Ability 50 Meters Sprint In Terms Of The Performance Of Leg Length And Weight Of SDS Bakau Estate Students

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ABSTRACT
This study aims to determine the performance of leg length and body weight in the ability to sprint 50 meters of SDS Bakau Estate students. This research is a quantitative descriptive study with two independent variables, namely leg length and body weight with one dependent variable sprint of 50 meters. The number of samples in this study is limited to 30 students from SDS Bakau Estate. The technique for determining the sample was by using purposive sampling, taking based on certain objectives as many as 30 students from SDS Mangrove Estate. Data analysis techniques were processed using computer assistance through the SPSS 22.0 program. Based on the data analysis, the results obtained: (1) There is a leg length performance with a 50-meter sprint ability of SDS Bakau Estate students, as evidenced by the value of r arithmetic (r:o) = 0.382 (0.037 <0.05), (2) There is a weight performance with a 50 sprint ability meters at SDS Bakau Estate students, as evidenced by the value of r arithmetic (r:o) = 0.409 (0.025<0.05), and (3) there is a performance of leg length and body weight on the 50-meter sprint ability of SDS Bakau Estate, as evidenced by the calculated R-value obtained R = 0.533, R2 value = 0.285 or 36.6% and calculated F value = 5.368 (0.011<0.05).

Keywords: Leg length; Body Weight; Sprint 50 Meter.

INTRODUCTION
Athletics is a physical activity consisting of dynamic and harmonious basic movements, namely walking, running, jumping and throwing (Johan Cahyo B., Musyafari Waluyo, 2012). Besides that, athletics is also useful for improving biomotor abilities, for example, strength, endurance, speed, flexibility, coordination, and so on (Rusli, 2017). And, this athletic activity is also used as a research tool for scientists in the field of sports (Purnomo & Dapan, 2017).

Athletics is the parent of all sports because all sports will involve activities in athletic numbers (Jaliusril et al., 2012). Various activities of running, throwing and jumping numbers.
include kicking off, which is a basic movement pattern that colours most of the branch activities in sports activities (Nesra Barus, 2020). Athletics is a physical activity in the form of physical exercise that contains natural and reasonable movements to be following the activities carried out and carried out following everyday life (Satun, 2018). Examples are walking, running, jumping, throwing and jumping (Nesra Barus, 2020). The branch called parent or mother of sport is athletics. Several types of numbers are contested in athletics, including running, throwing, jumping, and taking off. The short-distance races are 50, 200, and 400 m, while the middle-distance races are 800 m and 1500 m. Long distances are 300, 5000.5000 m, and a marathon (42.195 km). While throwing is discus throwing, hammer throwing, repulsing is shot put, and jumping is the long jump, high jump, pole jump, and triple jump (Julianto et al., 2019).

Athletics in Indonesia means sports which competed in numbers: walking, running, jumping, and throwing (Yoyo Happy, 2010). Athletics is a physical activity or physical exercise that contains natural or reasonable movements such as walking, running, jumping and throwing (Hartono et al., 2013). Other terms that have the same meaning as the term athletics in Indonesia are "leichtatletik" (Germany), "athletismo" (Spain), "sport" (Malaysia), and "track and field" (USA) (Jamaluddin & Ad'dien, 2020).

Athletics - walking, running, jumping and throwing - is also known as the "mother or parent" of all sports (mother of sports) (Evitamala et al., 2019). Because the movement or physical activity in athletics reflects human life in ancient times. They have carried out walking, running, jumping and throwing activities unconsciously to maintain and develop their life (Hidayat, 2019). This activity is used to save oneself from the disturbances of the surrounding nature. (Purnomo & Dapan, 2017).

Athletics is one of the developing sports today. In athletics, there are several race numbers. One of the most prestigious numbers in athletics is run distance short. Short-distance running (sprint) is all types of running that from start to finish is done at maximum speed. Sprinting takes 10-15 seconds and is a sport that is classified as anaerobic, because the higher the speed, the greater the source of aerobic energy (Rahadian, 2018). Short-distance running (sprint) is a way to run where one has to cover the entire distance with maximum speed (Jamaluddin & Ad’dien, 2020).

Sprints or sprints are all running competitions where participants run at a maximum speed over the distance that must be covered, up to a distance of 400 meters can still be classified as sprints or sprints, namely running competitions where participants run at full speed covering a distance of 50 m, 100 m, 200 m, and 400 m. The relative importance of
sprint running varies depending on the age category (Satun, 2018). A good sprint requires quick reactions, good acceleration, and an efficient type of running. The sprinter must also develop a good sprint start and maintain as much top speed as possible. In sprint running, attention must be paid to the energy system used because athletes use stored energy supplies or an an-aerobic capacity (Jamaluddin & Ad’dien, 2020).

The 50 meters sprint. Structural analysis of 50-meter performance and the training and learning needs to improve it must be seen as a complex combination of biomechanical, biomotor, and energetic processes, the most prestigious for athletics is a 50-meter sprint. A 50-meter sprint is a run that is carried out as fast as possible with maximum speed from start to finish to cover a distance of 50 meters in the shortest possible time. The main factor that plays a role and needs to be considered in the 50-meter race is the speed of the runner himself.

Rima Mediyana (2012) suggests that speed is one of the most important biomotor abilities in sports, namely: speed or capacity to move, to move as fast as possible. Sprint 50 meters when viewed from the stages of running consists of several stages, namely: 1) Reaction and drive stage, 2) Acceleration stage, 3) Transition stage, 4) Maximum speed stage (maximum speed), and 5) Speed maintenance stage (maintenance speed) 6) Finish.

The other 50-meter sprints follow the same basic pattern but differ in length and relative importance of stages and speed characteristics. This technique is very important for performance in Sprint. The demands on sprint technique and muscle activity, timing patterns and metabolic activity of athletes will vary through different phases of competition (Rusli, 2017). The main goal of moving from the reaction phase to the transition phase is to develop a steady posture speed, and strength is essential for effective technique. During the speed-maximum phase, the goal is to maximize circuit movement speed, where inter- and intra-muscular mobility and coordination are the dominant factors (Leyva et al., 2017). In the speed maintenance stage, the goal is to delay mechanical tendencies and sprint techniques to break down due to muscle and nervous system fatigue and at this point, speed endurance becomes a priority.

In the speed stage, the ability to do 50 meters sprint cannot only be seen from the physical component but other components can provide performance from the results of the ability to 50 meters sprint. The basic component in question is the body structure where leg length and body weight also contribute when the sprint process is carried out.

Combined with the basic athletic skills, especially the 50-meter sprint, it is clear that elements of body structure, especially in running, are needed to get good results and are on
target, including height, weight, thigh circumference and body length foot. The structure of the human body is determined by the bones and muscles. Tall people naturally have long bones and vice versa. Bones are passive tools, muscles are active tools. In this case, the longer the bone, the more likely it is to be pressed by a lever or High lever system with long nails and long legs for support. In activities such as running, long legs have a wider angle of motion than the other way around. A runner's stride with a wide stride will result in a faster run. Long leg lengths have a big effect on sprint speed, a comparison of two or more runners in the implementation of sprints with different leg lengths, most runners with long legs will win because their steps are wider than runners with short legs.

In addition to physiological factors, several supporting factors can increase running speed. A person's body composition is very influential on a person's motion. Agility plays a special role in physical mobility. Agility is not a single physical component but is composed of components of coordination, strength, flexibility, reaction time and power (Sahabuddin et al., 2020). The problem of body size and body parts owned by each athlete is one of the influential factors in sports performance. In several sports, a tall posture with ideal body weight and good physical condition will support the achievement of high sporting achievements. Anthropometric potential regarding body composition that is owned and exists in athletes often gets less attention from sports coaches. The good anthropometric potential will support the appearance of optimal attitudes and movements in a sport, so this potential must be developed in the process of sports coaching. (Rudiyanto. et al., 2012)

So one of the supporting factors is anatomical factors, including height, length, size, width and weight. Based on the facts that happened at the Men's 100 m Sprint World Championships in Berlin (the 12th IAAF World Championships in 2009), in the final round which was attended by 8 athletes from various countries, the average height of the athletes reached 184.1 cm and the weight they reach average level. 80.7kg. In an ideal body position, the athlete's average time is 9.92 seconds. The champion was Usain Bolt, the men's 50-meter sprinter from Jamaica. Bolt is 193 cm tall, weighs 76 kg and can run 100 meters in 9.58 seconds. The championship was won by Usain Bolt, the men's 100-meter sprint runner from Jamaica. With a height of 193 cm and a weight of 76 kg, Bolt can travel 100 meters in 9.58 seconds. The time record is the fastest 100-meter sprint running speed record to date. When viewed from the facts above, body posture should provide a large enough performance for the 50-meter sprint sports achievement. But to prove it scientifically, research must be carried out
Leg length and body weight are factors that help a runner get maximum speed so that the running results will be perfect. (Mustakim, 2019). Elementary school students can do sprints well if they are supported by running techniques and also physical condition factors and anthropomorphic structures possessed by these students. Anthropometric factors that can affect running speed include height and weight as well as the length of the legs (Yani & Hasri, 2020).

Various studies have often been carried out to improve achievement in athletics, especially in the 50-meter sprint. However, information from the results of previous studies regarding the anatomical factors that perform running speed is lacking and limited. So that a study is needed to find out in a more focused manner how much the performance of anatomical factors is related to sprint speed, therefore the authors feel interested in conducting research concerning the problem of "Ability 50 meters sprint in terms of the Performance of Leg Length and Weight of SDS Bakau Estate students".

**METHOD**

![Figure 1. Model design study](image)

Information:
- \(X_1 = \text{Leg Length}\)
- \(X_2 = \text{Weight}\)
- \(Y = \text{Ability 50 meters sprint}\)

Type study uses a method correlational with approach quantitative. (Yani & Hasri, 2020) with technique data collection is carried out through tests and measurement. By and large purpose the main study is descriptive to describe in a manner systematic facts and characteristics object and subject studied in a manner right. In a study, this is the independent variable (\(X_1\)) leg length and (\(X_2\)) body weight while the dependent variable is (\(Y\)) 50 meters sprint. Sample data collection technique this usually based on consideration of certain, for example, limitations in time, energy and funds so no one could take large
and distant samples. As for the method in the determination sample, the author uses the method of the purposive sample. This is conducted with method take subject no based on strata, random or area but based on existing purpose certain. (Sugiyono, 2014) explains that a purposive sample is a technique determination sample with consideration of a certain so sample in research this is a male student class on 4, 5 and 6 SDS Bakau Estate totalling 30 students.

To obtain empirical data as ingredients for test truth hypothesis, then conducted based data collection the variables involved. Necessary data collected in the study include; Leg length, body weight, speed 50 meters sprint types tests used for measure variables. The analysis model that will be used to obtain an explanation about strength variable determinant / independent to change variable bound/dependent is method regression double with the SPSS (Statistical Package For The Social Sciences) program version 25 for Windows on level significance $\alpha = 0.05$ (95%).

**RESULTS AND DISCUSSION**

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Leg Length (CM)</th>
<th>Weight (KG)</th>
<th>50 Meters Sprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>$N$</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Means</td>
<td>71.93</td>
<td>57.47</td>
<td>14.93</td>
</tr>
<tr>
<td>Median</td>
<td>72.50</td>
<td>58.00</td>
<td>14.73</td>
</tr>
<tr>
<td>$SD$</td>
<td>4.660</td>
<td>3.848</td>
<td>1.673</td>
</tr>
<tr>
<td>Minimum</td>
<td>63</td>
<td>50</td>
<td>12.20</td>
</tr>
<tr>
<td>Maximum</td>
<td>79</td>
<td>66</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Based on the summary of the results of the descriptive analysis of the data above, it can be described as follows:

For long data leg length obtained the average value ($mean$) of 71.93 cm, results deviation default (standard deviation) of 3.660 cm, value lowest ($minimum$) of 63 cm, and value highest ($maximum$) of 79 cm.

For body weight data obtained the average value ($mean$) of 57.47 kg, the results deviation default ($standard deviation$) of 3.848 kg, the value lowest ($minimum$) of 50 kg, and the value highest ($maximum$) of 66kg.
For the ability, 50 meters sprint data obtained the average value (mean) of 14.93 seconds, resulting in a deviation default (standard deviation) of 1.673 seconds score with the lowest (minimum) of 12.20 seconds and a value of the highest (maximum) of 18.22 seconds.

Table. 2
Summary long data normality test results leg length and weight, term in 50 meters sprint towards SDS Bakau Estate students

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Statistics</th>
<th>Sig</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Leg length</td>
<td>0.941</td>
<td>0.098</td>
<td>Normal</td>
</tr>
<tr>
<td>2</td>
<td>Weight</td>
<td>0.937</td>
<td>0.076</td>
<td>Normal</td>
</tr>
<tr>
<td>3</td>
<td>Spirit ability 50 meters</td>
<td>0.955</td>
<td>0.223</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Based on the table which is a summary of the results of the data normality test on each research variable, can be described as follows:

In testing long data normality leg length obtained Shapiro-wilk value $Z = 0.941$, with probability $(P) = \text{larger than} 0.098$, than the value $\alpha = 0.05$. With such long data obtained leg is normally distributed.

In testing the normality of body weight data obtained Shapiro-wilk value $Z = 0.937$, with probability $(P) = 0.076$, over big than value $\alpha = 0.05$. With this, the weight data obtained is normally distributed.

In testing the normality of 50-meter sprint data earned Shapiro-wilk value $Z = 0.955$ with probability $(P) = 0.223$ big than value $\alpha = 0.05$. With such is the capability data 50 meters sprint earned normally distributed.

Table. 3
Analysis results in performance Leg Length and Weight in terms of ability 50 meters sprint SDS Bakau Estate students

<table>
<thead>
<tr>
<th>Variable</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$P$-value</th>
<th>F</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leg Length (X₁), Body Weight (X₂), Ability 50 meters sprint (Y)</td>
<td>0.533</td>
<td>0.285</td>
<td>0.011</td>
<td>5.368</td>
<td>significant</td>
</tr>
</tbody>
</table>

Based on table 3 above seen that the results calculation regression double with using the regression r-test put forward as follows; the regression R-value (ro) is obtained = 0.533 ($P_{value} = 0.011 < \alpha = 0.05$) after the significant test was carried out or significance regression double with using the regression F test is obtained $F_{count} = 5.368$ ($P_{value} = 0.011 < \alpha = 0.05$), then $H_0$ rejected and $H_1$ accepted, with thus there is a significant relationship among long leg length, weight, strength muscle legs, speed 28.5% of 50 meters sprint by SDS Bakau Estate students.
Discussion

If somebody's own structure body (leg length and body weight) together, the SDS Bakau Estate pupils will be capable do whole Suite movement 50 meters sprint in branch sport distant athletics finer too. This is in line with some theories put forward by experts where long leg length is a tool common motion used by everyone does motion run and jump. While that is meant leg length in a study this is the whole tool existing motion under human hips. Leg length is size the length of a person's leg from the sole (malleolus mediates) to the greater trochanter, on the widest part of the bone on the outside of the thigh and when the thigh is moved the trochanter major can be felt at the top of the moving femur.

Leg length is a tool motion that is commonly used by every athlete to perform running, jumping and pedestal movements. Meanwhile, what is meant by the legs in this study is the entire locomotor that is under the human hip. The longer a person's leg allows a person to go longer and more efficiently in covering the distance being contested. Longer calf muscles are on average stronger than short ones.

While reviewing from aspect weight then some existing theory is also supported by results research where weight also performs real to sprinting ability can be seen from some opinion expert in the theory said that body weight is a very unstable anthropometric parameter. Under normal circumstances, where the state of health is good and the balance between consumption and the need for nutrients is guaranteed, body weight develops with age. On the other hand, in abnormal circumstances, there are two possibilities for weight development, which can develop faster or slower than normal. Body weight is the size of the body in terms of weight that is weighed in a state of minimal clothing without any equipment.

Body weight is an important measure to determine the condition of a person's body. Body weight is the result of an increase or decrease in all tissues in the body, including; bone, muscle, fat, body fluids, etc. Body weight gives an idea of the amount of protein, fat, water, and minerals in the bones. Fauzi et al said that information on body weight is generally obtained from measurements using body scales (Amir, S.Ns, 2020).

Body weight can provide an overview of current nutritional status and an overview of growth and change. Determination of body weight can use anthropometry which has been used generally in Indonesia. Anthropometry is a type of nutrition, especially about the energy and protein state of a person's body.
CONCLUSIONS

From the results of research that researchers explain based on study theory and review references as well as framework thinking and data analysis, the researcher could be interested in some conclusions as follows; 1. Performance long leg length to ability 50-meter sprint for SDS Bakau Estate students by 14.6%. 2. Performance weight against ability 50 meters sprint for SDS Bakau Estate students by 16.7%. 3. Performance long leg length and body weight against ability 50 meters sprint for SDS Bakau Estate students by 28.5%.

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