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# Effect of agility ladder exercises on agility of participants extracurricular futsal at Bina Darma University

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**Abstract.** The purpose of this study was to determine the effect of agility ladder training on the agility of the student of the futsal extracurricular Bina Darma University Palembang. The research method used in this study is a quasi-experimental method. The design of the research design used in this study was one group pretest-posttest design. A sample of 24 people participated in the Bina Darma University futsal extracurricular activity. The technique of collecting data uses an agility test instrument, namely Illinois Agility Run. The element of agility is very dominant in helping students gain student fitness. Usually students who are fit are characterized by good physical condition (agility). Agility in students is very useful to develop students' skills in any field of sports in general, and can help students master the physical education subjects related to agility. The results of the study revealed that the average score of agility pretest obtained by students was 19.05 seconds while for the average value of posttest (final ability test) student agility was 18.99 seconds. Normal and homogeneous distributed data because the results of the Kolmogorov Smirnov test and the data homogeneity test show that the large sig value is 0.05, so that it is continued with the paired t-test results obtained that the t-count value 1.930 is greater than the t-table 1.714 at a significant level of 0.05%. Thus it can be concluded that there is a significant influence agility ladder training for agility at participant's futsal extracurricular Bina Darma University of Palembang.

## 1. Introduction

Sports is a structured body of motion scenarios and rhythmically wrapped regulations with the goal of creating the human condition of a healthy physical, mental or spiritual. If the review of the exercise benefit, then it is natural if at every country sports has the best possible was owned directly so it has set in one unit of education from an early age. In physical education learning, a very prominent aspect usually appears in psychomotor aspects. This aspect provides space for student growth and development in terms of movement skills. This aspect is very important for the growth and development of students to achieve excellent fitness levels. This aspect has elements including anthropometry, speed, strength, endurance, coordination and agility.

Physical performance in soccer depends on various characteristics. Specifically, endurance, strength, speed, power and agility must all be well developed in order to achieve a high performance level in soccer [1]. Based on its definition, agility is defined as a person's ability to change the direction of his body in a very short time. In everyday life agility is also very helpful for students' activities in social interaction. So it is not surprising that agile students sometimes tend to be more active compared to students who are mediocre in matters of socializing horizontally.



The researcher chose the ladder agility exercise because consideration of this exercise is a type of exercise that is very suitable for the development of students who are in the growth phase. The reason for this exercise is the exercise that is charged with fighting one's own burden, so that it will not hinder the growth of students. Suhendro explains that agility is the ability of a person to change direction in a State of motion [2]. People who are agile is a person who is capable of changing one position to a position more with extremely high speed and good motion coordination.

Trisha D et al., Aerobic conditions relate to efforts to increase the strength, power, agility, agility or body movement skills that are indispensable in the sport [3]. According to George Dallas based on the present study sprinting run and agility are positively affected if DS precedes these skills, thus these tasks seems to be optimized by the use of DS in warm-up [4]. Thus, trainers and gymnasts recommended including DS in warmup to improve both sprint run and agility performance.

Agility is defined as a rapid whole-body movement with change of direction in response to a stimulus [5]. According to Larnando factors that may influence the agility of these are due to genetic or congenital traits from the father or mother [6]. Further that agility can also be caused due to activation a person in motion. Agility can also be caused due to the constant exercise. Moreover, RT, MT and agility are often practiced in the same physical education lesson or training unit [7].

Based on the opinion of the above it can be concluded that the factor that can influence the agility is the default since birth caused by genetic or heredity, nutritional balance, factors of speed and muscle elasticity and factors exercise to improve the quality of mobility as a person. Thus that some of the above factors is very influential to the quality of a person's mobility. The above opinion suggests that agility can be based because of several factors, namely genetic which is the default since birth, the liveliness of movement and constant practice.

Reynold the opinion: "Ladder drill fun and functional ways to teach movement skills. Although linear and lateral movements are biomechanical simple, their combination can be complex and many times overwhelming for the athlete. Buy teaching the mind and body to understand a variety of foot combinations, the chance for confusion and subsequent error decreases" [8]. The opinions expressed above can provide clarity that the ladder drill is to teach the functional skills of the exercise movement. Although his movements in Biomechanics are very simple but the good side is very complex for athletes.

Futsal was popularized in Montevideo, Uruguay in 1930, by Juan Carlos Ceriani. The uniqueness of the futsal gained attention throughout South America, primarily in Brazil. The skills developed in this game can be seen in the style of the world famous shown Brazil players outdoors on a regular-sized field. Pele, Brazil, famous star for example, develop his talent in futsal. While Brazil continues to be the center of the futsal world, the game is now played under the protection of the Fédération Internationale de Football Association in the world, from Europe to Central America and North America as well as Africa, Asia, and Oceania.

Futsal is a team-sport which requires high physical demands including endurance, speed, strength and the ability to change direction quickly and regularly [9]. It is estimated that 26% of a futsal match is completed at high intensity with changes in direction occurring every 3s [10]. The goal is to enter the ball to the opponent, by manipulating the ball with the foot. In addition to the five major players, each team is also allowed to have backup players. Unlike the indoor soccer game field, other futsal restricted line, instead of the net or the Board". Luxbacher states that "futsal is played by 2 teams which each team maintains his goal and tries to break down the opponent's goal with the number of each team 5 players" [11].

Agility ladder is a popular piece of equipment for training speed, coordination, balance, and agility of people with different age group, sports and gender [12,13]. Sports is an institutionalized competitive activity that involves physical exertion or the use of relative complex physical skills by individuals whose participation is motivated by a combination of the intrinsic satisfaction associated with the activity itself and the external rewards earned through participation.

The researcher chose the ladder agility exercise because consideration of this exercise is a type of exercise that is very suitable for the development of students who are in the growth phase. The reason

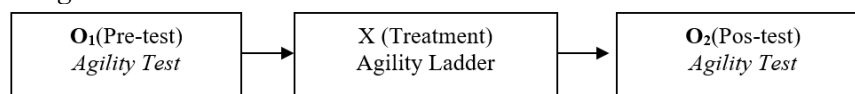
for this exercise is the exercise that is charged with fighting one's own burden, so that it will not hinder the growth of students.

## 2. Research methods

### 2.1. Types of research

This study can obtain good results and in accordance with expectations, then the research method used in this study is the experimental method. The basic use of the experimental method is the experimental activity with a pre-test (before being given treatment) and post-test (after being given treatment). So the experimental method is the most appropriate method for investigating causal relationships.

### 2.2. Research design



**Figure 1.** Pretest-posttest control group design.

In the initial stage before being given treatment to the sample, a preliminary test was carried out first to determine the initial ability of agility in the sample using the Illinois agility run test. After the initial test was carried out the sample was treated with agility training using the ladder agility. After being given treatment for 16 meetings at the final stage a final test was carried out to determine the increase that occurred between the initial ability and ability after being given treatment.

### 2.3. Research samples

The sample that will be examined in this study are 24 participants of the Futsal extracurricular activities at Bina Darma University.

### 2.4. Data collection technique

Technique of collecting or retrieving data is by using tests and measurements. The initial test with the student's agility test scores and the treatment given is the agility ladder exercise for 12 meetings. At the end of the treatment, the final test is carried out by taking the agility test scores on the sample.

### 2.5. Data analysis technique

Data analysis in this study used three tests, namely Data Normality Test, Homogeneity Test and Hypothesis Test using T Test.

## 3. Results and discussion

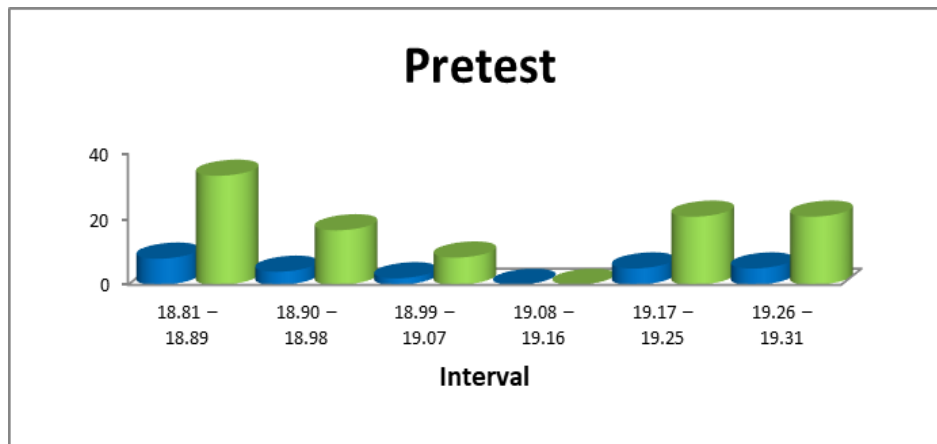
### 3.1. Pretest results frequency distribution

- The maximum value is 19.31 and the minimum value is 18.81. Average value (mean) 19.31. The standard deviation is 0.19.
- The following are presented frequency distribution data with the steps below: Range = Biggest data - smallest data = 0,5
- Many internal classes = 5,55

**Table 1.** Pretest results frequency distribution.

Number	Interval	Frequency	Percentage
1	18.81 – 18.89	8	33.3
2	18.90 – 18.98	4	16.6
3	18.99 – 19.07	2	8.3
4	19.08 – 19.16	0	0
5	19.17 – 19.25	5	20.8
6	19.26 – 19.31	5	20.8
	TOTAL	24	100

The frequency distribution of the pretest test will be presented in the histogram bar chart below:

**Figure 2.** Pretest distribution.

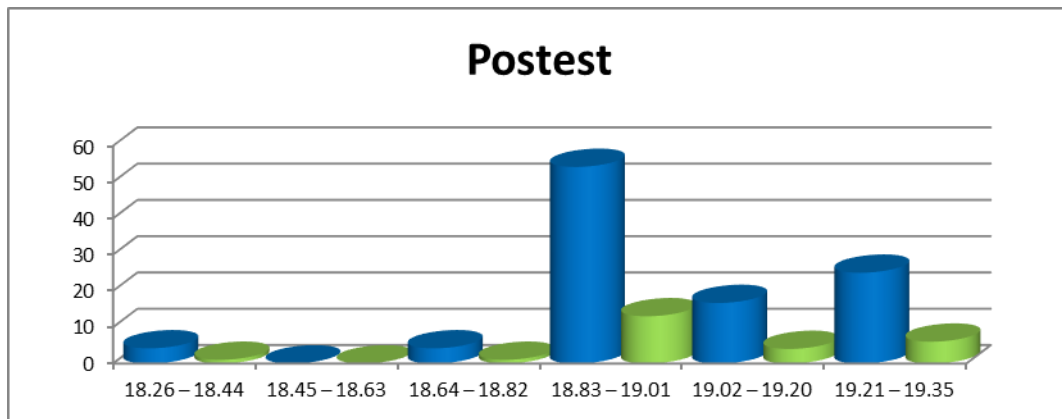
### 3.2. Posttest results frequency distribution

- The maximum value is 19.35 and the minimum value is 18.26. Average value (mean) 19.31. The standard deviation is 0.19
- The following are presented frequency distribution data with the steps below: Biggest data - smallest data = 1.09
- Many Classes =  $1 + 3,3 \text{ Log } n = 1 + 3,3 \text{ Log } 24 = 5,55$
- Length of class interval =  $\frac{1.09}{6} = 0,18$

**Table 2.** Distribution of frequency of posttest results.

Number	Interval	Frequency	Percentage
1	18.26 – 18.44	1	4.16
2	18.45 – 18.63	0	0
3	18.64 – 18.82	1	4.16
4	18.83 – 19.01	13	54.16
5	19.02 – 19.20	4	16.66
6	19.21 – 19.35	6	25
	TOTAL	24	100

The frequency distribution of posttest agility tests will be presented in the histogram bar chart below:



**Figure 3.** Posttest distribution.

### 3.3. Hypothesis testing

Based on the results of hypothesis testing data to determine the effect of agility ladder training on the results of agility can be seen in the table below:

**Table 3.** Hypothesis test.

Statistics	t-count	t-table (0,05) - (24-1=23)	t-significant	Information
Significant Pretest-Posttest	1.930	1.714	0,05	<b>Significant</b>

Based on the table above, it is obtained that the value of tcount 1.930 is greater than that of t table which is 1.714 at a significant level of 0.05%. Thus it can be concluded that there is a significant effect of agility ladder training on agility in Bina Darma University students.

## 4. Discussion

Based on the research findings it is known that the average value of the pre-test (initial ability test) of agility obtained by students is 19.05 seconds while for the average value of posttest (final ability test) the student's agility is 18.99 seconds. Normal and homogeneous distributed data because the Kolmogrov Smirnov test results and homogeneity tests show that the large sig value is 0.05, so that it is continued with the paired t test results obtained that the value of tcount 1.930 is greater than t table ie 1.714 at a significant level of 0.05 %. Thus it can be concluded that there is a significant effect of agility ladder training on agility in Bina Darma University students.

Exercising agility ladder is this exercise is an exercise using the agility ladder to get agility in someone. Pramukti and Junaidi explains that agility ladder is a form of physical exercise whose function is to train leg agility and synchronize motion in a balanced manner [14]. Ladder drill is a ladder used to increase agility, agility and movement speed.

The next opinion Bloomfield et.al., explains that practicing dexterity ladder will help improve various aspects of the basic movements of exercise such as improving body balance, reflex movement, muscle endurance, reaction speed and coordination between body parts [15]. Apart from the physical benefits, continuous Stunt Agility training will help improve the nervous system, stamina and leg muscle strength.

Based on scientific theories and findings of the above approaches, it appears very clear that with practice the agility ladder will certainly increase the agility of a person. Some previous research also shows the same thing. Graydon research finding ladder training led to a significant increase in agility, speed, flexibility and vital capacity [16]. Hadi et. al., found that ladder drill can improve the ability of soccer players' agility more effectively than conventional training. [17]

This research is expected to be an example for any extracurricular activities in order to be increasingly common practice especially utilizing stairs agility (agility ladder) in practice so that it can increase agility. With the increasing mobility of students is certainly imposes on growing performance of the game futsal students. Therefore, there is no harm if the coaches futsal utilizing media agility ladder as special agility exercise menu.

## 5. Conclusion

Based on the findings of the research and data analysis, this study concludes that there is an effect of agility ladder training on the agility of Bina Darma University futsal extracurricular students because the value of tcount 1.930 is greater than t table, namely 1.714. Based on scientific theory and findings in the field above, it seems very clear that practicing agility ladder will certainly improve one's agility. This research is certainly expected to be an example for any extracurricular in order to be able to practice more often, especially using agility ladder in training so that agility can increase. With the increasing agility of students it will certainly impact on the increasing performance of student futsal games.

## References

- [1] Hidayat A 2017 ABC Running Exercise in Increasing VO2 Max on Students of Football Extracurricular on Secondary High School *Proceedings of the 2nd International Conference on Sports Science, Health and Physical Education* 42-46
- [2] Suhendro 2007 *Kebugaran Jasmani* (Universitas Terbuka)
- [3] Scribbans T D, Vecsey S, Hankinson P B, Foster W S, and Gurd B J 2016 The effect of training intensity on VO2max in young healthy adults: a meta-regression and meta-analysis *International journal of exercise science* **9**(2) 230
- [4] Dallas G, Theodorou A, and Paradisis G 2019 The effect of different duration of dynamic stretching on sprint run and agility test on female gymnast *Journal of Physical Education and Sport* **19** 268-272
- [5] Van Gelder L H and Bartz S D 2011 The effect of acute stretching on agility performance *The Journal of Strength & Conditioning Research* **25**(11) 3014-3021
- [6] Larnando 2011 *Fitness Exercises* (Badung: Alfabeta)
- [7] Darst P W and Pangrazi R P 2009 *Dynamic physical education for secondary school students* (San Francisco: Pearson/Benjamin Cummings)
- [8] Reynold 2014 *Agility Ladder Skill* (Oxford: USA)
- [9] Makaje N, Ruangthai R., Arkarapanthu A and Yoopat P 2012 Physiological demands and activity profiles during futsal match play according to competitive level *Journal of sports medicine and physical fitness* **52**(4) 366
- [10] Dođramacı N S and Watsford L M 2006 A comparison of two different methods for time-motion analysis in team sports *International Journal of Performance Analysis in Sport* **6**(1) 73-83
- [11] Luxbacher 2004 *Permainan Futsal* (Bandung: Alfabeta)
- [12] Brown L and Ferrigno V 2014 *Training for Speed, Agility, and Quickness*, 3rd Edition (Human Kinetics)
- [13] Ricotti L 2011 Static and dynamic balance in young athletes *Journal of Human Sport and Exercise* **6**(4) 616-628
- [14] Pramukti T and Junaidi S 2015 Pengaruh Latihan Ladder Drill dan Latihan ABC Run terhadap Peningkatan Kecepatan Pemanjatan Jalur Speed Atlet Panjat Tebing FPTI Kota Magelang *Journal of Sport Sciences and Fitness* **4**(1)
- [15] Bloomfield J, Polman R., O'Donoghue P, and McNaughton L 2007 Effective speed and agility conditioning methodology for random intermittent dynamic type sports *Journal of Strength and Conditioning Research* **21**(4) 1093

- [16] Graydon G L 2010 Ladder Drill, Weight Training and Iron Yoga on Agility, Speed, Flexibility and Vital Capacity among College Softball Players *Journal of Strength and Conditioning Research, University of Connecticut Philadelphia* **4**
- [17] Hadi F S, Hariyanto E, and Amiq F 2016 Pengaruh Latihan Ladder Drills Terhadap Peningkatan Kelincahan Siswa U-17 Di Persatuan Sepakbola Jajag Kabupaten Banyuwangi *Jurnal Pendidikan Jasmani* **26**(1)