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The Effect Of Explosive Power Training On The Long Jump Ability Of College Students

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ABSTRACT
Long jump ability is influenced by various factors, one of which is physical condition. So that training is needed that can encourage the improvement of physical conditions such as training to increase the explosive power of leg muscles. This research is included in the experimental research category. Experimental research aims to investigate and improve the manifestation of explosive power in muscles. The sample in this study amounted to 17 people selected by total sampling technique. The stages in this study include taking pre-test data, providing treatment in the form of explosive power training, and taking post-test data. The data analysis technique used to answer the hypothesis is to use the paired sample T test. Based on the results of data analysis, the Sig. value of 0.000 <0.05 was obtained with a mean value for the pre-test of long jump ability of 3.2 and a mean value for the post-test of long jump of 4.3. So it can be concluded that leg muscle explosive power training has an effect in improving the long jump ability of PJKR-SD FIK UNM students with an increase of 34.4%.

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INTRODUCTION

Physical education is an important component of education, which serves as a means to improve the achievement of the goals of National Education. (A. Syafruddin & Suparman, 2023). To ensure harmonious development between intellectual and physical abilities, schools must organize physical education in accordance with the Law of the Republic of Indonesia No. 3 of 2005 concerning the National Sports System. (M. A. Syafruddin & Asri, 2022). Sports education refers to the integration of physical education and sports into a consistent and sustainable educational curriculum with the aim of gaining knowledge. Athletics is a sport that develops along with innate human behavior. Running, jumping and throwing are integral components of human existence. These athletic activities can be done anywhere and anytime. This is evidenced by the number of parents, teenagers, and even young children who pursue this sport both for physical well-being and personal achievement. The long jump is a competitive sport in athletics that involves three different styles:

Squatting Style (also known as tuck style), Hanging or Bouncing Style (also known as hanging style), and Walking Style in the air. (Nur, 2019). To achieve a long or maximum jump in the long jump branch, there are several important components that must be possessed. These important elements include explosive muscle strength, power, speed, flexibility, agility, balance, and strong endurance.

In order to achieve the greatest possible distance, it is imperative to perform jumps that push the center of gravity forward and upwards. This requires a combination of versatility, talent, and several aspects that contribute to success. Determinants of long jump ability include physical condition factors and technical issues. The condition element includes several aspects such as jumping power, coordination, reaction power, ease of movement, and agility. In addition, factors related to the execution of the jump include sprinting, airborne phase, and landing.

Explosive power refers to the ability to produce force quickly in order to move one's own body weight or load within a certain period of time. (SUGANDA, 2023). In long jump athletics, jumpers aim to achieve maximum leg muscle drive during high repulsion. They then try to push their bodies as far as possible with strength to achieve the farthest jumping distance. According to Corbin (1980) cited in (Pernanda et al., n.d.), muscular explosive power refers to the capacity to demonstrate or release power quickly and powerfully.

Bompa (1990) cited in (Akbar et al., 2020) Power can be categorized into two types: cyclical power and acyclical power. This obvious difference is seen in terms of the suitability of the type of movement or motor ability. In the field of sports, power can be identified based on its significance in a particular sport. Variables Affecting Explosive Power Based on the aforementioned viewpoints, it can be concluded that explosive power is determined by two key factors: strength and speed. (Romli, 2023). Muscle strength refers to the optimal performance of a group of muscles in terms of their architecture and function. Explosive power and other elements of physical condition are significantly affected by the quality of muscles and organs involved in information processing. For example, the auditory acuity of the five senses and the neural efficiency of the brain, as well as the special characteristics of muscle fibers. Power is the synergistic utilization of strength and speed, which are key elements of physical fitness, to produce strong and fast output.

Muscles are the organs responsible for body movement. (Makkasau et al., 2022) defines muscle as an organ or tool that enables body movement. Leg muscle explosive power training is a systematic approach aimed at increasing muscle capacity through the utilization of various techniques to achieve optimal results. (Mansur et al., 2018). To excel in the sport of long jump, it is important to have strong leg muscles with explosive power, as this will allow one to achieve optimal jump performance. (Arizky, 2024). Researchers will conduct various kinds of explosive power training such as jumping with one foot, jumping with two feet, and jumping over the box (box jmp).

MATERIALS AND METHODS

This research falls into the category of experimental research. Experimental research aims to investigate and improve the manifestation of explosive power in muscles. Furthermore, the sample is a component or example of the population under study (Swarjana & SKM, 2022). To ensure homogeneity in this study, the entire population sample was utilized as the sample, using a method known as total sampling. The sample for this study consisted of 17 male students enrolled in the PJKR-SD FIK UNM Study Program. To achieve good results, the necessary steps include: 1) A structured training regimen, with set intervals for training and recovery. 2) A comprehensive exercise regimen involving 14

exercise procedures. Data was obtained by conducting 14 trials, starting with test I and ending with test II. The findings were then compared. The data analysis method used in this study is the utilization of the t-test, with the aim of assessing the effect of leg muscle explosive power training in improving the long jump ability of FIK UNM students.

RESULTS

The results in this study were carried out with various stages of data analysis, such as descriptive tests aimed at knowing the description of the research results, normality tests to determine data distribution, homogeneity tests to determine the variance of research samples, and hypothesis testing to determine the effect of explosive power training on students' long jump abilities.

Table 1. Descriptive Test Results

Statistics	Pre-Test	Post-Test
N	17	17
Mean	3,2	4,3
Median	3,2	4,3
Std. Deviation	0,3	0,3
Minimum	2,7	3,8
Maximum	3,7	4,8

Descriptive test results for pre-test and post-test data on long jump ability of PJKR-SD FIK UNM students are as follows:

1. The results of the pre-test of long jump ability produced an average of 3.2 meters, a median of 3.2 meters, the lowest jump value of 2.7 meters, and the highest jump value of 3.7 meters.
2. The results of the long jump post-test test produced an average of 4.3 meters, a median of 4.3 meters, the lowest jump value of 3.8 meters, and the highest jump value of 4.8 meters.

Table 2. Normality Test Results

Data	Sig.	Description
Pre-Test	0,968	Normal
Post-Test	0,906	Normal

This normality test aims to determine whether the pre-test and post-test data on students' long jump abilities are normally or abnormally distributed. Based on the research results in the table above, it is known that the Sig. value for the pre-test data of students' long jump ability is 0.968. While the Sig. value for the post-test data of students' long jump ability is 0.906. Because the Sig. value of both data> 0.05, it can be said that the distribution of pre-test and post-test data on students' long jump ability is normally distributed.

Table 3. Homogeneity Test Results

Data	Sig.	Description
Pre-Test and Post-Test	0,934	Homogeneous

One of the prerequisite tests in this study is the homogeneity test which aims to determine whether the variants of the research data are homogeneous or inhomogeneous. From the research results, it is known that the Sig. value is 0.934> 0.05. So it can be said that the data variants in this study are homogeneous or the same.

Table 4. Hypothesis Test Results

Data	Mean	Mean Difference	df	Sig.
Pre-Test	3,2	1,1	16	0,000
Post-Test	4,3			

To answer the formulation of the research problem, the Paired Sample T Test was conducted. Based on the results of hypothesis testing, it is known that the average pre-test value of students' long jump ability is 3.2 meters, while the average post-test value of students' long jump ability is 4.3 meters, so the average difference is 1.1 meters. So it can be said that there is a difference between the pre-test and post-test values of the long jump ability of PJKR-SD FIK UNM students with an increase of 34.4%. In the table above it is also known that the Sig. value is 0.000 or <0.05. Because the Sig. value <0.05, it can be concluded that explosive power training affects the long jump ability of students.

DISCUSSION

Getting effective or maximum results in the long jump branch, there are several important components that must be owned. These important elements include explosive muscle strength, power, speed, flexibility, agility, and strong balance. (HISKYA, 2017). In order to achieve the greatest possible distance, it is imperative to perform jumps that push the center of gravity forward and upward. This requires a combination of versatility, talent, and several aspects that contribute to success. Determinants of long jump ability include physical condition factors and technical issues. The physical condition element includes several aspects such as jumping power, sense of rhythm, reaction power, ease of movement, and agility. In addition, factors related to the execution of the jump include sprinting, the airborne phase, and landing. (Ismail & Simal, 2021).

Explosive power refers to the ability to produce force quickly in order to move one's own body weight or a load within a certain period of time. In long jump athletics, the jumper aims to achieve maximum leg muscle drive during high repulsion. (Zawawi, 2016). They then try to push their bodies as far as possible with strength to achieve the farthest jumping distance. According to Corbin (1980) cited in (Rafles et al., n.d.)explosive muscle strength refers to the capacity to demonstrate or release power quickly and powerfully.

Based on the results of the study, it shows the importance of physical conditions, especially leg muscle explosive power in producing a good long jump. Through training to increase the explosive power of leg muscles, it is proven to be able to encourage better results in doing long jumps for students. This is a form of strengthening the student's leg muscles through various exercises such as one-legged jumps, two-legged jumps, and box jumps. With these exercises, it strengthens the power or ability of students' muscles to work optimally so that they are able to make a more powerful repulsion in pushing the body against gratification when doing a long jump.

Through this research, of course, it provides a real picture for coaches and educators in the field of sports, especially the long jump branch in maximizing the results of athletes' long jumps. Because to achieve good results in sports requires the right training method, especially in improving the physical condition of athletes, according to the needs of each sport performed.

CONCLUSION

Based on the results of research, data analysis, and discussion, it can be concluded that leg explosive power training has an effect in improving the ability of long jump students a PJKR-SD FIK UNM Study Program.

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