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The Effect of Ladder Exercises Varies on the Increase in Athlete's Foot Agility

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ABSTRACT
This research is a type of field survey research consisting of two variables, namely the independent variable and the dependent variable. This study aims to determine whether the influence of ladder training varies on increasing the skill of sepaktakraw athletes. The population and study sample were athletes who were prepared to take part in Pra-PON XX-2019. A total of 30 people were obtained through total sampling techniques. Data analysis of the athlete's foot agility. The results of this study are; 1). Ladder training varies to increase the foot agility ability of male athletes in South Sulawesi with statistical value; Sig = 0,000, smaller than the value $\alpha = 0.05$. Ladder training varies to increase the leg agility of the male athletes of Sepaktakraw Pengprov PSTI Sulawesi Selatan.

Keywords: *Sepaktakraw, ladder, foot agility*

1. INTRODUCTION

Sepaktakraw games that have been competed in the multi-event Asian Games make the level of competition even higher. Because not only countries in Southeast Asia are competing, but all countries in Asia have become participants such as Korea and Japan. The high level of competition makes the physical, technical, tactical and mental needs naturally higher. Of the several factors that are most visible and important to get the attention of coaches and coaches are physical factors. There are several types of conditions needed in sepaktakraw sports, among others; strength, speed, endurance, flexibility, power, agility, coordination, accuracy, and explosive power. Of the several physical conditions that are needed by sepaktakraw athletes, one that is much needed is the use of foot agility. Leg agility needs in sepaktakraw sports. The skills improve the ability of football techniques, holding and controlling the ball when the ball is serviced as well as when holding the ball smashed.

Each sport has basic techniques and physical needs that are different according to the characteristics of the sport, so that athletes in each sport have different needs [1],[2],[3]. It is like humans who have different needs in fulfilling their lives. Humans have different characteristics of needs. If you want to achieve high performance, of course, every player must meet their own needs, because every athlete has physical and psychological differences. The differences of each individual appear when doing exercises and matches both physical and technical. In sports activities, a person's physical needs have a very important role in order to be able to carry out optimal movement activities.

To meet the physical and technical needs of the South Sulawesi PSTI sepaktakraw athletes who are prepared to face the Pra-PON XX-2019 competition, a long training process is needed. Continuous and systematic with regard to the dose of exercise, which progressively has to increase from time to time, so that during the match, the athlete is ready to face the game patterns and characteristics of the opponent's game.

Physical training in order to improve the foot agility of the South Sulawesi PSTI sepaktakraw players preparing for the Pra-PON XX-2019 must be done well so that the agility of the athlete's foot is getting better. Foot agility training using ladder ladders has been done in many sports that require leg agility such as soccer, futsal and some sports. However, in the Sepaktakraw sport in South Sulawesi, it is still lacking.

Leg agility training using ladder ladders in the sports branch of sepaktakraw is indeed growing. Many forms of ladder training and selected in the agility training of the South Sulawesi PSTI sepaktakraw athletes. The forms are Hop Scotch, High Knee Run, Ali Shuffle, Icky Shuffle, Ford Ward In and Out, Back Ward In and Out, and Straddle Hops. Variations in the form of exercise

using a ladder have the goal of increasing the capacity of the leg muscle function and other body organs such as cardiovascular and respiration.

Trainers generally use ladder exercises to help athletes develop fast legs, body control, and kinesthetic awareness. And improve basic movement skills. Ladder drill with various variations is a form of agility training using tools that resemble steps that are placed on the floor. How to use this tool is by jumping with one foot or two feet. This exercise affects a lot of leg muscles. In order to increase agility, one of them can use a ladder tool. Ladder training has the function of training leg agility and synchronizing motion in a balanced way [4]. The ladder drills have ten or more boxes and each box is 50 x 520 cm wide with a spacing of 50 cm and then placed on the floor. An agility ladder is fitness equipment used by coaches in various sports to improve athletic agility, flexibility, coordination, and speed. The agility ladder can also be called the agility ladder. To practice improvising aspects of motion, improving balance, muscular endurance, reaction and coordination of other body parts can also use the agility ladder. Physical benefits that can be taken from exercise using the agility ladder that can improve the nervous system and related muscle groups. And if the exercise is done on an ongoing basis will increase the stamina and reaction time of athletes individually.

Based on theory and practice, as well as the results of research conducted, it turns out that the movement of the ladder drill with a variety of variations can provide good effects. One of them is increasing the agility and power of the limbs.

Ladder drill is an exercise with a variety of different foot movement patterns. Through exercise ladder placed on the ground/floor where an athlete is required to jump, move right to left quickly. Agility training equipment that helps athletes to learn a variety of different movement patterns. The ladder is a multidirectional tool to improve footwork and help to move the foot fast through complex patterns. Ladder drill training is not only for speed and agility, but can also improve aspects of balance, leg power, mobility and coordination as well as reaction speed that support increased agility.

2. RESEARCH METHODS

The method used in this research is the quasi-experimental method and using Two Group pre post-test Design. The independent variable is ladder agility training, while the dependent variable is the agility of the athlete's Sepaktakraw. The training as a research experiment was carried out for 16 meetings with a modified training dose according to the athlete's ability level. In contrast, the data of the agility of an athlete's used the agility test 5-10-5 Pro Agility Test. The number of research subjects was 30 male athletes of South Sulawesi sepaktakraw. The data obtained in this study processed and analyzed statistically descriptive and inferential (unpaired T-test) using computer analysis on the SPSS program version 21.00.

3. RESULTS AND DISCUSSION

The pre-test data and the post-test of the athlete's foot agility ability were processed with descriptive statistics as a condition for conducting an infra-analysis. The result is described in table 1.

Table 1. Analysis results of the Pre-Test and Post-Test Normality Data Test group for ladder exercises

Variable	Kolmogorov-Smirnov	α	Description
Ladder Varied Exercise Grup (Pre test)	0.205	0.05	Normal
Ladder Varied Exercise Grup (Post-test)	0.205	0,05	Normal

The Kolmogorov-Smirnov statistical value is 0.205 or greater than the value $\alpha = 0.05$. It can be concluded that the ladder exercise group data variations are categorized as the normal distribution. The same condition for statistical value of post test data. Furthermore, the statistical value of foot agility data also described on table 2.

Table 2. Results of a descriptive analysis of the pre-test and post-test foot agility data of a male athlete

Variable	Min	Max	Mean	SD	Variant
Ladder Varied Exercise Group Men's Athletes (Pre Test)	7.40	9.50	8.5367	72665	0.528
Laddae Varied Exercise Group Men's Athletes (Post Test)	7.00	9.00	7.8400	68848	0.474

Table 2 shows the difference value of pre-test and post test based on the deviation standard and value of variant. The minimum value of pre test is 7.40 and after the implementation of exercise, the minimum value is 7.00. While the minimum value in the pre-test is 9.50 and post-test resulted in 9.00. The average value in pre-test is

8.5367, and post-test data has a value 7.8400. However, these values cannot be used as a conclusion in this study because they must be followed by statistical analysis to answer the hypotheses or weak statements in this research. After a descriptive analysis was made as a test of the terms of the infra-analysis, then an inferential analysis was carried out on the agility data of athlete's. The result of the analysis was described in table 3.

Table 3. Results of the infra-analysis analysis of foot pre-test and post-test foot agility data

Variable	Mean	Sd	df	Sig (2-tailed)
Ladder Exercise training varies, Men's Group	.69667	.27546	14	0.000

Based on the results of the infinite data analysis of foot agility, it can be explained that; the average value = 0.69667, the value of Standard deviation (S.D.) = 0.27546 and the value of Sig (2-tailed) = 0.000, smaller than the value α 0.05. Then it can be explained that the application of various forms of ladder training for male athletes has an effect on increasing the agility of the legs of male athletes in South Sulawesi.

Based on the first hypothesis raised in this study that ladder training varies influential in increasing the agility of the feet of male athletes. The significance value are a Sig = 0,000 value smaller than the value α 0.05. This means that the hypothesis is accepted. The effect that occurs after doing these varied ladder exercises is a change or increase in the ability of the muscular work system (musculoskeletal). Then the increase in cardiovascular system work, respiration, nervous system, enzymes and anaerobic energy metabolism.

Foot agility is a fast muscle movement with high intensity that requires fast energy without using oxygen. There are two main divisions of muscles, namely the first type of muscle with high oxidative ability. However, this oxidative muscle fiber has the characteristics of slow-motion is the muscle fiber that primarily uses aerobic respiration to produce ATP. This muscle fiber has a lot of myoglobin, mitochondria and blood capillaries. ATPases in the myosin head carry out ATP hydrolysis relatively slowly compared to other types. The contraction cycle also occurs more slowly. The advantage of this muscle fiber is its good endurance so it does not get tired easily when used for a prolonged period of time. The second type of muscle fiber is skeletal muscle fiber can be distinguished based on the speed of contraction and relaxation. Variations in metabolic reactions that are used to produce energy in the form of ATP. The type of fibers that have speed in energy metabolism are muscle fibers with fast glycolytic or anaerobic glycolysis. But this muscle also has a high glycogen content so that it can produce anaerobic glycolysis ATP. The speed of ATP hydrolysis from ATPases on the myosin head reaches three to five times faster than slow oxidative fibers. That way, the speed of contraction is even faster. This muscle plays a role in activities such as walking and sprinting. Anaerobic glycolysis is a series of chemical reactions that produce energy without involving oxygen in their chemical reactions. Anaerobic glycolysis releases energy from glycogen molecules. The energy produced is used to reshape ADP and Pi into ATP, and muscles can use the energy produced from this ATP to [5].

From the discussion above, it can be concluded temporarily that varied ladder exercises are a form of exercise aimed at increasing leg agility. But before agility is formed, the first one that develops or grows is speed. Ladder training varies with the character of the movement is fast so that the ladder exercise is categorized as an exercise using the ATP-Pc energy system and Anaerobic Glycolysis. Murray explains that anaerobic glycolysis also has a disadvantage, which results in a final product in the form of lactic acid, which is very detrimental because it can cause muscle fatigue [6].

4. CONCLUSION

The ladder training varies increase the foot agility of male athletes of Sepak takraw in South Sulawesi. The descriptive analysis show that there is an increase in the average value of pre test and post-test. The results of the statistical analysis also show that the sig value of 0.000 <0.005 indicates that training activity can affect the increase in foot agility of sepaktakraw athletes. The researchers suggest to the coachs to use varied forms of ladder training to improve the athlete's foot agility.

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