Analisis Komponen Fisik Terhadap Kemampuan Lompat Jauh Mahasiswa FIKK UNM Makassar

Analysis Of Physical Components On The Long Jump Abilities Of FIKK UNM Makassar Students

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Abstract. This research aims to prove: 1) The relationship between running speed and long jump ability, 2) The relationship between leg muscle explosive power and long jump ability, 3) The relationship between leg muscle strength and long jump ability 4) The relationship between running speed, leg muscle explosive power and strength. leg muscles on long jump ability. The research method used is a quantitative research method and this type of research is correlational research involving 3 independent variables, namely running speed, leg muscle explosive power and leg muscle strength, while the dependent variable is long jump ability. The population in this study were FIKK UNM Makassar students, with a sample of 30 people taken using simple random sampling. The data analysis technique used is the correlation coefficient. The results of the research conducted show that: 1) There is a significant relationship between running speed and long jump ability with a value of $r = 0.463$ ($p<\alpha0.05$). 2) There is a significant relationship between leg muscle explosive power and long jump ability with a value of $r = 0.535$ ($p<\alpha0.05$). 3) There is a significant relationship between leg muscle strength and long jump ability with a value of $r = 0.599$ ($p<\alpha0.05$). 4) There is a significant relationship between running speed, leg muscle explosive power and leg muscle strength together with the long jump of 61.10% with a value of $R = 0.611$ ($p<\alpha0.05$).

Keywords: Running Speed, Leg Muscle Explosive Power, Leg Muscle Strength and Long Jump Ability.

1 Introduction

Athletics is a physical activity consisting of dynamic and harmonious movements, namely walking, running, jumping and throwing. If we look at the meaning or term "athletics", it comes from the Greek word Athlon or Athlim which means "race or competition". Athletics is a sport involving running, jumping, walking and throwing (Budianto, 2012). Apart from Greek, athletics can also be found in various forms, including; in English Athletic, in French

Ateletique, in Dutch Atletiek and in German Athetik. Athletic sports were first popularized by the Greeks around the 6th century BC. People who contributed to popularization were Iccus and Herodicus (Fahri, 2019).

Athletics is the oldest sport and is also the parent or mother of all sports. Because the movements in athletics are the basis of sports, such as walking, jumping and throwing, these have all been carried out in other sports activities and even in everyday life. Because it has various elements, athletics is said to be the mother of all sports (Fananlampir, 2015). Various types of athletic sports, such as long jump. The long jump is a form of jumping movement that begins with a horizontal movement and is changed to a vertical movement by pushing off the strongest leg to get as far as possible.

The goal of the long jump is to jump as far as possible by moving the whole body from one point to another. As stated above, to get maximum results, the elements that support the long jump ability are built based on a pattern. The method of implementing the long jump is divided into several styles. Like a squat style (Halim, 2011).

When implementing the squat style long jump, there are several things that must be considered, namely the start, as the start is done with a distance to the board (support). The fulcrum is a place to coordinate the speed and rhythm of steps, then continue with the body's floating posture in the air to achieve the maximum jumping distance by landing perfectly. The implementation of the four things mentioned above cannot be separated, because to produce long jumps which are greatly influenced by running speed and balance when running long and fast distances, initial running speed when resting, therefore, is one of the efforts required This is done to improve the ability to jump long jump squat style, namely by physical training or training physical condition. The elements of physical ability referred to as points of attention in this research are running speed, leg muscle explosive power and leg muscle strength.

Based on the results of observations when practicing the squat style long jump, there were still some students who did not master the long jump technique, for example, when doing the push-off, there were still many students who did not do the push-off correctly from the support board. Jump results are less than optimal. For this reason, researchers are interested in taking the research title "The Relationship between Running Speed, Explosive Power of Leg Muscles and Leg Muscle Strength on the Long Jump Ability of FIKK UNM Makassar Students".

2 Method

This research is a quantitative descriptive study which aims to see how physical factors relate to long jump. Method is defined as the study of the basic principles of inquiry which often involves problems of logic, classification and basic assumptions.

1. Research Place

This research will be carried out at the FIKK long jump field, Makassar State University.

2. Research Variables

The research variables used in this research include:

a.Free variable

1) Running Speed

2) Explosive Power of Leg Muscles

3) Leg Muscle Strength

b. Dependent variable:

Long Jump

Population

According to Sugiyono (2017:80) population is an analysis area consisting of objects that have certain qualities and characteristics obtained by research to be studied and then conclusions drawn from the research of all FIKK UNM Makassar students.

Sample

Sample measurement is a step to determine the size of the sample to be taken in carrying out a research. The sample must be able to describe the actual situation. According to Sugiyono (2017:81) the sample is part of the number and characteristics of the population. Samples were taken without paying attention to the levels in the population, each element of the population has the same opportunity and is known to have part of the sample object to be studied as many as 30 male FIKK UNM Makassar students.

Data Analysis Techniques

After all the data has been collected, the next step is to analyze the data. Conclusions can be drawn in this research using statistical analysis with the help of the SPSS Version 25 computer program to find out whether there is a significant relationship between the independent variable and the dependent variable. The relationship between running speed, leg muscle explosive power and leg muscle strength. on Long Jump Ability Squat Style.

3 Result

Data from tests on running speed, leg muscle explosive power and leg muscle strength together with the long jump obtained in the research were analyzed using descriptive statistical techniques.

Table 1. Summary of results of descriptive analysis of data

Statistik	running speed (X1)	leg muscle explosive power (X2)	leg muscle strength (X3)	Long Jump Ability (Y)
N	30	30	30	30
Mean	5.7803	2.245	39.47	3.571
Median	0,13437	0,0528	1.024	0,0901
Mode	6.0750	2.345	38.00	3.360
Std. Deviation	0,73600	0,2896	5.606	0,4935
Variance	0,542	0,084	31.430	0,244
Range	2.58	1.73	20	1.70

Minimum	4.10	1.05	30	3.10
Maximum	6.68	2.78	50	4.80
Sum	173.41	67.37	1184	107.15

Data Normality Test

1. The running speed variable (X1) in the table above shows that the data is in a normal distribution, because (P) is greater than 0.05 (significant level), namely KS-Z = 1.053 (P = 0.417> 0.05).

2. The leg muscle explosive power variable (X2) in the table above shows that the data is in a normal distribution, because (P) is greater than 0.05 (significant level), namely KS-Z = 1.262 (P = 0.583 > 0.05).

3. The leg muscle strength variable (X3) in the table above shows that the data is in a normal distribution, because (P) is greater than 0.05 (significant level), namely KS-Z = 0.931 (P = 0.451 > 0.05) .

4. The squat long jump ability variable (Y) in the table above shows that the data is in a normal distribution, because (P) is greater than 0.05 (significant level), namely KS-Z = 1.229 (P = 0.697 > 0, 05).

Correlation Analysis

After carrying out data normality tests on the hypothesis to be tested, the hypothesis is tested to prove its correctness.

Table 2. Correlation test results of running speed on long jump ability

Correlation	N	r	P_{value}	Description
X_1. Y	30	0,463	0,000	Significant

Based on the results of correlational analysis testing of arm balance data on squatting long jump ability, a correlation value (r) = 0.463 was obtained with a probability level of (0.000), less than α 0.05. So H0 is rejected and H1 is accepted or the correlation coefficient is significant, or the balance of long jump ability is significantly related to squatting long jump ability. So it can be concluded that there is a significant relationship between running speed.

Table 3. Correlation test results of leg muscle explosive power on long jump ability

Correlation	N	r	P_{value}	Description
X_2. Y	30	0,535	0,000	Significant

Based on the results of correlational analysis testing of tugkai muscle strength data on squatting long jump ability. So we get a correlation value (r) = 0.535 with a probability level of (0.000), less than α 0.05. So H0 is rejected and H1 is accepted or the correlation coefficient is significant, or leg muscle explosive power is significantly related to squatting long jump ability.

So it can be concluded that there is a significant relationship between the explosive power of leg muscles and the ability to squat long jump in athletic games.

Table 4. Correlation test results of leg muscle strength on long jump ability

Correlation	N	r	P_{value}	Description
$X_3. Y$	30	0,599	0,000	Significant

Based on the results of correlational analysis testing of leg muscle strength data. So we get a correlation value (r) = 0.599 with a probability level of (0.000), less than α 0.05. So H0 is rejected and H1 is accepted or the correlation coefficient is significant, or running speed is significantly related to squatting long jump ability. So it can be concluded that there is a significant relationship between leg muscle strength.

Table 5. Correlation test results of running speed, leg muscle explosive power, and leg muscle strength on long jump ability

Correlation	N	R	R^2	P_{value}	Description
$X_1.X_2. X_3. Y$	30	0,611	0,373	0,000	Significant

Based on the results of multiple regression analysis testing data between running speed, explosive power of the leg muscles, and leg muscle strength on long jump ability in the squat style. So the regression value (R) = 0.611 is obtained with a probability level (0.000) smaller than α 0.05 for a value of R2 (determinant coefficient) = 0.373 R3. This means 85.5% of the long jump ability of the squat style with running speed, leg muscle explosive power and leg muscle strength. For the remainder (100% - 85.5% = 10.5% influenced by other factors. So H0 is rejected and H1 is accepted or the correlation coefficient is significant, or running speed, explosive muscle power, and leg muscle strength are really significantly related to ability. squat style long jump. So it can be concluded that there is a significant relationship between running speed, leg muscle strength, and leg muscle strength on squatting long jump ability.

4 Discussion

1. There is a relationship between running speed and long jump ability

Speed is the ability to carry out similar movements consecutively in a short time, or the ability to cover a distance in the shortest possible time.

Based on the understanding above, running speed in the long jump squatting ability has an influence and advantage in performing the long jump squatting style, the role of running speed in the long jumping squatting style is to increase the distance of a person's jump when landing.

So it can be concluded that running speed can influence the ability to squat long jump in athletic games, the better a person's running speed, the farther the jump they produce. What has been produced in this research shows that there is a significant relationship between running speed and long jump ability in Makassar.

Based on the calculation results, the correlation coefficient (r) = 0.463 with a probability level of (0.000) less than (α=0.05), then H0 is rejected and H1 is accepted or the correlation coefficient is significant, or the running speed contracts significantly, or the speed contracts significantly. significant impact on squatting long jump ability in athletics

2. There is a relationship between leg muscle explosive power and long jump force ability

Power or explosive power is also called explosive power. Power concerns the strength and speed of dynamic and explosive muscle contractions and involves the maximum expenditure of muscle force in the shortest possible time. Power is the product of force (force) and distance (distance) divided by time (time) or power can also be expressed as work divided by time. Thus, tests that aim to measure power should involve force, distance and time components Fenanlampir and Muh Faruq, (2015:140).

Leg muscle explosive power is an important component in jumping. The stronger the explosive power of the leg muscles, the greater the power produced in making a jump. And of course, with greater power the results of the jump will be stronger. The results of this study show that there is a significant relationship between leg muscle explosive power and long jump ability

Based on the calculation results, the correlation coefficient (r) = 0.535 with a probability level of (0.000) less than (α=0.05), then H0 is rejected and H1 is accepted or the correlation coefficient is significant, or the explosive power of the leg muscles contracts significantly, or the power Explosive leg muscles contract significantly on the ability to squat long jump in athletics.

3. There is a relationship between leg muscle strength and the ability to squat long jump.

According to Albertus Fenanlampir and Faruq, (2015:119). The strength of muscle contraction achieved in the maximum effort exerted by a group of muscles to overcome an obstacle is strength. Due to the driving force and prevention of sunburn, strength is a very important element in sports activities and also plays an important role in other physical components, such as strength and agility versus speed. Thus the main factors for optimal performance are strength,

Leg muscle strength is an important component in jumping. The better the leg muscle strength, the better and more perfect the results of the long jump in the squat style. The results of this research show that there is a significant relationship between the strength of the leg muscles and the long jump ability in the squat style.

Based on the calculation results, the correlation coefficient (r) = 0.599 with a probability level of (0.000) less than (α=0.05), then H0 is rejected and H1 is accepted or the correlation coefficient is significant, or the leg muscle strength contracts significantly, or muscle strength The legs contract significantly on the long jump ability of the squat style in athletic games. So these findings prove that in performing the long jump ability in the squat style, the strength of the muscles is one of the supporting factors in carrying out the jump.

4. There is a relationship between running speed, leg muscle explosive power, and leg muscle strength on long jump ability

The fourth hypothesis, H0, was rejected and H1 was accepted. The results of testing the fourth hypothesis showed that there was a significant relationship between running speed (X1), leg muscle explosive power (X2) and leg muscle explosive power (X3) on squatting long

jump ability (Y). Based on the calculation results, the correlation coefficient (r) = 0.895. Explained through the regression equation $\check{Y} = 1.911 + 0.579 X1 + 0.452 X2 + 0.554$

It is known that the results of hypothesis testing in this study show that "there is a significant relationship between running speed, explosive power, and leg muscle strength together on long jump ability in athletic games.

Based on the results of this research, it was found that there was a relationship between running speed, leg muscle explosive power, and leg muscle strength on long jump ability in athletic games. This is because to achieve good squatting long jump results requires running speed, explosive power in the muscles used, and leg muscle strength as a driving force so that the jump results are stronger and maximum. By having running speed, leg muscle explosive power, and leg muscle strength and good jumping ability, together they make a positive contribution to success in performing the long jump. Based on the results of the data analysis above, the variables of running speed, leg muscle strength, and leg muscle strength together can provide a positive contribution of 89.5% to success in performing a squat long jump in athletic games.

Based on the results of research on the variables of running speed, leg muscle explosive power, and leg muscle strength on long jump ability, it can be concluded that there is a relationship between running speed, leg muscle explosive power, and leg muscle strength on squatting long jump ability in athletic games.

5 Conclusion

Based on the results of data analysis and discussion, the research conclusions are stated as follows:

1. There is a significant relationship between running speed and the long jump ability of FIKK UNM Makassar students.

2. There is a significant relationship between leg muscle explosive power and the squatting style long jump ability of FIKK UNM Makassar students.

3. There is a significant relationship between leg muscle strength and the squatting style long jump ability of FIKK UNM Makassar students.

4. There is a significant relationship between running speed, leg muscle explosive power, and leg muscle strength on the squat style long jump ability of FIKK UNM Makassar students.

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