



The Effect of Leg Muscle Strength Training on the Shooting Ability of Students in the Futsal Extracurricular Activity at SMP PAB 8 Sampali in 2025

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Abstract.

Background

The futsal extracurricular activity at SMP PAB 8 Sampali is characterized by many shots aimed at the goal, but few resulting in goals. This is due to their weak shooting power, which makes them easily intercepted or blocked by the goalkeeper. Therefore, explosive power training, particularly leg muscle strength, is considered to have an impact on shooting power.

Objectives

This study aims to determine the effect of leg muscle strength training on the shooting abilities of students participating in the futsal extracurricular activity at SMP PAB 8 Sampali until 2025. The subjects of this study were all 20 students participating in the futsal extracurricular activity at SMP PAB 8 Sampali.

Methods

The method used in this study was an experimental method, to determine the impact of leg muscle strength training on the shooting abilities of futsal extracurricular students at SMP PAB 8 Sampali in 2025. The author used a pretest-treatment-posttest design. The research instrument used in this study was a futsal shooting test according to Narlan. The purpose of this test was to measure the skill, speed, and accuracy of kicking the ball on target.

Results

The research results show a significant effect of plyometric training variations on improving the shooting ability of students in the 2025 extracurricular futsal program at SMP PAB 8 Sampali. The effectiveness of the various training exercises in the extracurricular futsal program at SMP PAB 8 Sampali on improving shooting ability was 45.86%. Based on the results of data analysis, description, testing of research results, and discussion,

Conclusion

There was a significant effect of the plyometric training group on the shooting ability of futsal extracurricular students at SMP PAB 8 Sampali. The calculated t-value was 2.703 and the table t-value (df 9) was 2.262, with a significance value of p-value of 0.024. Therefore, the calculated t-value of 2.703 was greater than the table t-value of 2.262, and the significance value of 0.024 was <0.05, indicating a percentage increase of 45.86%. Meanwhile, the percentage increase in ball speed during shooting after the treatment of leg muscle strength training variations, namely plyometric training, was 20.79%.

Keywords: Training, Leg Muscles, Shooting.

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INTRODUCTION

Sport is an activity carried out to train a person's body, not only physically but also mentally. It also represents the execution of physical activities that are competitive in nature within a game. There are various types of sports that can be performed individually or in teams. One team sport that is currently very popular is futsal.

Futsal is one of the most popular sports across various levels of society, including schools. It is enjoyed not only by men but also by many women. Futsal is a game that is played in a way similar to soccer. Both futsal and soccer share the same ultimate objective, which is to score as many goals as possible into the opponent's net. However, there are several differences in their rules, such as the size of the field—futsal courts are smaller and the number of players, which is fewer in futsal.

To play futsal well, a person must equip themselves with good muscle strength and fundamental technical skills. Futsal is a complex sport in which a player must not only possess good technical and tactical abilities but also be supported by strong muscle power. There are four aspects that must be properly trained by a futsal player: (1) physical training, (2) technical training, (3) tactical training, and (4) mental training. Good physical condition supports the execution of both technique and tactics. In futsal, there are several

basic techniques, including passing, shooting, dribbling, controlling, heading, and chipping, all of which contribute to playing ability.

Shooting is one of the fundamental techniques that every player must master. It functions to score goals by directing the ball toward the goal using the foot with force and power. Kicking the ball can be done when it is stationary, rolling, or in the air, with the aim of scoring into the opponent's goal. The key to powerful shooting lies in leg muscle strength and the optimal angle of the kick. The better a player's shooting technique, the greater their chances of scoring goals. In matches, goals are often created through shooting. The outcome of a futsal game is determined by which team scores more goals, and the team with the highest number of goals wins. Players are required to perform shooting under pressure, as well as utilize space and opportunities effectively to score.

Accurate shooting in tight spaces, under physical fatigue, and within limited time are challenges that every player must face. In this context, the problem observed among futsal extracurricular students at SMP PAB 8 Sampali is that many of their shots are directed toward the goal, but only a few result in goals. This is due to weak shooting power, making it easier for goalkeepers to catch or block the ball. Therefore, explosive power training especially for the leg muscles is considered important in improving shooting power.

In futsal, actions such as kicking, running, jumping, and dynamic movement all require good explosive power. Players who have strong explosive power or leg swing will produce stronger kicks. One way to improve shooting ability is through training that enhances both strength and the speed of leg movement. The success of shooting in creating goals is influenced by several factors, including proper shooting technique, ball speed, ball weight, and shooting distance. The greater the force applied to the ball, the faster its speed, making it more difficult for the goalkeeper to react and block it, thus increasing the chance of scoring.

Based on lower body training methods, one effective way to improve leg muscle explosive power is through plyometric training, either with or without equipment. Weak shooting is often caused by insufficient strength in the muscles responsible for movement. One solution to this problem is to implement structured and systematic training programs. Players need to practice repeatedly to reinforce movement patterns that support kicking techniques. By performing various exercises aimed at improving explosive power, players can enhance their fundamental technical skills, particularly shooting.

METHOD

Research Design

The method used in this study was an experimental method, to determine the impact of leg muscle strength training on the shooting abilities of futsal extracurricular students at SMP PAB 8 Sampali in 2025. The author used a pretest-treatment-posttest design. The research instrument used in this study was a futsal shooting test according to Narlan. The purpose of this test was to measure the skill, speed, and accuracy of kicking the ball on target.

Participant

This research was conducted on the futsal field of SMP PAB 8 Sampali. The population in this study were 20 students from the SMP PAB 8 Sampali futsal extracurricular program who regularly participate in routine training every Wednesday and Saturday. The author believed that taking samples from members who regularly participate in match preparation would facilitate and improve their physical abilities and the ability of each individual to face upcoming matches. With the treatment provided in this study, the author believed that the participants were more likely to participate in regular training sessions.

Data Analysis

Before testing the hypothesis, prerequisite tests are necessary. Testing the measurement data related to the research findings aims to improve the analysis. Therefore, in this study, data normality and homogeneity tests will be conducted. Before proceeding to the t-test, the researcher must meet the requirement that the analyzed data be normally distributed. Therefore, normality and homogeneity tests are necessary.

RESULTS AND DISCUSSION

Results

a. Pretest and Posttest of Shooting Ability

The pretest and posttest results for students' shooting ability in futsal at SMP PAB 8 Sampali are as follows:

Table 1. Pretest and Posttest Results for Shooting Ability

Name	<i>Pretest</i>	<i>Posttest</i>	Difference
Revan Pratama	12	14	
Daffi nugroh	17	22	5
Alviansyah	13	14	
Mhd Azan	9	14	5
Aditya	14	18	
Andika Pratama	17	22	
Alfan Pradana	13	18	
Rifki	14	18	
Habib	15	18	
M. Iqbal	12	18	
Livi	15	26	
Satrio	19	22	
Eza Anggara	9	18	9
M. Dzaki	12	18	6
Rehan	12	22	
Gilang	20	26	
Arkan	7	18	
Fatan	9	18	
Sultan	14	22	
Rizwan	13	22	
Mean	13,3	19,4	
Standar Deviasi	3,358	3,501	
Minimum	7	14	
Maximum	20	26	

The percentage increase after being given a variation of leg muscle strength training, namely plyometric training, was 45.86%. Based on the data in Table 1 above, the pretest and posttest of shooting ability in futsal games of extracurricular futsal students at SMP PAB 8 Sampali can be presented in Figure 2, namely as follows:

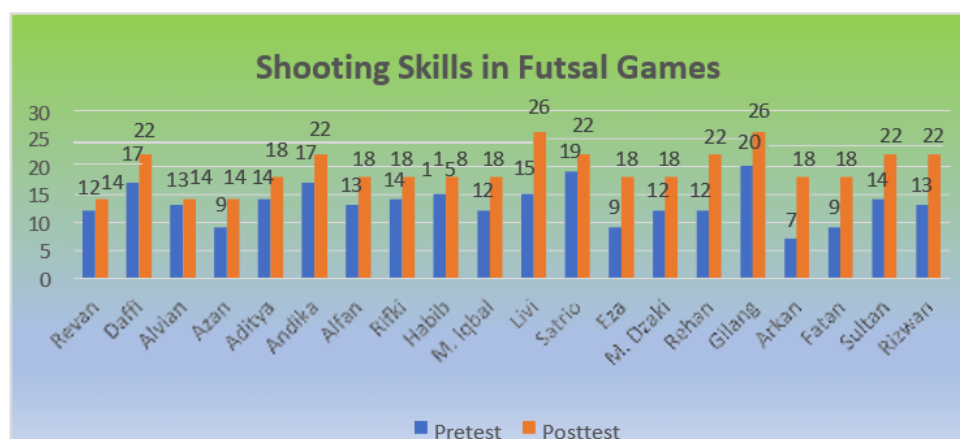


Figure 1. Bar Chart of Pretest and Posttest Shooting Ability in Futsal Game of Students from the Extracurricular Futsal Team of SMP PAB 8 Sampali

b. Pretest and Posttest Ball Speed

The pretest and posttest results for the ball speed achieved during shooting in futsal by students in the futsal extracurricular program at SMP PAB 8 Sampali are as follows:

Table 2. Ball Speed Pretest and Posttest Results

Name	Pretest	Posttest	Difference
Revan Pratama	2,78	2,34	
Daffi nugroh	3,28	2,42	
Alviansyah	3,45	2,68	0,77
Mhd Azan	3,44	2,61	
Aditya	3,57	2,53	
Andika Pratama	3,58	2,72	
Alfan Pradana	2,84	2,59	
Rifki	3,67	2,58	
Habib	3,48	2,73	0,75
M. Iqbal	3,51	2,91	0,60
Livi	2,62	2,09	0,53
Satrio	3,27	2,64	0,63
Eza Anggara	3,47	2,89	0,58
M. Dzaki	2,65	1,96	0,69
Rehan	3,29	2,45	0,84
Gilang	3,06	2,28	0,78
Arkan	3,47	3,05	0,42
Fatan	3,42	2,47	0,95
Sultan	3,23	3,18	0,05
Rizwan	3,32	2,70	0,62
Mean	3,27	2,59	
Standar Deviasi	0,312	0,298	
Minimal	2,62	1,96	
Maksimal	3,67	3,18	

The percentage increase in ball speed during shooting after being given a variation of leg muscle strength training, namely plyometric training, was 20.79%. Based on the data in Table 2 above, the pretest and posttest of ball speed during shooting in the futsal game of extracurricular futsal students at SMP PAB 8 Sampali can be presented in Figure 18, namely as follows:

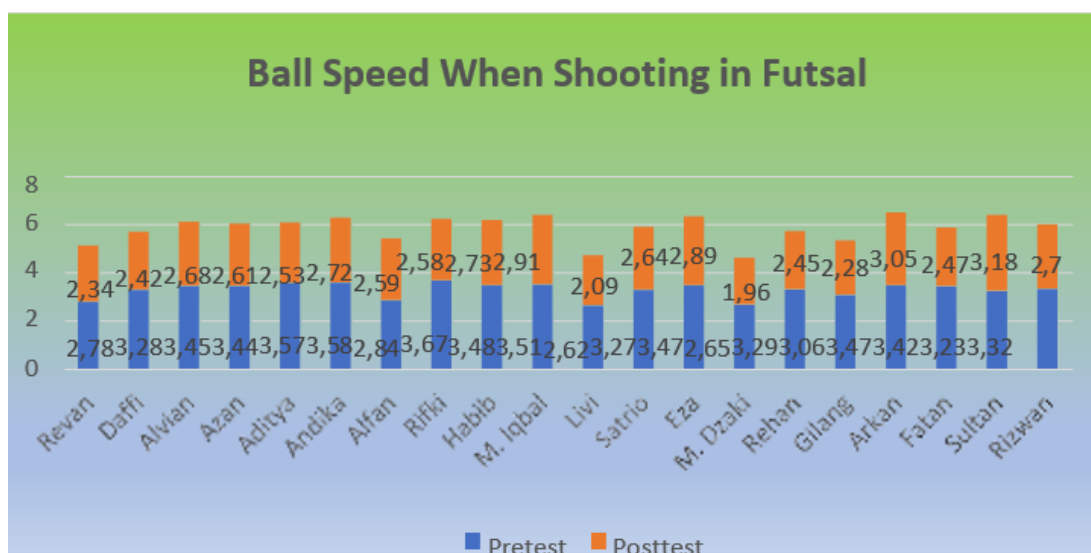


Figure 2. Bar chart of pretest and posttest ball speed when shooting in futsal game

Discussion

Based on the t-test analysis conducted, several conclusions can be drawn regarding whether there is an improvement in shooting ability in futsal among extracurricular students of SMP PAB 8 Sampali after participating in varied training for 1 sessions. The research results indicate that there is a significant effect of plyometric training variations on improving the shooting ability of futsal extracurricular students at SMP PAB 8 Sampali in 2025. The effectiveness of the training variation on improving shooting ability is 45.86%. Ahmed et al. (2014) define plyometric training as the capacity to control the position and movement of the body's core.

In other words, plyometric training provides control over posture and movement centered in the core, which is essential for managing changes in direction and dynamic movements during agility performance. Improving shooting ability requires enhancement of several influencing factors, including speed, strength, reaction time, balance, flexibility, and neuromuscular coordination. Plyometric training aims to improve stability and balance, enhance sensorimotor function, and enable the body to move effectively and efficiently.

Plyometric training is an application within sports conditioning programs, where it is explained that it can significantly enhance athletic performance by providing a foundation for generating greater force in both the upper and lower extremities. Plyometric training also has a positive effect on stability (Hayden et al., 2005). Stability in the lumbopelvic region is crucial as it provides a foundation for upper and lower limb movement, supports load-bearing, and helps protect the spinal cord.

Plyometric training is a form of power and coordination training that is varied and innovative, often modified using simple equipment. It is a training method used to improve leg power, which contributes to increased stamina, coordination, agility, and speed. The advantages of plyometric training include: (1) the use of varied obstacles that create a new and engaging training method for athletes, encouraging curiosity and challenge in completing training sessions; (2) the ability for coaches to vary and combine different movements, thereby training not only leg power but also coordination; and (3) well-programmed plyometric training can optimize an athlete's performance (Ismoko & Sukoco, 2013: 4).

CONCLUSION

Based on the results of data analysis, description, testing of research results, and discussion, the following conclusion can be drawn: "There is a significant effect of the plyometric training group on the shooting ability in futsal games of extracurricular futsal students at SMP PAB 8 Sampali, with a calculated t of 2.703 and a table t (df 9) of 2.262 with a significance value of p of 0.024. Therefore, the calculated t of 2.703 is $>$ t of 2.262, and the significance value of 0.024 is $<$ 0.05, with a percentage increase of 45.86%. Meanwhile, the percentage increase in ball speed when shooting after being given a variation of leg muscle strength training, namely plyometric training, was 20.79%.

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AUTHOR CONTRIBUTION STATEMENT

This research was conceptualized and designed by Muhammad Ridho, who developed the research objectives and methodology, managed data collection, coordinated with participants, and supervised fieldwork at STOK Bina Guna Medan. Dicky Hendrawan performed data analysis, interpreted the findings, and contributed significantly to the preparation of the manuscript. All authors participated in manuscript revisions, 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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