

Contribution of Leg Muscle Power and Balance to Shooting Accuracy in SSB Elang Biru Soccer Team Players

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Abstract. The game of soccer fundamentally requires leg muscle power and balance to achieve good shooting accuracy. Shooting accuracy is a basic technique that every player must master, as it is the way to create goals. This research aims to determine the relationship between leg muscle power and shooting accuracy, the relationship between balance and shooting accuracy, and the contribution of leg muscle power and balance to shooting accuracy. This study employs a quantitative approach using simple correlation. The research sample consists of 20 soccer athletes from the SSB Elang Biru team. The instruments used to collect data include test items: 1) leg muscle power using the standing broad jump test, 2) balance using a body balance test, and 3) shooting accuracy using a shooting accuracy test. The research results can be summarised as follows: 1) there is a significant relationship between leg muscle power and shooting accuracy, 2) there is a significant relationship between balance and shooting accuracy, 3) there is a significant contribution of leg muscle power and balance to shooting accuracy in soccer games for the SSB Elang Biru team. These findings indicate that leg muscle power and balance contribute to shooting accuracy in SSB Elang Biru soccer players.

Keywords: Leg Muscle Power; Balance; Shooting Accuracy.

INTRODUCTION

The essence of soccer is a team game that uses a soccer ball, and it is also one of the competitive sports. Soccer is played on a grass field by two teams facing each other, with each team consisting of eleven players. The objective of this game is to score as many goals as possible by putting the ball into the opponent's goal while trying to defend your goal from the opponent's attacks. The characteristic that distinguishes this game is using the entire body to play the ball.

According to [1], "Soccer is a game played by kicking, to score goals by putting the ball into the opponent's goal while defending one's own goal to prevent the ball from entering". Soccer predominantly relies on foot skills, except for the goalkeeper, who can use any body part. Leg muscle power is one of the crucial components that every soccer player must possess.

Executing a kick requires power for a teammate or towards the opponent's goal. Leg muscle power is the strength and speed of the muscles in the

lower extremities when contracting maximally, as defined by [2], "Power is the strength or speed of dynamic and explosive muscle contractions that involve the output of maximum muscle force as quickly as possible".

When athletes kick the ball or take a shot, an element of power is involved because kicking requires strong force to produce a ball that travels far and quickly toward the desired direction. Power is the ability to exert maximum pressure in a concise amount of time. The author [3] states, power is the product of strength and speed. This means that strength and speed training are already incorporated; even in every strength and speed exercise, there is an element of power training."

In addition to requiring power, shooting accuracy also demands balance so the body can maintain its position when kicking. According to [4], balance is the ability to maintain the correct posture and body position while standing (static balance) or during movement (dynamic balance). The

ability to maintain balance is influenced by several factors, including visual and auditory (inner ear) factors.

Shooting accuracy results from the magnitude of power and body balance, especially in the legs, when a soccer player takes a shot. The greater the energy generated, the farther the distance of the shot, and the better the player's balance, the easier it is to put the ball into the goal. Good accuracy is essential when shooting, and it can be defined as the precision of the ball reaching the intended target with a perfect landing. Accuracy is closely related to the shooting distance's precision and the shot's strength.

Accuracy or precision is a supporting aspect of a basic technique that every player must possess, including its application in soccer. The author [3] states, "Accuracy is the skill to move an object precisely so that its intended goal is achieved effectively." For example, in soccer, a player with good accuracy can move the ball precisely to the target. In other words, accuracy is a factor required for someone to reach their desired target. The better a person's accuracy skills, the more skilled a player is in directing the target with specific intent and purpose.

Kicking is a fundamental element in the game of soccer. According to [5], "Kicking is done to pass, shooting at the goal, and clearing to thwart the opponent's attack. There are several types of kicks, including using the inside of the foot, the outside of the foot, the instep, and the inside". An excellent kicking technique should consider strength and speed while requiring precision. All players can kick in, creating goals and winning matches. Kicking with the tip of the foot is also often performed by players during practice or games. The basic technique of kicking with the end of the foot is almost the same as the shooting technique.

Based on the observations conducted by the researcher on the players of the SSB Elang Biru Soccer Team, it was noted that during training, the results of the players' power and body balance when shooting towards the goal were quite impressive. Shooting with the foot is a fundamental technique that all players must master, as it is the way to create goals, and every player has the opportunity to score and win the game [2]. The required shooting falls into the category of strong, fast, and accurate shots. Furthermore, players have different body postures and varying strengths in their kicks. These differing body pos-

tures also significantly influence the outcome of the kicking power of each SSB Elang Biru athlete.

Based on the background information provided above, the researcher believes that players, in addition to mastering the techniques of the game, must also possess leg muscle power, balance, and accuracy to perform practical shooting.

METHOD

Based on the issue to be examined, the Contribution of Leg Muscle Power and Balance to Shooting Accuracy in Players of the SSB Blue Eagle Soccer Team, this research employs a quantitative method using simple correlation to provide an overview of individual abilities. According to [6], quantitative research is a method grounded in positivist philosophy, used to study specific populations or samples; data collection involves research instruments, and data analysis is quantitative / numeric to test established hypotheses.

According to [6], "Research instruments are tools used to measure observed natural and social phenomena". Specifically, all of these phenomena are referred to as research variables. These instruments are used as tools to measure and collect data about a variable. The instruments used in this research consist of test items.

Data collection techniques are the procedures for obtaining data in a research study. These procedures consist of instructions for conducting measurements to get data in this research. This study's data collection techniques include testing and measurements, specifically the standing broad jump, body balance, and shooting accuracy tests.

After obtaining data from field measurements, the next step is to analyse the data using statistical formulas to determine the extent of the contribution of leg muscle power and balance to shooting accuracy in players of the SSB Blue Eagle soccer team. The steps taken in analysing the data include prerequisite and data analysis tests.

RESULTS AND DISCUSSION

From the Table 1, the Asymp. Sig values for all variables are more significant than 0.05, indicating that the hypothesis stating the sample is drawn from a normally distributed population is accepted. Based on this information, the data for

the variables in this study can be analysed using a parametric statistical approach.

Table 1 – Results of Normality Test Calculate

No	Variable	Asymp. Sig	Conclusion
1	Leg Muscle Power	0,691	Normal
2	Balance	0,498	Normal
3	Shooting Accuracy	0,076	Normal

Table 2 – Results of Linearity Test Calculation

Variable	Significance	Conclusion
Leg Muscle Power – Shooting Accuracy	0,470	Linear
Balance – Shooting Accuracy	0,675	Linear

From the results above, it can be concluded that both of their significance values are greater than 0.05, which indicates a linear relationship.

The first and second hypotheses are tested using correlation analysis techniques. In contrast, the third hypothesis is tested using multiple regression analysis techniques to determine whether leg muscle power and balance contribute to shooting accuracy in SSB Elang Biru soccer team players.

The first hypothesis states that there is a relationship between leg muscle power and shooting accuracy in SSB Blue Eagle soccer team players. Testing the first hypothesis uses a simple regression analysis technique, and the results can be seen in the following table.

Table 3 – Summary of the Relationship between Leg Muscle Power and Shooting Accuracy in SSB Elang Biru Soccer Team Players

Type of Correlation	Value of r		Description
	Calculated	Table (n=20, $\alpha=5\%$)	
X ₁ -Y	0,831	0,444	Significance

The correlation coefficient obtained is 0.831, more significant than the critical value of r-table=0.444. This indicates a substantial contribution of leg muscle power to shooting accuracy in the SSB Blue Eagle soccer team players.

The second hypothesis states that there is a relationship between balance and shooting accuracy in SSB Elang Biru soccer team players. Testing the second hypothesis uses a simple correlation

analysis technique, and the results can be seen in the following table.

Table 4 – Summary of the Relationship between Balance and Shooting Accuracy in SSB Elang Biru Soccer Team Players

Type of Correlation	Value of r		Description
	Calculated	Table (n=20, $\alpha=5\%$)	
X ₂ -Y	0,506	0,444	Significance

The correlation coefficient obtained is 0.506, more significant than the critical value of r-table = 0.444. This indicates a substantial contribution of balance to shooting accuracy in SSB Blue Eagle soccer team players.

Table 5 – Summary of Multiple Regression Significance Test Results

R _y	R ²	Df	Value of F		Description
			Calculated	Table	
0,841	0,672	17	20.503	3,59	Significance

The significance of the multiple regression coefficients is determined using the F-value. From the numerous correlation analyses, an F-value of 20.503 is obtained. This value is then compared to the F-table at a significance level of 5%, resulting in an F-table value of 3.59. The F-value of 23.726 is greater than the F-table value of 3.59, which means the multiple regressions, is significant.

In conclusion, leg muscle power and balance significantly contribute to shooting accuracy in SSB Blue Eagle soccer players. The multiple correlation analysis is accompanied by the coefficient of determination (R²). The obtained coefficient of determination is 0.672, which means that (0.672 x 100%) = 67.2% of the variation in shooting accuracy in SSB Blue Eagle soccer team players is determined by the combination of leg muscle power and balance.

This research aimed to determine the contribution of leg muscle power and balance to shooting accuracy in SSB Blue Eagle soccer players. The research results indicated a significant contribution between the independent variables (X₁ and X₂) and the dependent variable (Y). Multiple regressions demonstrated that both leg muscle power and balance significantly contributed to

shooting accuracy in soccer games played by the SSB Blue Eagle team. The coefficient of determination obtained was 0.672, which means that $(0.672 \times 100\%) = 67.2\%$ of the variation in shooting accuracy in SSB Blue Eagle soccer team games is determined by the combination of leg muscle power and balance.

The standing broad jump test for SSB Elang Biru soccer players indicates that out of the 20 sampled soccer players, 6 (30%) achieved scores in the "Good" category. In contrast, the remaining 14(70%) samples received scores in the "Very Good" category. Referring to the Standing Broad Jump Test norms, the average scores obtained by the sampled SSB Blue Eagle soccer players in this research fall into the "Very Good" category.

In the body balance test of SSB Blue Eagle soccer players, the average score indicates a reasonable level. Five players (25%) achieved scores in the "Very Good" category, while nine players (45%) received scores in the "Good" category. Six players (30%) received scores in the "Fair" category in the remaining samples. This demonstrates that leg muscle power, especially the muscles involved in leg movement, provides the strength and propulsion needed to maintain body balance. Strong and high-powered leg muscles enable the ability to generate the necessary force for maintaining balance while standing or moving. Leg muscles work together to preserve body stability when walking, running, or other physical activities.

The research results show that the combined leg muscle power and balance can significantly contribute to shooting accuracy in soccer games. To achieve good shooting accuracy, players must possess both leg muscle power and good balance to execute precise shooting. This indicates that leg muscle power and balance are crucial in supporting optimal outcomes in shooting accuracy.

Power is essential as a support for the legs to generate strong and accurate kicking abilities. Power or explosive strength combines strength and speed, the maximum utilisation of muscles at full speed [4]. Power is an individual's ability to use strength to the maximum extent quickly [7]. Explosive power is needed in all sports branches, so it involves strength and speed. Therefore, an athlete must have significant leg muscle explosive power to produce robust and accurate propulsion and target readiness. Leg muscle explosive power is the ability of leg muscles to over-

come resistance with high contraction in a short time.

In shooting, leg muscle explosive power is crucial because it results in robust, fast, and directed shots, making it difficult for the goalkeeper to block the ball and score a goal. Shooting is one of the fundamental techniques that every player must master as it is used to move the ball towards the target with the foot. Kicking the ball can be done when it is still, rolling, or flying to put it into the opponent's goal. Explosive or leg muscle explosive power involves coordination between strength and speed to overcome resistance with high muscle contraction speed [8]. Leg muscle explosive power is the power that leg muscles possess to perform robust and fast vertical and horizontal movements [9].

Leg muscle capabilities are needed to generate maximum power in kicks, while balance is required to create enough space to take the lead before making a kick. Balance is not only for kicking but also serves other purposes when running fast, jumping high, and playing soccer. According to [10], in soccer, players are required to have good balance because, during a shooting movement, a player relies on one foot while using the other to kick the ball and the hands to balance the body to avoid falling. Balance is how an individual maintains body position, both statically and dynamically.

Balance is crucial because it enables an individual to coordinate movements and exhibit various agility skills, as mentioned by [10].

When kicking towards the goal in a soccer game, the balance used in this technique is dynamic. Dynamic balance refers to the body's position when performing the main movements during a kick, with one foot as support. Regarding the importance of emotional balance in soccer, balance training for athletes has been proven to reduce the risk of falls and injuries such as ankle sprains and strains [7]. Dynamic balance is also crucial in various soccer techniques to achieve effectiveness and efficiency, including passing, ball control, dribbling, and shooting [7].

There are many supporting factors to becoming a skilled soccer player, such as physical, technical, tactical, and mental aspects. This research significantly contributes to shooting accuracy between leg muscle power and balance. This research shows leg muscle power and balance substantially contribute to shooting accuracy.

CONCLUSIONS

Based on the research findings, it can be concluded that leg muscle power significantly contributes to shooting accuracy. Balance also contributes considerably to shooting accuracy. Additionally, leg muscle power and balance significantly contribute to shooting accuracy in soccer games for the SSB Elang Biru team. These results indicate that leg muscle power and balance contribute to shooting accuracy in the SSB Elang Biru soccer team players.

Based on the research findings, it can be concluded that leg muscle power and balance significantly contribute to the accuracy of soccer shooting among the SSB Elang Biru Team players. The implications drawn from these findings underscore the importance of incorporating training programs focused on developing leg muscle strength and improving balance for the players. Players can generate more robust and accurate shots by enhancing leg muscle strength. Furthermore, improving body balance is equally crucial, as good balance aids players in maintaining stability and control during shooting. There-

fore, training that includes leg muscle strength and balance exercises can help enhance the shooting abilities of SSB Elang Biru Team's soccer players. These efforts can positively impact their match performance, improve shooting accuracy, and potentially elevate the team's overall achievements.

Recommendations

1. Coaches should be able to provide more effective training programs, particularly in improving shooting quality.
2. Players must train harder to develop their playing abilities and achieve maximum shooting quality.
3. For soccer athletes, disciplined training and overall skill enhancement are essential for high performance.
4. The results of this research can serve as a guideline for other researchers in similar situations or contexts in different sports disciplines to enhance the performance of sports experts.

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