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## THE RELATIONSHIP BETWEEN LEG AND ABDOMINAL MUSCLE STRENGTH AND SHOOTING ACCURACY OF FUTSAL ATHLETES

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### **Abstract**

The problem in this research stems from the observation that there are still many futsal players who do not have good kicking accuracy skills, it can be seen from the kicks that are not hard and easily reached by the goalkeeper. This study uses a correlational method with surveys, testing techniques, and measurements. This study involves 55 athletes from the Sheyfa Futsal Academy. Data was obtained from leg dynamometer measurements, leg muscle strength, sit up tests for abdominal muscle strength, and targeted goals to see the accuracy of kicks. Data is analyzed using multiple correlation tests. The results show that the sig. value of leg muscle power and sit-ups (greater) > 0.05. The correlation value of leg power to shooting accuracy is 0.136, which is in the very weak category. Meanwhile, the correlation value of sit-ups to shooting accuracy is 0.177, also in the very weak category. The results show a Sig value of 0.216. Therefore, Sig (greater) > 0.05 indicates no significant relationship. With an R value of 0.239 in the weak category. It can be concluded that there is no significant relationship between leg and abdominal muscle power and shooting accuracy, or that the relationship is weak.

**Keywords:** Leg Muscle Strength; Abdominal Muscle Strength; Kicking Accuracy

### **INTRODUCTION**

In Indonesia, there are various types of sports that are favored by the public, one of which will be explained in this study is Futsal (Hamdi et al., 2025). Futsal was first introduced in 1930 and has been steadily gaining popularity across the globe (Aktaş & Ali, 2024). Futsal began to gain popularity in Indonesia in the late 2000s and has continued to grow rapidly until today (Ali Akhfan et al., 2025). Futsal is a major ball sport that was introduced in Indonesia in the early 21st century and was officially recognized by PSSI in 2004 (Widiyono et al., 2022). A futsal court measures at least 42 meters in length, 20 meters in width, and 15 meters in height (Kasuma et al., 2023). In fact, futsal has been around in Indonesia for a long time before it became a household name, although it wasn't called that back then. Futsal has the same level of popularity as soccer. In a futsal game, players are trained to always be ready to receive the ball quickly and remain active despite pressure from opponents. Futsal is a sport that involves two groups, where each group consists of five players. The goal of the game is to score goals by dribbling and directing the ball towards the opponent's goal using the foot (Aziz et al., 2024). Futsal is played

in two halves with each half lasting 20 minutes of clean time, each team has the opportunity to call time out once in each half and a break between halves of 10 minutes (Radiansyah, 2021). Futsal requires mastery of specific techniques, effective strategies, and quick thinking skills (Yanur & Arifin, 2024).

Currently, futsal emphasizes more on individual ability and often underutilizes proper strategy and tactics, especially in Indonesia. Given the small field and little room for error, players are required to have excellent stamina and a good level of shooting accuracy (Suryadi et al., 2021). Techniques in futsal games include shooting, passing, control, dribbling, heading, kick in. In addition to having these technical skills, a player approaching the goal must be able to overcome the opponent's defense and then shoot on target. To produce good shooting, physical condition also has an important role. Accuracy in shooting the ball into a futsal goal is one of the basic techniques in futsal, but it is quite difficult for inexperienced players. Therefore, basic shooting skills in futsal games are very important to master well, but should not neglect other basic skills. Shooting is one of the crucial skills that must be mastered by the players. This skill is very important in a futsal game to score goals, which aims to win the match (Mahyuddin & Siregar, 2024). Players who possess good shooting accuracy can pose a serious threat to the opposing team (Gussanto et al., 2022)

Shooting is a fundamental skill that all players need to master, as this technique is the method to produce goals. Every player has the opportunity to score a goal to win the match. Shooting is a kick directed at the goal with the aim of turning the ball into a goal for the opposing team (Hutami & Iswana, 2020). Shooting is a technique that is consistently used by players to score as many goals as possible into the opponent's goal. In addition to shooting ability, muscles in sports activities can be considered as the main driver in every physical action performed to obtain the desired results and achieve the maximum possible achievement (Saleh & Martiani, 2020). In futsal, leg muscle strength has an impact on shooting techniques, while abdominal muscle strength is related to leg muscle ability. This explanation can be interpreted that leg muscle strength and abdominal muscles play an important role in supporting shooting techniques in futsal (Nur

Khoiriah & Riyad Fadhli, 2020). In addition, the way the leg muscles are used during movement is also a key factor that affects shooting accuracy.(Mahyuddin & Siregar, 2024). Thus, it can be concluded that having strength in the leg muscles and good abdominal muscles is one of the important conditions for achieving optimal results in futsal goal kicking training. This must be adjusted to the characteristics of each player so that the training results achieved can be maximized according to their existing abilities (Adityatama, 2017).

The reality on the field during the selection of the sheyfa futsal academy team in 2025 which is prepared to participate in the Semarang futsal league championship and the AFP championship in 2025 the basic techniques of the current players are still not satisfactory. A statement from the selectors stated that, "Players still need a lot of practice to master basic techniques, especially in terms of shooting." Here it appears that their leg muscles and abdominal muscles are still not strong enough. Futsal in Kendal Regency has experienced growth since 2011 until now. Various futsal clubs from various regions have established academies, causing futsal in Kendal Regency to develop quickly, both for early ages and adults. Sheyfa Futsal Academy is still relatively young, but its achievements have been quite satisfactory, even surpassing those of futsal clubs that have been around for longer. It is important to learn about Sheyfa Futsal Academy's achievements and the human resources involved (Nova et al., 2021). One of the basic techniques that needs to be mastered by a sheyfa academy futsal player is the ability to shoot, especially regarding the accuracy of shooting. With a player having good leg muscle strength and abdominal muscles is expected to improve shooting accuracy, this explains that many of the sheyfa futsal academy players are still not perfect in mastering basic futsal techniques, especially in shooting towards the goal.

When someone plays futsal they are influenced by optimal mental and physical fitness as well as the ability to respond well in various situations encountered (Ghurri 2018). For example, the physical influence of leg muscle strength and abdominal muscles. The strength of the leg muscles and abdominal muscles is influential for sheyfa academy futsal players in supporting shooting accuracy. Leg muscle strength is very important in every sport, especially in futsal,

especially when kicking during play (Rosita et al., 2019). And having strong abdominal muscles not only supports their performance in training, but is also an important foundation for their future as professional athletes (Arga, 2025). In sports activities, explosive power is a crucial biomotor component as it determines how forcefully a person can perform a kick (Amir Supriadi, 2022). Based on observations made by researchers in the field, the technique of sheyfa academy players is still low, especially shooting ability. This condition may occur because <sup>5</sup> the physical condition of the players is still low and the players have never previously received physical tests from the coach. In this case the researcher is interested in conducting research with the title “The Relationship between Limb Muscle Strength and Abdominal Muscles to Shooting Accuracy of Futsal Athletes Sheyfa Academy Kendal Regency”.

Research that has been done before by Rayhan Ali Akhfan in 2025. The findings show that abdominal muscle strength does not correlate with shooting accuracy, but leg muscle explosiveness correlates with shooting accuracy. Overall the combination of leg explosive strength and abdominal strength contributes 25.7% to improving the shooting accuracy of futsal players. And <sup>3</sup> the purpose of writing this article is to find out the relationship between leg muscles and abdominal muscles with shooting accuracy in sheyfa academy futsal athletes. With the findings in writing this article, it can be used as input to add and improve the sheyfa academy futsal training program, find better ways to develop futsal games to improve achievement, and can understand that the weaknesses of each individual they have are not things that cannot be repaired or improved.

#### **METHOD**

In this study, researchers used correlational research methods. This research uses a survey method with test and measurement techniques (Simbolon et al., 2022). This research involved 55 athletes from the sheyfa academy futsal team. data collection was carried out on Saturday, July 5, 2025 at Gor Futsal Rejosari Weleri. This research design used is a multiple correlation design. Data analysis in this study consists of descriptive analysis, pre-requisite tests which include normality test and linearity test, the last hypothesis test which includes multiple

regression test. This process includes <sup>10</sup>organizing data into categories, breaking down into patterns, determining data that is considered significant and which <sup>10</sup>will be studied, and drawing conclusions so that they can be easily understood both by yourself and others (Melyza & Aguss, 2021). Data collection in this study in <sup>8</sup>leg muscle strength using a leg dynamometer, abdominal muscles using the sit up test, and shooting accuracy using a targeted goal.

## RESULT AND DISCUSSION

### Result

Data description provides an overview of the information obtained based on the research variables. This information is collected through experiments on samples, producing numerical data which is then analyzed using descriptive statistics. The process of processing, compiling, and presenting data <sup>1</sup>was carried out with the help of Microsoft Excel and SPSS version 27.

**Tabel 1.** Data description

Variables	N	Min	Max	Mean	Standard deviation
Limb Muscle Power	55	61	298	181,11	69,41
Sit-Up	55	10	58	9,08	1.3
Shooting Accuracy	55	8	12	9,25	1.2

Data can be analyzed using parametric or non-parametric statistics, so it is necessary to do a prerequisite test first. The purpose of the prerequisite <sup>1</sup>test is to find out whether the data to be analyzed has met the requirements or not. So that it can determine the next step. <sup>1</sup>The prerequisite tests in this study include normality test and linearity test.

<sup>12</sup>The sample normality test or testing the normality of the sample, is nothing but testing the normality of the distribution of data to be analyzed. Testing is carried out depending on the variable to be processed. <sup>12</sup>Testing the normality of the data distribution using Kolmogorov Smirnov because the sample (more than) > 50 with the help of the SPSS program. Normality rules if <sup>9</sup>sig > 0,05. Then the data distribution is declared abnormal, if sig < 0,05. Then the data distribution is declared normal.

**Tabel 2.** Normality test

Group	Statistic	Df	Sig	Description
Limb Muscle Power	0,102	55	0,200	Normal

Sit-Up	0,072	55	0,200	Normal
Shooting Accuracy	0,087	55	0,200	Normal

The normality test was conducted to determine whether the data from each variable in this study had a normal distribution. Based on the results of the Kolmogorov-Smirnov test, the significance value for the leg muscle power variable is 0,200. The same thing is also seen in the sit-up variable which has a significance value of 0,200. As well as on the shooting accuracy variable which gets a significance value of 0,200. Thus, all variables with these results are normally distributed because they are greater than 0,05.

The linearity test is carried out to identify whether there is a significant relationship between two variables or not. The linearity test in this study uses the test for linearity. With the sig value rule. Deviation From Linearity > 0,05 then it is fulfilled with a relationship, if the sig value. Deviation From Linearity < 0,05 then it is not fulfilled with no relationship between variables.

**Tabel 3.** Linearity test

Group	Sig. Deviation From Linearity	Sig.	Description
Limb Muscle Power	0,814	0,05	Fulfilled
Sit- Up	0,366	0,05	Fulfilled

Based on the test results using the Test for Linearity, the significance value of Deviation From Linearity on the leg muscle power variable is 0,814 and on the sit-up variable is 0,366. Both values are greater than the significance limit of 0,05 which means that the relationship between these variables is linear. Thus, it can be concluded that the relationship between the variables in this study fulfills the linearity assumption.

Correlation test is a reciprocal relationship between two variables. If one variable changes, then the other variable also changes. The correlation significance test is used to determine whether the relationship between the two variables is truly significant or merely coincidental. If the significance value (p-value) is smaller than 0,05 ( $\alpha = 5\%$ ), then the correlation is declared significant.

Multiple Regression Test is an analysis used to determine the effect of two or more independent variables on one dependent variable. In multiple linear regression, the significance test is used to determine and partial (each) has a

significant effect on the dependent variable and whether the independent variables simultaneously (together).

**Tabel 4.** Multiple Regression Test (simultaneous)

Group	Sig.	F Change	R	Description
Against Shooting Accuracy	0,216		0,239	Weak

The Multiple Regression Test Table above shows the Sig result of 0,216.

Then Sig (greater) > 0,05 there is no significant relationship, with an R value of 0,239 in the weak category. So it can be concluded that leg muscle power and abdominal muscles to the accuracy of Shooting there is no significant relationship or the relationship is weak.

### Discussion

Futsal is one of the sports experiencing rapid growth in the world, especially in Indonesia (Irma Rahmayanti, Anggi Setia Lengkana, 2024). Shooting is a technique that is consistently used by players to score as many goals as possible against the opponent's goal. Shooting (kicking the ball) is a kick directed at the goal with the aim of turning the ball into a goal for the opposing team (Hutami & Iswana, 2020). In futsal, the strength of the leg muscles affects shooting technique, while the strength of the abdominal muscles is related to the leg muscle capabilities. It can be concluded that the components of physical fitness related to lower limb muscle strength are very important for futsal players, especially when performing shooting during the game (Faazi et al., 2024).

Many factors influence it, one of which is the lack of a regular training schedule, both for technical training and physical training. Training is a bodily activity performed by the muscles in an organized, systematic way, and done repeatedly, which requires energy to improve physical condition (Pranata & Kumaat, 2022). In addition, the absence of experienced coaches with licensed certification means that previously players only trained at their respective schools, most of which were coached by students or physical education teachers. Therefore, a coach must possess sufficient skills to conduct training. Some basic components that a coach must possess include the ability to know, understand, comprehend, and be able to conduct training well (Putro, 2020).

<sup>6</sup> Shooting is a basic technique that must be mastered by all players, as this technique is the main way to score goals. This happens because every player has the opportunity to score goals and win the match or game (Jhyo Frayogha, 2019).

The concentration and strength of the leg muscles that futsal players have affect their ability to make accurate kicks (Sarifudin et al., 2023). The strength of the abdominal muscles is very important for helping the body remain stable. Some types of exercises, such as sit-ups, can help improve the strength of the abdominal muscles perut (Piyana et al., 2020).

The strength of the leg muscles is very important in executing kicks, as players often kick in futsal. This strength helps players to perform hard and strong kicks throughout the match (Ded Putra, 2022). Abdominal muscles help the body change the direction of movement quickly without losing balance; this ability can support deceptive movement techniques during an attack (Ratri et al., 2024). Shooting accuracy is one of the basic techniques in soccer, but it is quite difficult to learn, especially for players who are not skilled and are not accustomed to executing shooting movements reflexively. The goal in soccer is to create a precise shooting process and score points on every opportunity, which is a requirement for the team to be declared the winner (Kuncoro, 2017).

#### **CONCLUSION**

The exercise method <sup>8</sup> using a leg dynamometer to measure leg muscle strength and sit-up exercises for abdominal muscle strength is beneficial for increasing the power of a futsal player's kick, but it is less suitable for measuring shooting accuracy. This is because the method is more useful for long-range kicks. Suggestions for further research include involving samples from various futsal clubs to broaden the scope of the results. Additionally, utilizing technology such as resistance bands and target sensors on the goal to enhance shooting accuracy is recommended. This training method also needs to be further explored to determine the most effective training approach in enhancing athlete performance.

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