 0{,}05$.

3. RESULTS

The interpretation of ANOVA analysis and the result of data analysis influenced the construction of the research hypothesis testing. These hypotheses aimed to investigate the impact between variations of agility ladder drills training and agility hurdle drills on the dribbling technique of young female football players. Ha was accepted if the value of sig < 0.05. This study had the first hypothesis, namely:

Ho: There is no significant difference between the variation of agility ladder drills training and agility hurdle drills on the dribbling technique of young female football players.

Ha: There is a significant difference between the variation of agility ladder drills training and agility hurdle drills on the dribbling technique of young female football players.

Table 2.

ANAVA Test Results between agility ladder drills training and agility hurdle drills on the dribbling technique of young female football players

Source	*Type III Sum of Squares*	*Df*	*Mean Square*	*F*	*Sig*
Training Method	13,794	1	13,794	9,498	0,005

Source: Primary Data

Table 1 shows that H_0 was rejected based on the p-significance value is 0.005 < 0.05 and the F value of 9.498. Therefore, there was a significant difference in the influence of the training methods. Moreover, the agility hurdle drills training method group, with an average difference of 3.39 seconds, is higher (good) than the agility ladder drills training method group, with 2.08 seconds. Meanwhile, 1.31 was the average difference between of two groups. Therefore, the hypothesis was accepted based on the findings above.

4. DISCUSSIONS

In this section, the present research explains and discusses the further interpretation of the study's findings. The findings illustrated a significant difference in the impact of variations in the agility ladder drill training and the agility hurdle drill training methods on the agility of the dribbling technique of young female football players. According to the result, the agility hurdle drill method group is higher (good) than the agility ladder drill training method group. A form of plyometric exercise was known as an agility hurdle drill. This finding was supported by

circuit training as an important method for improving tennis players' agility, running speed, and lower or upper extremity strength (Mohanta, et al., 2019).

Furthermore, another study explained that the ability of handball players in the experimental group increased agility performance compared to the control group (Kaur, 2018). In other words, football players could improve their agility by using plyometric training. Therefore, the players and coach were recommended to use this training exercise to increase the skillful and speed performance of the athletes (Tendulkar et al., 2018).

The agility hurdle drill training method can increase the agility of players. Agility hurdle drill exercises will increase the muscles around the legs (Pranyoto & Suharjana, 2019). Hurdle training is considered aerobic because it requires rhythmic contractions of large muscle groups from the legs to transfer the entire body weight (Sudarmanto, 2018). This exercise can improve the gluteals, gastrocnemius, quadriceps, hamstrings, hip flexors, lower back, and abdominal muscles. Based on this, the muscles will become strong and flexible to increase the athlete's agility. Agility is one element of special physical conditions, combining elements of strength, speed, and flexibility (Irawadi, 2011). These three combinations will produce agility.

Applying the basic principles of training systematically and repeatedly over a long period will stress the muscles so that the muscles will undergo physiological adaptation (Hariyanta et al., 2014). Physiological adaptations that occur in the leg muscles involve almost all muscles, especially the muscles of the legs, such as the quadriceps, hamstring, gluteus, gastrocnemius, and abductor hip muscles, with hypertrophy. Football players could get hypertrophy because of the improvement in the number while muscle fibers or fast-twitch, an improvement in capillary density in muscle fibers, and an improvement in the number of myofibrils in each muscle fiber, therefore the leg muscles could become stronger, making speed improve (Anantawijaya et al., 2018).

Neutral adaptation was associated with agility, and it could occur because the exercise caused an improvement in the force of muscle contraction, which was conducted directly. It happened because of increased inhibition of the antagonist's muscles, synergistic muscles contracting more precisely, and increased activation of the prime mover muscles. The trained athletes could activate their muscles to the optimal condition. Therefore they could use their energy as a maximum conscious effort (Astrawan, 2020). Moreover, physiological hypertrophy of muscles could occur because the number of ligaments, tendons, and nerves, the density of capillaries, myofibril size, the number of myofibrils, and the total number of contractile proteins, such as myosin, was proportionally increased. There is a potential increase in the speed of muscle contraction due to a greater increase in white muscle fibers so that changes in muscle fibers do not all occur simultaneously. Thus, an increase in agility can occur due to an increase in the size of muscle fibers, which affects the speed of muscle contraction (Womsiwor & Sandi, 2014). Football players must also have good physical endurance. There is a value of 48.8 ml/kg/minute. The midfield player has been named the player with the highest VO2 max. Meanwhile, the goalkeeper, with a value of 40.8 ml/kg/minute, is the player with the lowest VO2 max compared to other players, with an average VO2 max of 43 ml/kg/minute. (Paskalis et al., 2022).

The study findings also explained that there was a significant impact of jumping rope and ladder training on increasing leg muscle strength, agility, and speed. The ladder exercise was more effective in improving agility and speed than the jump rope exercise and control

group. (Pratama et al., 2018). Ladder drills exercises (in-out and ickey shuffle) can significantly increase agility and speed (Fatchurrahman et al., 2019). Other studies have shown that the dribbling technique significantly correlates with agility, namely 16.9%. Also, the dribbling technique correlates with agility and body mass index, namely 3.4% (Puguh & Allsabah, 2020). These findings are also in line with previous research, which explains that the agility ability of U-17 soccer players can experience a better improvement through ladder drills for training (mean = 20.03 and SD = 1.63) when compared to the training given to the control group (mean = 26.30 and SD = 2.16). Thus, ladder drill has a significant effect in increasing the agility ability of U-17 soccer players when compared to conventional training. (Hadi et al., 2016).

Very contrasting results are obtained from the following research. The findings illustrated that no substantial differentiation from the pre test and post test in the skill index, slalom dribbling test, agility test, and speed test from $p > 0.005$. Moreover, this study also found that no differentiation in any variable from the control and experimental group based on the between group. As a conclusion, this currents research recommended that the young female football player could employ agility ladder training even though the result was not effective to improve dribbling ability and physical fitness (Padrón-Cabo et al., 2020).

Table 3.

Summary of Discussion Results

Author, Year	Samples	Training Method	Results
Hadi et al., 2016	U-17 male Football players	ladder drills and the control group (conventional exercise)	ladder drills gave a better effect than a conventional exercise in increasing agility capabilities
Pratama et al., 2018	Senior high school student	Ladder drills and jump rope	Ladder drill showed better result than jump rope to improve the agility and speed of the athletes.
Fatchurrahman et al., 2019	Senior high school student	Ladder drills exercises (in-out and ickey shuffle)	Offers substantial impact to improve speed and agility.
Puguh & Allsabah, 2020	U-14 male Football players	Agility exercises	dribbling technique has a significant relationship with agility and body mass index
Padrón-Cabo et al., 2020	U-18 male Football players	Agility ladder group and the control group	This method was not effective to improve physical fitness and dribbling

Source: Primary Data

Based on the above analysis, the novelty of the study developed by the researcher is the type of exercise method applied and the training tool used. Researchers use modern sports

equipment and holistic exercises that can directly affect the samples given during treatment. Different from other studies, the sample used is young female football players.

5. CONCLUSIONS

Based on the research results and the data analysis that has been carried out, it is concluded that there was substantial differentiation in the impact of variations in agility ladder drill and agility hurdle drill exercises on dribbling technique agility from young female football players. This statement was in line with the finding of ANAVA test which showed that there is a significant difference in influence both of the treatment based on the p-significance value is 0.005 <0.05 and the F value is 9.498. According to the finding, the hurdle drill method shows better agility than ladder drill training method. Therefore, there was substantial differentiation in the impact of variations in agility ladder drill and agility hurdle drill exercises on dribbling technique agility from young female football players

This study has several limitations when carrying out this research, namely the implementation of exercises or the application of group treatment not in dormitory or quarantine but living in their respective homes. So if the sample outside the exercise carries out no control over the activities, then indirectly, it can give other influences from the research results. In addition, the sample did not have strict control so that other interactions could occur, and the sample could exercise independently or with other teams/ other sports with forms of exercise that were not treated.

Based on the conclusions of the research results above, the results of this study imply that improving agility and football dribbling technical skills can be done by applying the agility hurdle drill and agility ladder drill training methods. Athletes can be made an exercise model according to their characteristics so that in the training process, they feel happy and motivated to follow the training process, then the training objectives can be achieved. Another implication is that encouraging coaches to apply appropriate training methods can trigger athlete involvement in training and in designing training programs, especially in determining the right exercises to use in improving agility and dribbling technique skills in athletes, especially female football, so that coaches, coaches and Female's football sports activists need to pay attention to appropriate and good methods, techniques, and strategies. The methods, techniques, and strategies used are the best and carried out to the maximum. The characteristics of the athlete and the training must match the chosen exercise. The findings showed the agility hurdle drill training method and athletes with a lower average body mass index have a better effect on increasing agility and dribbling technique skills in athletes, especially female football.

Acknowledgment

The author would like to thank supervisors, reviewers, research samples, and all those who have supported and assisted in this research.

REFERENCES

Anantawijaya, G. Y., Yoda, I. K., & Wahyuni, N. P. D. S. (2018). Pengaruh pelatihan ladder practice terhadap peningkatan kecepatan dan kelincahan. *Jurnal Ilmu Keolahragaan Undiksha*, *6*(1), 1–10.

Arikunto, S. (2010). Prosedur Penelitian: Suatu Pendekatan Praktik (Edisi Revisi). Jakarta:

Rineka Cipta.

Astrawan, I. P. (2020). Comparison Between the Effects of 10 Repetition 2 Sets Footwork with 5 Repetition 4 Sets Footwork for Improving Trainees' Agility in Badminton Training. *3rd International Conference on Innovative Research Across Disciplines (ICIRAD 2019)*, 425–429.

Bompa, T. (2009). Theory and Methodology training. *Dubuque: Hunt Publishing Company*.

Burhaein, E., Ibrahim, B. K., & Pavlovic, R. (2020). The relationship of limb muscle power, balance, and coordination with instep shooting ability: A correlation study in under-18 football athletes. *International Journal of Human Movement and Sports Sciences*, *8*(5), 265–270.

Fatchurrahman, F., Sudijandoko, A., & Widodo, A. (2019). The comparison of the effect of ladder drills in out training and ladder drills ickey shuffle exercises on increasing speed and agility. *Jurnal SPORTIF: Jurnal Penelitian Pembelajaran,* 5(1), 154-165. https://doi.org/10.29407/js_unpgri.v5i1.12753

Hadi, F. S., Hariyanto, E., & Amiq, F. (2016). Pengaruh Latihan Ladder Drills Terhadap Peningkatan Kelincahan Siswa U-17 Di Persatuan Sepakbola Jajag Kabupaten Banyuwangi. *Jurnal Pendidikan Jasmani*, *26*(1).

Hariyanta, I. W. D., Parwata, I. G. L. A., Wahyuni, N. P. D. S., & Ked, S. (2014). Pengaruh Circuit Training terhadap Kekuatan Otot Tungkai dab Vo2max pada Siswa Putra Kelas VII SMP N 3 Selemadeg Timur Tabanan Tahun Pelajaran 2013/2014. *Jurnal Ilmu Keolahragaan Undiksha*, *2*(1). https://doi.org/10.23887/jiku.v2i1.2654

Irawadi, H. (2011). *Kondisi fisik dan pengukurannya*. Padang: *FIK UNP*.

Kaur, A. (2018). Impact of plyometric and SAQ training on physical fitness indices of handball players. *International Journal of Yogic, Human Movement and Sports Sciences*, *3*(2), 876–879.

LH, P. V., de Andrade, V. L., Aquino, R. L., Moraes, R., Barbieri, F. A., Cunha, S. A., Bedo, B. L., & Santiago, P. R. (2016). Construct validity of tests that measure kick performance for young soccer players based on cluster analysis: exploring the relationship between coaches rating and actual measures. *The Journal of Sports Medicine and Physical Fitness*, *57*(12), 1613–1622.

Mohanta, N., Kalra, S., & Pawaria, S. (2019). A Comparative Study of Circuit Training and Plyometric Training on Strength, Speed and Agility in State Level Lawn Tennis Players. *Journal of Clinical & Diagnostic Research*, *13*(12).

Padrón-Cabo, A., Rey, E., Kalén, A., & Costa, P. B. (2020). Effects of training with an agility ladder on sprint, agility, and dribbling performance in youth soccer players. *Journal of Human Kinetics*, *73*(1), 219–228.

Parwata, I. M. Y. (2015). Kelelahan dan recovery dalam olahraga. *Jurnal Pendidikan Kesehatan Rekreasi*, *1*(1), 2–13.

Paskalis, P. R., Wati, I. D. P., & Rubiyatno, R. (2022). Survey of Differences In Endurance Levels of Soccer Players with Various Positions. *JUMORA: Jurnal Moderasi Olahraga*,

2(1), 12–22.

Pranyoto, F. S., & Suharjana, S. (2019). The influence of agility hurdle drills, agility ring drills and speed exercises on determination. *Quality in Sport*, *5*(4), 21–27.

Pratama, N. E., Mintarto, E., Kusnanik, N. W., & Pratama, N. E. (2018). The influence of ladder drills and jump rope exercise towards speed, agility, and power of limb muscle. *Journal of Sports and Physical Education*, *5*(1), 22–29.

Puguh, A., & Allsabah, M. A. H. (2020). Hubungan Index Massa Tubuh Dan Kelincahan Dengan Hasil Dribbling Sepakbola Di SSB Cendoro Usia 14 Tahun Di Kabupaten Tuban. *SPRINTER: Jurnal Ilmu Olahraga*, *1*(1), 53–56.

Reina, R., Sarabia, J. M., Caballero, C., & Yanci, J. (2017). How does the ball influence the performance of change of direction and sprint tests in para-footballers with brain impairments? Implications for evidence-based classification in CP-Football. *PloS One*, *12*(11), e0187237.

Riffai, M., Imanudin, I., & Hamidi, A. (2018). Dampak Kelelahan terhadap Akurasi Tendangan Longpass Pemain Sepakbola. *Jurnal Ilmiah Sport Coaching and Education*, *2*(2), 67–74.

Sibarani, M. A., & Manurung, J. S. R. (2021). Difference in The Influence of Practice Regulating Passes and Regulating The Game Against The Accuracy of Passing in Junior Football Players. *JUMORA: Jurnal Moderasi Olahraga*, *1*(02), 75–83.

Siyoto, S., & Sodik, M. A. (2015). *Dasar metodologi penelitian*. Literasi Media Publishing.

Sucipto, D. (2000). Sepakbola. *Jakarta: Departemen Pendidikan Nasional Dirjen Dikdasmen Bagian Proyek Penataran Guru SLTP Setara D III*.

Sudarmanto, E. (2018). Perbedaan Pengaruh metode Latihan Plyometric Depth Jump dan Hurdle hopping terhadap Peningkatan Power Otot Tungkai Pada Pesilat Remaja Putri Perguruan Tapak Suci Putera Muhammadiyah Simo Boyolali Tahun 2018. *JOSSAE (Journal of Sport Science and Education)*, *3*(2), 60–68.

Sudjana, N., & Ibrahim, M. A. (2012). Penilaian dan penelitian pendidikan. *Bandung: Sinar Baru Algensindo*.

Sugiyono, D. (2013). *Metode penelitian pendidikan pendekatan kuantitatif, kualitatif dan R&D*.

Sukadiyanto. (2011). Pengantar teori dan metodologi melatih fisik. *Bandung: Lubuk Agung*.

Sukatamsi. (2001). Teknik Dasar Bermain Sepakbola. In *Solo : Tiga Serangkai*.

Tendulkar, S. S., Shirpure, S. S., & Yeole, U. L. (2018). Effect of plyometric training program on agility in football players. *International Journal of Physical Education, Sports and Health*, *5*(1), 144–146.

Widiyono, I. P., & Mudiono. (2021). Keterampilan Dasar Futsal Peserta Ektrakurikuler di SMK Ma'arif 1 Kebumen Tahun Ajaran 2019/2020. *JUMORA: Jurnal Moderasi Olahraga*, *1(01)*, 10–17.

Widiyono, I. P., Setiandi, A., & Susanto, A. (2022). Survey on Development Pattern of Women's Futsal Club in Kebumen Regency. *JUMORA: Jurnal Moderasi Olahraga*, *2*(1), 77–88.

Womsiwor, D., & Sandi, I. N. (2014). Pelatihan lari sirkuit haluan kiri lebih baik daripada haluan kanan untuk meningkatkan kelincahan pemain sepak bola siswa SMK X Denpasar. *Sport and Fitness Journal*, *2*(1), 10–17.