

The Relationship between the Flexibility of the Torso with the Ability to Long Jump Hanging Style in Male Students of Class XI IPS SMA Negeri 4 Palembang

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Abstract: From observations made by researchers when sports learning with long jump material was underway, not many students can perform movement techniques in the long jump, especially the hanging style with a structure according to the teacher's direction. This was seen when the PE teacher held daily exams at the second meeting, the result was that not many students were able to reach KKM which was 75. Of all the existing problems, related to the student's ability to do the long jump hanging style, Researchers focused the problem on the low level of flexibility of the torso. This study aims to find out whether there is a relationship between the flexibility of the torso and the ability to long jump the hanging style in male students of class XI IPS SMA Negeri 4 Palembang. This research method uses the correlation method. The subjects of this study were 15 male students of class XI IPS SMA Negeri 4 Palembang. Data collection techniques use measurement tests. Data analysis using the product moment correlation formula. Based on data analysis that has been done by researchers, it can be concluded that there is a relationship between the flexibility of the torso with the ability to long jump hanging style in class XI social studies students of SMA Negeri 4 Palembang.

Keywords: Long Jump Hanging Style, Male Student, Torso Flexibility

A. Introduction

Sport has a very basic function to shape humans into whole people. It is characterized by simple basic human movements such as walking, running, jumping, resisting, and throwing that are well composed into an activity called exercise (Abernethy, 2013). One sport that includes all the basic human movements as outlined above is athletic growth of science and technology in the current period of globalization is so quick, it is critical to prepare quality and moral human resources. The field of education is particularly significant in this regard. Education is critical because success in education has ramifications in other areas such as the economy, development, and so on. Excellent education will develop quality people, allowing the country to prosper.

Athletics is a combination of several types of sports that can generally be grouped into walking, running, throwing, and jumping. Numbers contested in athletics

include walking, running, quadruple, jumping, and repelling. The number contested in athletics that is quite popular is the long jump whose goal is to jump as far as possible, and the movement begins with running as fast as possible, then doing repulsion with one of the legs, then floating in the air, and finally landing in the sandbox.

According to Wiarto (2013), the long jump is a jumping movement that begins with horizontal movement and is changed to vertical movement by repulsion on one of the strongest legs to get as far as possible. Sukirno (2012), states that the long jump is the result of a combination of both movements or in other words, the long jump is the result of the accumulation of horizontal speed before the pedestal board and vertical speed resulting from foot repulsion on the pedestal, then the combination of the two movements will produce parabolic movement. Then Sukirno (2012), defines the long jump as an effort to be able to control the highest horizontal speed and change the speed when repulsing on the pedestal, into a vertical speed far from the center of the gravitational point.

From some of the opinions of the experts above, it can be concluded that the long jump is a combination of movements carried out in a controlled manner between running horizontally quickly and jumping speed vertically resulting from the repulsion of the feet from the pedestal. The long jump has elements of motion related to speed, strength, flexibility or flexibility, and balance. The long jump style is divided into three, namely squatting style, hanging or flexing style, and gait in the air. The three forces have differences only in the technique of hovering in the air, while the prefix, repulsion, and landing of the three forces have no difference at all. Most beginners have difficulty when performing hanging or bending techniques, as this requires adequate flexibility. However, the basic stage long jump and the starting form or beginning of the hanging or bending technique are within reach for beginners.

Sukirno (2012), argues that the long jump technique is seen as a series of effective movements from the beginning then continued on the pedestal and hovering in the air to create a jumping force and continued with preparation for landing. Sukirno (2012), as for the description of the basic elements or basic techniques in the long jump in general, namely the first start then the pedestal, hovering in the air, and finally landing. The first thing a jumper must do is to make a start. The prefix in the long jump number relates to making a swing before performing a repulsion movement on a repulsion board or fulcrum board. The purpose of the prefix is to obtain horizontal velocity. In general, jumpers start with about 21 steps to 23 steps or about 30 to 40 meters. Controlling the initial running speed must be done systematically to master the accuracy of the distance with the pedestal. This is important to do to provide accuracy to the foot of the pedestal so that it is right on the pedestal. Then next is the pedestal.

The focus in the long jump is to obtain vertical speed, in as short a time as possible. The entire series of repulsion movements must be done perfectly starting from (1) placing the soles of the feet on the pedestal, (2) the soles of the feet, (3) the tips of the feet to perform the repulsion as hard as possible, while the ideal fulcrum angle is 45°. There are several movements in the series of pedestal movements, namely: (1) placing the feet on the fulcrum correctly, (2) combining and coordinating several movements that support vertical movements to be higher and farther such as coordination between legs and arms, concentration on the eyes on the fulcrum, (3) horizontal speed must not change, if changing steps will eliminate concentration and balance running and repulsion. To produce a movement pattern quickly and precisely on the pedestal, the pedestal in the long jump is done very quickly. A jumper doing a pedestal only takes about 0.12 to 0.13 seconds, to gain vertical speed. After the pedestal or tulle, the next movement is to float in the air.

The hovering motion is the result of a combination of horizontal speed, fulcrum strength, and fulcrum angle when repulsing on the repulsion board to produce vertical speed. The movement of hovering in the air in the long jump will be influenced by factors that are fundamental to the long jump and are determined when the jumper is still related to the ground, namely the start and repulsion. The purpose of the movement of hovering in the air is only to fight the rotation caused by the repulsion/pedestal. Then the last movement in the long jump is landing. The movement of landing in the sandbox in the long jump is a series or continuation of the motion of hovering in the air. The purpose of landing is to obtain a body position with a squatting posture, both legs parallel to touch the sand as far forward as possible, the weight force center of the jumper, and be supported by both hands extended forward as far as possible to keep the body from falling back. To make a landing, both legs should not be strained, should be flexible, with both legs bent, and try to land from the toe by slapping with both legs opened shoulder level. Avoid landing with both feet standing upright.

To be able to improve the ability to long jump hanging or hanging style, special training is needed as needed using methods that adjust to the level of the student's ability to perform movements at the beginning, pedestal, hover, and landing. According to research, the physical component that has a dominant contribution is the flexibility of the torso. As stated by Ismaryati (2011), flexibility is the ability to move the body or its parts as widely as possible without joint tension and muscle strain. Related to the series of motions in the long jump, researchers pay attention to the flexibility involved, especially in the flexibility of the torso. According to Sukirno (2013), the torso or column vertebral is (vertebrae) that make up our body. So that the column vertebral is unevenly shaped as in the lordosis cervicalis (protruding forward), the thoracal is vertebrae are kyphosis shaped (going inward).

Based on the results of research observations at SMAN 4 Palembang, athletic material, especially the long jump, is a challenge for health teachers to be conveyed to students through sports learning. The average student prefers to follow sports teaching materials in the form of team sports such as volleyball, basketball, and football. As for sports that incidentally are individual sports, especially jumping, are much less desirable. According to the results of observations made by researchers when sports learning takes place with long jump material in progress, not many students can perform movement techniques in the long jump number, especially hanging or hanging styles structured according to the direction of their sports teacher. This was seen when the teaching teacher held daily exams at the second meeting, and the average result was that students only got a score of <75 while the KKM achieved by students was 75.

Of all the problems that exist, related to the ability of students to perform long jumps hanging or hanging style, researchers focused the problem on the level of flexibility of the torso. Referring to the description above, researchers are motivated to study further through a study entitled "The Relationship between Torso Flexibility and Long Jump Ability Hanging Style in Class XI Social Studies Students of SMAN 4 Palembang.

B. Methods

Arikunto (2014), argues that variables are the object of research, or what is the point of attention of a study. In this study, there are two variables, namely the independent variable is the flexibility of the torso (X) and the dependent variable (Y), namely the ability to long jump hanging style. The operational variable in this study is the flexibility of the torso is the ability to move the vertebrae or *column vertebral* as wide as possible to the maximum without joint tension or injury to the muscles. While a long jump, the hanging style is a body movement in the air like a person who hangs with the body flexed back. The hanging style long jump ability was measured using the hanging style long jump test.

Arikunto (2014), defines research methods as the method used in collecting data. In this study, researchers used correlation methods or correlational research. Correlation research is used to determine the relationship between the flexibility of the torso with the ability to long jump the hanging style. This research was conducted at SMAN 4 Palembang. The population in the study was all 40 male students of class XI IPS SMAN 4 Palembang. While the sample in this study amounted to 15 people. In determining the sample, researchers use *purposive sampling techniques*. Sugiyono (2016) explained that *purposive sampling* is a sampling technique with certain considerations. Referring to Sugiyono (2016) explanation above, in this study, researchers determined samples based on student's ability to do long jumps.

This study was based on test methods and measurements. According to Kostewicz et al., (2016), a test is an instrument used to obtain information about individuals or objects. Kostewicz et al., (2016), also explained that measurement is a collection of information. Through measurement determined the level of achievement or present status of the participants. To collect data on torso flexibility, researchers used *static tests* of upper body and neck flexibility. As for the data collection of long jump skills, researchers used long jump skill tests. To obtain research conclusions while testing the correctness of this research hypothesis, the data collected after being classified then researchers' process and analyze it using the product moment correlation formula. While the significance of the correlation can be calculated by the t-test. The criteria for testing the hypothesis in this study is that H_0 is accepted if $t_{count} < t_{table}$, there is no relationship between the flexibility of the torso and the ability to long jump hanging style in male students of grade XI IPS SMAN 4 Palembang. While H_a is accepted if $t_{count} > t_{table}$, there is a relationship between the flexibility of the torso and the ability to long jump hanging style in male students of class XI IPS SMAN 4 Palembang.

C. Results and Discussion

The data collection of this study was obtained from the results of the torso flexibility test and the hanging style long jump test conducted by students (Skurikhina et al., 2016). For the torso flexibility test researchers use static tests of upper body and neck flexibility, as for the hanging style long jump test, researchers used the hanging style long jump test as usual. In this study, researchers used tests and measurements that were carried out directly in the field. After the data is collected from the test results, the data is described so that it will be easy to understand and understand. For this reason, researchers will enter the data that has been obtained into the table.

Table 1. Torso Flexibility Results Data

No	Name	Class	Gender	Torso Flexibility Results (Inches)
1	Alvian Feriansyah	XI IPS I	L	7,8
2	Defri Wimkhameswara	XI IPS I	L	10
3	Farhan Ramdhan	XI IPS I	L	8,2
4	Ferdy Darmawan	XI IPS II	L	6
5	M. Akbar Nurfauzan	XI IPS II	L	10
6	M. Fahmi Ramadhan	XI IPS III	L	9,2
7	M. Usman	XI IPS III	L	6,3
8	M. Syarif Wijaya	XI IPS III	L	10
9	Yoga Aditya Dwi. C	XI IPS III	L	9
10	M. Ridho Almansyah	XI IPS IV	L	6,5
11	Ahmad Baidawi	XI IPS IV	L	9,5
12	Kemas Muhammad. R	XI IPS IV	L	8
13	M. Taufik Pratama	XI IPS IV	L	8,5
14	Satrio Nugroho	XI IPS V	L	7
15	M Hanif Zaidan	XI IPS V	L	7,8

The torso flexibility test was carried out at SMAN 4 Palembang. The total population taken is all male students of class XI IPS SMAN 4 Palembang. While the samples taken with *purposive sampling* techniques were 15 students. Students perform a torso flexibility test using a static test of upper body and neck flexibility using students lying on their stomachs, both hands on the sides of their heads, and straight forward, lifting the body as high as possible and holding the waist on the floor. This test is carried out three times, on these three occasions the highest score will be taken. After the test was carried out, the highest score was 10 and the lowest score was 6 with an average of 8.13.

Table 2. Long Jump Results Hanging Style Data

No	Name	Class	Gender	Long Jump Results Hanging Style (m)
1	Alvian Feriansyah	XI IPS I	L	3,60
2	Defri Wimkhameswara	XI IPS I	L	3,30
3	Farhan Ramdhan	XI IPS I	L	4,10
4	Ferdy Darmawan	XI IPS II	L	3,20
5	M. Akbar Nurfauzan	XI IPS II	L	4,10
6	M. Fahmi Ramadhan	XI IPS III	L	3,20
7	M. Usman	XI IPS III	L	3,30
8	M. Syarif Wijaya	XI IPS III	L	4,10
9	Yoga Aditya Dwi. C	XI IPS III	L	3,30
10	M. Ridho Almansyah	XI IPS IV	L	3,40
11	Ahmad Baidawi	XI IPS IV	L	4,00
12	Kemas Muhammad. R	XI IPS IV	L	3,65
13	M. Taufik Pratama	XI IPS IV	L	3,50
14	Satrio Nugroho	XI IPS V	L	3,60
15	M Hanif Zaidan	XI IPS V	L	3,40

The hanging-style long jump test was carried out at SMAN 4 Palembang. The total population taken is all male students of class XI IPS SMAN 4 Palembang. While the samples taken with *purposive sampling* techniques were 15 students. Students perform a hanging-style long jump test. This test is done by starting by running as hard as possible, then doing a pedestal or repulsion, then doing a floating movement in the air. This test was carried out three times, and from three times the highest score was taken. From the test, the highest score was obtained at 4.10 and the lowest at 3.20 with an average of 3.583.

Table 3. Torso Flexibility and Long Jump Results Hanging Style Data

No	Torso Flexibility Results (Inches)	Long Jump Results Hanging Style (m)	X ²	Y ²	XY
1	7,8	3,60	60,84	12,96	28,08
2	10	3,30	100	10,89	33
3	8,2	4,10	67,24	16,81	33,62
4	6	3,20	36	10,24	19,2
5	10	4,10	100	16,81	41
6	9,2	3,20	84,64	10,24	29,44
7	6,3	3,30	39,69	10,89	20,79
8	10	4,10	100	16,81	41
9	9	3,30	81	10,86	22,1
10	6,5	3,40	42,25	11,56	22,1
11	9,5	4,00	90,25	16	38
12	8	3,65	64	13,32	29,2
13	8,5	3,50	72,25	12,25	29,75
14	7	3,60	49	12,96	25,2
15	7,8	3,40	36	11,56	20,4

Based on the table above, then proceed to find the coefficient after the researcher calculated using the formula, a correlation coefficient (r) of 0.473 was obtained. When viewed from the correlation interpretation table, the number is found in the interval 0.400 – 0.599 which means it has a fairly strong level of relationship.

Based on the results obtained, it can be calculated the contribution of the relationship between torso flexibility and the ability to long jump hanging style in grade XI male students of SMAN 4 Palembang using *determination (correlation coefficient)* (Monyeki et al., 2005). After calculation, the result $KP = 22.37\%$. Thus, it can be stated that the percentage of contribution of the relationship between torso flexibility and the ability to long jump hanging style in male students of class XI IPS SMA 4 Palembang is 22.37% while the remaining 77.63% is influenced by other factors or other variables. Continued with a *significance test* that serves to find the meaning of the relationship between variable X to variable Y, then the correlation results are tested for *significance* using the *t-test correlation formula*.

Based on the calculations that have been done by researchers, the results $(a) = 0.05$ and $Dk = n - 2 = 15 - 2 = 13$. So, the table is 1.770 while the count is 1.932. It turns out that $t_{stat} > t_{crit}$, thus H_a is accepted to mean that there is a relationship between the flexibility of the torso with the ability of the long lock hanging style in male students of class XI IPS SMA Negeri 4 Palembang.

D. Conclusion

Referring to the results of research that has been conducted by researchers at SMAN 4 Palembang and after researchers have processed, analyzed data, and tested

hypotheses and all the data that has been collected, the researchers concluded that there is a relationship between the flexibility of the torso and the ability to long jump hanging style in male students of class XI IPS SMAN 4 Palembang, with a correlation coefficient of 0.473 and determination of 22.37%.

From the conclusions above, the researcher proposed the following suggestions, namely that students should maximize the agility of the torso in doing the long jump, especially hanging style, to get maximum jump results, It is expected that teachers pay more attention to other components that can affect long jump, hanging style, it is hoped that this research can be used as comparison material in similar studies conducted by other students or any party.

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