The Contribution of Leg Muscle Explosive Power and Strength to Long Jump Ability in USK Physical Education Students Class of 2022

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Abstract
This study is entitled "The Contribution of Limb Muscle Explosive Power, Balance to Jumping Ability in Class XI Students of SMA Negeri 9 Banda Aceh Academic Year 2012/2013". Jumping is one of the athletic numbers whose achievement is influenced by components of physical condition such as Limb Muscle Explosive Power, Balance. This study aims to determine the contribution of Limb Muscle Explosive Power, Balance to jumping ability in grade XI students of SMA Negeri 9 Banda Aceh Academic Year 2012/2013 using purposive sampling techniques. The instruments used in this study were: (1) leg muscle explosive power, measured by standing broad jump test, (2) balance, measured using stork stand test, and (3) jumping ability measured by jumping test. Data is processed using statistical techniques in the form of calculation of mean value, standard deviation (SD) and correlational test. The results obtained were as follows: (1) there was a positive and significant relationship between the explosive power of the leg muscles and the ability to jump infection by \( r = 0.49 \), (2) there was a positive and significant relationship between balance on the ability to jump infection by \( r = 0.54 \) and (3) there was a positive and significant relationship between the explosive power of the leg muscles and balance on the ability to jump infection by \( R_{(Y \cdot X_1 \cdot X_2)} = 0.61 \). The results of hypothesis testing show that \( F_{\text{calculate}} = 6.52 \geq F_{\text{table}} = 3.44 \). Therefore, the explosive power of the limb muscles and balance have a significant contribution to the ability to jump infections.

Keywords: Limb Muscle Explosive Power, Balance and Jumping Ability

INTRODUCTION
Strength is the basic capital that needs to be fostered and improved. According to Nossek (1982: 126) "If a form of training is given to athletes, especially those trained are beginner athletes,
then it must be considered the basic abilities of the athlete, especially muscle strength". However, other elements of physical condition should not be ignored either. This is in accordance with what Harsono (1988: 1999) stated, namely: "Is strength alone enough for athletes to improve their performance? The answer is clearly not yet. Therefore, people who have strength or strong muscles, may not necessarily be able to perform high, if the person is not also supported by fast muscles". Especially for beginner athletes, to increase muscle explosive power can be done weight training both outside loads and by using weights from their own body.

Exercises to increase muscle explosive power and strength, will affect muscle hypertrophy. According to Sudarno (1991: 45) that: "Strong muscles have great explosive power, whereas large explosive power almost certainly has great strength value as well". Explosive power is generally needed in activities that require a short time and require rapid and strong muscle contractions in explosive power automatically there is strength and speed, because explosive power is a combination of strength and speed. In jumping numbers, especially jumping infections, the strength of muscle contraction must be maximal and so is the explosive power of the muscle, so that maximum speed and strength are obtained for muscle explosive power during takeoff.

So the long jump number must have these two components, namely the explosive power of the leg muscles and strength. Therefore, in the long jump must have good muscle explosive ability and strength. Thus it will affect the jump on the long jump number. Therefore, based on these problems, it is necessary to study how much the contribution of leg muscle explosive power and strength to the ability to jump long. In addition, schools or coaching places also help in supporting the career and achievements of these athletes. As well as in the department of penjaskesrek, Unsyiah is a popular sports department in Aceh, especially those with sports coaching. And the Unsyiah Physical Education Department has also produced or created many athletes who perform well at the Regional, National, and International levels. Therefore, the Unsyiah Physical Education Department became the destination for the research that I researched.

METHOD

In accordance with the problems posed, this research is a type of descriptive research, namely: a study that seeks to describe events and events and symptoms (phenomena) that exist in the present. This is in accordance with the opinion, Arikunto (1991: 63), that: "Descriptive research is the study of problems in society and certain situations including activities, attitudes, views and processes that take place as well as certain influences" or a review of the abilities possessed by individuals. In this case Arikunto, (1991: 21) stated, that: "Correlation research is research that has individuals who vary in terms of what they want to study as research subjects, then calculated to know the correlation". To be able to provide an overview of research data and systematics effectively and efficiently, this research design must be prepared. The sampling technique was carried out with purposive sampling techniques by setting the number of samples in this study at 25 people from a population of 112 people.
Research instruments are test tools used in research to retrieve data in research. The test instruments used in this study consist of three types: Limb Muscle Explosive Power Test Strength test Measurement of the distance of the long jump. To determine the explosive power of leg muscles, balance and distance jumps, the data obtained must be analyzed using statistical formulas. Hypothesis testing uses the statistical formula $F$ as proposed by Sugiyono (2002:219).

RESULTS AND DISCUSSION

The research data obtained in the test results conducted on grade XI students of SMA Negeri 9 Banda Aceh Academic Year 2012/2013 is in the form of quantitative or numerical form data, this data is obtained directly from abdominal muscle strength tests, leg muscle power tests and long jump ability tests. The data is tabulated into a table and the results are as follows. Based on the results of research and data processing tests of leg muscle explosive power and balance on jumping ability in grade XI students of SMA Negeri 9 Banda Aceh for the 2012/2013 Academic Year, results have been obtained as contained in hypothesis testing. The results of testing the first hypothesis showed that the explosive power of the leg muscles ($X_1$) contributed significantly to the ability to jump infection ($Y$), where the test results obtained a value of $r = 0.49$. Thus, the explosive power of the leg muscles (standing broad jump) contributes 24.01% ($0.492 \times 100\%$) to the ability to jump infection. This shows that 24.01% of the variation in scores that occur in the ability to jump infection in grade XI students of SMA Negeri 9 Banda Aceh for the 2012/2013 Academic Year can be explained by the explosive power of the leg muscles, so that the contribution of other factors is 75.99%.

The explosive power of leg muscles is the ability of leg muscles that are deployed in a short time. Explosive power is a combination of elements of physical conditions, namely strength and speed. The stronger and faster the leg muscles work, the better the explosive power of a person's / athlete's leg muscles, with the good explosive power of the leg muscles, then any movements / activities related to the endurance of the leg muscles can be done optimally. So the explosive power of the leg muscles is absolutely necessary in the sport of long jump.

The results of testing the second hypothesis showed that balance ($X_2$) contributed significantly to the ability to jump infection ($Y$), where the test results obtained a value of $r = 0.54$, thus balance contributed 29.16% ($0.542 \times 100\%$) to the ability to jump infection. This shows that 29.16% of the variation in scores that occur in the ability to jump infection in grade XI students of SMA Negeri 9 Banda Aceh for the 2012/2013 academic year can be explained by leg muscle power, so that the contribution of other factors is 70.84%.

Balance is the ability to maintain our neuromuscular system in a static state or control the neuromuscular system in an efficient position or attitude as we move. (Barrow and McGee: 1979). From the explanation above, it is clear that balance is a factor supporting the achievement of achievements in jumping. In this regard, an infectious jumper must have a good balance. Balance in jumping is needed to support the movement of an athlete say jumping, balance is also needed when an
athlete makes a movement after repulsion before jumping, in that position an athlete needs high concentration in order to change position in the most efficient time possible.

The results of testing the third hypothesis showed that leg muscle power (X1) and balance (X2) contributed significantly to the ability to jump infection (Y), where the test results obtained a value of \( R_{(Y,X_1 X_2)} = 0.61 \). Thus, leg muscle power (X1) and balance (X2) contribute 37.21% (0.612x100%) to the ability to jump. This shows that 27.21% of the variation in scores that occurred on jumping ability in grade XI students of SMA Negeri 9 Banda Aceh for the 2012/2013 Academic Year can be explained by the explosive power of leg muscles and balance, so that the contribution of other factors amounted to 62.79%.

From the calculation of the hypothesis, the value of \( F_{h} (F-calculated) = 6.52 \), while the value of \( F_{t} (F-table) \) at a significant level of 5% is 3.44, meaning that the value of \( F_{calculate} = 6.52 \geq \text{the value of } F_{table} = 3.44 \). Therefore, the explosive power of the leg muscles and balance contributed significantly to the ability to jump infection in grade XI students of SMA Negeri 9 Banda Aceh for the 2012/2013 academic year. This research is only limited to proving the theories that have been put forward by sports experts, however, this research is expected to be a meaningful input for the development of science in general and more specifically for the development of sports science in order to improve sports achievements, especially Athletics in Jumping Numbers.

CONCLUSION

There is a significant contribution between the explosive power of leg muscles and the ability to jump infections, this is indicated by a correlation coefficient of 0.49. The explosive power of the leg muscles contributed 24.01% to the ability to jump infection in grade XI students. There is a significant contribution between balance and jumping ability, as indicated by a correlation coefficient of 0.54. Balance contributes 29.16% to the ability to jump. There is a significant contribution between the explosive power of the leg muscles and balance with the ability to jump long, this is indicated by a correlation coefficient of 0.61. So that together the explosive power of the leg muscles and balance contributed 37.21% to the ability to jump infection.

REFERENCE

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