



The Effect of Long Pass Training Methods and Leg Power on Long Pass Results in Bhayangkara POP Semarang City Soccer Athletes

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Abstract

This research is motivated by the low long pass ability of Bhayangkara POP Semarang City soccer athletes, which indicates the need to improve skills by applying appropriate long pass training methods. This research uses a quantitative method with a 2x2 experimental design. The research sample consisted of 36 Bhayangkara POP Semarang City soccer athletes selected using purposive sampling techniques and divided into four groups. The training was carried out 18 times, with four meetings each week. The instruments included a *standing board jump test* to measure leg explosive power and an *extended pass accuracy test* to measure long-distance kick results. Data analysis was carried out through prerequisite tests, including normality tests, homogeneity tests, and two-way ANOVA tests. The results of the study showed that: (1) there was a significant difference in the influence between the horizontal target *long pass training method* and the vertical target *long pass training method* on the *long pass results* of Bhayangkara POP Semarang City soccer athletes ($F = 4.475$; $\text{Sig.} = 0.042 < 0.05$); (2) there is a significant difference in the influence between groups with high leg explosive power and low leg explosive power on *long pass results* ($F = 11.496$; $\text{Sig.} = 0.002 < 0.05$); and (3) there is a significant interaction between training methods and leg explosive power on *long pass ability* ($F = 13.975$; $\text{Sig.} = 0.001 < 0.05$). Thus, training methods (horizontal and vertical *long passes*) and leg explosive power (high and low) significantly influence improving *long pass results* in Bhayangkara POP Semarang City soccer athletes.

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INTRODUCTION

Football is the world's most popular sport, with millions of fans worldwide, making it more than just a sport (Imran et al., 2025). Mudayat et al. (2023). Football is a sport that combines technical skill, physical strength, and strategic play. Every touch of the ball creates a connecting story, demonstrating the spirit of teamwork and competition.

In soccer, scoring goals is the primary objective of any team's offensive strategy (Yanuar et al., 2024). A goal occurs when the ball completely crosses the opponent's goal line and enters the net, awarding points to the scoring team and influencing the match's outcome (Prieto-González et al., 2024). Players must possess effective heading, shooting, and passing skills to score goals. Teams can also improve their game strategy by analyzing matches to identify their opponents' strengths and weaknesses (Mićović et al., 2023). Soccer also demands solid teamwork, with each player playing a specific role in creating scoring opportunities and contributing to the team's overall success.

According to Zainuddin et al. (2022), the basic techniques of football are the key to every player's success on the field. Every component of the technique, from precise ball control to precise passing (Moh Rifai, 2022), *affects the quality of a player's game*. In football, the basic techniques that must be mastered are controlling and passing the ball correctly and maintaining balance and mobility while moving on the field (Afrinaldi et al., 2021). In addition, the ability to read the game and make quick decisions is an important component of basic techniques because it allows players to adapt to situations in the game effectively. Players can advance their basic techniques to reach a high level of expertise, contributing to the team during matches.

The long pass technique in soccer is passing the ball over long distances to teammates to reach a wider playing area or directly to a strategic position. The *long pass technique* moves the game quickly or avoids pressure from the opponent. The (Billal et al., 2024) *long pass* technique in soccer requires accuracy, strength, and good coordination (Nugraha & Iskandar, 2024). *The long pass* in soccer is a strategic element in various game schemes. A player's ability to execute an effective *long pass* can open up space in the opponent's defensive area, break up formations, or speed up the transition from the back line to the front line (Forcher, 2023).

The long pass technique plays a significant role in soccer, as it is used to pass the ball to a distant teammate or direct it into the opponent's defensive area. Accuracy in this type of pass is crucial, as it makes it easier for other players to receive and control the ball, thus increasing the chances of scoring a goal (Soniawan & Irawan, 2018).

Executing a *long pass* with a high degree of accuracy is a technical skill in soccer that is challenging to master, especially for soccer players. This technique requires complex motor coordination and mastery of several mutually supporting physical and psychomotor components. Various internal and external factors influence successful long pass execution (Rustiawan et al., 2024) *long pass* execution. Internal factors include the player's basic motor skills, leg muscle strength, body flexibility, and basic kicking skills (Majid et al., 2024a). Meanwhile, external factors include pressure from opponents, field conditions, wind direction, and the dynamic game situation.

Leg strength is a crucial physical component in sports, particularly in executing *long passes* (Amrullah, 2017). *Long passes* require significant power and strength from the leg

muscles, particularly when the leg pushes the ball with maximum force (Briliant, 2023). Research by Umri & Situmeang (2021) shows that optimal leg strength can improve the accuracy and distance of the ball in long passes. The muscles involved in this movement, such as the thigh, calf, and gluteus muscles, must have sufficient strength and endurance so that players can deliver the ball at high speed and on target. According to (García et al., 2018), athletes with higher levels of leg strength tend to produce longer and more accurate long passes than athletes with lower leg strength. Therefore, increasing leg power through appropriate training can positively impact long pass performance.

Based on the researcher's initial observations, 49 *long passes* out of 68 attempts made by SSB Bhayangkara POP Semarang City athletes did not reach the target. This finding indicates that the level of accuracy of the athletes' *long passes still needs to be improved. Inaccuracy in executing long passes* can be caused by suboptimal basic technique, lack of kicking power, and less-than-optimal body coordination. The results of interviews with coaches revealed that many players experienced difficulty in controlling the power and direction of the ball when executing *long passes*, which resulted in the ball often not reaching the target accurately.

Based on the background above, the researcher provides a solution, namely by applying the passing and leg power training method to the long pass ability of the Bhayangkara Pop football school athletes in Semarang City.

METHODS

The type of research used in this study is experimental. (Sari et al., 2022) Experimental research is a method that examines the relationship between cause and effect variables.

In this study, one or more variables are manipulated to determine their effect on other variables, while variables unrelated to the studied problem are controlled as much as possible. This study used a 2x2 factorial design.

The sample used in this study was 36 players. The sampling technique used was *purposive sampling*, with the sample size being U-15 athletes from the Bhayangkara POP Semarang City SSB. A standing board jump test measures leg power (Imaniyah & Yani, 2025). The Move Ball Long Pass Test is used to test *long passing accuracy*. (Kurniawan & A'la, 2021) The purpose of this instrument is to measure *long pass accuracy* in soccer. *The Move Ball Long Pass Test is also used.*

This research will be conducted at the Bhayangkara POP Mijen Field, Semarang City, which is the training ground of the Bhayangkara POP Semarang City Football School, for the treatment of football training with the horizontal target *long pass training method* and the vertical target *long pass*. This research will be conducted 18 times; each week will be held 4 times, on Monday, Wednesday, and Friday. According to Ariani and Kardiawan (2020), providing training with a frequency of 4 times a week will allow the body to adapt to the training load it receives. Meetings in this training are held between 3:00 and 5:00 p.m. Training activities will be carried out in 16 meetings.

Table 1. Research Design

Leg power	Long pass training	
	Long pass vertical target	Long pass horizontal target
High (B1)	A1B1	A2B1
Low (B2)	A1B2	A2B2

Table 2. Long Pass Training Program

Week	Long Pass Target Horizontal	Long Pass Vertical Target
3	Distance 23 meters with target goals A, B, C, D, E. Set: 5x Repetition: 2x	Distances 17 m, 19 m, 21 m, and 23 m with target goals A, B, C, D. Sets: 5x Repetitions: 2x

6	Distance 22 meters with target goals A, E, B, D. C. Set: 5x Repetition: 3x	Distance 20–25 m with target goals A, B, C, D. Sets: 4x Repetitions: 3x
9	Distance 25 meters with target goals A, B, C, D. Set: 4x Repetition: 4x	Distance 17–25 m with target goals A, B, C, D. Sets: 4x Repetitions: 4x
12	Distance 22 meters with target goals A, D, B, C. Set: 5x Repetition: 4x	Distance 20–25 m with target goals A, D, B, C. Sets: 5x Repetitions: 4x
14	Distance 25 meters with target goals A, B, D, C. Set: 5x Repetition: 4x	Distances 19 m, 21 m, 23 m, and 25 m with target goals A, B, D, C. Sets: 5x Repetitions: 4x
16	Distance 25 meters with goal targets A, B, C, D, E. Sets: 5x Repetitions: 4x	Distances 19 m, 20 m, 22 m, and 24 m with target goals A, B, C, D. Sets: 5x Repetitions: 4x

RESULTS

This study analyzes how training methods and leg power affect long pass results in Bhayangkara POP Semarang City soccer athletes.

Table 3. Research results statistics

Group	Min	Max	Mean $\pm$ SD
Pre-test			
A1B1	9	27	37 + 31.67
A1B2	9	22	39 + 31.56
A2B1	9	11	27 + 19.89
A2B2	9	25	46 + 34.11
Post-test			
A1B1	9	35	43 + 38.89
A1B2	9	30	48 + 38.22
A2B1	9	18	39 + 27.11
A2B2	9	30	52 + 40.33

Based on the descriptive statistics in Table 3, it is known that in the pre-test stage, the highest average *long pass ability* was shown by the A2B2 group with a mean value of 34.11, while the lowest average was found in the A2B1 group with a mean value of 19.89. Meanwhile, the A1B1 and A1B2 groups had relatively balanced averages, namely 31.67 and 31.56, respectively. After being given treatment (post-test), all groups experienced an increase in their average scores. The A2B2 group remained in the highest position with a mean of 40.33, followed by the A1B1 group at 38.89, A1B2 at 38.22, and A2B1 at 27.11. A

significant increase was seen in the A2B1 group, which previously had the lowest average in the pre-test, but after treatment, experienced a significant increase. In addition, the minimum and maximum value ranges also showed a shift towards higher levels in the post-test stage, indicating an increase in long pass ability in each group.

Table 4. Normality Test

Group	Statistics	Df	Sig
Pre-test			
A1B1	.967	9	.869
A1B2	.971	9	.904
A2B1	.983	9	.979
A2B2	.909	9	.309
Post-Test			
A1B1	.940	9	.583
A1B2	.974	9	.930
A2B1	.955	9	.741
A2B2	.954	9	.793

Table 4 shows the results for each group, indicating that all values were significant. The data were declared normally distributed because the significance value was greater than 0.05.

Table 5. Homogeneity Test Levene's Test of Equality of Error Variance

F	DF 1	DF 2	Sig
2,553	3	32	.073

Based on Table 5 above, the significance value shows results greater than 0.05, so the data is declared homogeneous.

Table 6. Hypothesis Testing Paired T-Test

Group	Paired Difference		T	Sig
	Lower	Upper		
A1B1	-8,974	-5,470	-9,507	.000
A1B2	-10,478	-3,966	-5.115	.001
A2B1	-10,567	-2,766	-3,941	.004

A2B2	-8,354	-4,090	-6,729	.000
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The results of the paired t-test in Table 6 show a significance value (p-value) <0.05 , thus concluding that there are significant differences in each treatment group (A1B1, A1B2, A2B1, and A2B2). In other words, the training methods applied to each combination significantly affected the *long pass results* of the Bhayangkara POP Semarang City football athletes.

Table 7. Effect of leg training and power on long pass

Source	DF	F	Sig
Passing practice	148,028	4,475	.042
Leg power	380,250	11,496	.002
Passing exercises * leg power	462,250	13,975	.001

The results of the Two-Factor ANOVA test in Table 7 show a significant influence of the passing training method on the *long pass skills* of Bhayangkara POP Semarang City football athletes ($p = 0.042 < 0.05$). In addition, the leg power factor also has a significant effect on the *long pass results* ($p = 0.002 < 0.05$), which confirms that differences in leg strength levels (high or low) have a tangible impact on the ability to perform *long passes*. Furthermore, the interaction analysis between the passing training method and leg power also produces a highly significant value ($p = 0.001 < 0.05$), so it can be concluded that the effectiveness of the passing training method is greatly influenced by the level of leg power the athlete possesses.

DISCUSSION

Football is a sport that requires optimal leg strength (power) to determine the ability to make long-distance kicks or *long passes*. (Ariesta & Banat, 2021) In this game, good leg strength is crucial in increasing the power and accuracy of

long-range kicks, supporting a player's performance in creating scoring opportunities. Therefore, leg muscle strength is crucial in determining the accuracy and power of *long-range kicks* in soccer (Umri & Situmeang, 2021b).

The study's results showed a significant difference in the effect of horizontal and vertical long pass training methods on long pass ability in soccer athletes. This difference indicates that varying the direction and orientation of the training target influences the adaptation of long-distance passing skills in terms of strength, accuracy, and consistency.

Horizontal target long pass training requires players to direct the ball accurately at a target on a flat surface with a lateral orientation, so the training emphasizes controlling the ball's direction and distributing the kick's power evenly. This model tends to improve players' *spatial awareness* of the width of the field and the ability to build attacks from the side of the field (Mahbubi & Adi, 2016). In contrast, long vertical target passes require adjustments to the kick angle and ball speed to reach the target on a long trajectory. This encourages players to optimize leg muscle explosiveness, waist coordination, and ball contact *timing* to achieve maximum distance (Hadi & Ridlo, 2025).

Physiologically, these differences in adaptation can be understood through the principle of *specificity of training*, which states that the neuromuscular system will adapt optimally to the movement patterns, intensities, and conditions that are most frequently trained (Bompa & Buzzichelli, 2021). In other words, the more similar the training stimulus is to the actual movement demands, the greater the likelihood of forming functional adaptations that support improved performance (Del Vecchio et al., 2024).

Horizontal target training focuses more on motor patterns, lateral directional control, and

flat accuracy, while vertical target training strengthens biomechanical components that support high ball trajectories and long distances. In other words, differences in training stimuli result in different adaptation patterns in long passing ability. Rico-González et al. (2022) argue that varying the direction of passing training targets can improve specific player abilities according to tactical needs. Furthermore, studies have Sado et al., (2024) shown that varying the angle and direction of training targets can optimize *motor learning* in long-distance passing techniques by improving motor coordination and kicking power specific to the training stimulus.

The findings of this study indicate that the selection of long pass training methods should be tailored to the desired skill development objectives. If the primary goal is to improve the accuracy of long-range passes on flat or diagonal lines, then horizontal target training is more relevant. However, if the goal is to improve passing distance and the ability to exploit space behind the opponent's defense, then vertical target training will yield more optimal results.

The study's results showed a significant difference in the influence between the group of athletes with high leg power and those with low leg power on the results of *long passes* in Bhayangkara Pop Semarang City soccer athletes. This finding indicates that leg power strength significantly contributes to the ability to make long passes. This result aligns with the opinion (Tuyà Viñas et al., 2023) that explosive leg muscle power is important in supporting a series of movements in soccer games, especially in *long passing skills*. Strong legs can help players direct the ball precisely to the target when making long passes (Augustus et al., 2024). Furthermore, (Riansoi et al., 2024) confirms that leg muscle strength plays an important role in producing *long passes* with adequate accuracy and power.

Research conducted by Hidayati et al. (2023) also shows that higher leg muscle strength positively correlates with the ability to generate greater ball speed when making *long passes*. Optimal ball speed increases the effectiveness of attacks and reduces the opponent's chances of intercepting. Leg muscle strength is crucial in generating the power needed to deliver the ball over long distances accurately (Aminudin et al., 2020). Key muscles such as *the quadriceps*, *hamstrings*, and other leg muscles generate the power to launch the ball over long distances (Ishøi et al., 2021). In addition, muscle strength is also closely related to body stability, which affects the consistency of *long passing technique*. (Parmadi et al., 2022).

It can be concluded that the explosive power component of leg muscles contributes significantly to the ability to execute *long passes* in Bhayangkara Pop Semarang City soccer athletes. Athletes with high leg power can produce long passes with optimal distance, accuracy, and power compared to athletes with low leg power. This finding supports the results of previous research that confirmed that leg muscle strength is a crucial component in *long passing technique*, because it plays a role in generating optimal ball speed, increasing attack effectiveness, and minimizing the opportunity for opponent interception.

The results of this study indicate a significant interaction between training methods and leg strength on *long pass ability* in athletes from the Bhayangkara Pop Football School in Semarang City. This finding indicates that the effectiveness of a training method cannot be separated from the athlete's specific physical condition, particularly *leg power capacity*. In other words, the adaptive response resulting from a training method will differ depending on the athlete's level of leg strength.

The ability to execute a *long pass* with high accuracy is one of the important skills in soccer, which requires complex movement coordination and mastery of various physical and psychomotor components that support each other (Akbar Sudirman et al., 2024). The success of executing a *long pass* is influenced by internal factors, such as basic motor skills, leg muscle strength, body flexibility, and ball kicking skills (Gian Vembarto & Lismadiana, 2018), as well as external factors, such as opponent pressure, field conditions, wind direction, and the dynamics of the game situation.

One of the dominant internal factors is leg power, which plays a crucial role in generating propulsion during a kick (Muhamad Iqbal Abdillah et al., 2024). The *long pass technique* requires significant leg muscle strength to propel the ball with optimal distance and accuracy (Majid et al., 2024b). Physiologically, leg strength is key in generating propulsion and impulse during a kick. Athletes with high leg power can generate greater leg speed and kicking force, thereby increasing the distance and accuracy of *long passes*. If the training method applied is aligned with these characteristics, combining the two will result in optimal performance improvements (Sandya et al., 2023). This aligns with the principle of specificity, which states that physiological adaptation will be maximized if the training program is tailored to the technical and physical demands relevant to the sport (Bompa & Buzzichelli, 2019).

Conversely, implementing training methods that do not consider leg power capacity can potentially result in a less effective training stimulus, resulting in less than optimal *long pass ability*. This aligns with the principle of *individuality*, which emphasizes that the success of a training program is highly dependent on the

individual's physical characteristics and initial abilities.

Therefore, trainers need to conduct a leg strength assessment before determining the training method to use, so the program can provide the right stimulus and encourage maximum adaptation.

Therefore, the findings of this study confirm that athletes with high leg strength tend to benefit more from training methods tailored to their physical capacities, as they can maximize their propulsion and passing accuracy. Conversely, athletes with low leg strength require training methods emphasizing strength and coordination development before mastering long-distance techniques. Integrating the selection of appropriate training methods and developing leg strength is a crucial strategy for effectively and sustainably improving *long pass skills* in soccer athletes.

CONCLUSION

long pass training methods and high and low leg strength levels significantly impacted *long pass skills* in Bhayangkara POP Semarang City football athletes. Specifically, the athletes with high leg strength achieved optimal results by applying the horizontal *long pass training method*. In contrast, the group with low leg strength improved through the vertical *long pass training*.

For further research, it is recommended to expand the sample to different competition levels and age groups so that the findings can be more broadly generalized. Furthermore, measuring supporting variables such as coordination, balance, and flexibility could provide a more comprehensive picture of the factors influencing the effectiveness of *long pass training*.

The implications of this research can be used as a basis for designing more specific training programs tailored to the athletes'

physical characteristics. Athletes with high leg strength are advised to focus more on horizontal *long pass training methods*, while athletes with low leg strength can be directed to optimize vertical *long pass training methods*. This individualized training approach is expected to increase the effectiveness of *long pass technique mastery* and support overall team performance.

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