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The Effect of Small Box Plyometric and Alternate Leg Bound Training Methods on Long Jump in Students in Class XI State Madrasa Aliyah 5 of Jombang

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ABSTRACT

This research is irritated by the observation that athletic achievement cannot be achieved speculatively, but must go through intensive training with the right training program. These determinants and supporting factors for achievement can be used as a basis for preparing a training program. One of the supporting factors in increasing long jump results is physical exercise. Several methods of physical training can be put forward such as weight training, interval training, circuit training, and small box plyometric exercises.

In accordance with the formulation of the problem, the purpose of this study was to determine the difference in the effect of the small box plyometric and Alternate Leg Bound training methods on long jump results in class XI students at State Madrasa Aliyah 5 Jombang. large, medium, and small bodies in class XI students at State Madrasa Aliyah 5 Jombang and to determine the effect of the interaction between the small box plyometric training method and alternate leg bound and the ratio of leg length and height to the results of the long jump in class XI students at State Madrasa Aliyah 5 Jombang. Based on the results of field research, the two plyometric training methods have different results in the long jump. This is evidenced by the value of Fcount = 6.299 > Ftable = 4.04 at a significant level = 0.05 with a p-value = 0.016 <0.05, the difference in the increase in long jump results between students who have large, medium and small leg length and height ratios. This is evidenced by the value of Fcount = 27.786 > Ftable = 3.17 at a significant level = 0.05 with a p-value = 0.000 <0.05 and the interaction between plyometric training methods and the ratio of leg length to height is very significant. This is evidenced by the value of Fcount = 24.542 > Ftable = 3.16 at a significant level = 0.05 and p-value = 0.000 <0.05. Based on the conclusions in this study, it turns out that the application of the right training method will have a significant influence on the results of learning or training. The small box plyometric and alternate leg bound training methods and the ratio of leg length to body height is the variables that influence the long jump results.

Keywords: [Training Method, Long Jump, Athletics]

INTRODUCTION

Athletics is a sport that must be taught in schools, both elementary school, junior high school, high school to university. One of the athletic branches taught is the long jump number. In the long jump, the exercises carried out must be specific in nature to develop the components needed in the long jump. One of the supporting factors in increasing long jump results is physical exercise; several methods of physical training can be put forward such as weight training, interval training, circuit training, and small box plyometric training. This small box plyometric training method has an effect on increasing leg muscle power, so it

will have a good impact on repulsion, when flying or landing in a long jump.

The implementation of the small box plyometric exercise method is by jumping forward and upward using hip extension and arm movement to push forward to reach the maximum height and distance with an upright body position. Other supporting factors in increasing long jump results is when viewed from the physical form related to anthropometrics which is a variable that has a significant impact on the achievement of long jump results. The comparison of the length of the body parts with the height of each individual or briefly called the anthropometric size ratio, which can provide a relative value for each individual that can be compared with other individuals. The ratio of leg length to body height is an anthropometric size ratio which is biomechanically thought to be an independent variable for increasing long jump results. Because in long jump motion, body height and leg length will directly affect the achievement of long jump results. The proportions of the human body vary from one person to another. This diversity is an important part of the self-selection process for different sports and events, and it is clear that little can be done to change the anatomical proportions of the body. Long limbs are the body's best leverage tool for lifting body weight.

The factors that affect leg length lie in the size and proportions of the body that develop as the child grows and develops. At a certain age, the size and proportions of the body parts of big children change compared to small children. Likewise, leg length has increased along with development and growth. Long legs allow for farther and longer leg swings, so this will affect the speed at which you run. It's different for a long jump athlete who has short legs will also have short leg reach and swing, so that his running results are also not optimal compared to those who have long legs. Therefore, to obtain maximum speed and jump, a long jumper must be able to use his legs to produce long jumps.

Based on the description above, the purpose of this study was to determine the difference in the effect of the small box plyometric and Alternate Leg Bound training methods on increasing long jump results as well as the interaction effect between the small box plyometric and alternate leg bound training methods as well as the ratio of leg length and height to the increase results of the long jump in class XI students at MAN 5 Jombang.

LITERATURE REVIEW

Long Jump

Syarifuddin, 1992 stated that the long jump is a form of jumping movement lifting the legs up and forward in an effort to carry the body weight as long as possible in the air (floating in the air) which is done quickly and clearly by repulsing one leg to reach the farthest distance. Nur, 2019 stated that "long jump is one of the jumping numbers of the athletics branch. In a long jump competition, one will try to go forward by relying on the pedestal as hard as possible to land in the tub as far as possible." Furthermore Nur, 2019 stated that "long jump is one of the jumping numbers of the athletics branch. In a long jump competition, one will try to go forward by relying on the pedestal as hard as possible to land in the tub as far as possible." Furthermore (Aziz, M. A., & Yudi, 2019) stated that the basic techniques of long jump include: square off, preparation for the jump, hover and landing phase. Dwi, 2018 said that the long jump includes running up, followed by leg repulsion, hovering, falling and landing. From the opinion of the experts above, especially the long jump number, it can be concluded that the basic techniques of the long jump consist of: run up, pedestal, flight, and landing. All of these activities constitute one continuous and uninterrupted movement in their implementation. In the long jump there are three styles such as squat style, hanging or bouncy style, and air walking style.

Small Box Plyometric Training Method

According to (Eraslan, L., Castelein, B., Spanhove, V., Orhan, C., Duzgun, I., & Cools, 2021) this exercise develops the power of the leg and hip muscles, especially the gluteals, hamstrings, quadriceps, and gastrocnemius. The muscles of the arms and shoulders are also indirectly involved. This exercise has wide application to a wide variety of sports involving jumping, running, weightlifting and swimming. The starting position for this exercise is in the half-squat position. Arms are beside the body, shoulders leaning forward beyond the knee position. Keep your back straight and look forward.

The small box plyometric exercise uses two footstools in doing the forward jump. Hip extension and arm swing in this exercise are very influential in determining the distance of the jump. The distance of the jump in this plyometric small box exercise is different for each individual. One of these differences is influenced by the ratio of leg length and height of each individual. The implementation of small box plyometric exercises has advantages, including jumping movements using two high fulcrum feet far forward providing benefits when making landing movements.

Leg Bound Alternate Plaiometric Exercise Method

According to Kusuma, I. A., & Ramadhan, 2021 this exercise is almost the same as the double leg bound exercise, to develop leg and hip power. By changing both legs especially the work of the flexors and extensors of the thighs and hips, this exercise is used to improve running, stride, and sprinting movements. The initial position for carrying out this exercise is in a comfortable standing position with one leg slightly forward to start stepping relaxed beside the body (Fajar, 2020). The implementation of this exercise begins with pushing back the legs, moving the knees to the chest and trying to jump as high and as far as possible before landing, then stretch the legs forward quickly by swinging both arms. The implementation of the alternate leg bound exercise method uses two legs alternately, so that in practice one leg will support the entire body weight that is doing it as well as the next leg will support the same body weight. In this training method, it will be greater because the load obtained in this exercise is also greater, so that the quality of muscle contractions and muscle power will also be better.

MATERIALS & METHODS

This research approach uses a quantitative approach. The sample in this study was 30 students of class XI State Madrasa Aliyah 5 Jombang and the sample was determined using purposive random sampling. Suharsimi Arikunto, 2013 said that for experimental research, the number of samples of more than 30 people is a large sample. Research data collection used test techniques and measurement instruments, then the data were analysed using two-way analysis of variance (ANOVA) with the help of SPSS.

RESULT

Prior to data analysis, a prerequisite test was carried out was the normality test using the Kolmogorov Smirnov and the results were normally distributed. Then a homogeneity test was carried out using the Levene's Test method and it was concluded that the two groups had the same variance.

Source of Variation	DF	SS	MS	FCounted	Ftable	P
Treatment Average	1					
A	1	0,022	0,022	6,299	4,04	0,016
B	2	0,195	0,098	27,790	3,19	0,000
AB	2	0,172	0,086	24,547	3,19	0,000
Error	42	0,147	0,004			

DISCUSSION

Differences in Effect between Small Box Plyometric and Alternate Leg Bound Training Methods on Increasing Long Jump Results

There was a significant difference in the effect between groups of students who received the small box plyometric and alternate leg bound training methods (p-value = 0.016 <0.05). The alternate leg bound group had an average increase in long jump results of 0.3344, higher than the small box plyometric group which had an average increase of 0.30311. Alternate leg bound training method is better than small box plyometric due to the different characteristics of the form of the exercise. The small box plyometric training method uses two footstools in making a forward jump. While the alternate leg bound exercise method uses one footstool in doing the forward jump. Thus the alternate leg bound exercise is suitable for the long jump sport. The tendency of movement with one foot support is relatively more efficient than movement with two foot support. This is because the supporting leg in the alternate leg bound movement always works alternately so that one leg will get a heavier load than in the small box plyometric training method, always together so that the load is lighter. The tendency to synchronize motion is more possible in alternate leg bound exercises than small box plyometric exercises.

The difference in the increase in long jump results between students who have large, medium and small ratios of leg length and height

Based on measurements of leg length and body height, the ratios obtained are classified into three levels; they are large, medium and small. One of the supporting achievements in sports is the proportion of the body (anthropometric ratio), as well as viewed from the long jump athlete in supporting the increase in the distance of the jump lies in the anthropometric ratio in terms of the ratio of leg length to body height. The ratio of leg length and height of large and medium is ideal, and the ratio of short limb length and height is one of the anthropometric ratios that are not ideal for long jump athletes.

Hypothesis testing showed differences in long jump score increases among students with different leg length-to-height ratios. The group of students with a high leg length to height ratio had an average increase of 0.71 in long jump scores similar to those with a medium leg length to height ratio. Groups of students with a high or medium leg length to height ratio had a higher average increase in long jump scores than students with a small leg length to height ratio of 0.44.

The Effect of Interaction between Plyometric Training Methods and the Ratio of Leg Length and Body Height on the Improvement of Long Jump Results

The results of the study shows that there was an interaction between the small box plyometric and alternate leg bound training methods with the ratio of leg length and height of the large, medium and small bodies to the increase in long jump results. This is evidenced by the value of H0 being rejected at $\alpha = 0.05$. The results of the calculation of the two-factor analysis of variance show that p-value = 0.000 <0.05. With these results, it means that there is a very significant interaction effect between the two or there is an interaction between the two variables. The group of students who have a large ratio of leg length to height is better given the alternate leg bound exercise method, and the group of students who have a medium and small ratio of leg length to height is better given the small box plyometric training method.

CONCLUSION

Based on the results of the research and the results of the data analysis that has been done, it can be concluded that there is a significant difference in effect between the small box plyometric training method and

the alternate leg bound on the increase in long jump results. The alternate leg bound group has an average increase in long jump results higher than the group small box plyometric, there is a significant difference in the increase in long jump results between students who have a large, medium and small ratio of leg length to height. There is a significant interaction effect between the plyometric training method and the ratio of leg length and height to the increase in long jump results. The alternate leg bound exercise method is better given to students who have a large ratio of leg length to body height, while the small box plyometric training method is better given to students who have medium and small ratios of leg length to height.

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