Long Jump Ability: Analyze of Leg Explosive Power and Running Speed for Junior High School Students

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A B S T R A C T

The purpose of the study. aims to determine the contribution of leg explosive power and running speed to long jump ability.

Materials and methods. a research sample of 30 male students. Measurement of leg explosive power is determined by the ability to jump long without starting (standing broad jump). Running speed measurements are determined by running a sample distance of 30 meters. Measurement of long jump ability is determined by a sample of jumping as far as possible in the jumping.

Results. The results showed that leg explosive power, leg length and running speed contributed to long jump ability (r > 0.05). The results show that leg explosive power and long jump ability contribute (r = 0.58). There was a contribution in the correlation test between running speed and long jump ability (r = 0.51). The results of the multiple correlation test of leg explosive power and running speed with long jump ability showed that there was a contribution (r=0.70 and r² = 0.49)

Conclusions. There is a contribution between leg explosive power, leg length and running speed to long jump ability. The influence of physical activity and regular and structured training also greatly influences a person's long jump ability.

Keywords: explosive leg power; running; long jump; Junior High School Students.

INTRODUCTION

The long jump is a jumping movement that begins with a horizontal movement and then changes to a vertical movement by pushing off the strongest leg to get as far as possible (Wiarto, 2013). Long jump is an athletic sport that requires the skill of jumping forward with one jump as far as possible. Athletics is an effective physical activity for optimal growth and development of children (Suryadi, 2017). Three types of long jump styles are squatting, hanging and walking in the air (Laksono, 2015).
Factors that influence the long jump (Syarifuddin, 2002) Speed is the ability of a person to run to change direction or make movements as quickly as possible (Pratiknyo, 2009). Strength is the maximum performance by a muscle or muscle group to receive a load (Kemenpora RI, 2009) Explosive power is a combination of speed and strength to do work with a certain load (Pratiknyo, 2009). Explosive power is a person’s ability to overcome an obstacle with a high contraction speed in a complete movement (Muhajir, 2007).

In good body condition, there will be an increase in the ability of the body’s circulatory system, strength, stamina, speed, flexibility, better movement during training, and faster recovery (Harsono, 2015). Sports have grown and developed in many forms. For the Indonesian people, athletics is very popular in society, because athletics is the mother of all sports. This is evident from the reality in society, that athletics are increasingly being played from rural areas to the urban level. Leg explosive power, leg length and running speed are factors that influence the long jump. However, the phenomenon occurs, students and teachers or trainers do not pay attention to this. At school, through extracurricular activities students are able to develop their long jump abilities. The functions of extracurricular activities include development, recreation, career preparation and social. And the principles of extracurricular activities are choice, individual, active, work ethic, fun and social benefit (Ministry of National Education, 2007).

The source of population and potential for sports problems and development is school age. Sports development for students is one of the programs of the Ministry of Youth and Sports and related agencies in searching for athletes who can support national sports achievements (UU SKN No. 3 of 2005 Article 1 paragraph 3). To produce potential athletes, it cannot be done instantly, it requires tiered coaching, availability of coaching funds and supporting facilities (Wibisono, 2011). Nursery can be done by carrying out talent identification and continuing with the development stage (Islahuzaman, 2010). The long jump consists of a series of movements that include running, support, floating in the air and landing. Of these four components, more attention is directed to the initial and fulcrum running with an emphasis on the training
material on the horizontal and vertical components. The physical components that are considered to contribute to increasing students' long jump ability are: leg explosive power, leg length and running speed.

**MATERIALS AND METHODS**

**Study participants**

The research location is Junior High School Students 25 Medan, Indonesia. The research sample consisted of 30 people using random sampling techniques.

**Study Organization**

The type of this research is descriptive with the following research design:

![Diagram of research design](image)

**Test and measurement procedures**

The data collection technique used to measure the leg explosive power test is by pushing forward with both feet without starting and landing on both feet with a meter measuring instrument. Running speed was measured by running the sample as fast as possible over a distance of 30 meters. Long jump ability is measured by measuring the distance from the tub then running as fast as possible, then leaning on the support board then flying and landing with both feet. The data obtained in the research will be analyzed descriptively and inferentially.

**RESULTS AND DISCUSSION**

The data analysis used in this research is analysis using inferential statistical techniques. The descriptive data analysis is intended to get a general picture of the data which includes average, standard deviation, variance, range, maximum and minimum data, frequency tables and graphs. Next, the analysis requirements were tested, namely the normality test with a significance of $p>0.05$. To test the hypothesis, if it turns out that the data is normally distributed, then a parametric statistical test,
namely correlation, will be used product-moment from Pearson (r test), but if it turns out that the data is not normally distributed, then a non-parametric statistical test is used, namely the Spearman’s correlation test (rho). The results of the normality test for research variable data are $p>0.05$ for variables $X_1$, $X_2$ an $Y$ normally distributed.

The research hypothesis was tested using the $r$ test ($r>0.05$) which can be seen in the table:

**Table 1. The Correlation Test Results**

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>N</th>
<th>R</th>
<th>INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$ - $Y$</td>
<td>30</td>
<td>0.58</td>
<td>Sig.</td>
</tr>
<tr>
<td>$X_2$ - $Y$</td>
<td>30</td>
<td>0.51</td>
<td>Sig.</td>
</tr>
<tr>
<td>$X_1$, $X_2$ - $Y$</td>
<td>30</td>
<td>0.70</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

The correlation test results show that leg explosive power ($X_1$) and long jump ability ($Y$) have a contribution. There is a contribution to the correlation test of running speed ($X_2$) with long jump ability ($Y$). And the results of the multiple correlation test of leg explosive power ($X_1$) and running speed ($X_2$) with long jump ability ($Y$) show that there is a contribution. The results of the Pearson correlation analysis ($r$) in the hypothesis need to be studied further by providing an interpretation of the relationship between the analysis results achieved and the theories underlying this research. This explanation is needed so that we can know the suitability of the theories put forward with the research results achieved. To draw research conclusions that are in accordance with the research objectives, the results of data analysis need to be discussed in accordance with underlying theories.

This supports the existing theory. This can be explained by the fact that if a student has good leg explosive power, it will produce a strong jumping ability resulting in a long jump. Therefore, one type of physical condition that needs to be developed in sports is the element of leg explosive power. However, it must be realized that this physical element does not stand alone, but must be supported and combined with other physical elements such as leg length and running speed and so on. Running Speed with Long Jump Ability in Junior High School students. This can be explained
that these three independent variables together make a real contribution to the long jump ability of Junior High School students. Leg explosive power is a supporting factor in jumping, where when jumping it is used to help improve ability. The jump can be maximized. The length of the legs in relation to running is utilized to direct strength and speed so as to produce maximum jumping ability. Meanwhile, running speed is used when starting and ending, resulting in good jumping ability.

CONCLUSION

The conclusion from the research results and discussion that has been described is that there is a contribution between leg explosive power and running speed and long jump ability. Physical activity and structured training are the most important factors in sports, especially performance sports.

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Law of the Republic of Indonesia No. 3 of 2005 concerning the National Sports System.

APPENDIX

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