



The Impact of Training Methods and Leg Muscle Strength to the Long Jumping Squat Style Skills of SMA Pesantren Pancasila Bengkulu

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Abstract

The purpose of this study was to determine the impact of the Training methods (Plyometrik and Weight Training) and in terms the high strength of leg muscle and the low strength of leg muscle. Based on the problems, the design of this study was the treatment by the level of 2 x 2. Analysis of variance between the group at a significant level $\alpha = 0.05$. This study also aims to determine the interaction between exercise and leg muscle strength against to the long jumping squat style skills. This study was done in SMA Pesantren Pancasila, Bengkulu. The sample was consisted of 24 athletes in this study, then divided into four groups, each group consisting of 6 athletes which as the object of this study. The data analysis technique was the analysis of variance of two lanes and then followed by Tukey test with significance level $\alpha = 0.05$. The results of this study indicate that (1) Overall, the results of long jumping skills to the group that trained with exercise methods of Plyometrik better than the group trained with the type of Weight Training, (2) There are interactions between the Training methods with leg muscle strength to the results of Long Jumping Squat Style Skills, (3) For those athletes who have high leg muscle strength, the result of long jumping skills through the implementation of exercise methods Plyometrik better than the method of Weight Training, (4) For those athletes who have low leg muscle strength, the result of long jumping skill through the implementation of Weight Training methods not better than the Training methods of Plyometrik.



INTRODUCTION

Physical activities as one of the design of human creativity, that is a form of physical activity which is very complex. Physical activities which human existence is something that can not be separated. Physical activity is a human necessity which is essential element and it is very influence to the formation of the soul (spiritual) and strong physical (physical/body). According to the Ancient Greek's motto is: *Orandum est ut sit mens sana in corpore sano* which means "Wish, there will be healthy soul in the strong physical or body". So as every human being who often do physical activities will have a healthy spiritual and physical which is better than human who rarely or never do it (Abidin, 2012).

Jumping is one part of athletics. In athletics is known some types of jumping numbers that is long jumping, triple jumping or three jumping, high jumping and pole vault. Kadek (2014). These four types of jumping is always competed in the national championships, regional or international events. As the jumping numbers that is always competed, these four types of jumping should always be fostered and developed the performance as early as possible (Tangkudung, et al 2012). It means that development should started from an early age. Therefore, through the development and creation's community, sports must be taught in the school start from elementary school, junior and senior high school. Extracurricular activities is an activity which outside of school hours, so its not too limited by the time as well as in intracurricular that 2 hours of lessons a week only. It means that the teacher or trainer can develop the activities which detail and overall, for example the development of basketball games and other sports. Teacher or trainer can be

explained the techniques, tactics, strategies and other components about physical conditions, or the rules in detail and specific.

In the long jumping, there are several kinds of style or posture when suspended in the air. (Faigenbaum et al 2009). According to Soegito et al, there are three ways, attitudes drift namely: 1) Squat Style (when drifted time being squat), 2) Resilience Style (the body was resilenced when in the air) and 3) Walking street style in the air (when hovering, the legs moving as walking as in the air). Chu (1992). Appearance techniques of a person is depend the link between the technical maturity and thinking ability in taking a decision. Remember that to mastering the basic techniques and efforts to increase sport achievements', it should have the physical capability that is meant the strength, speed, agility, flexibility, balance, endurance, power, and coordination. Long jumping style that we used for this study is the long jumping squat style. Long jumping squat style technique is the most simple style than others (Eddy, 2011).

Each component of the physical capabilities was effected to spesific skills in the basketball (Richard, 2011). One of the component is power. The strength of leg muscle is very influence when jump to the board of fulcrum in the long jumping. Leg muscle strength affects the stability when jumping which the leg muscle strength was weak, the stability of jumping is low, and the result of the jumping was not optimal, it will affect indirectly to the achievement in the sport's long jumping in which decrease the performance of athletics in the long jumping of SMA Pesantren Pancasila, Bengkulu. Decreasingly in the achievement its showed they did not achieve as the winner anymore in the championship although the branched of

championships long jumping among students is often carried out either by the government through the Pekan Olahraga Daerah (PORDA) and the others through the programmed championships. Based on the observations of the writer and the results of discussions with the coach of Athletic SMA Pesantren Pancasila Bengkulu decreasing of the result of training due to the strength of leg muscle's players is weak and the application of training methods that is not effective and efficient yet. SMA Pesantren Pancasila Bengkulu is one of favorite senior high school, which have many achievements in the academic and non-academic skills. It is the interesting thing so that the athletes want to continue to this school. The long jumping sport is one of the extracurricular in SMA Pesantren Pancasila Bengkulu, the implementation is three times a week. In fact, SMA Pesantren Pancasila Bengkulu has not show encouraging results of the achievement of long jumping sport yet. Another writer's observation showed there has been no specific program of training when doing the long jumping squat style (Jess, 2012).

Another facts, when doing jump squat style there are many mistakes such as they are not exactly stepping on the board pedestal while doing jumping, the repulsion feet and posture are not strong while jumping, the foot and body are not maximum while in the air. Error position of the foot on landing sand. Ultimately, they could not reach the maximum jumping when the scoring of long jumping sport (Wiarso, 2013). Additional supporting element in doing jumping skills squat style is the good element of coordination between all the movement of elements. Coordination of the leg muscle movement, body movement and eyes sight is a combination of functions that made up a specific motion patterns in arrange movement, especially when

doing jumping squat style skills. The factors that affect learning movement divided into two groups, namely: (1) Internal conditions, and (2) External conditions. Internal condition covers the factors that exist in individuals or other activities that could differentiate between one individual with other individuals. One factor from internal conditions is the level of leg muscle strength that have by the athletes (Rustam et al, 2019). Thus, teachers, trainers and sports coaches only could determine whether the athlete have leg muscle strength to learn specific skill during join the lesson. External conditions covers the outside factors of the individual that can influence the results of jumping training. One of the external factors is the method or by providing training so that the objective can be achieved optimally.

The speed and power of jumping is a factor when determining the jumping distance (Ismaryati, 2011). To increase the power while jumping, training is needed. One way to train the muscle strength is by plyometric and weight training. Leg muscle strength is a skill possessed by the athlete while begin a training activity and the important component in the train planning. Coaches and teachers may not be able to arrange a program that is needed by the athletes if they do not know where they should start. Therefore, the coach should know the athlete's leg muscle strength before entering the training and learning activities or exercise. Thus the coach can distinguish whether the athlete have skill or not during the training process.

Training method can provide a real influence on the process and results of training (Mylsidayu et al, 2014). The differences that found in each athlete, it gives insight to the teachers and coaches that the training methods must pay attention to their differences. In order to create a conducive atmosphere which

needed an exactly training method. It can be concluded that the internal and external conditions in athletes must be considered in the practice of long jumping process. The leg muscle strength of athletes need to be measured to find out which groups of athletes are homogeneous and the method of training is necessary in order the training process will effectively. Based on the brief description above expectations and reality, it can be formulated central theme in this study as follows: "The lack of teacher or coach's attention to the athletes of SMA Pesantren Pancasila Bengkulu to long jumping sport were observed while giving the material of jumping squat style". This is due to the learning process of jumping squat style technique without training and methods properly so that its needed a method which is effectively and efficiently. However, Plyometrik and weight training methods is used in this study (Kadir, et al, 2021).

METHODS

The method was used in this study is a experimental field method. As noted Sugiono that, there is no treatment (Treatment) in this study, thus the metehod of experimental research can be interpreted as the research methods that used to find a specific treatment effect against in uncontrolled conditions to others. (Sugiono, 2013). There are three variables that including in this study, namely: (1) The independent variable is plyometrik and weight training methods, (2) The dependent variable is long jumping squat style, and (3) Variable attributes that is leg muscle strength. The research design or study design was a plan and structure investigations which is arrangely so the researchers will get the answers to the questions of the research. This study was used the design of

treatment by the level of 2 x 2. The design of treatment is experimental units into the randomly manner cells, so that the experimental units within each cell are relatively homogeneous..

RESULT AND DISCUSSION

1. Overall, the results of long jumping skills through the application of plyometrik training methods (A1) better than weight training method (A2).

Long jumping skill is one of the motion process which is complex, as in its implementation through the four steps that must be coordinated quickly and perfectly such as prefix, pedestal, hovering and landing. Especially in this era the development of achievement long jumping were very rapidly. Its needed properly training in order can enhance the effective and efficient physically to support the implementation of the long jumping skills. In this study, there are two methods of training was applied, the plyometrik and weight training methods with the aim to see which method is better to improve the skill of the long jumping. Both of these training methods have the same goal that improve the skill of the long jumping in which the leg muscle strength is support for getting a good long jumping skills, but each of these training methods have differences in the terms of implementation.

The results analysing of motion is reinforced by the results of the effectiveness analysing of variance about the differences between the two methods of training overall, namely; F observation between columns ($F_A = 13.397$, larger than F table, namely 4.35 ($F_o = 13.397 > F_t = 4.35$), and by seeing at the long jumping skills that is used training method of plyometrik ($\bar{x} = 73,67$ dan $s = 8,40$) compared to the long jumping skills that is used weight training method ($\bar{x} = 69,08$ dan $s = 3,40$), it can be concluded that overall training methods of plyometrik

better than weight training methods to the results of the long jumping skills. Therefore, based on the results of research discussion, it can be recommended that plyometrik training methods more appropriate to improve the long jumping skills.

2. There is no interaction between the training method of leg muscle strength with the results of the long jumping skills

The variance of results analysis 2x2, that is about the interaction between training methods with leg muscle strength against the long jumping skills of $F_{\text{observation}} = 29,057 > F_{\text{tabel}} 0,05 = 4,35$. This interaction was illustrates that plyometrik training methods more appropriate for athletes who have high leg muscle strength compared with weight training methods: $A1B1 > A2B1$. In contrast, weight and plyometrik training method can equally be applied to athletes who have low leg muscle strength. This was confirmed by the further of results tests which differentiate between plyometrik training methods with high leg muscle strength and weight training methods with high leg muscle strength; $A1B1 : A2B1$ ($P1 : P2$), results $Q_{\text{count}} 9,05 > Q_{\text{tabel}} 4,34$.

In other words, the effectiveness of plyometrik training methods with high leg muscle strength ($\bar{x} = 81,33$ dan $sd = 2,50$) was significantly better than the weight method training ($\bar{x} = 70,00$ dan $sd = 2,61$). The weight training methods with lower leg muscle strength and plyometrik training methods with lower leg muscle strength; $A2B2 : A1B2$ ($P4 : P3$), hasil $Q_{\text{count}} 1,73 < Q_{\text{tabel}} 4,34$. In other words, weight training method ($\bar{x} = 66,00$ dan $sd = 2,50$) and plyometrik training methods ($\bar{x} = 68,17$ dan $sd = 4,07$), both they are provide the effectiveness of the results of long jumping skills. It can be concluded that the athletes who have high leg muscle strength if they want to improve

long jumping skills should be trained by using Plyometrik training methods, in contrary, the athlete who have low leg muscle strength if they want to improve long jumping skills the athletes can use both methods of stretching train both plyometrik or weight.

3. The athletes who have high leg muscle strength, the result of long jumping skills through the application of plyometrik training methods (A1) better than weight training method (A2).

As we know that these two methods have the same goal of improving the results of long jumping skills, but each methods have difference in the terms of implementation. While practicing plyometrik training methods, the athletes emphasizes which strong contractions and it is response from dynamic weight. For athletes who have high leg muscle strength, it will only be able to develop they abilities to the upgrading achievement of skills. While this weight training methods is one method of train that is widely used by coaches in the sports coaching, because this training method can improve the physical condition of athletes. It is simple because it can use simple tools such as barbells, dumbbells and others. Besides, it can give a general appearance, this is because the effect of weight training on the body, whcih can be changed anatomical, biochemical and nerve system. Then, weight training method is a common type of training.

However, the constraints of weight training when the concentric and esentrik contraction can not be done quickly because of the burden that is used as ballast, it causing stiffness that leads the lack of achievement increasing of long jumping skills. The results of motion analysis above the further of results test reinforced by high of group of leg muscle strength is trained with plyometrik training methods (P1) compared with

high leg muscle strength are trained in weight training methods (P2), the results; $Q_{count} = 9,05 > Q_{tabel} = 4,34$. In other words, the athletes who have high leg muscle strength, the effectiveness of plyometrik training methods ($\bar{x} = 81,33$ dan $sd = 2,50$) significantly better than weight training methods ($\bar{x} = 70,00$ dan $sd = 2,61$). Therefore, based on the results of research discussion, it can be recommended that for athletes who have high leg muscle strength, Plyometrik training methods more appropriate to improve long jumping skills.

4. The athletes who have low leg muscle strength, the result of long jumping skills through the application of weight training method (A2) better than plyometrik training methods (A1).

It is said that both of the training methods have the same goal to improve the results of long jumping skills, but each method have difference in the terms of implementation. Weight training method is one method of exercise that is widely used by coaches in sports coaching, because this training method can improve the physical condition of athletes. It is simple because it can use simple tools such as barbells, dumbbells and others. Besides, it can give a general appearance, this is because the effect of weight training on the body, whcih can be changed anatomical, biochemical and nerve system. Then, weight training method is a common type of training. For athletes who have low leg muscle strength, this training was relevant because it does not need fast and eksplosive movement and it can provide motivation for children to train the movement depend on their own ability of body. So the increasing is more maximum. The implementation of plyometrik training methods have special characteristic that is strong contraction and its response to the dynamic weight. The stretching suddenly before the contraction of muscle will be

back and it allows the muscles to reach maximum strength in short time. Thus for athletes who have low leg muscle strength it will certainly feel difficult in doing contraction of constrict and eccentric rapidly. If there are too many difficulties that faced by the athlete, it wiil impact to their decreasing motivation, so the long jumping skill will not maximum.

The analysis results of motion is supported by the further results of low group leg muscle strength test are trained in weight training methods (P4) compared with low limb muscle strength are trained in Plyometrik training methods (P3), the result; $Q_{count} = 1,73 < Q_{tabel} = 4,34$. In other words, for athletes who have low leg muscle strength, the weight training method ($\bar{x} = 66,00$ dan $sd = 2,83$) and plyometrik training methods ($\bar{x} = 68,17$ dan $sd = 4,07$) did not provide the significant results on the effectiveness of long jumping skills. Therefore, based on the discussion results of research, the athletes who have low leg muscle strength better than weight training methods that is applying to improve long jumping skills.

CONCLUSION

Based on the data analysis and research discussion that have been obtained, it can be explained several conclusions, implications of research and suggestions as follows:

1. The results of long jumping skills for a group that trained with plyometrik training methods overall better than the group was trained by weight training methods.
2. There is interaction between the training method with leg muscle strength to the results of long jumping skills.
3. For the athletes who have high leg muscle strength, the result of long

jumping skills through the implementation of plyometrik training methods better than weight training methods.

4. For the athletes who have low leg muscle strength, the result of long jumping skills through the implementation of weight training methods is not better than plyometrik training methods.

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