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## **The effect of balance and strength of muscle leg on the accuracy of kicking a ball towards the goal in the student football University of Lampung**

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### **Abstract**

The ability to view toward the goal is the most important factor in the success of football. The low accuracy of kicking towards the University of Lampung football student's goal, it is necessary to know what factors influence the problem. The purpose of this study was to determine whether or not there was an influence between Balance (X1), and Leg Muscle Strength (X2) on the accuracy of kicking the ball towards the goal at the University of Lampung football students. The research method used in this study is a survey method with a test technique, while the analysis technique uses the path analysis approach. The population in this study were all members of the University of Lampung football as many as 70 students. The sample in this study is the entire population used as research samples.

Based on the results of data analysis, the results of the study can be voiced as follows: There is a positive influence between the balance of the accuracy of kicking the ball towards the goal (Shooting) at the University of Lampung football students. There is a positive direct effect between Leg Muscle Strength on the accuracy of kicking the ball toward the goal. There is a positive direct effect between Balance on leg muscle strength in the University of Lampung football students. A good balance will restore the balance of the accuracy of kicking toward the goal. Good leg muscle strength will successfully win the accuracy of kicking toward the goal supported by the player obtained. A good balance will cancel the strength of leg players. Thus the accuracy of kicking towards the goal can be increased through increased balance and leg muscle strength.

**Keywords:** balance, leg muscle strength, accuracy, shooting

### **Introduction**

The immense popularity of football has pushed the campus to maximize students interested in playing football through activities in student activity units (UKM)

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football. As an institution of higher education that is very dynamic in forming a good generation of people who have intellectual, quality academic, insightful, cultured nation, and can master the science of technology, art, and sports by their scientific disciplines and talents. The University of Lampung has many Student Activity Units (UKM), one of them is UKM, enthusiasts of UKM are many, both male and female.

The excellent performances of soccer players are influenced by various aspects, so these aspects need to get attention proportionally. Four main aspects need to be prepared in conducting training for all sports, including for soccer players, which include; (1) physical preparation, (2) technical preparation, (3) technical preparation, (4) psychological preparation.

Various physical aspects that have a close relationship with the game of football include balance and strength. Balance is the ability to maintain the center of gravity in the fulcrum, especially when in an upright position (O'Sullivan, 1981). Balance is the ability to maintain the body in an equilibrium position or in a static or dynamic state, as well as using minimal muscle activity (Ann Thomson, 1991). The balance element used in football games is a static and dynamic balance. Balance is one of the physical conditions that cannot be released in any sport, including football, in football balance is very much needed when going to make a move in football such as going to kick the ball, hold the ball, dribble the ball and deceive opponents. Balance is the ability to control the nerve organs of the muscles (while M Sajoto). In the law of balance, it is stated that stability is directly proportional to the area of the fulcrum (Dadang masnun). Balance can be divided into two types, namely: (1) Static balance, where the motion is usually very small, for example standing on a narrow base (balance beam, railroad tracks), doing a handstand to maintain balance after turning in place. (2) Dynamic balance, one's ability to move from a point or space to another point or space by maintaining balance, for example, dancing exercises on horses or parallel bars, water skiing, skating, roller skates and so on (harsono).

Balance is also interpreted as the ability of individuals to maintain the neuromuscular system in a static condition for an agility response or to control it in a special dexterity when moving posture. The composition of the human nerve is also very influential to the balance of motion when going to make movements that are seen, heard, and requested.

Equilibrium is an absolute quality, meaning that an object is in equilibrium, so it can be said that equilibrium is a symptom or condition that occurs in an object at which time the amount of energy acting opposite each other on an object is zero. While the element of strength needed in football games is leg muscle strength, which functions to kick the ball. Accuracy or accuracy is one's ability to control free movements towards a target (M. Sajoto). With the right target, feed and control the ball, and kick the ball hard on the opponent's goal.

Students or football players must also have leg muscle strength because without leg muscle strength the player will not be able to make a hard kick towards the goal, the balance, and strength of the leg muscles have a very tight influence on scoring goals against the opponent.

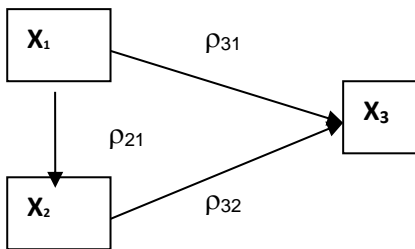
When a student or player will make a kick toward the goal, it will be very much needed between the balance and strength of the leg muscles where it has an effect, without balance the soccer player will not be able to balance the technique of kicking

the ball toward the goal, also without leg muscle strength will not be possible to score against the opponent's goal with a hard kick.

### Methodology

The research method used in this study is a survey method with non-test techniques, while the analysis technique uses the path analysis approach, which is a study that will examine or analyze the relationship between research variables, and measure the direct and indirect effects of one variable on the variable the other.

The path analysis model is used to analyze the pattern of relationships between variables with the aim to determine the direct or indirect influence of a set of independent (exogenous) variables on the dependent variable (endogenous). The variables studied consisted of three variables consisting of two exogenous (free) variables and one endogenous (bound) variable. Exogenous variables consist of balance and strength of leg muscles. Endogenous variables consist of the accuracy of kicking the ball toward the goal at the Lampung University Soccer UKM. The relationship pattern between research variables can be seen in the following figure:



**Figure 1.** Research Design information:

X1: Endogenous Variable 1: Balance

X2: Endogenous Variable 2: Leg muscle strength

X3: Exogenous Variables: the accuracy of kicking the ball towards the goal

The form of data in this study is the form of numbers including balance data, leg muscle strength, and coordination and the results of the accuracy of kicking the ball towards the goal. In accordance with the formulation of research methodology and theoretical models that have been described in advance, the analysis technique used in testing the hypothesis of this research is path analysis.

Before testing the data analysis, the data analysis requirements are calculated first, namely the Normality and Homogeneity Testing of the data.

## Results and discussion

### Results

**Table 1.** Summary of Research Results

STATISTICS	VARIABLE		
	X1	X2	X3
Sample (n)	70	70	70
Maximum Value	50	80	48
Minimum Value	15	53	28
Range	35	27	20
Average ( $\bar{X}$ )	35,43	67,04	38,40
Standard Deviation (s)	8,79	6,84	5,23
Variance (s <sup>2</sup> )	77,35	46,74	27,37

Information:

X1: Balance

X2: Leg Muscle Strength

X3: Accuracy of Kicking Towards

The description of the data presented is a description of the research variables studied consisting of three variables consisting of two exogenous (free) variables and one endogenous (bound) variable. Exogenous variables consist of leg muscle balance and strength. Endogenous variables consist of precision in the direction of the goal. Presentation of data descriptions are presented for each variable in a row (data can be seen in Appendix 2) starting from the dependent variable as follows:

#### 1. Accuracy in Kicking Goals

Based on research data for the accuracy of kicking toward the goal obtained the lowest score of 28, and the highest score of 48, with a range of scores of 20, from the results of data analysis, obtained an average of 38.40; standard deviation 5.23; and variance 27.37. With lots of class 7 and class 3 length, frequency variable data distribution is made to the precision of kicking toward the goal.

#### 2. Balance

Data regarding the balance obtained through the test shows the range of empirical scores between 15 and 50, with a range of theoretical scores of 5 - 50. The results of calculations show an average price of 35.43; standard deviation 8.79; and Variance 77,35. With the number of class intervals 7 and length of class 5 the frequency distribution is obtained

#### 3. Leg muscle strength

Data on leg muscle strength from the results of the study indicate the range of empirical scores between 53 to 80. The results of the calculation of the average price of 67.04; standard deviation 6.84; and the variance of 46.74. With the number of interval classes 7 and the length of the interval class 4, the frequency distribution is obtained.

After analyzing the structural model, the results obtained are used to test the proposed hypothesis and measure the amount of direct influence between variables.

The conclusion of the proposed hypothesis will be drawn through the path coefficient and significance test for each path examined.

**1. Positive direct effect of balance on Kick towards the goal**

The results of the calculation of the path coefficient and tcount, to test the above hypothesis are presented in the following table:

**Table 2.** Testing the Hypothesis Balance against the Accuracy of kicking toward the goal.

Observation (n)	Path coefficient ( $\rho_{41}$ )	tcalculate	ttable	
			$\alpha=0,05$	$\alpha=0,01$
70	0,329	3,609*	1,676	2,403

Information:

\*= The path coefficient is very significant, tcal (3,609)>ttable on  $\alpha=0,01$ ; DF(50)=(2,403)

The calculation results as seen in the table above show that the coefficient of the balance path to the accuracy of kicking toward the goal ( $\rho_{31}$ )= 0,329, tcalculate= 3,609. because tcalculate= 3,609 and ttable= 2,403 on  $\alpha=0,01$ , then tcalculate > ttable, 3,609 > 2,403, then H0 is rejected which means there is a direct positive effect on the balance of kicking towards the goal.

**2. Positive direct effect of leg muscle strength on kicking toward the goal**

The results of the calculation of the path coefficient and tcount, to test the above hypothesis are presented in the following table:

**Table 3.** Hypothesis Testing of Leg Muscle Strength Against Kicking in the Wicket

Observation (n)	Path coefficient ( $\rho_{31}$ )	Tcalculate	ttable	
			$\alpha=0,05$	$\alpha=0,01$
70	0,403	2,532*	1,676	2,403

Information:

\*= The path coefficient is very significant, tcal (2,532)>ttab on  $\alpha=0,01$ ;DF(50)=(2,403)

The calculation results as seen in the table above show that the path coefficient of leg muscle strength towards kicking toward the goal ( $\rho_{32}$ )= 0,403, tcalculate = 2,532. because tcalculate = 2,532 and ttable = 2,403 on  $\alpha=0,01$ , then tcalculate > ttable, 2,532 > 2,403, then H0 is rejected which means there is a direct positive effect on leg muscle strength towards kicking toward the goal.

**3. Positive direct effect of balance on leg muscle strength**

The results of the calculation of the path coefficient and tcalculate, to test the above hypothesis are presented in the following table:

**Table 4.** Testing of Hypothesis Balances on Leg muscle strength

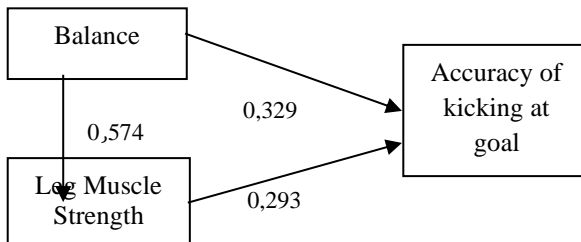
observation (n)	Path coefficient ( $\rho_{42}$ )	Tcalculate	ttable	
			$\alpha=0,05$	$\alpha=0,01$
70	0,293	3,027*	1,676	2,403

Information:

\*= The path coefficient is very significant,  $t_{cal} (3,027) > t_{tab}$  on  $\alpha=0,01; DF(50)=(2,403)$

The calculation results as seen in the table above shows that the path coefficient of balance to leg muscle strength ( $\rho_{21}$ )= 0,293,  $t_{calculate} = 3,027$ . Because  $t_{calculate} = 3,027$  and  $t_{table} = 2,403$  on  $\alpha=0,01$ , maka  $t_{calculate} > t_{table}$ ,  $3,027 > 2,403$ , then  $H_0$  is rejected which means there is a positive direct effect of balance on leg muscle strength.

The path coefficient of each variable can be described as follows:



**Figure 2.** Path diagram for Path coefficient

## Discussion

Based on the results of the analysis and testing of hypotheses, it shows that of the three hypotheses proposed in this study, all hypotheses are proven to be in accordance with the theoretical model based on the results of analysis of research data with path analysis. To be further related to the results of this study are explained as follows:

### 1. Balance and Accuracy Kicking toward the goal

The results of testing the first hypothesis, shows that the balance is directly positive effect on the accuracy of kicking toward the goal. Thus the balance is an important exogenous variable in achieving accuracy in kicking towards the soccer goal. The results of testing the hypothesis of a positive direct effect of equilibrium on the accuracy of kicking toward the goal show a standardized loading factor of 0.329 and a t-value of 3.609. The positive value of standardized loading factor that is produced shows that the causal relationship of equilibrium to the accuracy of kicking towards the goal has a direct positive effect on the accuracy of kicking towards the goal. The results of further testing with the t-test showed that the t-calculate was 3.609 greater than the t-table whose value was 2.403. The results of this t-test confirm that the positive direct effect of balance on the accuracy of kicking towards the goal is proven.

### 2. Leg muscle strength and accuracy of kicking toward the goal

The results of the second hypothesis testing showed that leg muscle strength had a direct positive effect on the accuracy of kicking toward the goal. Thus leg muscle strength is an important exogenous variable in the accuracy of kicking toward the goal. Hypothesis testing results of the positive direct effect of leg muscle strength on the accuracy of kicking toward the goal shows a standardized loading factor of 0.403 and a tvalue of 2.532. The positive standardized loading factor produced shows that the causal relationship of leg muscle strength to the accuracy of kicking toward the

goal has a direct positive effect. The results of further testing with the t-test showed that the t-calculate was 2.532 greater than the t-table whose value was 2.403. The results of this t-test confirm that the positive direct effect of leg muscle strength on the accuracy of kicking toward the goal is proven.

### **3. Balance and strength of leg muscles.**

The results of testing the third hypothesis, shows that the balance has a direct positive effect on leg muscle strength. Thus balance is an important exogenous variable in leg muscle strength. The results of testing the hypothesis of a positive direct effect of balance on leg muscle strength showed a standardized loading factor of 0.293 and a t-value of 3.027. The resulting positive standardized loading factor shows that the causal relationship of balance to leg muscle strength has a direct positive effect. The results of further testing with the t-test showed that the tcount of 3.027 was greater than the ttable whose value was 2.403. The results of this t-test confirm that the positive direct effect of balance on leg muscle strength is proven.

## **Conclusion**

Based on data analysis and statistical calculations outlined in the previous chapter of the discussion of the results of research conducted at the University of Lampung Football students, this chapter presents the following conclusions, implications, and suggestions. Conclusions are drawn based on research findings with variables consisting of balance, leg muscle strength and accuracy of kicking toward the goal, as follows:

1. There is a positive direct effect of balance on the accuracy of kicking towards the goal at the University of Lampung Football Students. This means that a good balance will result in increased accuracy in kicking toward the goal.
2. There is a positive direct effect of leg muscle strength on the accuracy of kicking toward the goal at the University of Lampung Football Students. This means that good leg muscle strength will result in increased accuracy in kicking towards the goal achieved by the player in question.
3. There is a positive direct effect between the balance on leg muscle strength in the University of Lampung Football Students. This means that a good balance will result in increased muscle strength of the player's limbs.

Thus the accuracy of kicking toward the goal can be improved through increased balance and leg muscle strength.

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