

# The Influence of Running Speed, Leg Muscle Explosion Power in Long Jump Ability

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## ABSTRACT

The aim of the study was to determine the direct effect between exogenous and endogenous variables, namely finding the direct effect of running speed, explosive leg muscle strength, and long jump ability. The type of this research is Path analysis with causal associative correlation approach. The purpose of this research is to know the influence either directly or indirectly, the population in this research was 45 people and the sampling technique used was Random Sampling. The results of data analysis show that: (1) the direct effect of running speed on confidence is 35.3%. (2) The direct effect of limb muscle explosive power on self confidence is 23.8%.

**Keywords:** *Running speed, leg muscle, long jump ability*

## 1. INTRODUCTION

The condition of physical and sports education at global level, both macro and micro conditions are in poor condition. The crisis at the world level is characterized by a lack of effective learning processes, and a decline in status compared to other subjects (Depdiknas, 2009). In Indonesia the condition is still far from what is expected. In addition to classical problems, such as lack of infrastructure, lowest status, limited time allocation, also because the quality of learning is not effective. This is reinforced by the results of the Kemenegpora survey in the Ministry of National Education (2009) showing that 2,382 education units, ranging from Primary Schools to Universities in 13 Districts / Cities, showed less encouraging conditions.

The quality of the teaching and learning process of physical education and sports, both intra-curricular and extracurricular needs to be improved so that the practice of physical education is truly a vehicle for education and at the same time as a seed for sportsman seeds can be realized. Effective teachers will creatively create learning plans and strategies that are appropriate for their students. Thus, effective teachers will creatively create media to learn effectively when the availability of facilities is minimal.

In order to improve the quality of education, in the upstream Koto Kampar sub-district various actions and policies have been carried out, such as improving the curriculum, completing sports infrastructure, increasing the number and quality of teaching staff, and organizing various forms of seminar and research forums. Ideally this will contribute significantly to the growth and potential development of children individually. Gifted

children or potential sports achievements will emerge. The implication is that in the macro issue the Indonesian nation's plummet experienced in the arena of the world of sports achievements will be increasingly answered.

However, of course this will return to our efforts to empower it. That is, creating and implementing a learning strategy of physical education and sports a new paradigm for students. Because in addition they have potential, but also have vulnerabilities that always accompany and influence their growth and development, both related to their physical and psychological. If there is negligence or an error in managing it, it could be that the intended potential will disappear swallowed by time, as well as fatal to the lives of individual children and the life of the nation in the future.

Athletics develops in schools and becomes a fundamental subject and is a natural activity in human life and basic activities of human movement. It can be implemented with facilities that are relatively simple and can be done regardless of age and gender limits. Under no circumstances can schools carry out teaching and learning activities that are adapted to the conditions and facilities available. At present, athletics consist of several numbers. Broadly speaking, divided into 4 numbers, namely road, run, throw, and jump. The road number and run are carried on the track, while the number is toss and jump on the field.

Jump learning far above researchers are interested in helping in finding a way out of the problems faced through planned research, especially related to running speed, leg muscles explosive power and confidence in the results of long jump so that from this study

conclusions can be drawn as anticipatory and corrective in the future.

Based on the problems that have been formulated above, and taking into account the research variables, this study aims to disclose the magnitude: 1) Direct Effect of Running Speed on the long jump results of female students of SMP Negeri 1 Koto Kampar HuluSubdistrict?; 2) Does the leg muscle explosive power directly affect the long jump results of female students of SMP Negeri 1 Koto Kampar Hulu Subdistrict?

### **Athletics**

Athletics is one of the Physical Education subjects that must be taught to students from elementary school to high school level, in accordance with the decree (SK) of the Minister of Education and Culture No. 0413 / U / 87. Even in some universities, athletics is offered as one of the general basic courses. Whereas for students of the Faculty of Sports and Health Education are compulsory subjects that must be taken, not least, even in exceptional schools athletic subjects are subjects that must be given to students.

#### **Running Speed**

According to Mane (2008) suggests "Sprinting, which you usually do in short distances, may not seem difficult, but this is not as easy as it seems". Wiarto (2013) also expressed his opinion "In the science of sprinting, this is called anaerobic exercise or exercise that uses very little oxygen."

Speed is the ability to perform similar movements in a row in the shortest possible time, or the ability to travel a distance in the shortest possible time in a sprint, the speed of flight is determined by successive movements of the feet performed rapidly. The speed obtained from the prefix results is called horizontal velocity, which is very useful to help power when doing upward forward repulsions on the long jump. In order to produce a large repulsion, the step start must be done steadily and stopping (dynamic step).

Asep (2018) states that running speed play an important role in the long jump implementation. A jumper without a good running start, the jump results are also not good. In the long jump the running speed is used in starting the run. Therefore, a jumper who wants to achieve good results in his leap is required to run a fast start with fixed steps, so that he can rely on the support beam appropriately and produces a good jump.

### **Explosion Power**

Syafruddin (2011) explains that explosive power is a person's ability to overcome resistance or load at high speed in a complete movement. Fox (1988) argues that explosive power is an ability to overcome sub-maximum resistance with maximum speed. Meanwhile Kirkendall et al in Syafruddin, (2011) suggested that: "explosive power is the result of effort carried out in

units of time which is carried out when the muscles contract to move objects at a certain distance or time".

Explosive power is combination of strength and speed that overcomes the load or resistance with a high speed of muscle contraction. Thus, it is clear that explosive power contains elements of strength and speed. Strength describes the ability of the muscles to overcome the burden or resistance, while the speed shows the ability of muscle contraction in overcoming the load quickly. For jumps, the main muscles in the movement included in the prime mover muscle group are Rectus Femoris, Gastrocnemius, Gluteus maximus, Biceps Femoris (hamstrings), and others as stabilizers.

In addition, Jever in Zikrur (2014) suggested that the explosive power of leg muscles is the ability to work quickly, the ability of material that is much needed in sports, especially sports that have elements of jumping, throwing, rejecting and spirit. Leg muscle explosive power is the ability of the muscles to overcome the load or resistance with a very high contraction speed. Leg muscle explosive power is a product of two abilities, namely strength (strength) and speed (speed) where the power is deployed to a maximum in a very fast time

Syafruddin (2011) said that: "If someone wants to achieve optimal performance it needs to have four kinds of completeness which include: 1) physical development, 2) technical development, 3) mental development, 4) champion maturity". This is in accordance with the statement of Syafruddin (2012) who says that: "muscular power is a quality that allows muscles or groups of muscles to produce explosively physical work, the intensity of muscle contraction depends on directing as many motor units as possible and on muscle volume".

### **Long Jump**

Long Jump is an athletic sport which is one of the basic training in sports and physical movement, so the role of athletic learning is very important for students by adjusting students' abilities. Athletic learning in schools is an effort to lay the foundation of body and exercise abilities so that the learning process emphasizes the joy factor of students from motion games and athletic sports activities. In learning to introduce long jump motion problems, it is generally done indirectly. And the long jump is reviewed anatomically, how to improve the long jump attitude and increase students 'motivation towards learning, so that ultimately increases students' physical fitness.

According to Mane (2008) "The long jump requires extraordinary speed and very strong muscles". Based on the expert opinion above, the long jump is a form of jumping movement which begins with horizontal movement and is converted to vertical motion by repelling one of the strongest legs to get as far as possible.

Based on the description above, the research hypothesis can be formulated as follows: 1) There is a significant direct effect of running speed on long jump results. Students of SMP Negeri 1 Subdistrict, Koto Kampar HuluSubdistrict; 2) There is a significant direct effect of leg muscle explosive power on long jump. Students of SMP Negeri 1 Subdistrict, Koto Kampar HuluSubdistrict

## 2. METHOD

The method used in this study is a quantitative method using Path Analysis approach, which uses structural equations that see dimensional causality of influences, Running Speed (X1), and Leg Muscle Explosion Power (X2) to see whether or not there is the influence of the cause variable on the variable due to the use of the Path Analysis method.

The population according to Arikunto (2010) is the overall research subject. The subjects referred to in this study were the population in this study, namely all female junior high school female students in the upstream class of Kampar Koto, consisting of 22 people, class VIII consisted of 23 people and a total of 45 people. Then obtained a sample is a portion of the population will be examined (Ridwan, 2012: 56). Then the population is relatively small, so the sampling technique in this study is Total Sampling (saturated sample / census), that is, all female junior high school female students in upstream class VII Kampar Kampar sub-district consist of 22 people, class VIII consists of 23 people and a total of 45 person.

## 3. RESULTS AND DISCUSSION

Running Speed Directly Affects Students Ability of Kampar Hulu Middle School 1 Jump

The results of the first hypothesis testing obtained by the value of  $t$  speed of 2.548, the value of the path coefficient between X1 and Y ( $\rho_{yx1}$ ) = 0.295 and the value of Sig. 0.015. It turns out the value of Sig. <probability value is 0.015 <0.05, so the path analysis coefficient is significant, meaning that there is a significant direct effect between running speed on the ability of the long jump or in other words  $H_0$  is rejected and  $H_a$  is accepted. Then it can be said that the direct effect between running speed and long jump capability is 0.295 or 29.5% (significant). There is a significant influence between running speed and long jump ability. A good running speed can be obtained through good training, programmed and continuous, so that later it is expected that with increased running speed it will contribute greatly to the long jump ability of Kampar Hulu 1 Public Middle School students

The Power of Leg Muscle Explosion Influences Directly on the Ability of the Long Jump of Students of Kampar Hulu 1 Middle School

The results of the second hypothesis test in substructure 2 are shown in Table 14, obtained by the value of leg muscle explosive power of 2.449, the path coefficient value between X2 and Y ( $\rho_{yx2}$ ) = 0.273 and the value of Sig. 0.019. It turns out the value of Sig. <probability value is 0.019 <0.05, so the path analysis coefficient is significant, meaning that there is a significant direct effect between the leg muscle explosive power on the ability of the long jump or in other words reject  $H_0$  and accept  $H_1$ . Then it can be said that the direct effect between leg muscle explosive power and long jump ability is 0.273 or 27.3% (significant). there is a significant influence between leg muscle explosive power and long jump ability. To increase the explosive power of the leg muscles, it is necessary to consider the factors that can affect the long jump ability, including the explosive power of the leg muscles. The better the leg muscle explosive power of Kampar Hulu 1 Public Middle School students, the greater the contribution to the long jump ability, it is obtained by good and programmed training.

## 4. CONCLUSION

Based on the results of the analysis and discussion above, the conclusions that can be drawn from the research are as follows (1). Running speed has a significant direct influence on the long jump ability of Kampar Hulu Junior High School 1 Students. (2). Leg muscle explosive power has a significant direct influence on the long jump ability of Kampar Hulu Junior High School 1 Students.

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