



## Leg Length and Running Speed Against Squat Long Jump Ability

**Ricardo Valentino Latuheru**

Department of Physical Education, Health and Recreation, Faculty of Sports Science, Makassar State University, Indonesia

Address: Jln. Wijaya Kusuma Raya No. 14 (Kampus FIK Banta-Bantaeng), Makassar, South Sulawesi, Indonesia, 90222

[ricardo.valentino@unm.ac.id](mailto:ricardo.valentino@unm.ac.id)

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### **ABSTRACT**

*This study aims to determine the relationship between leg length and running speed on the squat style long jump ability. This research belongs to the type of descriptive research. The population of this study was all students of SD 154 Waecekke'e, Lappariaja District, Bone Regency. The Makassar Model State with a total sample of 40 female students selected by random sampling. The data analysis technique used is correlation and regression analysis technique using the SPSS version 15.00 system at a significant level of 95% or 0.05. Starting from the results of data analysis, this study concludes that: (1) There is a significant relationship between leg length and squat style long jump ability in elementary school students 154 Waecekke'e, Lappariaja District, Bone Regency, it is proven that the value of  $r_o = -0.845$  ( $P < 0.05$ ); (2) There is a significant relationship between running speed and long jump squatting ability in SD 154 Waecekke'e Students, Lappariaja District, Bone Regency, it is proven that the value of  $r_o = 0.771$  ( $P < 0.05$ ); and, (3) There is a significant relationship between leg length and running speed on the long jump ability of the squat style at SD 154 Waecekke'e Students, Lappariaja District, Bone Regency, it is proven that the value of  $R_o = 0.847$  ( $P < 0.05$ ).*

**Keywords:** Leg Length; Running Speed; Long Jump.

### **INTRODUCTION**

Athletics is one of the oldest sports that has existed and has been carried out by humans since ancient times until now (Giyatno, 2017). It can even be said that since the existence of humans on this earth, athletics have existed and been carried out by humans (Kurnia, 2018). This is because every movement in athletics such as walking, running, jumping and throwing is a manifestation of basic movements in everyday human life (Yuherdi et al., 2013). In ancient times, the movements carried out by humans were very important because they were related to the fulfillment of their life needs, namely hunting and gathering food (Penggalih et al., 2018). For this reason, primitive humans are required to have strength, speed, endurance and agility, especially in using ancient

equipment such as javelin, arrows, boomerangs, stones and so on (Said, 2008) which can be obtained from doing various athletic movements even though they are not aware of it (Depdikbud, 1992). The movements found in all sports are essentially basic movements that come from movements in athletics (Faizah, 2016). Therefore, it would not be an exaggeration to say that athletics is the mother of all sports (Ariyantinin et al., 2016). Athletics is also a means of physical education for students in an effort to increase endurance, strength, speed, agility and so on (Agus, 2010). Physical education learning is one of the contents of education at all levels of education (Satur, 2018). In addition to uniformity of educational material, it is also a method of achieving educational goals or trying to achieve a certain level of achievement (Hidayat, 2019). This is marked by the frequent holding of championships or competitions that involve students (Hidayat, 2019) and competing in sports, which include athletics and include walking, running, jumping and throwing (Nuryadi & Firmansyah, 2018).

The long jump number athletic sport requires a prefix that is influenced by maximum speed and repulsion (leg power) (Umah et al., 2016) to be able to produce the maximum jump distance (Asep Dedi Paturohman, 2018). In order for coaching to achieve the desired goals, it is necessary to know several factors that influence (Rusli, 2017) and determine the success of an athlete, especially in athletics (Dwi et al., 2018) (Sahabuddin et al., 2020). These factors according to, among others, are as follows: 1) Physical Development, 2) Technical Development, 3) Mental Development, 4) Champion Maturity (Lilik Evitamala, I Nyoman Adiputra, Luh Putu Ratna Sundari, Luh Made Indah Sri Handari Adiputra, I Putu Adiartha Griadhi, 2019). The physical aspect, which consists of several components, really supports the achievement of coaching, because this aspect is fundamental to the development of other aspects (Taufik Hidayat, Ramadi, 2016). The development of physical conditions is not only to improve the achievements of athletes (Sahabuddin, 2019), but also to maintain the health of the perpetrators (Liputo, 2016). This can be seen in athletes who have good physical conditions (Sahabuddin, 2017) will automatically have good health (Section, 2015), so that automatically they will be able to perform the techniques of each sport they are engaged in (Yuherdi et al. al., 2013).

The maximum jump or the distance of the jump can be achieved (Ferdian, 2015) if it is supported by excellent physical abilities and supported by long legs (Wijaya, 2015). This physical ability is running speed, running speed is the ability to cover a short distance of time (Asep Dedi Paturohman, 2018). Long limbs and supported by the

physical ability of speed will help achieve long jumps. Because these two things have a big role in making the jump (Kartika, 2015). Leg length and running speed greatly affect long jump ability (Pramana et al., 2019). In the long jump, the legs are used as the main mover, so the legs are very required to have good condition (Pujianto, 2020), the taller a person is, the longer the legs are so that they can carry out their duties by jumping optimally (Hasanuddin, 2020). Things that need to be considered in achieving these goals are leg length and speed, which are potential and physical abilities that can support the maturity level of the long jump technique (Firdaus & Hadisaputro, 2021). The length of the legs they have will make it easier to carry out movements, especially when running and lengthening the steps for jumping (Dirgantoro & Wijanarko, 2019). Likewise, speed can help when doing the prefix, namely when running so that when making a jump it can push the body forward (Haryanto & Fataha, 2021).

## METHOD

The method used in this research is a descriptive correlational method. Descriptive research aims to describe systematically, factually, and accurately about the facts and characteristics of the population. The population in this study were students of SD Negeri 154 Waekece'e, Bone Regency. The researcher used a female sample because to find out more details about leg length and running speed on the long jump ability of the female students of SD Negeri 154 Waekece'e, Bone Regency. And the number of population that can represent students, especially those who have or are currently taking physical education subjects, are 40 people. After all research data has been collected, namely leg length data, running speed data and long jump ability data, to test the hypotheses proposed in this study, they can be compiled, processed, and statistically analyzed using computer facilities through the SPSS program..

## RESULTS AND DISCUSSION

### Results

#### Descriptive analysis

**Table 1.**  
The results of the descriptive analysis of each variable

	N	Sum	Mean	Stdv	Range	Min.	Max.
Leg length	40	2784,00	69,6000	5,05762	19,00	60,00	79,00
Running speed	40	282,54	7,0635	0,48646	1,80	6,25	8,05
Long jump squat style	40	90,73	2,2683	0,12846	0,57	2,05	2,62

**Table 2.**  
 Normality test results for each variable

Variable	K – SZ	P	$\alpha$	Ket.
Leg length	0,931	0,351	0,05	Normal
Running speed	1,079	0,195	0,05	Normal
Long jump squat style	0,816	0,519	0,05	Normal

**There is a relationship between leg length and long jump ability in squat style**

The results of the data obtained from the study aimed to determine between the independent variable and the dependent variable and to prove the existing hypothesis. Therefore, the results of hypothesis testing based on data processing through correlation and regression analysis from the SPSS program regarding the relationship of leg length to the squat style long jump ability in elementary school students 154 Waekecce'e, Lappariaja District, Bone Regency, were obtained according to summary table 3 below:

**Table 3.**  
 The results of correlation and regression analysis for the first hypothesis

VARIABLE	r/R	Rs	F	t	P	$\alpha$
Leg length (X1)						
Long jump squat style (Y)	0,748	0,559	48,138	6,938	0,000	0,05

Based on the results of the correlation analysis and regression analysis of the data between leg length and the squat style long jump ability in elementary school students 154 Waekecce'e, Lappariaja District, Bone Regency. Obtained a correlation value of 0.748 with a probability level  $(0.000) < 0.05$ , for the value of R Square (coefficient of determination) 0.559. This means that 55.9% long jump squat style is explained by leg length. From the Anova test or F test, the calculated F is 48.138 with a significance level of 0.000. Because the probability (0.000) is much smaller than 0.05, the regression model can be used to predict the squat style long jump (can be applied to the population where the sample is taken). From the t-test obtained 6.938 with a significance level of 0.000. Therefore the probability (0.000) is much smaller than 0.05. Then  $H_0$  is rejected and  $H_1$  is accepted or the regression coefficient is significant, or the length of the leg really has a significant effect on the ability of the squat long jump. Thus, it can be concluded that leg length has a significant relationship with the long jump ability of the squat style of elementary school students 154 Waekecce'e, Lappariaja District, Bone Regency, proven to have a correlation value of 0.748 with a probability level  $(0.000) < 0.05$ .

**There is a relationship between running speed and the ability to jump long squat style**

The results of the data obtained from the study aimed to determine between the independent variable and the dependent variable and to prove the existing hypothesis.

Therefore, the results of hypothesis testing based on data processing through correlation and regression analysis from the SPSS program regarding the relationship between running speed and the long jump ability of the squat style in SD 154 Waekecce'e students, Lappariaja District, Bone Regency, were obtained according to the following table 4 summary:

**Table 4.**

The results of correlation and regression analysis for the second hypothesis

VARIABLE	r/R	Rs	F	t	P	$\alpha$
Running speed (X2)						
Long jump squat style (Y)	-0,676	0,457	32,012	-5,658	0,000	0,05

Based on the results of the correlation analysis and data regression analysis between running speed and long jump squatting ability in elementary school students 154 Waekecce'e, Lappariaja District, Bone Regency. The correlation value is -0.676 with a probability level  $(0.000) < 0.05$ , for the value of R Square (coefficient of determination) 0.457. This means that 45.7% of the squat style long jump is explained by running speed. From the Anova test or F test, the calculated F is 32,012 with a significance level of 0.000. Because the probability (0.000) is much smaller than 0.05, the regression model can be used to predict the squat style long jump (can be applied to the population where the sample is taken). From the t-test obtained -5.658 with a significance level of 0.000. Therefore the probability (0.000) is much smaller than 0.05. So  $H_0$  is rejected and  $H_1$  is accepted or the regression coefficient is significant, or the running speed really has a significant effect on the squat style long jump ability. Thus, it can be concluded that running speed has a significant relationship with the squat style long jump ability of elementary school students 154 Waekecce'e, Lappariaja District, Bone Regency, as evidenced by the correlation value -0.676 with a probability level  $(0.000) < 0.05$ .

### **There is a relationship between leg length and running speed on the long jump ability of the squat style**

The results of the data obtained from the study aimed to determine between the independent variable and the dependent variable and to prove the existing hypothesis. Therefore, the results of hypothesis testing based on data processing through regression analysis from the SPSS program about the relationship between leg length and running speed on the long jump ability of the squat style in SD 154 Waekecce'e students, Lappariaja District, Bone Regency, were obtained according to the summary of table 5 below:

**Table 5.**  
The results of the regression analysis for the third hypothesis

VARIABLE	r/R	Rs	F	t	P	$\alpha$
Leg length (X1), and running speed (X2)						
Long jump squat style (Y)	0,750	0,563	23,840	5,844	0,000	0,05

Based on the results of the regression analysis of the data between leg length and running speed on the squat style long jump ability in elementary school students 154 Waekece'e, Lappariaja District, Bone Regency. The regression value is 0.750 with a probability level (0.000) < 0.05, for the R Square value (coefficient of determination) 0.563. This means that 56.3% long jump squat style is explained by leg length and running speed. From the Anova test or F test, the calculated F is 23,840 with a significance level of 0.000. Because the probability (0.000) is much smaller than 0.05, the regression model can be used to predict the squat style long jump (can be applied to the population where the sample is taken). From the t-test obtained 5.844 with a significance level of 0.000. Therefore the probability (0.000) is much smaller than 0.05. So Ho is rejected and H1 is accepted or the regression coefficient is significant, or leg length and running speed really have a significant effect on the ability to jump long jump style. Thus, it can be concluded that leg length and running speed have a significant relationship with the long jump ability of the squat style of elementary school students 154 Waekece'e, Lappariaja District, Bone Regency, the regression value is 0.750 with a probability level (0.000) < 0.05.

## Discussion

### **There is a significant relationship between leg length and long jump ability with squat style.**

The results of statistical analysis showed that the leg length had a significant relationship with the squat style long jump ability. If the research results are related to the theory and the underlying framework, then basically the results of this study support and strengthen the existing theories and results of previous research. It is evident from the results of the analysis that the observation correlation value is greater or the probability value is smaller than 0.05. This proves that long jump ability is strongly influenced by leg length. Long limbs will greatly support the maximum jump in the squat style long jump (Arif et al., 2021). A student who gets the long jump must have leg length. Leg length is very necessary for every student to achieve a jump (Kartika, 2015). Long limbs provide a

wider range of motion to step and reach a maximum jump (Astuti, 2015). Therefore, every student who does the long jump needs a wider range of motion to move to reach the maximum jump distance (Ferdian, 2015). Thus, the length of the legs has a significant relationship with the long jump ability of the squat style.

### **There is a significant relationship between running speed and long jump ability in squat style**

The results of statistical analysis showed that running speed had a significant relationship with the squat style long jump ability. If the results of this study are related to the theory and the underlying framework, then basically the research results support and strengthen the existing theories and results of previous research. It is evident from the results of the analysis that the observation correlation value is greater or the probability value is smaller than 0.05. This proves that speed is crucial for a long jump athlete, athletes will react quickly if they are stimulated to perform with very fast movements. The speed is used when doing the prefix (Firdaus & Hadisaputro, 2021), the distance to do the prefix can be adjusted according to the ability of a jumper (Arif et al., 2021) therefore, the achievement of a jumper to reach the maximum jump can be determined from the prefix by their running speed (Astuti, 2015). Thus, running speed has a significant relationship with the squat style long jump ability.

### **There is a significant relationship between leg length and running speed on the long jump ability of the squat style**

The results of statistical analysis showed that leg length and running speed had a significant relationship with the squat-style long jump ability of elementary school students 154 Waekece'e, Lappariaja District, Bone Regency. If the results of this study are related to the theory and the underlying framework, basically the results of this study support and strengthen the existing theory. It is evident from the results of the analysis that the observation correlation value is greater or the probability value is smaller than 0.05. This proves that leg length and running speed greatly affect the long jump ability of the squat style. In the long jump, the legs are used as the main mover, so the legs are highly required to have good condition (Pramana et al., 2019). The thing that needs to be considered in achieving this goal is running speed which is the potential and physical ability that can support the maturity level of the squat style long jump technique (Haryanto & Fataha, 2021). Speed can help when doing the prefix, namely when running

so that when making a jump it can push the body forward (M. Arif, 2017). Therefore, leg length and running speed cannot be ignored (Ferdian, 2015). Thus, leg length and running speed have a significant relationship with the long jump ability of the squat style.

## CONCLUSIONS AND SUGGESTIONS

### Conclusions

In accordance with the results of the analysis of hypothesis testing based on the problems posed, the following conclusions can be drawn: Leg length and running speed have a significant relationship with the squat style long jump ability in elementary school students 154 Waekece'e, Lappariaja District, Bone Regency..

### Suggestion

So that the results of this study can be used to improve the squatting style long jump ability for students at school, the following suggestions can be put forward: (1) Sports teachers in schools are expected to improve the squat long jump style for their students by applying innovative learning models, ( 2) The components that are related or needed in the squat style long jump should be developed towards achievement development, (3) It is hoped that further research with a larger sample of relevant research will be carried out so that the results of this research can be developed to enrich the repertoire of sports disciplines, especially in an effort to improve the ability to jump long squat style.

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