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The Effect of Training Variations on Football Shooting Accuracy at Budi Agung Private Senior High School Medan in 2025

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Abstract

Objectives: *This study aimed to determine the effect of training variations on football shooting accuracy among students at Budi Agung Private Senior High School Medan in 2025.*
Materials and Methods: *This study used an experimental method with a one-group pretest-posttest design. The participants were 11 football students selected through purposive sampling. The intervention consisted of several shooting training variations, including target shooting, zig-zag dribbling and shooting, passing and shooting, zig-zag running and shooting, chest jump and shooting, volley shooting, and sprint-step shooting exercises. The treatment was conducted for 18 sessions from April to May 2025. Data were collected using a football shooting accuracy test and analyzed using normality, homogeneity, and t-tests.*
Results: *The results showed an increase in football shooting accuracy after the training program. The pretest mean score was 25.27 with a standard deviation of 8.19, while the posttest mean score increased to 36.73 with a standard deviation of 8.84. The hypothesis test showed that the t-count value was 4.38, which was higher than the t-table value of 2.23 at df = 10 and α = 0.05. Therefore, the alternative hypothesis was accepted.*
Conclusions: *Training variations had a significant effect on improving football shooting accuracy among students at Budi Agung Private Senior High School Medan. These findings indicate that varied and structured shooting exercises can be used as an effective method to improve students' football shooting performance.*

Keywords: training variations, football, shooting accuracy, drill method, senior high school students.

Introduction

Sport is an important physical activity that contributes to physical fitness, motor development, mental strength, and social interaction(Fukuda, 2026; Wang et al., 2022). In the school context, sport also functions as a medium for developing students' skills, discipline, cooperation, and achievement orientation (Essiet et al., 2021; Fizi et al., 2023; https://doi.org/10.58962/HSR.2025.11.1.102-112 et al., 2025). One of the most popular sports among students is football(Kuswoyo, 2020; Kuswoyo, Wasa, et al., 2020; Wiewiorski et al., 2017). Football is widely played because it is simple, enjoyable, and can be practiced by various age groups.

Football is a team sport played by 11 players, with the main objective of scoring goals while preventing the opponent from doing the same(Kuswoyo, Lahinda, et al., 2020; Kuswoyo & Donggoran, 2019; Silva et al., 2025). To perform well, players need to master several basic techniques, including passing, dribbling, controlling, heading, and shooting(Kekuatan et al., 2016; Rismoko et al., 2013;

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Wahyono, 2017). Among these techniques, shooting is one of the most decisive skills because it directly affects the opportunity to score goals.

Shooting accuracy is an essential component of football performance(Admin, 2025; Champ et al., 2020; Mothna Mohammed, 2016). Players must be able to direct the ball accurately toward the goal using proper technique, power, timing, and concentration. However, accurate shooting is not easy to master. It requires repeated practice, proper body positioning, effective foot contact, and the ability to make quick decisions under game pressure.

Based on preliminary observations at Budi Agung Private Senior High School Medan, many students still had difficulty performing accurate football shooting. Several shooting attempts were not directed properly toward the target, and the students' shooting technique was still inconsistent. In addition, the training process was often monotonous, so students were less enthusiastic during practice. Therefore, more varied training methods are needed to improve shooting accuracy.

Training variation is one method that can be used to make practice more effective and engaging. Varied shooting exercises can help students develop technical accuracy, movement coordination, motivation, and confidence. Previous studies have shown that shooting variation exercises can improve football shooting accuracy because they provide repeated technical practice in different movement situations (El-Rajab et al., 2025; Haegele et al., 2021). Therefore, this study aimed to determine the effect of training variations on football shooting accuracy among students at Budi Agung Private Senior High School Medan in 2025.

Materials and Methods

Study Participants

(Sugiyono, 2012)This study was conducted at Budi Agung Private Senior High School Medan from April to May 2025. The participants were 11 students who participated in football training activities. The sampling technique used was purposive sampling, in which participants were selected based on specific criteria relevant to the study. The selected participants were students who actively joined football practice, were physically healthy, and were willing to follow the complete training program.

Study Organization

This study used an experimental method with a one-group pretest-posttest design. The participants were given a pretest before the treatment to determine their initial football shooting accuracy. After the pretest, the participants followed a training program consisting of several shooting variations. The training variations included target shooting, zig-zag dribbling and shooting, passing and shooting, one zig-zag run and shooting, chest jump and shooting, volley shooting, and sprint-step shooting exercises.

The treatment was conducted for 18 training sessions. After the training program was completed, the participants took a posttest using the same shooting accuracy test. The posttest was used to determine whether there was an improvement in shooting accuracy after the intervention.

Statistical Analysis

The data were analyzed using descriptive and inferential statistics. Descriptive statistics were used to calculate the highest score, lowest score, total score, mean, and standard deviation of the pretest and posttest results. Before hypothesis testing, normality and homogeneity tests were conducted to ensure that the data met the assumptions for parametric analysis. The hypothesis was tested using a paired-sample t-test. The result was considered significant if the t-count value was higher than the t-table value at a significance level of $\alpha = 0.05$.

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Results

The pretest and posttest results showed an improvement in football shooting accuracy after the participants completed the training variation program. The pretest results showed that the highest score was 43, the lowest score was 15, the total score was 278, the mean score was 25.27, and the standard deviation was 8.19. After the treatment, the posttest results showed that the highest score increased to 48, the lowest score remained 15, the total score increased to 404, the mean score increased to 36.73, and the standard deviation was 8.84.

Table 1. Pretest and Posttest Results of Football Shooting Accuracy

Variable	Pretest	Posttest
Highest score	43	48
Lowest score	15	15
Total score	278	404
Mean score	25.27	36.73
Standard deviation	8.19	8.84

The results indicate that the participants' shooting accuracy improved after receiving the training variation program. The increase in the mean score from 25.27 to 36.73 shows that the structured and varied shooting exercises had a positive impact on students' football shooting performance.

The hypothesis test showed that the t-count value was 4.38. Based on the t-distribution table with df = 10 at $\alpha = 0.05$, the t-table value was 2.23. Since the t-count value was higher than the t-table value, the null hypothesis was rejected and the alternative hypothesis was accepted. This means that training variations had a significant effect on football shooting accuracy among students at Budi Agung Private Senior High School Medan.

Table 2. Summary of t-Test Results

Variable	df	t-count	t-table	Significance Level	Interpretation
Pretest–posttest shooting accuracy	10	4.38	2.23	0.05	Significant

Discussion

The results of this study showed that training variations significantly improved football shooting accuracy among students at Budi Agung Private Senior High School Medan. The improvement can be seen from the increase in the mean score from 25.27 in the pretest to 36.73 in the posttest. The t-test result also confirmed that the improvement was statistically significant.

This improvement occurred because the training program provided students with repeated shooting practice in various movement situations. The exercises were not limited to simple shooting but also included target shooting, zig-zag dribbling and shooting, passing and shooting, zig-zag running and shooting, chest jump and shooting, volley shooting, and sprint-step shooting. These variations helped students practice shooting from different angles, movement patterns, and technical situations.

The findings are in line with(Kuswoyo, 2018)), who reported that shooting variation exercises toward the goal improved shooting accuracy in young football players. Similarly, (Ah & S, 2020; O'Sullivan et al., 2023; Sullivan et al., 2021) found that training variations had a positive effect on

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football shooting accuracy. These results suggest that varied training can reduce monotony, increase motivation, and provide more diverse movement experiences for players.

The results also support the findings of (Kuswoyo, 2017), who showed that shooting after dribbling and shooting after passing exercises improved shooting accuracy in football players. This is relevant to the present study because the intervention included shooting drills that combined dribbling, passing, running, and finishing movements. Such exercises reflect real game situations, where players rarely shoot in a static condition.

From a technical perspective, shooting accuracy requires coordination between body position, foot placement, ball contact, balance, and concentration (Kuswoyo et al., 2017; Sarifudin et al., 2023). explained that shooting is a player's attempt to score by directing the ball toward the opponent's goal using the foot. Therefore, shooting practice must be carried out repeatedly and systematically so that players can develop better accuracy and consistency.

The improvement in students' shooting accuracy may also be influenced by the novelty of the training program. Before the intervention, the students were used to relatively monotonous training. After receiving more varied shooting exercises, they became more enthusiastic and engaged in the training process. This condition may have supported better learning outcomes because students practiced with higher motivation and attention.

However, this study has several limitations. The study used a one-group pretest-posttest design without a control group, so the comparison was limited to the participants' performance before and after treatment. The sample size was also relatively small, involving only 11 students. Future studies are recommended to use a control group, involve a larger sample, and compare different types of shooting training methods to obtain stronger evidence.

Conclusions

Training variations had a significant effect on football shooting accuracy among students at Budi Agung Private Senior High School Medan in 2025. The posttest results showed an improvement compared with the pretest results, and the t-test confirmed that the improvement was statistically significant. Therefore, varied shooting exercises can be used as an effective training strategy to improve football shooting accuracy in senior high school students.

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Conflict of Interest

The authors declare no conflict of interest related to this research.

References

Admin, A. (2025). *The Benefits of Teamwork in Football – Abc Football Academy*. https://abcfootball.academy/the-benefits-of-teamwork-in-football/

Ah, A.-S., & S, A.-K. (2020). Incidence of Football and Futsal Injuries Among Youth in Malaysian Games 2018. *Malaysian Orthopaedic Journal*, *14*(1), 28–33. https://doi.org/10.5704/MOJ.2003.005

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Received: April 20, 2026, Accepted: May 11, 2026

Champ, F. M., Nesti, M. S., Ronkainen, N. J., Tod, D. A., & Littlewood, M. A. (2020). An Exploration of the Experiences of Elite Youth Footballers: The Impact of Organizational Culture. *Journal of Applied Sport Psychology*, *32*(2), 146–167. https://doi.org/10.1080/10413200.2018.1514429

El-Rajab, I., Klotzbier, T. J., Korbus, H., & Schott, N. (2025). Camera-based mobile applications for movement screening in healthy adults: A systematic review. *Frontiers in Sports and Active Living*, *7*, 1531050. https://doi.org/10.3389/fspor.2025.1531050

Essiet, I. A., Lander, N. J., Salmon, J., Duncan, M. J., Eyre, E. L. J., Ma, J., & Barnett, L. M. (2021). A systematic review of tools designed for teacher proxy-report of children's physical literacy or constituting elements. *International Journal of Behavioral Nutrition and Physical Activity*, *18*(1), 131. https://doi.org/10.1186/s12966-021-01162-3

Fizi, R. M., Winarni, S., Guntur, & Hartanto, A. (2023). A game model in physical education to improve motor skills, cooperation, and discipline of primary school learners. *Pedagogy of Physical Culture and Sports*, *27*(6), 448–455. https://doi.org/10.15561/26649837.2023.0602

Fukuda, K. (2026). A fundamental research on issues of baseball-type physical education classes in Japan: Through a review of practice-based research. *Sustainability and Sports Science Journal*, *4*(1), 14–24. https://doi.org/10.55860/XZDO7563

Haegele, J. A., Wilson, W. J., Zhu, X., Bueche, J. J., Brady, E., & Li, C. (2021). Barriers and facilitators to inclusion in integrated physical education: Adapted physical educators' perspectives. *European Physical Education Review*, *27*(2), 297–311. https://doi.org/10.1177/1356336X20944429

https://doi.org/10.58962/HSR.2025.11.1.102-112, I., Nugroho, S., & Nasrulloh, A. (2025). Can traditional games improve gross motor performance of elementary school students? Meta-analysis study. *Health, Sport, Rehabilitation*, *11*(1), 102–112. https://doi.org/10.58962/HSR.2025.11.1.102-112

Kekuatan, S., Punggung, O., & Dan, P. (2016). *Tungkai Terhadap Jauhnya Hasil Heading Pada Siswa Ssb Bina Liga Ku-14 Pemalang Skripsi*.

Kuswoyo, D. D. (2017). Hubungan Antara Kekuatan Otot Tungkai dengan Ketepatan Shooting ke Arah Gawang pada Peserta Ekstrakurikuler SMP Patra Mandiri 2 Palembang. *Jurnal Pendidikan Olahraga*, *7*(2), 37–40.

Kuswoyo, D. D. (2018). Identifikasi Tingkat Keterampilan Sepak Bola Siswa Putra Kelas V SDN Monta Kecamatan Monta Kabupaten Bima Tahun Ajaran 2018-2019. *Jurnal Ilmu Keolahragaan*, *17*(2), 6–10. https://jurnal.unimed.ac.id/2012/index.php/JIK/article/view/12297

Kuswoyo, D. D. (2020). *Buku Ajar Sepak Bola*. Penerbit NEM.

Kuswoyo, D. D., & Donggoran, M. F. (2019). Identifikasi Tingkat Kemampuan Dasar Permainan Sepak Bola Mahasiswa Penjaskesrek. *Musamus Journal of Physical Education and Sport (MJPES*, *02*(01), Article 01. http://ejournal.unmus.ac.id/index.php/physica

Kuswoyo, D. D., Lahinda, J., & Syamsudin. (2020). The effects of high-intensity interval training (HIIT) in improving VO<inf>2</inf> max football student activity unit, University of Musamus. *Enfermeria Clinica*, *30*. https://doi.org/10.1016/j.enfcli.2019.10.130

Kuswoyo, D. D., Pramono, H., & Rifai, A. (2017). Kontribusi Percaya Diri, Konsentrasi dan Motivasi terhadap Kinerja Wasit Persatuan Sepak Bola Seluruh Indonesia Provinsi Sumatera Selatan. *Journal of Physical Education and Sports*, *6*(3), Article 3. http://journal.unnes.ac.id/sju/index.php/jpes

Kuswoyo, D. D., Wasa, C., & Dongoran, M. F. (2020). Back-up training effects to the students' ability in heading the ball. *Edu Sportivo Indonesian Journal of Physical Education*, *1*(1), 25–32. https://doi.org/10.25299/es:ijope.2020.vol1(1).5190%0AHow

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Received: April 20, 2026, Accepted: May 11, 2026

Mothna Mohammed. (2016). Identify the Tests to Measure Physical Characteristics and Basic Skills for the Football Players in Iraq. *International Journal of Kinesiology and Sports Science*, *4*(3). https://doi.org/10.7575/aiac.ijkss.v.4n.3p.18

O'Sullivan, M., Vaughan, J., Rumbold, J. L., & Davids, K. (2023). Utilising the learning in development research framework in a professional youth football club. *Frontiers in Sports and Active Living*, *5*. https://doi.org/10.3389/fspor.2023.1169531

Rismoko, A., Waluyo, M., & Sutardji. (2013). Sumbangan Hiperekstensi Togok, Kekuatan Otot Perut, dan Leher Terhadap Kemampuan Heading. *Journal of Sport Sciences and Fitness*, *2*(3), Article 3. http://journal.unnes.ac.id/sju/index.php/jssf

Sarifudin, A. I., Anam, K., Setyawati, H., Permana, D. F. W., & Mukarromah, S. B. (2023). TINGKAT KONSENTRASI DAN POWER OTOT TUNGKAI TERHADAP KETEPATAN SHOOTING SEPAK BOLA. *Jambura Health and Sport Journal*, *5*(1), 56–65. https://doi.org/10.37311/jhsj.v5i1.18421

Silva, A. F., Trybulski, R., Trybek, G., Moska, W., Castro, H., & González-Fernández, F. T. (2025). Comparing Adapted Small-Sided Team Sports and Aerobic Exercise with or without Cognitive Games: Effects on Fitness and Cognition in Older Men. *Journal of Sports Science and Medicine*, 589–602. https://doi.org/10.52082/jssm.2025.589

Sugiyono. (2012). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. CV. Alfabeta.

Sullivan, M. O., Woods, C. T., Vaughan, J., & Davids, K. (2021). Towards a contemporary player learning in development framework for sports practitioners. *International Journal of Sports Science & Coaching*, *16*(5), 1214–1222. https://doi.org/10.1177/17479541211002335

Wahyono, R. A. B. (2017). *Pengaruh Latihan Sit Up, Back Up Dan Flexibility Terhadap Peningkatan Jauhnya Heading Pada Siswa Ssb Kkk Klajuran Godean Kelompok Usia 13 – 15 Tahun*. Universitas Negeri Yogyakarta.

Wang, S. H., Qin, Y., Jia, Y., & Igor, K. E. (2022). A systematic review about the performance indicators related to ball possession. *PLOS ONE*, *17*(3), e0265540. https://doi.org/10.1371/journal.pone.0265540

Wiewiorski, M., Wurm, M., Barg, A., Weber, M., & V, V. (2017). Football/Soccer. In V. Valderrabano & M. E. Easley (Eds.), *Foot and Ankle Sports Orthopaedics* (pp. 459–46). Springer, Cham. https://doi.org/https://doi.org/10.1007/978-3-319-15735-1_52