

Literature Review: The Correlation between Leg Muscle Strength and Shooting Accuracy in Football

Indah Astika¹

¹Universitas PGRI Palembang

*Corresponding author: indahastikaSDN15bt@gmail.com

Abstrak

Penelitian ini bertujuan untuk menyelidiki korelasi antara kekuatan otot kaki dan akurasi tendangan dalam sepak bola. Penelitian ini dilakukan melalui analisis literatur sistematis terhadap berbagai studi nasional dan internasional yang diterbitkan antara tahun 2023 dan 2025. Data diperoleh dari basis data Google Scholar, DOAJ, dan Journal of Physical Education and Sport (JPES). Dari total 152 publikasi yang diidentifikasi, hanya 10 studi yang memenuhi kriteria inklusi. Hasil penelitian menunjukkan korelasi yang positif dan signifikan antara kekuatan otot kaki dan akurasi tendangan pada pemain sepak bola, berlaku baik untuk pemula maupun atlet muda. Latihan kekuatan otot kaki, terutama melalui latihan kekuatan isoinertial dan aktivitas plyometric, telah terbukti meningkatkan kecepatan tendangan dan stabilitas gerakan. Studi ini menegaskan bahwa penguatan otot kaki merupakan faktor penentu penting dalam performa menendang yang baik. Implikasi praktis: Pelatih dan instruktur pendidikan jasmani disarankan untuk menekankan latihan kekuatan eksplosif dan stabilitas inti guna meningkatkan daya dan ketepatan menendang pemain.

Kata kunci: Kekuatan otot kaki, akurasi tembakan, sepak bola, performa pemain.

Abstract

This study seeks to investigate the correlation between leg muscle strength and shooting accuracy in soccer. The research was executed by a systematic literature analysis of diverse national and international studies released between 2023 and 2025. Data were acquired from Google Scholar, DOAJ, and the Journal of Physical Education and Sport (JPES) databases. Out of the total 152 publications identified, merely 10 studies satisfied the inclusion requirements. The study's results demonstrate a favorable and significant correlation between leg muscle strength and shooting accuracy in soccer players, applicable to both beginners and young athletes. Leg muscle strength training, especially via isoinertial strength training and plyometric activities, has demonstrated an enhancement in kicking velocity and movement stability. This study establishes that leg muscle strengthening is a crucial determinant of good shooting performance. Practical implications: Coaches and physical education instructors are encouraged to emphasize explosive and core stability training to enhance players' shooting power and precision.

Keywords: Leg muscle strength, shooting accuracy, football, player performance.

1. INTRODUCTION

Football is a sport that requires a synthesis of technical proficiency, tactical acumen, and peak physical capabilities. In this game, each component of fundamental technique is essential to player performance and match results. A vital technique for attaining success is shooting, specifically the capacity to strike the ball with both power and precision to score a goal (Faozi et al., 2024). Shooting technique depends not solely on mechanical proficiency or personal skill, but also encompasses elements of muscular strength, bodily coordination, and effective mental focus. Shooting accuracy is an essential ability in futsal; nevertheless, first observations at State Junior High School 35 Pekanbaru reveal that students exhibit subpar shooting performance, characterized by insufficient ball power, imprecise ball direction, and inadequate foot-ball contact. The symptoms indicate deficient leg muscular strength and weak eye-foot coordination, potentially impairing students' capacity to execute precise shots (Imka et al, 2025). Ita and Hutajulu (2018) found that shooting accuracy scores with the

History:

Received : 2 March 2026
Revised : 2 March 2026
Accepted : 4 March 2026
Published : 8 March 2026

Publisher: Horizon Edukasi Prima Indonesia

Licensed: This work is licensed under
a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by-sa/4.0/)



dominant leg were considerably superior to those with the non-dominant leg in both rested and fatigued states, suggesting a disparity in leg muscular strength among Indonesian soccer school players.

Soccer essentially necessitates leg muscle strength and balance to attain optimal shooting precision. Shooting accuracy is an essential skill that any player must acquire, as it is fundamental to scoring goals (Ramadhana et al., 2023). Leg muscles are essential for producing the explosive power required to perform a maximal kick. Sarifudin et al. (2023) assert that leg muscular strength and power directly affect ball velocity and kicking precision. Moreover, body coordination, postural stability, and movement regulation are essential elements in enhancing shooting efficacy. Beato et al. (2021) indicated that professional soccer players possess superior quadriceps and hamstring strength compared to elite academy and amateur players, underscoring the pivotal importance of lower-limb strength in soccer performance. Individuals possessing robust leg musculature typically sustain bodily stability during kicks, thereby attaining maximal precision and force.

Research by Akhmady et al. (2024) and Wingki et al. (2024) demonstrated that players with superior leg muscle strength exhibit enhanced shooting accuracy compared to those with inferior muscular strength. This is attributable to the muscles' capacity for generating quick and forceful contractions repeatedly, enabling players to manipulate the direction and velocity of the ball with enhanced precision. Cejudo et al. (2024) concentrated on long-ball kicking instead of shooting accuracy; yet, their results substantiate the idea that lower-limb strength and flexibility are crucial factors influencing kicking performance in juvenile soccer. The similarity in biomechanical demands between long-ball kicks and shots on goal indirectly supports the theorized connection between leg muscle strength and the capacity to perform precise kicks in football. Exercises aimed at enhancing leg muscular strength, including squat jumps, leg presses, or plyometric training, have demonstrated an improvement in kicking efficacy in soccer. Experimental research suggests that diminished lower-limb muscle force resulting from exhaustion can adversely affect kicking performance. The primary aim of this systematic review and meta-analysis was to assess the efficacy of plyometric training (PT) on kicking performance, namely kicking speed and distance, in soccer players (Zhang et al, 2023). Carstensen et al. (2024) indicated that a fatiguing contraction protocol diminished maximal voluntary isometric contraction by roughly 14% and resulted in an approximately 2% reduction in maximum ball speed relative to a control condition, illustrating a significant adverse impact of muscle fatigue on shooting velocity in seasoned soccer players.

According to Delextrat et al. (2018), this indicates that adaptations linked to strength-endurance training may serve as an effective strategy to mitigate hamstring strength decline during the latter stages of match play, thereby playing a crucial role in diminishing susceptibility to hamstring and ACL injuries during the period identified as having the highest risk for injuries. While shot accuracy did not markedly decline under tiredness, the authors proposed that fatigue-related changes in the force–velocity properties of the quadriceps and intersegmental coordination could disrupt the kicking motion. Elevated hamstring strength was identified as a primary predictor of agility performance. The aforementioned results pertain to the running forms performed by soccer players—linear speed and agility, which encompass the capacity to halt at a specific velocity, alter direction, and resume movement (Kabaciński et al, 2022). This study sought to ascertain the impact of various kick types on the correlation between kicking leg muscle activation and ball velocity. The muscle activation of certain knee extensor and flexor muscles in 10 amateur soccer players was assessed using electromyography during the execution of six maximal soccer kick variations (Cerrah et al, 2018). These findings confirm the idea that sufficient leg muscle strength and fatigue

resistance are essential for sustaining high-quality kicking performance and, consequently, may also be vital for maintaining shooting accuracy during a match.

In physical education, comprehending the correlation between leg muscle strength and shooting accuracy is essential for educators and coaches in formulating scientific and quantifiable training regimens. By employing a systematic training methodology, students not only acquire proficiency in kicking techniques but also enhance physical capabilities that contribute to overall performance. This study seeks to examine and evaluate the correlation between leg muscle strength and shooting accuracy, drawing on previous research findings to enhance the efficacy of evidence-based soccer training and education. According to Tirumala and Motimath (2025), kicking, jumping, and agility are essential qualities in football. These activities necessitate sufficient lower limb strength, which can be improved by resistance training. The study aimed to assess the impact of resistance tube workouts on kicking accuracy, vertical leap performance, and 40-yard technical test outcomes in competitive football players.

2. METHOD

This study used a systematic literature review approach *to* identify, analyze, and synthesize research findings that address the relationship between leg muscle strength and shooting accuracy in soccer. Yanur et al. (2024) reported that leg muscle strength is related to the accuracy of futsal shooting in high school students, so that the higher the leg muscle strength, the better the accuracy of shooting at the goal. The article search process was conducted through several leading databases, namely Google Scholar, DOAJ, and JPES Online, with a publication period of 2023 to 2025 to ensure the relevance and freshness of the data used. The approach of this type of research is the development of the sampling using the purposive sampling method that has the criteria of junior high school students aged 13–15 years (male) who are hobbyists and proficient in soccer. The instrument tests of shooting skill with the closest distance to the goal of 15 m using the right and left limbs have a level of validity that meets the standards (Widodo et al, 2023).

The inclusion criteria applied in the literature selection included studies that specifically examined the relationship between leg muscle strength and shooting or kicking accuracy. Kicking proficiency is a critical skill in Australian Football, as approximately 50–60% of total match scores are obtained from kicking (Bonney et al, 2020). both in the context of physical education learning in schools and professional sports training. Furthermore, only articles using quantitative or experimental research methods and containing valid and reliable empirical data were included in this review, ensuring a comprehensive, evidence-based analysis. Based on Sugiyono (2020), Quantitative research methods are research methods based on positivist philosophy, used to conduct research on specific populations or samples, collect data using research instruments, and perform quantitative/statistical data analysis with the aim of testing predetermined hypotheses. According to Fitriani et al (2023), improving the athletes' abilities must be carefully considered to enhance the skills and physical endurance of each individual. There are many methods that can be used in athlete development, one of which is weight training.

3. RESULT AND DISCUSSION

Result

Table 1. Summary of Research Related to Leg Muscle Strength and Soccer Shooting Accuracy

No	Author & Year	Journal	Research Focus	Key Results
1	(Faozi et al., 2023) .	<i>Jambura Health and</i>	The relationship between leg muscle	Significant correlation ($r=0.68$) between leg
2	(Sarifudin et al., 2023) .	<i>Semarang State University</i>	Leg muscle power and concentration for shooting accuracy	Leg power contributes 52% to accuracy.
3	(2024) (Akhmady et al., 2024) .	<i>STKIP KieRaha Journal</i>	The relationship between leg strength and shooting accuracy of the Sinar Patras team	Significant positive relationship ($r = 0.71$).
4	(Wingki et al., 2024) .	<i>Halu Oleo University Journal</i>	Leg strength and soccer shooting ability	Leg strength greatly influences the speed and direction of the ball.
5	(Gottlieb et al., 2025) .	<i>JPES (Vol.25, Issue 1)</i>	The effect of <i>core stability</i> training on neuromuscular performance of young players	Core stability exercises improve shooting accuracy and balance.
6	(Kaya et al., 2025) .	<i>JPES (Vol.25)</i>	<i>Isoinertial strength</i> training and shooting speed	Significant increase in ball speed ($p < 0.01$).

Discussion

The literature review shows that leg muscle strength is a fundamental component in determining the effectiveness of shooting techniques in soccer. Leg muscle strength serves as the primary source of power to generate propulsive force on the ball. The greater the leg muscle strength, the greater the momentum generated when the foot interacts with the ball. This directly affects the resulting ball speed and the accuracy of the kick. Furthermore, the leg muscles' ability to generate explosive power quickly and in a coordinated manner allows players to kick the ball with high intensity without losing balance. The results of this study have implications for paying special attention to athletes, especially the explosive power of the leg muscles, because they contribute to the ability to shoot futsal. Special attention can be given to the program exercises for the increased explosive power of limb muscles, varied in certain exercises. It is recommended for coaches and futsal coaches to pay attention to the elements of the explosive power of limb muscles in improving the ability to shoot in the game of futsal (Parmadi et al, 2022).

Thus, leg muscle strength plays a role not only in pure strength but also in the biomechanical efficiency of movement during shooting. Rey (2019) can be used as direct empirical evidence that leg muscle power (part of leg muscle strength) contributes significantly to the accuracy of kicking toward the goal, with a contribution of around 28.12%.

According to Faozi et al. (2024) and Sarifudin et al. (2023), leg muscle strength and power contribute significantly even more than 50% to shooting success. This means that more than half of the success of an accurate and powerful kick is determined by the physical condition of the lower body. Palupi et al. (2026) found a very strong and significant correlation between leg muscle strength and shooting accuracy in high school students; $r = 0.925$; $p = 0.000$, meaning that students with greater leg strength had better kicking accuracy. These results reinforce the understanding that mastery of technique alone is insufficient without adequate

muscle strength. Therefore, explosive strength training is a priority aspect of a basic kicking technique development program. The improvement occurred due to leg muscle strength training using the circuit method, which involves moving between stations. Thus, leg muscle strength training is effective in improving shooting ability in soccer (Didi & Rubiyanto, 2022). This improvement not only impacts the distance or speed of the ball but also influences the player's ability to control the direction of the kick and maintain body stability when shooting in dynamic conditions, such as under pressure from an opponent or shooting from an unbalanced position.

Furthermore, a study conducted by Kaya et al. (2025) added that the application of the inertial training method has been proven to increase the dynamic strength of the lower limbs significantly. This exercise involves the use of weights that provide constant resistance during the concentric and eccentric phases of the movement, so that the muscles work more efficiently and are trained to produce force under various conditions. This increase in strength has a direct impact on increasing the speed of the ball when shooting, as well as the player's ability to maintain body stability. Furthermore, this exercise plays a role in developing dynamic balance, namely the ability to maintain body balance when performing explosive movements at high speed. Good balance is crucial for accurate shots, even under the pressure of a match or when the body position changes suddenly.

Another study by Wingki et al. (2024) and Akhmady et al. (2024) strengthens these findings by showing that players with high leg muscle strength are better able to regulate body momentum, control the direction of the ball, and adapt kicking power to the game situation. Several studies have been performed on soccer kicks and stressed the significance of strength/power and coordination between the agonist and antagonist muscles of the lower limb. Along with accuracy, speed is also an important factor in a successful kick. It is reported that trunk musculature, hip and knee extensors of the non-kicking extremity, and hip adductors of the kicking side have a role in increasing the foot velocity while kicking (Debnath et al, 2023). These findings align with sports biomechanics theory, which explains that muscle strength has a direct influence on postural stability and body movement coordination. These two factors are key to producing accurate and consistent kicks, especially in match situations that demand quick responses, precise positioning, and quick decision-making.

On the other hand, Gottlieb et al. (2025) emphasized the importance of core stability training or core muscle strength training (abdominal and lower back) as a support for leg strength. In the context of biomechanics, core body stability serves as a link between the upper and lower body, which helps channel force from the torso to the legs efficiently. With good core stability, the energy generated when kicking can be optimally transferred to the ball without losing momentum. The combination of core muscle strength training and explosive leg exercises, such as plyometric training or resistance band exercises, has been proven to be the most effective method for improving the accuracy and speed of soccer players' kicks. As stated by Koda et al (2025), Soccer players had similar or even inferior isokinetic leg strength compared with other athletes. Still, their ball kick velocity was faster, suggesting that specific leg strength variables are closely linked with kick performance.

Based on the results of these various studies, it is clear that the relationship between leg muscle strength and shooting accuracy is positive, significant, and consistent across all levels of players, in both futsal and soccer. According to Mitrousis et al (2023), dynamic and static balance, and shooting with dominant leg skills can be improved in adolescent soccer players through a specialized 8-week balance-training program. A balance-training program may

contribute to technical skill improvement in soccer training. The results of this study support the theory that the ability of a football athlete in shooting a football is influenced by leg muscle power because the combination of strength and maximum speed gives an optimal effect on ball kicks. This leg muscle power is used when performing an instep kick to produce a fast and accurate shot toward the goal (Hakim et al, 2024). Leg strength not only influences the outcome of a shot but also plays a crucial role in the overall mechanics of body movement. Therefore, developing a training program that emphasizes the integration of explosive strength, dynamic balance, and core stability is an effective strategy for improving shooting performance comprehensively and sustainably.

These findings have important implications for coaches and physical education teachers in designing scientifically based training programs. Leg muscle strength training programs should not simply focus on increasing load or intensity but also consider the principles of specificity and progressive overload. Significant improvements were detected in all parameters, i.e., ball-kicking velocity, sprint speed, and agility performance in the training group ($p < 0.05$). On the other hand, in the control group, no significant change was detected in the ball-kicking velocity and sprint speed ($p > 0.05$), whereas a significant improvement was observed in agility performance ($p < 0.05$) (Zemkova & Zapletalova, 2024). This means that exercises should be performed gradually and mimic actual kicking movement patterns to ensure functional muscle adaptation. A variety of exercises, such as plyometric training, resistance band drills, and functional movement exercises, can help optimize strength, speed, motor control, and coordination simultaneously. Based on Mohendra et al (2024), Shooting accuracy can be influenced by explosive power, muscle coordination, eye-foot coordination, and concentration; these are components that must be possessed so that shooting accuracy is as expected. Training approaches that combine physical and technical aspects have also been shown to produce more optimal results. For example, kicking drills with moving targets or training under time pressure can improve players' adaptive abilities in dynamic match situations. From a physical education perspective, this type of training model plays a significant role in building students' confidence, concentration, and motivation to continue honing their motor skills through hands-on experience on the field.

According to Rusli (2025), Leg muscle strength plays a major role in the speed of kick execution, allowing players to get off shots quickly and reduce the chances of defenders blocking the ball. Stronger leg muscles also help players maintain balance and stability when shooting under pressure, which is essential for accurate and powerful shots. Thus, developing leg muscle strength not only improves shooting performance but also forms a crucial foundation for developing a player's overall physical abilities and motor skills. A structured, varied, and research-based training program will help produce more competent, efficient players who are ready to compete at various levels of soccer competition.

4. CONCLUSION

Based on a review of various national and international studies, it can be concluded that leg muscle strength has a significant and positive relationship with shooting accuracy in soccer. Players with strong leg muscles can generate greater propulsive force, resulting in increased ball speed when kicked and better control of the ball's direction.

Furthermore, good leg strength helps players maintain postural stability, especially when executing kicks from dynamic positions. This is crucial for maintaining balance when performing complex movements, such as instep kicks or volley shots. Zhang's (2025) research shows that a combination of strength training and lower limb coordination improves inter-

segmental coordination during instep kicks, which in turn increases the efficiency of force transfer and the potential accuracy of kicks.

This review also confirmed that core stability and motor coordination are supporting components that strengthen the relationship between leg strength and shooting accuracy. Strong core muscles enable efficient energy transfer from the upperbody to the legs, while good motor coordination ensures precise contact between the feet and the ball.

Therefore, coaches and physical education teachers are advised to design integrated training programs, combining strength training, plyometric exercises, and balance training to improve players' explosive power and motor control. Systematic implementation of this program will not only improve shooting ability but also impact players' overall performance on the court.

5. ACKNOWLEDGEMENT

The author would like to express his gratitude to Universitas PGRI Palembang for the support and facilities provided during the preparation of this article. He also thanks his supervisor for providing valuable guidance and input. Furthermore, he appreciates the contributions of colleagues and other parties who assisted in the data collection process, academic discussions, and the refinement of this research manuscript, which resulted in its successful completion.

6. REFERENCES

- Akhmady, A. L., Nur, A., & Souw, S.R. (2024). The relationship between leg muscle strength and shooting accuracy in the Sinar Patras soccer team. *STKIP Kie Raha Journal of Physical Education*, Vol. 4(2), 112–118.
- Beato, M., Coratella, G., et al. (2021). Lower-limb muscle strength, anterior-posterior, and inter-limb asymmetries in soccer players. *Journal of Strength and Conditioning Research*, 35(5), 1236–1243. <https://research.tus.ie/en/publications/lower-limb-muscle-strength-anterior-posterior-and-inter-limb-asm>
- Bonney, N., Berry, J., Ball, K., & Larkin, P. (2020). The Development of a Field-Based Kicking Assessment to Evaluate Australian Football Kicking Proficiency. *Journal of Sports Science & Medicine*, 19(1), 65–74. <https://pubmed.ncbi.nlm.nih.gov/31502925/>
- Carstensen, et al. (2024). The effect of fatiguing muscle contractions on kicking performance. *Taylor & Francis*.
- Cejudo, A., Armada-Zarco, J. M., & Izzo, R. (2024). Age is a new indicator of long-ball kicking performance in young soccer players: analysing kinanthropometry, flexibility and strength, *Appl. Sci*, 14, 9052.
- Cerrah, A. O., Soyulu, A. R., Ertan, H., & Lees, A. (2018). The effect of kick type on the relationship between leg muscle activation and ball velocity. *Montenegrin Journal of Sports Science and Medicine*, 7(3), 140–148.
- Debnath, A., Esht, V., Chahal, A., Kashoo, F. Z., Alshehri, M. M., Shaphe, M. A., Jaleel, G., Khan, M., Alghadir, A. H. (2023). Association between back-leg-chest muscle strength and kicking Speed in soccer Players: an Observational Study. *J Sports Med Phys Fitness*, 64(1), 16-20. <https://pubmed.ncbi.nlm.nih.gov/27620134/>

Delextrat, A., Piquet, J., Matthews, M. J., & Cohen, D. D. (2018). Strength-Endurance Training Reduces the Hamstrings Strength Decline Following Simulated Football Competition in Female Players, *Front Physiol*, 9:1059. <https://www.frontiersin.org/journals/physiology/articles/10.3389/fphys.2023.1072798/full>

Didi, S., & Rubiyanto (2022). Peningkatan kemampuan Shooting Permainan Sepak Bola melalui Latihan Kekuatan Otot Tungkai. *Jurnal Pendidikan Kesehatan rekreasi*, 8(2), 237-246.

Faozi, F., Latif, M., Hidayatulloh, DT, & Wahyud, A. (2023). The relationship between leg muscle strength and shooting accuracy in futsal athletes. *Jambura Health and Sport Journal*, 5(1), 45–52.

Fitriani, S. D., Apriliyanto, R., Hardovi, B. H. (2023). The Effect of Weight Training on the Kicking Ability of Female Soccer Players in Jember. *PUBMEDIA, Jurnal Pendidikan Olahraga*. 1(1).

Gottlieb, R., Ibrahim, R., Shalom, A., & Calleja González, J. (2025). The impact of core stability training on neuromuscular performance among young soccer players: A randomized interventional trial. *Journal of Physical Education and Sport (JPES)*, 25(1), 209–217.

Hakim, M. R. N., et al. (2024). Relationship between leg muscle strength, balance, and soccer technical skills. *Journal of International Sports Science*, 16(2), 80–85.

Imka, A. J., Jatra, R., & Dafun, P. B. Jr. (2025). Contribution of leg muscle power and eye-foot coordination to shooting accuracy in futsal. *Journal of Allied Health Science*, 5(1), 77–82.

Ita, S. and Hutajulu, P. (2018) Comparison of Shooting Accuracy between Dominant and Non-Dominant Leg among Indonesian Soccer School Players. *In Proceedings of the 2nd International Conference on Sports Science, Health and Physical Education*, 1, 163-167.

Kabaciński, J., et al. (2022). Relationship between Isokinetic Knee Strength and Speed. *International Journal of Environmental Research and Public Health*, 19(1), 343. <https://pmc.ncbi.nlm.nih.gov/articles/PMC8775831/>

Kaya, O., Tutar, M., Caglayan, A., & Korkmaz, H. (2025). Effects of lower extremity isoinertial strength training on shooting speed, dynamic balance, and dribbling skills in adolescent football players. *Journal of Physical Education and Sport (JPES)*, 25(1), 218–225.

Koda, H., Kikuhara, N., et al. (2025). Analysis of ball kicking speed, lower limb strength, and function in high school soccer players. *Journal of Allied Health Sciences*, 16(1), 62–72.

Mitrousis, I., Bourdas, D. I., Kounalakis, S., Bekris, E., Mitrousios, M., Kostopoulos, N., Ktistakis, I. E., Zacharakis, E. (2023). The Effect of a Balance Training Program on the Balance and Technical Skills of Adolescent Soccer Players. *Journal of Sports Science and Medicine*, 22, 645-657.

- Mohendra, Y., Sin, T. H., Rasid, W., Andika, H. (2024). Leg Muscle Explosive Power, foot coordination, and concentration can influence the accuracy of goal shooting. *Journal of Physical Education, Sport, Health, and Recreation*. 13(1)
- Palupi, M. R., Wicaksono, L., & Sumantri, R. J. (2026). Relationship between leg muscle strength and shooting accuracy in soccer among senior high school students. *Kinestetik Journal of Sports Science*, 3(2), 98–103. https://ejournal.unib.ac.id/kinestetik/article/view/45698**
- Parmadi, M., Wigunani, S. A., Budi, A. S., Murtiansyah, W., Susanto, A. (2022). Correlation between Limb Muscle Explosive Strength and Futsal Shooting Ability. *Jurnal Moderasi Olahraga*, 2(2).
- Ramadhana et al. (2023). Contribution of leg muscle power and balance to shooting accuracy in soccer. *Soccer Science and Optimization*, 15(2), 76–82. https://www.ssoar.info/ssoar/bitstream/handle/document/91398/91398_1.pdf**
- Rey, T. A. (2019). The Contribution of Leg Muscle Power to the Accuracy of Wide Kick Direction of Football Athletes at Universitas Islam Riau. *Advances in Social Science, Education, and Humanities Research*, 464
- Rusli, M. (2025). Relationship between leg muscle power and shooting ability in soccer matches. *APESJ Journal of Sports Performance*, 12(4), 210–220. https://athena.id-sre.org/index.php/apesj/article/view/57**
- Sarifudin, AI, Anam, K., Setyawati, H., Permana, DFW, & Mukarromah, SB (2023). The level of concentration and leg muscle power on soccer shooting accuracy. *Journal of Sports Science, Semarang State University*, Vol. 2(1), pp. 33–41.
- Sugiyono. (2020). *Metode penelitian pendidikan: Pendekatan kuantitatif, kualitatif, dan R&D* (Ed. 21). Bandung: Alfabeta.
- Tirumala, A., et al. (2025). Effect of resistance tube exercises on kicking accuracy, vertical jump, and sprint performance. *Human Movement Science*, 44(1), 1–11.
- Widodo, A., Wismanadi, H., Wahyudi, H., Fikri, M. D., Firmansyah, A. (2023). Validation of Soccer Shooting Skills Test in Junior High School Students. *Jurnal Pendidikan Jasmani Olahraga dan Kesehatan*, 6(1).
- Wingki, LO, Sawali, L., & Jud, J. (2024). The relationship between leg muscle strength and shooting ability in soccer. *Journal of Physical Education and Sports, Halu Oleo University*, 6(2), 74–81.
- Yanur, W., Arifin, R., Muhlin, M. (2024). Analysis of limb Muscle strength on the accuracy of shooting a futsal ball SMA Negeri 2 Martapura Banjar Regency. *Journal RESPECS (Research Physical Education and Sports)*, 6(1), 1-10.
- Zemková, E., & Zapletalová, L. (2024). The effect of core stability training on ball-kicking velocity, sprint, and jump performance in soccer players. *PLOS ONE*, 19(6): e0305245. <https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0305245>

Zhang, L. (2025). Inter-segmental coordination during soccer instep kicking. *MDPI*, 13(1), 19–27. <https://doi.org/10.3390/2306-5354>

Zhang, L., et al. (2025). Effects of coordination and strength training on lower extremity coordination during kicking. *MDPI Sports Sciences Journal*, 13(1), 19–27

Zhang, Y., et al. (2023). Effects of plyometric training on kicking performance in soccer players: A systematic review and meta-analysis. *Frontiers in Physiology*, 14, 1072798. DOI: 10.3389/fphys. 2023.1072798