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THE EFFECT OF PLYOMETRIC TRAINING UP AND DOWNSTAIRS AND OBSTACLE JUMPING ON THE IMPROVEMENT OF SQUAT STYLE LONG JUMP RESULTS FOR MALE PARTICIPANTS IN THE DKI JAKARTA ATHLETIC CLUB

Mohammd Fathan Mubina[1], Moch. Asmawi[1], Heny Widyaningsih[1]

[1] Physical Education, Univeristas Negeri Jakarta, Jl. Rawamangun Muka, RT.11/RW.14, Rawamangun, Pulo Gadung, Kota Jakarta Timur, Daerah Khusus Ibukota Jakarta 13220

Correspondiing author. Email : mohammdfathanmubina_9903820001@mhs.unj.ac.id

Abstract: The objectives of this study were 1) To improve the hurdle jumping training on the long jump results of the squat style in the male participants of the DKI Jakarta club. 2) Increasing the plyometric training up and downstairs to the results of the squat-style long jump in the male participants of the DKI Jakarta club. 3) This is more influential between the plyometric training of hurdle jumping and plyometric training up and downstairs to improve the squat style long jump results for male participants in the DKI Jakarta club. The method to be used is an experimental method, namely the research design using "(Pre-Test and Post Test Two Group Design (pretest-posttest randomized group design)", namely to determine the independent and dependent variables (Ronny, 2007: 138). The initial and final tests using the hurdle jump obtained an average deviation of MD = 0.26 standard deviation SD = 0.07 and the standard error mean SEMD = 0.03 these results produce at-table at degrees of freedom (DK) = 5-1 = 4 with a significant level 5% obtained the critical value of t-table = 2.776 with these results, then H0 is rejected because t-count = 7.63 which means that t-count ≥ t-table then H0 is rejected and Ha is accepted, where the hypothesis is Ha = there is an increase in obstacle jump training to the long jump results squat style on club athletes in DKI Jakarta.

Key Words*:* - Plyometric Step Up Down, Obstacle Jump, Long Jump.

INTRODUCTION

Athletics comes from the Greek Athlon or Athlu which means a race, match, struggle or struggle, people who do it are called Atleta (athletes). Athletics is a physical activity consisting of dynamic and harmonious movements such as walking, running, jumping, and throwing. Humanity has carried out athletic competitions since ancient times to the present Olympics. In every achievement comparison, there are always winners and losers, and any competition for achievement will lead to success or failure. To achieve maximum performance, all jumpers, both long jumpers, double jumpers, high jumpers, and pole high jumpers, must try to improve their jumping skills. The ability to be able to jump with the strongest leg in a long-jump is influenced by many factors, but many achievements are also achieved by teaching proper jumping techniques. The long-jump is basically divided into three stages, namely the prefix run, repulsion and hovering, and landing. In the long jump, the athlete tries to run and refuse forward with a distance stomping his strongest foot right on the repulsion board as hard as possible to float in the air and then land in the sandbox. The success of a person to make a leap is influenced by many factors, both internal and external factors. Internal factors include running speed, strength when resisting, body posture in the air, and landing, while external factors are wind speed and gravity and the field conditions themselves. The factors in the long jump technique require coordination of movements, in his book Dadang Masnun states that: A movement will be successful if each different skill number can be combined with the nature and ability of kinesiology (Dadang, 2001: 6).

A long jump is a movement of jumping forward up in an effort to carry the weight point as long as possible in the air (hovering in the air) which is done quickly and by repulsing one leg to reach the greatest distance. To form long jump athletes with maximum performance is not easy, it requires a long series of achievement-building processes. This is because the achievements of the sport depend on many factors. The factors that influence a jumper to achieve include physical ability, technique, psychological tactics, and theory preparation. All of these components must be fulfilled for a long jumper, because it is a condition for the jumper to achieve, in this case, the researcher will specialize in the jump number, namely the long jump. The achievements of a jumper can be seen from the records of the jump distance achieved from the results of the jump. In fact, the strength of the leg while resting on the repulsion board is a determining factor in the distance of the jump. The basic asset for a jumper is leg strength, in addition, the speed of running also greatly affects the result of the jump. Apart from a form of training to train leg strength, jumping over obstacles is one form of training that is appropriate for beginners and advanced/advanced athletes, giving these exercises can contribute more to increasing the ability to jump.

The correct technique can help make your jump. Many training methods can be used to improve your jumping ability and leg muscle strength. One of the efficient methods to increase leg muscle strength is by jumping using obstacles. This exercise aims to improve and improve a good condition, namely gaining the power of jumping. Like plyometric training up and downstairs, hurdle jumping is a method that works to increase leg strength, because there are obstacles in the form of stairs of a predetermined size, so using this exercise the athlete will be challenged by these obstacles. Based on the description above, the researcher wanted to know the effect of plyometric training up and downstairs and obstacle jumping on the improvement of squat-style long jump results for male

participants in the DKI Jakarta Athletic Club.

METHODS

The method to be used is an experimental method, namely the research design using "(Pre-Test and Post Test Two Group Design

(pretest-posttest randomized group design)" which is to determine the independent and dependent variables (Ronny, 2007: 138). The independent variable is the plyometric method of hurdle jumping and plyometric training up and downstairs, while the dependent variable is the result of the long jump squatting style of the male participants in the DKI Jakarta club.

Participants

The population is a comprehensive collection of an object which is the researcher's concern (Walpole, 1992: 33). The population that the researchers used was 15 male athletic participants at the DKI Jakarta club. The sample is part of the population (Walpole, R.E). If the researchers use all the athletic clubs in DKI Jakarta, then the 15 athletic participants of the DKI Jakarta club are the samples. Of the 15 athletic participants of the DKI Jakarta club, 10 male participants were taken using the purposive sampling technique

Procedure /Instruments

In this study, the instrument used was the preliminary test with a long jump with a squat style. In order to obtain initial data in the form of value or quality of the jump results from each participant, after obtaining the results of the squat style long jump test, besides the results of the long jump, the squatting style also obtained the jump results of each participant which will later be made training programs and given treatment in the form of training for all samples for 2 months, with the hope that the long jump results will increase. According to M. Sajoto (1995; 35), the frequency of training per week, the program from De Lorme and Watkin is 4 times per week, but today's coaches generally agree to run an exercise program 3 times a week, so that chronic fatigue does not occur. The length of exercise required is 6 weeks or more

Data collection and analysis

Introduction. Conducting identity data collection on research subjects then validating the stopwatch to ensure that the time measuring device is really valid when the results are displayed when data collection.

Retrieval of initial data (pre-test) and final data (post-test), at the initial data collection stage and the final data using the squat style long jump test

Implementation of the study, after all the initial data (pre-test) of each subject, was known, then the subjects would be given treatment (treatment) of obstacle jumping exercises and up and downstairs.

Statistical analysis

The data analysis technique in this study is to use the t-test statistical technique. The research hypothesis testing was carried out by comparing the t-count value with the t-table value, between the null hypothesis (Ho) and the experimental hypothesis (H1).

RESULTS

The initial test data for Obstacle Jumping Exercise obtained the lowest score of 4.83 and the highest score of 5.82 with an average of 5.20. The final test data for Obstacle Jump Exercise obtained the lowest score of 5.13 and the highest score of 6.10 with an average of 5.46 In the pre-test and final test in the Obstacle Jump Exercise group, the standard deviation data obtained were SX2 = 0.07 and the standard of error mean SEMX2 = 0.03 can be described in the table the frequency distribution of the initial and final tests and can also be described in the histogram graph, below:

Table 1.
The Obstacle Jump Preliminary Test

No.	Interval Class	The midpoint	Frekuensi	
			absolut	Relatives
1	4.78 – 5.13	4.95	2	40%
2	5.18 – 5.48	5.33	2	40%
3	5.53 – 5.98	5.75	1	20%
Total			5	100%

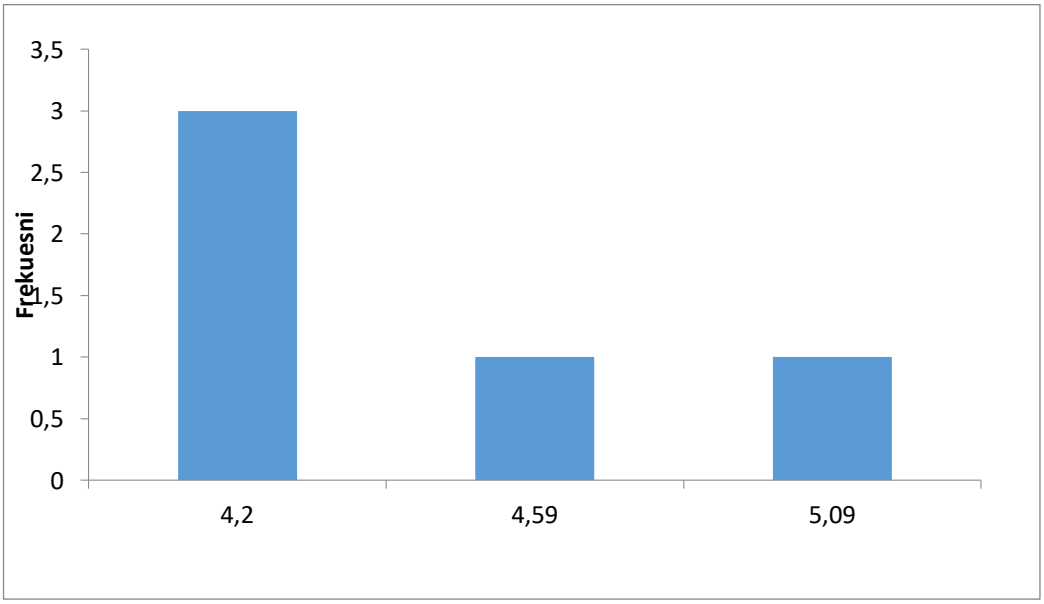

Figure 1. Obstacle Jump Preliminary Test

Table 2. Obstacle Jump Final Test

No	Interval Class	The midpoint	Frekuensi	
			absolut	Relatives
1	5.08-5.43	5.25	3	60%
2	5.48-5.75	5.63	1	20%
3	5.84-6.19	6.01	1	20%
Total			5	100%

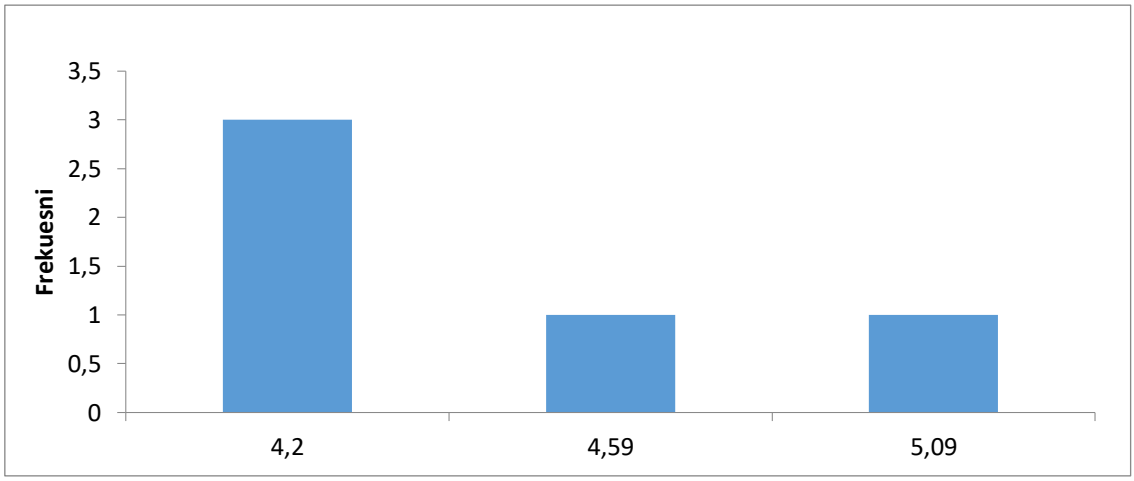

Figure 2. Obstacle Jump Final Test

Table 3. Initial Test Descend Up the ladder

No	Interval Class	The midpoint	Frekuensi	
			absolut	Relatives
1	3.96 – 4.44	4.19	3	40%
2	4.49 – 4.84	4.66	1	40%
3	4.89 – 5.84	5.36	1	20%
Total			5	100%

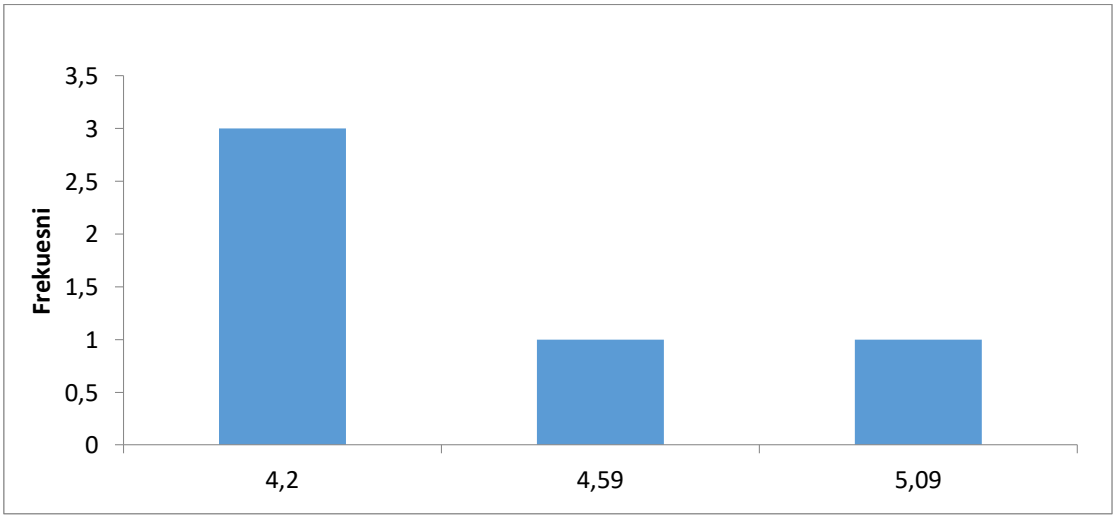

Figure 3. The Preliminary Test of Climbing Up the Stairs

Table 4. Final Test Climbing Up the Stairs

No	Interval Class	The midpoint	Frekuensi	
			absolut	Relatives
1	4.17-4.79	4.48	3	60%
2	4.84-5.22	5.03	1	20%
3	527-6.04	5.65	1	20%
Total			5	100%

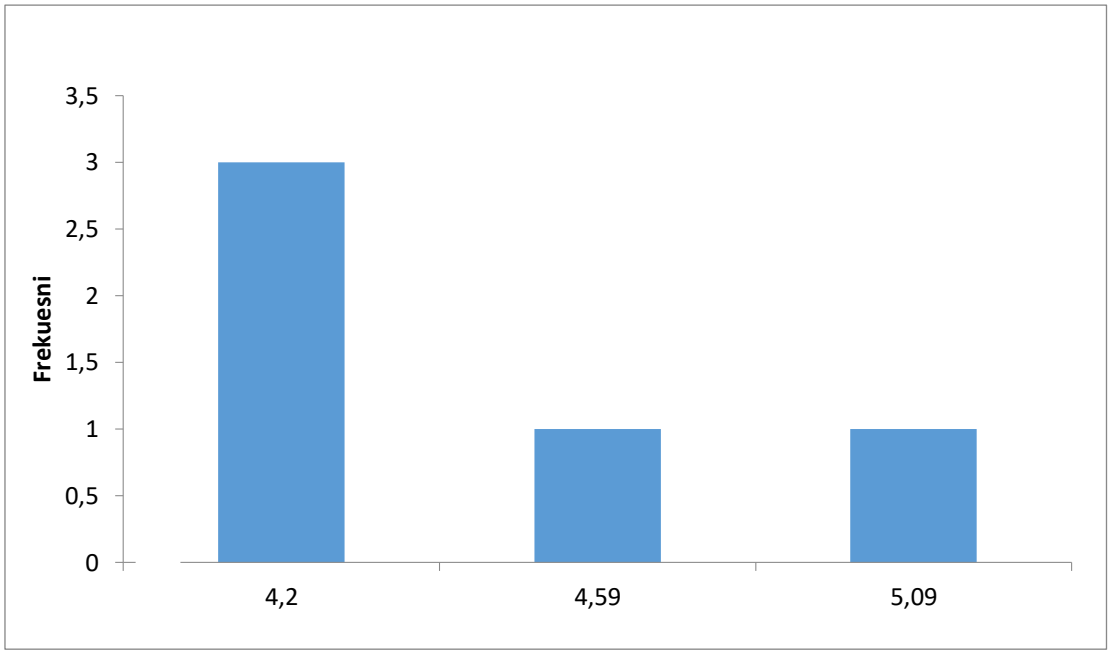

Figure 4. Final Test Climbing Up the Stairs

Discussion

Preliminary Test Results and Obstacle Jump Final Tests

The results of the analysis of the initial test and the final test using the hurdle jump obtained an average deviation of MD = 0.26 standard deviation SD = 0.07 and the mean standard error of the mean SEMD = 0.03 these results produce t table at degrees of freedom (DK) = 5-1 = 4 with the degree of significant 5% obtained critical value t table = 2.776 with these results, then H0 is rejected because t-count = 7.63 which means t-count ≥ t table then H0 is rejected and Ha is accepted, where the hypothesis is Ha = there is an increase in hurdle jumping training to the long jump squatting results in club athletes. DKI Jakarta. From the calculation results, it can be concluded that the research hypothesis (Ha) is accepted. It proves statistically that there is an increase in hurdle jumping training on the squat-style long jump results of DKI club athletes. the process of implementing long jump exercises using a crossbar is installed in

stages starting from a low height of 25 cm and increasing according to body height. In the long jump training method, the squat style uses a crossbar obstacle, in addition to aiming to stimulate athletes to jump higher, the ruler also functions as a determinant of the height that must be jumped when floating in the air.

The downside of this method is that the athlete will be seized with fear. However, it is known that the method of using the crossbar obstacle can be obtained several advantages, including that the athlete can jump higher so that it will slow down when hovering in the air. In addition, with a crossbar that must be jumped, when it is over the bar at that time, it is most appropriate to form a squatting attitude in the air. With these advantages, the crossbar obstacle training method will make it easier for the athlete to master the squat style and thus will enable the athlete to perform better. Visually, we can see jumping with crossbar obstacles. In the hurdle jumping exercise, it has an effect on increasing leg power (Nur, 2019). In addition to jumping hurdles, such as hurdling, it also affects the increase in leg muscle power of an athlete. (Shodiq and Sugihartono, 2019).

Preliminary Test Results And Final Test Plyometric Exercises Up And Down Stairs.

The results of the analysis of the preliminary and final tests using the Up and Down Stair Plyometric Exercise, the average deviation of MD = 0.14 standard deviation SD = 0.06 and the standard error of mean SEMD = 0.03 results in ttable at degrees of freedom (dk) = 5-1 = 4 with a significant level of 5% obtained a critical value of t table = 2.776. With these results, H0 is rejected because tcount = 4.50 means thiutng ≥ t table, then H0 is rejected and Ha is accepted, where the hypothesis is: Ha = increased exercise by climbing stairs to the long jump squat style results in club athletes in DKI Jakarta. From the calculation results, it can be concluded that the research hypothesis (Ha) is accepted. Proving the statistical increase in the increase in exercise by climbing stairs on the long jump results of squatting styles in DKI Jakarta club athletes.

Exercises up and downstairs is an exercise method to train leg muscle strength. Exercise up and downstairs is a form of exercise method to develop the physical condition with the main target is leg power. Exercise up and downstairs is one of the plyometric exercises, which according to Chu (2000: 4), explains that plyometric is a training method that focuses on movements at high speed.

Meanwhile, Summit argues that plyometrics are specific exercises to improve jumping ability equipped with stretching exercises and shorten muscle contraction, this elastic force is then reused to shorten the activity of muscles that become stronger. It can be concluded that the "Up and Down Ladder" Exercise is a method of power training with the characteristics of using very strong and fast muscle contractions in order to improve your jumping ability.

Exercise "Up and Down Ladder" is very necessary in the long jump, that is, if you have good leg power, it is expected to be able to jump well during repulsion. How to do the "Up and Down Ladder" exercise, where both legs are used to jump up and down the stairs and immediately land back on the ground. Exercises using both legs further reduce the load being held, but to increase the intensity, jump on one leg. Repetitive jumping "Up and down the stairs" is a

very useful exercise for athletics, especially long jump.

Exercise up and downstairs is very necessary in the long jump sport, that is, if you have good leg power, it is hoped that you can jump properly when doing techniques that require jumping, for example when taking off on a pedestal, climbing and climbing stairs has an effect on increasing leg power (Kartikasari , 2017). (Fadli, 2017). (Sudarsana, et al, 2019)

CONCLUSIONS

Based on the problems raised and supported by a description of the theory and framework of thinking as well as data analysis, these results can be concluded that:

1. There was an increase in squat-style long jump results after being given hurdles jumping plyometric training to the male participants of the DKI Jakarta Athletics Club.
2. There was an increase in the results of long jump squatting after being given plyometric training up and downstairs to the male participants of the DKI Jakarta Athletics Club.
3. The plyometric training of hurdle jumping is more influential than the plyometric exercise up and downstairs to improve the squat-style long jump results for the male participants of the DKI Jakarta Athletic Club.

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