



The Relationship Between Leg Muscle Power and Shooting Ability in Extracurricular Soccer Players at Adhyaksa Private Junior High School

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Abstract.

Background

The problem in this study was the suboptimal shooting performance of the extracurricular soccer players at Adhyaksa Private Middle School. In other words, their shots were not hitting the intended target. In accordance with this,

Objectives

This study aims to reveal the relationship between leg muscle explosive power and shooting ability in extracurricular soccer players at Adhyaksa Private Middle School.

Methods

This study is a correlational study that seeks to examine the relationship between two variables, namely lower limb muscle power and shooting ability among extracurricular soccer players at Adhyaksa Private Junior High School. Lower limb muscle power is the independent variable, and shooting ability is the dependent variable.

Results

The results of the hypothesis testing showed that lower limb muscle power (x) did not have a significant relationship and did not contribute significantly to shooting ability (y), $P=0.524$. The correlation between leg muscle explosive power and shooting ability is $0.616 < r_{tab} 0.374$. Therefore, the alternative hypothesis (H_a) is accepted. Therefore

Conclusion

There is a significant relationship between explosive leg muscle power and shooting ability in extracurricular soccer players at Adhyaksa Private Middle School aged 13-15 years.

Keywords: Lower Limb Muscle Power and Shooting Ability

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INTRODUCTION

Sports at present can be considered a necessity, as they are activities carried out by people who want to maintain both physical and mental health. By engaging in physical activities, a person can maintain the stability of their body condition so that they remain enthusiastic in carrying out daily activities. For an athlete, achieving or reaching a target requires effort through well-planned and well-implemented programs, coordinated actions, and the provision of adequate facilities and infrastructure. Through sports activities, we attempt to create a new attitude and performance for the entire Indonesian nation in contributing to national development.

In Law of the Republic of Indonesia No. 11 of 2022 concerning the National Sports System, Chapter II Article 4, it is stated that: *“National sports aim to maintain and improve health and fitness, achievement, and the quality of human resources, instill moral values and ethics, promote sportsmanship and discipline, strengthen and foster national unity and integrity, reinforce national resilience, and elevate the dignity and honor of the nation.”*

Based on the quotation above, it is clear that sports can provide very meaningful and valuable contributions to human beings as a whole. This is because sports not only develop aspects of flexibility and physical fitness but also other important aspects of the complete human being, such as the development of knowledge and reasoning, emotional intelligence, and other traits that build a strong, sportsmanlike, and disciplined character.

In achieving high performance, there are two factors that influence athletes. As stated by Syafruddin (2019:22), these factors are internal and external factors. Internal factors include physical ability, technical skills, mental condition, tactics, nutrition, and diet. Meanwhile, external factors are influences that arise from outside the athlete, such as facilities and infrastructure, coaches, and family support.

One sport that can be developed as an achievement sport is football (soccer), which is one of the most popular and widely favored sports among the community. In Indonesia, football is managed by the national governing body, the *Football Association of Indonesia (PSSI)*. This is evident from the fact that football has been organized in Indonesia since 1930, with Ir. Suratin serving as its first chairman (Ratinus, 1991).

With the rapid development of football in many countries, PSSI, as the parent organization, has attempted to reduce the gap by creating various levels of competition as part of its development goals. These competitions include the Premier Division competition, Division I competition, Division II competition, Division III competition, Youth League competition, Yamaha Cup competition, and the Danone Cup League. The aim of these competitions is to produce professional players who are capable of representing Indonesia in international competitions.

With the implementation of these competitions, PSSI has also established a tiered football development system according to the existing competition targets. This tiered development begins from the under-12 age group, 12–14 years, 15–16 years, 17–19 years, and 20–23 years. The ultimate goal is to develop players who can strengthen the Indonesian National Team in international competitions.

In addition, PSSI also emphasizes football development by collaborating with government agencies to establish football training centers in several provinces. Furthermore, extracurricular coaching in schools in various regions is also expected to contribute to the development of football players. The Football Extracurricular Program, which is one of the largest contributors of players, has implemented a fairly good training process. They have training schedules three times a week, namely on Monday, Wednesday, and Saturday afternoons from 3:00 p.m. to 6:00 p.m., and they have a well-planned training program. In addition, the football extracurricular coach of SMP Swasta Adhyaksa already holds a coaching certificate from PSSI. The football extracurricular students of SMP Swasta Adhyaksa conduct their training sessions on the school's football field.

Based on the author's initial observations in the field during training sessions and internal practice games among the football extracurricular players of SMP Swasta Adhyaksa, the players were not optimal in performing shooting towards the opponent's goal. Many shots taken did not reach the intended target or, in other words, did not result in goals. For example, the ball often went over the crossbar, missed to the side of the goalpost, or the shot was too weak as if it lacked power, making it easy for the goalkeeper to catch. If this condition continues, it will be difficult to achieve the desired achievements due to the lack of improvement. Therefore, it is necessary to conduct research on factors related to shooting ability, such as the contact of the kicking foot with the ball, the position of the supporting foot, leg muscle power, coordination of movements in football, and the influence of the field or available facilities and infrastructure. From the results of this research, conclusions can be drawn as anticipatory and corrective measures for the future development of football extracurricular players of SMP Swasta Adhyaksa.

As previously mentioned, achieving success in football can be influenced by many factors, one of which is technique. Technique is a very important aspect for someone playing football. Ratinus (2019) states that the basic techniques in playing football can be grouped into two categories:

1. Techniques with the ball, including kicking the ball, dribbling the ball, heading the ball, throwing the ball (throw-in), and goalkeeper techniques.
2. Techniques without the ball, including running, jumping, and tackling.

Based on the quotation above, it is clear that basic techniques are very important for someone who wants to play football. Among the many forms of basic techniques in football, shooting is one of the fundamental techniques that must be mastered by a football player in order to score goals against the opponent in a match. The ability to perform shooting is not only required for forward players but ideally should be possessed by all players so that they can take advantage of every opportunity that arises.

The execution of shooting here is not merely about performing a shot, but about the ability to direct the ball into the goal when shooting. This means that the direction of the shot must be accurate enough to produce a goal, which is the main objective of the game of football. Coreton (1975:35) states that the main function of movement ability is to develop an individual's physical capabilities, which are useful in increasing work capacity. Based on this statement, it can be concluded that movement ability is a basic capability possessed by someone to acquire skills in a sport, including the ability to perform shooting in football. In other words, the better a person's movement coordination, the better the results that can be achieved in performing a movement.

Since shooting can be performed whenever an opportunity arises, its execution will be more effective if accompanied by strong power and accurate direction. In performing shooting, the explosive power of the leg muscles is highly required. This is because explosive leg muscle power contains elements of

strength that are essential when executing a shot. Strength itself can be interpreted as a person's ability to use muscles to bear loads while working.

METHOD

Research Design

This type of research is correlational, aiming to examine the relationship between the independent and dependent variables. The independent variable is explosive power and the dependent variable is shooting ability.

Participant

The data collection was carried out during the Adhyaksa Private Middle School Student Football Extracurricular training schedule. The population in this study were the Adhyaksa Private Middle School Student Football Extracurricular players aged 16-19 years who were registered and actively training. After the researcher conducted a field survey and based on information provided by the Adhyaksa Private Middle School Student Football Extracurricular administrators, the number of active players aged 16-19 years who were actively training was 28 people.

Data Analysis

The data obtained were processed using product-moment correlation analysis. This is in accordance with the type of research the researcher conducted. Before processing the data, a normality test was conducted to determine whether the data obtained from the results of the leg muscle explosiveness test and the shooting ability of the Adhyaksa Private Middle School Student Extracurricular Soccer players were normally distributed. Once the data were normally distributed, the Pearson product-moment correlation was applied.

RESULTS AND DISCUSSION

Results

The research data processing is presented sequentially as follows:

Table 1. Arithmetic Mean and Standard Deviation of Research Data

Variabel	N	X	Std.dev	Min	Mak
Leg Muscle Explosive Power	28	49.9993	9.9993	12.70	66.58
Shooting Ability		50.0007	9.9996	32.03	64.95

The descriptive analysis can be presented as follows:

1. Leg Muscle Explosive Power

Descriptive analysis of the leg muscle explosive power of the study respondents yielded a mean of 49.9993, a standard deviation of 9.9993, a minimum value of 12.70, and a maximum value of 66.58. The results are presented in the following table:

Table 2. Frequency Distribution of Leg Muscle Explosive Power Data

<i>K-I</i>	<i>Fa</i>	<i>Fr</i>
12.70 - 23.48	1	3.57
23.49 - 34.26	0	0.00
34.27 - 45.04	6	21.43
45.05 - 55.82	12	42.86
55.83 - 66.60	9	32.14
Σ	28	100.00

Note: Fa = Absolute Frequency, Fr = Relative Frequency (%)

For greater clarity, it can be illustrated as follows:

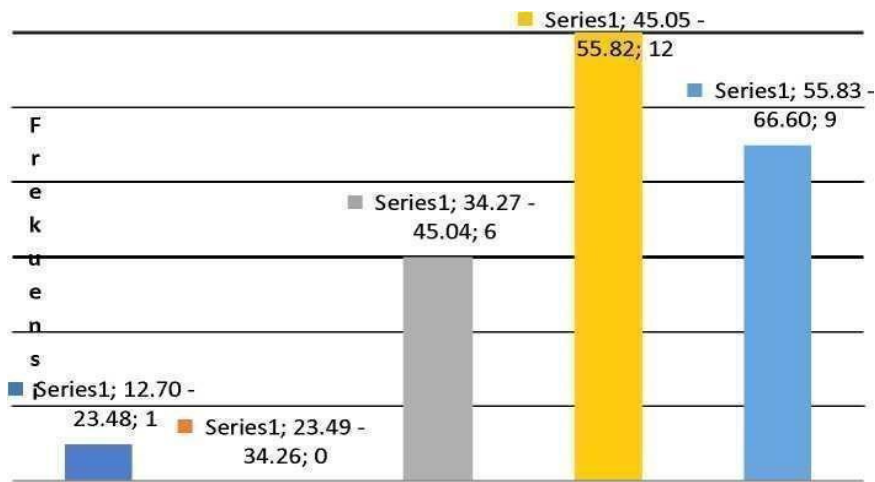


Figure 1. Histogram of Leg Muscle Positional Power Data

2. Shooting Ability

A descriptive analysis of the shooting ability of the study respondents yielded a mean of 50.0007, a standard deviation of 9.9996, a minimum value of 32.03, and a maximum value of 64.95. This can be further explained in the following table:

Table 3. Frequency Distribution of Shooting Ability Data

<i>K-I</i>	<i>Fa</i>	<i>Fr</i>
32.03 - 39.52	4	14.29
39.53 - 46.12	4	14.29
46.13 - 52.72	11	39.29
52.73 - 59.32	1	3.57
59.33 - 65.92	8	28.57
<i>Z</i>	28	100.00

For more details, it can be described as follows:

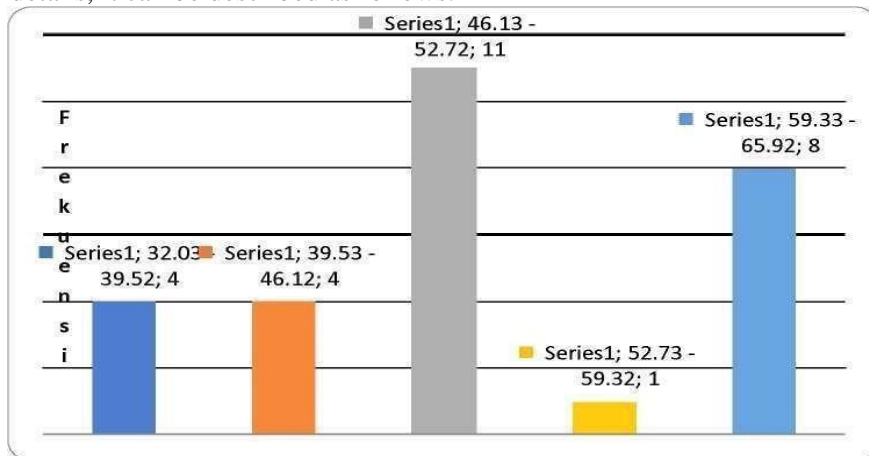


Figure 2. Histogram of Shooting Ability Data

Analysis

Data processing and analysis were conducted on the relationship between leg muscle explosive power (X) and shooting ability (Y). The statistical test used was a simple correlation at a significance level of 0.05. The results of the analysis indicate that leg muscle explosive power (X) has a significant relationship with shooting ability (Y). The following explanation is presented:

There is a Significant Relationship Between Leg Muscle Explosive Power(X) and Shooting Ability(Y).

The results of the analysis indicate that leg muscle explosive power (X) does not have a significant relationship and does not make a significant contribution to shooting ability (Y), $P = 0.524 > 0.05\alpha$. The correlation table shows that the correlation between leg muscle explosive power and shooting ability is $0.616 < r_{\text{tab}} 0.374$, indicating a relationship between leg muscle explosive power and shooting ability. Therefore, the proposed working hypothesis (H_a) is accepted.

Discussion

The results of the data analysis show that the explosive power of the leg muscles does not have a significant relationship and does not provide a meaningful contribution to the shooting ability of the football extracurricular players of SMP Swasta Adhyaksa. The correlation calculation between leg muscle explosive power (X) and shooting ability results (Y) was conducted.

According to Sudjana in Mulia (2006:37), the testing criteria state that if $r_{\text{calculated}} > r_{\text{table}}$, then there is a significant relationship, and if $r_{\text{calculated}} < r_{\text{table}}$, then there is no significant relationship. This result is very contradictory to the proposed hypothesis, where the hypothesis stated that there was a meaningful relationship between the explosive power of the leg muscles and shooting ability. However, the results of the research that has been conducted indicate that there is no meaningful relationship between leg muscle explosive power and the shooting ability of the football extracurricular players of SMP Swasta Adhyaksa.

According to Arikunto (2006:75), the formulation of a hypothesis must be carried out carefully after the researcher obtains complete materials based on a strong theoretical foundation. However, a hypothesis formulation is not always correct. The correctness of a hypothesis is not always related to whether it is proven or not. A researcher may formulate a hypothesis that is theoretically correct, but after the data are collected and analyzed, the hypothesis may be rejected or not proven. Conversely, a researcher may formulate a hypothesis that is theoretically incorrect, but after it is compared with the data, the hypothesis may be proven.

According to Annarino in Arsil (1997:71), explosive power is defined as the strength and speed of muscle contraction dynamically and explosively in a short period of time.

The shooting referred to in this study is shooting directed at the goal according to predetermined targets. According to Aang (1982), several factors can influence shooting results, including the position of the supporting foot, the contact between the foot and the ball, the explosive power of the leg muscles, and body movement during the shooting action. From these results, it can be understood that besides leg muscle explosive power, there are still many other factors that determine the shooting results performed by the football extracurricular players of SMP Swasta Adhyaksa. This means that shooting ability is not only influenced by leg muscle explosive power but also by many other factors that affect the shooting results. The shooting ability possessed by the sample or players of the SMP Swasta Adhyaksa Football Extracurricular Program will improve with regular training while also paying attention to other factors that can influence the results of shooting.

With the existence of this research, it is hoped that it can provide valuable input regarding the shooting ability of the football extracurricular players of SMP Swasta Adhyaksa. It should also be understood that the results of shooting are not only influenced by the explosive power of the leg muscles but also by many other factors that play an important role in determining the outcome.

CONCLUSION

Based on the results of the research that has been described in the previous chapter, it can be concluded that the results obtained from the explosive power of the leg muscles have a significant relationship with shooting ability, this is indicated by the results obtained $0.616 < r_{\text{tab}} 0.374$ meaning that the level of relationship between the two variables exists. From these results we can see that shooting results are not only influenced by the explosive power of the leg muscles, but there are still many other factors that determine it.

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AUTHOR CONTRIBUTION STATEMENT

This research was conceptualized and designed by M. Ridho, who developed the research objectives and methodology, managed data collection, coordinated with participants, and supervised fieldwork at STOK Bina Guna Medan. Pedomanta Keliat performed data analysis, interpreted the findings, and contributed significantly to the preparation of the manuscript. All authors participated in the revision of the manuscript, approved the final version for submission, and take full responsibility for the integrity and accuracy of the work.

CONFLICT OF INTEREST AND FUNDING

The authors declare no conflict of interest related to the conduct, authorship, or publication of this study.

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