2025, Retos, 62, 335-340


# The influence of leg muscle power, waist flexibility and self-confidence on soccer long passing ability

La Influencia de la potencia muscular de las piernas, la flexibilidad de la cintura y la confianza en sí mismo en la habilidad de pases largos en el fútbol

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**Abstract.** The problem in this study is the low ability of Long Passing soccer school players Buah Hati. This study aims to see the effect of leg muscle strength, waist flexibility and self-confidence on long passing ability, both directly and indirectly and simultaneously. This type of research is quantitative with a path analysis approach. the sample in this study were all 30 players of Buah Hati Football School. Sample withdrawal using saturated sampling technique. The leg muscle power instrument uses the Vetical Jump Test, waist flexibility using the Sit and reach test, confidence using a Likert scale model questionnaire and long passing ability with the Aerial Pass for Accuaracy test. The results showed that, (1) there is a direct effect of leg muscle power on long passing ability with ρz1 = 0.337 or 11.35%, (2) there is a direct effect of waist flexibility on long passing ability, with ρz2 = 0.458 or 20.97%, (3) there is a direct effect of self-confidence on long passing ability, with ρz3 = 0.225 or 5.06%, (4) there is an indirect effect of leg muscle power on Long Passing ability through self-confidence, with ρz31 = 0.1131 or 11.31%, (5) there is an indirect effect of waist flexibility on Long Passing ability through self-confidence, with ρz32 = 0.0893 or 8.93% and (6) there is an effect of leg muscle power, waist flexibility and self-confidence simultaneously on three point shooting ability, with ρz123 = 0.942 or 94.2%.
**Keywords:** Leg Muscle Power, Waist Flexibility, Self-Confidence, and Long Passing Ability.

**Resumen**. El problema en este estudio es la baja capacidad de los jugadores de la escuela de fútbol de pases largos Buah Hati. Este estudio tiene como objetivo ver el efecto de la fuerza de los músculos de las piernas, la flexibilidad de la cintura y la confianza en uno mismo sobre la capacidad de pases largos, tanto directa como indirectamente y simultáneamente. Este tipo de investigación es cuantitativa con un enfoque de análisis de trayectoria. La muestra de este estudio fueron los 30 jugadores de la escuela de fútbol Buah Hati. Retiro de muestra mediante técnica de muestreo saturado. El instrumento de potencia de los músculos de las piernas utiliza la prueba de salto vertical, la flexibilidad de la cintura mediante la prueba de sentarse y alcanzar, la confianza mediante un cuestionario modelo a escala Likert y la capacidad de pases largos con la prueba de pase aéreo para precisión. Los resultados mostraron que, (1) existe un efecto directo de la potencia de los músculos de las piernas sobre la capacidad de pases largos con ρz1 = 0,337 o 11,35%, (2) existe un efecto directo de la flexibilidad de la cintura sobre la capacidad de pases largos, con ρz2 = 0,458 o 20,97%, (3) hay un efecto directo de la confianza en uno mismo sobre la capacidad de pases largos, con ρz3 = 0,225 o 5,06%, (4) hay un efecto indirecto de la potencia de los músculos de las piernas sobre la capacidad de pases largos a través de la confianza en uno mismo, con ρz31 = 0,1131 o 11,31%, (5) hay un efecto indirecto de la flexibilidad de la cintura sobre la capacidad de pases largos a través de la confianza en uno mismo, con ρz32 = 0,0893 o 8,93% y (6) hay un efecto de la potencia de los músculos de las piernas, la flexibilidad de la cintura y confianza en sí mismo simultáneamente en la capacidad de tiro de tres puntos, con ρz123 = 0,942 o 94,2%.
**Palabras clave**: potencia muscular de las piernas, flexibilidad de la cintura, confianza en uno mismo y capacidad de pases largos.

Fecha recepción: 30-07-24. Fecha de aceptación: 05-10-24
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## Introduction

Football is a sport that requires a combination of complex physical and mental skills (Hwang n.d. 2024) (Such et al. 2020) (Liskustyawati et al. 2024). Among the various aspects of skill in soccer, the ability to perform long passing effectively is one of the important factors in determining the outcome of a match (Haris et al. 2024; Nusri et al. 2024; Pitnawati et al. 2023; Pranoto et al. 2024; Umar, Ockta, and Mardesia 2023). Long passing, which involves sending the ball long distances to teammates with accuracy and power, requires good body coordination, adequate muscle strength, optimal waist flexibility, and a high level of confidence.

In this article, we will explore the relationship between the three main factors thought to influence long passing ability in soccer, namely leg muscle strength, waist flexibility and the athlete's confidence level. We will outline the importance of each of these factors individually, as well as how the interaction between them can affect performance in long passing.

Leg muscle strength is an important aspect in generating the power needed to deliver a long ball accurately. (Sari et al. 2024) (Ahn, Bae, and Kim 2023). Major muscles such as the quadriceps, hamstrings, and other leg muscles play a role in generating the power needed to launch a long ball. (Kyselovičová et al. 2023) (Jeong, Choi, and Shin 2023). In addition, muscle strength is also closely related to body stability, which can affect consistency in long passing techniques. (Tsolakis et al. 2023) (Shi et al. 2023).

Lumbar flexibility plays a key role for players to produce the movement required to release a long pass with precision. (Bais et al. 2023) (Parolini et al. 2024). A flexible waist allows for a greater range of motion, allowing the player to take optimal positions and deliver accurate passes. (Tuyà Viñas et al. 2023) (Steijlen et al. 2021). Lack of waist flexibility can limit body movement and hinder the ability to perform long passes effectively. (Tseng et al. 2023)

(Walker et al. 2021).

An athlete's confidence level also has a significant impact on their performance in sporting activities. (Neldi et al. 2023). High self-confidence can improve focus and peace of mind, which are important factors in making decisions. (Ghosh et al. 2023). Conversely, a lack of confidence can lead to hesitation and anxiety, which can interfere with concentration and accuracy in delivering the ball. (Hadwin et al. 2023).

By exploring the relationship between leg muscle strength, waist flexibility, and confidence level on long passing ability, this article aims to provide a better understanding of the factors that can affect athletes' performance in this crucial aspect of the game of soccer. With a better understanding of these factors, coaches and players can develop more effective training strategies to improve long passing ability and, ultimately, improve their team's performance on the field.

Based on the problems and descriptions above, the researchers are interested in conducting research with the title The Effect of Limb Muscle Power, Waist Flexibility, and Self-Confidence on Long Passing Football Ability in Buah Hati Football School players**.**

## Method

### *Participants and match data*

The research method used in this study is an associative quantitative method with a path analysis approach with data collection techniques using tests and questionnaires with a Likert scale. The variables associated with this study are leg muscle power (X1), waist flexibility (X2), and self-confidence (Y) toward the ability to pass under (Z). (X1) and (X2) as independent variables, (Y) as an intervening variable, while the dependent variable is Long Passing ability (Z) (Sugiyono 2022). The sample was determined using a saturated sampling technique. The number of samples in this study was 30 players of the Buah Hati Football School in the U-12 age group which was carried out for 3 days a week. The leg muscle power instrument used the Vertical Jump Test, waist flexibility used the sit and reach test, long passing ability used the Aerial Pass For Accuracy, and self-confidence used a questionnaire with a total of 45 question items.

### *Statistical analysis*

The analysis requirements in question are requirements that must be met before conducting a correlation analysis. The analysis requirements include the Normality Test, which is as follows

Table 1.
Normality Test with Lilliefors

| Variables | Sample | Lilliefors Test | | Conclusion |
|---|---|---|---|---|
| | | Lo | Ltabel | |
| Leg Muscle Power | 30 | 0.167 | 0.161 | Normal |
| Waist Flexibility | 30 | 0.157 | 0.161 | Normal |
| Self Confidence | 30 | 0.131 | 0.161 | Normal |
| Long Passing | 30 | 0.141 | 0.161 | Normal |

Based on the description above, all data variables are $L_o < L_{Tabel}$ criteria. It can be concluded that each data is normally distributed.

## Result

The results of this study can be seen as follows:

Table 2.
Data Distribution of Long Passing Ability

| Interval | Frequency Absolute | Relative % |
|---|---|---|
| >28.46 | 3 | 10 |
| 22.12 – 28.45 | 4 | 13,33 |
| 15.78 – 22.11 | 16 | 53,33 |
| 9.44 – 15.77 | 6 | 20 |
| <9.43 | 1 | 3,33 |
| Amount | 30 | 100 |

Based on table 2 above, from 30 samples of Buah Hati soccer school players, the interval class is obtained more than 28.46 as many as 3 people (10.00%), interval class 22.12 - 28.45 as many as 4 people (13.33%), interval class 15.78 - 22.11 as many as 16 people (53.33%), interval class 9.44 - 15.77 as many as 6 people (20%), and interval class less than 9.43 as many as 1 person (3.33%).

Table 3.
Leg muscle power results

| Interval (kg.m/s) | Frequency Absolute | Relative % |
|---|---|---|
| >106 | 4 | 13,33 |
| 98-106,0 | 3 | 10,00 |
| 90-97 | 18 | 60,00 |
| 81-89 | 5 | 16,67 |
| <81 | 0 | 0,00 |
| Amount | 30 | 100 |

Based on table 3 above, it can be explained from 30 samples of Buah Hati soccer school players, obtained interval classes that are more than 106 kg.m/s as many as 4 people (13.33%), interval classes 98-106.0 kg.m/s as many as 3 people (10%), interval classes 90-97 kg.m/s as many as 18 people (60%), interval classes 81-89 kg.m/s as many as 5 people (16.67%), interval classes less than 81 as many as 0 people (0%).

Table 4.
Waist Flexibility Results

| Interval | Frequency Absolute | Relative % |
|---|---|---|
| > 27.85 | 1 | 3,33 |
| 21.45 – 27.84 | 12 | 40,00 |
| 15.05 – 21.44 | 10 | 33,33 |
| 8.65 – 15.04 | 5 | 16,67 |
| < 8.65 | 2 | 6,67 |
| Amount | 30 | 100 |

Based on table 4 above, that from 30 samples of Buah Hati soccer school players, the interval class is obtained more than 27.85 as many as 1 person (3.33%), the interval class 21.45 - 27.84 as many as 12 people (40%), the interval class 15.05 - 21.44 as many as 10 people (33.33%), the interval class 8.65 - 15.04 as many as 5 people (16.67%), and the interval class less than 8.65 as many as 2 people (6.67%).

Based on table 5 above, it is explained that from 30 samples of Buah Hati football school players, the interval class obtained is more than 153 as many as 2 people (6.67%), the interval class 144-153 as many as 9 people (30%), the interval class 135-143 as many as 8 people

(26.67%), the interval class 126-134 as many as 10 people (33.33%), and the interval class 129-134 as many as 7 people (23.33%), and the interval class less than 125 as many as 1 person (3.33%).

Table 5.
Self-Confidence Results

| Interval (kg.m/s) | Frequency Absolute | Relative % |
|---|---|---|
| >153 | 2 | 6,67 |
| 144 – 153 | 9 | 30,00 |
| 135 – 143 | 8 | 26,67 |
| 126 – 134 | 10 | 33,33 |
| < 125 | 1 | 3,33 |
| Amount | 30 | 100 |

## Discussion

Based on the results of the analysis test on the variables of leg muscle power, waist flexibility, and self-confidence simultaneously on the long passing ability of Buah Hati football school players, a value of 0.942 was obtained. The results of this study indicate that the magnitude of the influence of leg muscle power, waist flexibility and self-confidence simultaneously on the long-passing ability of Buah Hati football players is 94.2%, the rest is influenced by other variables.

### *Leg Muscle Power*

From the results of the study it can be said that leg muscle power has a contribution to Long Passing ability, in line with what Silva said leg explosive power is the most important thing and supports a series of movements carried out in soccer games, especially in long passing (Silva et al. 2023). Strong limbs will help a player to achieve the direction of the ball during long passing. (Augustus, Hudson, and Smith 2024) (Burhaein, Ibrahim, and Pavlovic 2020). Leg muscle strength plays an important role in a player's ability to perform long passes accurately and with sufficient power. (Chainok 2024). A study published in the "Champion of Sport Journal" found that higher leg muscle strength correlated with a player's ability to generate higher ball speed during long passing. (Hidayati, Sulaiman, and Hartono 2023). A person's playing ability can certainly be seen from the athlete's level of confidence. Because high self-confidence is one of the factors in doing long passing.

### *Waist Flexibility*

Besides that, one of the factors that affect long passing ability is waist flexibility. (Afrizal and Soniawan 2021) (Antara et al. 2023). Lumbar flexibility affects a player's ability to produce the movements required in the long passing technique. (Liskustyawati et al. 2024) (Luo et al. 2023). A flexible waist allows for a greater range of motion, allowing the player to take optimal positions and deliver accurate passes. (Mitrousis et al. 2023). However, a lack of waist flexibility can restrict body movement, interfere with long passing techniques, and reduce the ability to deliver the ball with precision. Waist flexibility can be related to a person's confidence. With good waist flexibility, soccer players can pass well and on target, and of course, will increase the confidence of soccer players.

### *Self-confidence*

And last but not least, high confidence is a key factor in consistency and precision in long passing. A player who has a high level of confidence tends to be more focused and calm when executing long passing techniques. (Faisal and Abd Zaid 2023) (Hidayat et al. 2023). They are better able to cope with pressure from opponents and decisive game situations, which can contribute to improved performance in delivering long passes with accuracy. Leg muscle strength, waist flexibility, and confidence are interrelated and can influence each other in a player's long passing ability. Strong leg muscles can increase strength and explosiveness in long passing. (Gao 2023), while good waist flexibility allows the player to produce the movements required for proper technique. (Amirzan and Sujarwo 2024). High confidence can optimize the use of such strength and flexibility, ensuring that players can execute long passes with consistency and accuracy (Bolckmans et al. 2023). In this context, developing leg muscle strength, improving lumbar flexibility, and building a high level of confidence through training, performance monitoring, and psychological approaches can be important strategies for soccer players who want to improve their long passing ability. By understanding the complex interactions between these factors, players and coaches can develop a holistic approach in training and preparing players to become more effective in mastering long passing techniques in soccer games. Some of the components mentioned above, an important component that players must have is confidence when performing long passing skills. Self-confidence in doing sports can be interpreted as confidence in the ability to perform activities in sports, especially in performing long passing skills. The results of this study explain that long passing ability is influenced by these three factors or it can be interpreted that the long passing ability of soccer school players can be maximized if they have variables of leg muscle power, waist flexibility and self-confidence. Apart from the three variables that affect long passing, there are also supporting factors for the success of player achievement, namely strategies or tactics that must always be considered also in the success of player achievement which includes four supporting factors for physical, technical, tactical, and mental achievements.

## Conclusions

Based on the results of the author's research that leg muscle strength, waist flexibility and self-confidence simultaneously affect long passing ability in Buah Hati soccer school players. In a soccer game, long passing ability plays an important role in determining the outcome of the match. In this context, leg muscle strength, waist flexibility, and confidence level are key factors that affect the

quality and consistency of long passing techniques. Leg muscle strength contributes to players generating the power and explosiveness required to launch a long ball accurately. Higher leg muscle strength correlates with higher ball speed during long passing. lumbar flexibility plays an important role in allowing players to produce the movements required in long passing techniques. Good flexibility allows players to take optimal positions and deliver accurate passes. A high level of confidence is essential for consistency and precision in long passing. High confidence helps players to stay focused and calm in decisive game situations, thereby improving the ability to deliver long passes accurately. Overall, the interaction between leg muscle strength, waist flexibility, and confidence level are key factors in a soccer player's long passing ability. By understanding the complex relationship between these factors, players and coaches can develop holistic training strategies to improve long passing ability and, ultimately, improve their team's performance on the field. It is expected to clubs and related institutions, to understand the importance of the components involved in long passing ability such as leg muscle power and waist flexibility so that long passing ability can be improved, as well as confidence as one of the supporting factors in long passing ability. It is expected for soccer players to improve long passing ability by doing exercises related to leg muscle power and waist flexibility. Then, instill self-confidence so that you have confidence in your abilities. Future researchers, because this research is very limited in terms of variables and the number of samples, it needs to be developed again by developing similar variables and a wider number of samples regarding the ability of long passing football.

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