JSES: Journal of Sport and Exercise Science
Volume 8, Number 2, September 2025
ORIGINAL ARTICLE

A Holistic Approach to Soccer Training: Combining Speed Endurance Training and Technical Drills

Febry Noeh Cahya Prasetya[1ABCE], Yanyong Phanpheng[2ACD]

[1] Universitas Negeri Surabaya, Indonesia
[2] Loei Rajabhat University, Thailand

Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection.

Corresponding Author: Yanyong Phanpheng, yanyong.pha@lru.ac.th

Received 10 October 2025
Accepted 24 November 2025
DOI https://doi.org/10.26740/jses.v8n2.p87-94

ABSTRACTS

Purpose The use of combination training models is becoming increasingly popular in soccer coaching. While many combination training models focus on physical and tactical aspects, there is still a lack of integration with technical training. This study aims to analyze the effect of combining speed endurance training (SET) and technical drills on the aerobic capacity of university soccer players.

Materials and Methods Nineteen male university soccer players, randomly selected from a population of 82 players, participated in this study. The sample characteristics included an average age of 20.21 ± 0.92 years, height of 170.74 ± 4.52 cm, weight of 62.37 ± 6.65 kg, body mass index of 20.21 ± 0.92 kg/m², and soccer experience of 6.21 ± 0.85 years. This research employed a pre-experimental design with a one-group pretest-posttest. We used the paired-samples and Wilcoxon tests to analyze pretest and posttest differences, with normality assessed using the Shapiro-Wilk test. The study evaluated speed performance, total distance, and VO2max.

Result Results showed significant differences in pretest and posttest mean values for speed, total distance, and VO2max ($p < 0.05$). Speed performance increased by 0.52 ± 0.50 km/hr, total distance by 362.11 ± 247.11 meters, and VO2max by 3.06 ± 2.07 ml/kg/min.

Conclusion These findings indicate that the combination of SET and technical drills positively impacts the aerobic performance of male university soccer players.

Keywords Speed endurance training; Technical drills; Aerobic; Soccer.

INTRODUCTION

Soccer is one of the most complex sports in the world, requiring players to possess technical, tactical, and physical skills to succeed and win matches (Otero-Saborido et al., 2021). Many consider soccer an intermittent aerobic activity interspersed with high-intensity periods (Yi et al., 2018). To play soccer effectively, players need endurance, speed, strength, and a high level of coordination skills (Mendes et al., 2022; Sulistiyono et al., 2024). Therefore, a holistic training program integrating physical, technical, tactical, and mental aspects is essential to meet the demands of match play.

Good aerobic fitness is crucial because soccer players generate most of their energy through aerobic metabolism. It enables players to sustain high-intensity activities, accelerates recovery, and sustains physical performance during matches (Garcia-Tabar et al., 2019; Slimani et al., 2019). Furthermore, coaches often face challenges in training aerobic capacity and strength or power within a single micro-cycle, on the same day, or even within a single training session (Makhlouf et al., 2016). Coaches can adopt more varied and structured training approaches to address these needs. One recommended approach combines physical and technical training, such as passing and dribbling drills, which aim to enhance players' physical, technical, tactical, and mental qualities (Dellal et al., 2011; Suryadi et al., 2023). Drill methods offer significant benefits, especially in sports that demand high technical proficiency, like soccer. Drills involve repetitive activities to strengthen players' skills or connections (Ade et al., 2020; Barrett et al., 2020; Kunz et al., 2019). Moreover, strong passing and dribbling abilities support the game's flow and create goal-scoring opportunities (González-Rodenas et al., 2021; Shan & Zhang, 2022; Wilson et al., 2020).

Although various studies have highlighted the importance of physical and technical training for improving soccer player performance, few have specifically integrated Speed Endurance Training (SET) with technical drills such as passing and dribbling into a single training approach. Previous research combining physical and tactical training has demonstrated its effectiveness in enhancing soccer players' performance (Bharlaman et al., 2024; Fahrudin et al., 2024; Kusuma et al., 2024; Nayıroğlu et al., 2022). However, if players' basic technical skills are not optimal, such training may yield suboptimal results. Therefore, new training innovations using technical approaches are necessary to accommodate players with underdeveloped technical skills while allowing them to train effectively in physical aspects.

Previous studies combining technical and physical aspects have shown promising results but have been applied only to futsal (Wiranata et al., 2023). Further exploration in the context of soccer is warranted. Additionally, studies involving university students as subjects are limited, even though this group has significant potential for development in soccer training contexts. This study offers novelty by examining the effectiveness of integrating SET and technical drills as a holistic training method that enhances university soccer players' aerobic capacity and technical skills.

This study aims to examine the effectiveness of integrating Speed Endurance Training (SET) with technical drills, such as passing and dribbling, as a holistic training method to enhance aerobic capacity and technical skills in university soccer players. By addressing the research gap on technical and physical training in soccer, this study seeks to provide innovative training solutions that cater to players with varying technical proficiencies while optimizing their physical performance.

METHODS

Study Participants

This study's population consisted of 82 male university soccer players. It used 19 participants selected via random sampling. The sample characteristics included an average age of 20.21 ± 0.92 years, height of 170.74 ± 4.52 cm, weight of 62.37 ± 6.65 kg, body mass index of 20.21 ± 0.92 kg/m², and soccer experience of 6.21 ± 0.85 years. This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. The research protocol, instruments, and informed consent procedures were reviewed and approved by the Health Research Ethics Committee of Nahdlatul Ulama University of Surabaya. Ethical clearance was granted under approval number No.

JSES: Journal of Sport and Exercise Science
ISSN 2615-8744

0449/EC/KEPK/UNUSA/2024, dated November 28, 2024. All participants provided written informed consent prior to enrollment in the study.

Study Organization

This research employed a pre-experimental design with a one-group pretest-posttest. The study aimed to determine the effect of combining SET and technical drills on aerobic capacity, including total distance and VO2 max. The researchers used the Yo-Yo Intermittent Recovery Test Level 1 to measure the differences between pretest and posttest results after the intervention. The intervention spanned six weeks, divided into one week for pretesting, four weeks of treatment, and one week for posttesting.

Training Program

The training program combined Technical Drills for Dribbling and Passing with Speed-Endurance Training. The session began with players in Area 1 performing paired passing drills for 18 seconds, focusing on accuracy and passing tempo. Next, players sprinted 20 meters through Area 2 to Area 3, where they conducted dribbling drills through cones or obstacles for 18 seconds. After completing the drill in Area 3, players sprinted 20 meters back to Area 1 to repeat paired passing drills for 18 seconds. Players then sprinted another 20 meters to Area 3 to repeat the pattern. At the end of each repetition, players completed four 20-meter sprints, covering a total sprint distance of 80 meters per repetition, with a total drill time of 72 seconds (18 seconds × 4).

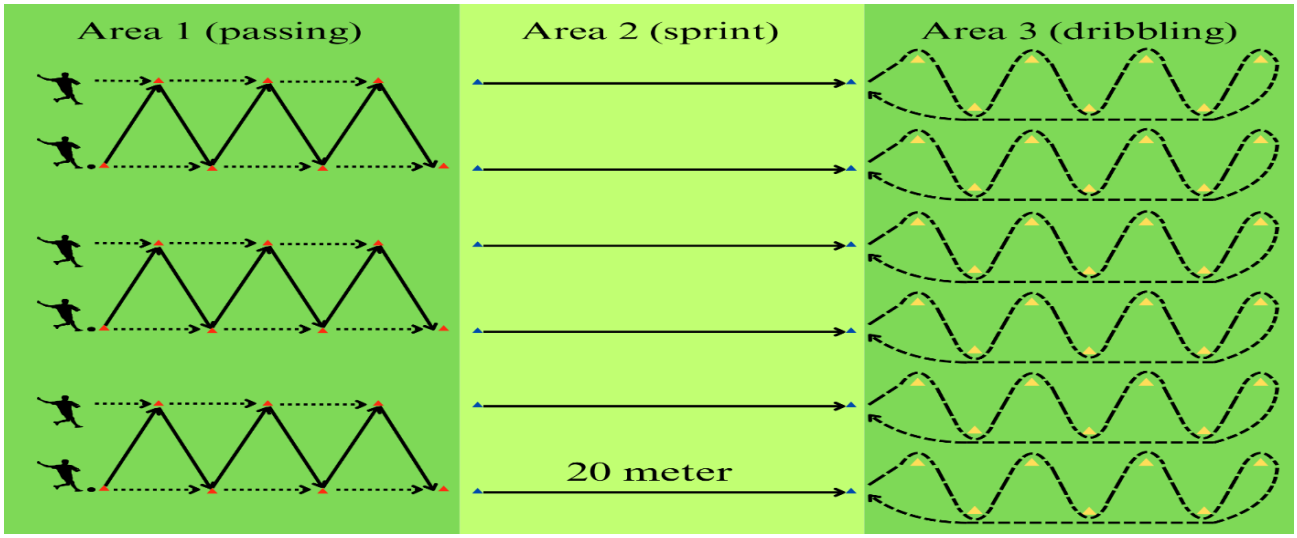


Figure 1. Training program combining SET and Technical Drills

In one training session, players performed eight repetitions, totaling 640 meters (80 meters × 8) and 576 seconds (72 seconds × 8). The activity intervals were set at a 1:2 ratio to balance work intensity and rest (Bharlaman et al., 2024).

Statistical Analysis

The researchers presented the data as means and standard deviations. Statistical analysis was conducted using a paired sample t-test, with normality assessed using the Shapiro-Wilk test. Additionally, we used percentages to analyze trends between the pretest and posttest results.

RESULT

Table 1. Sample characteristics

Age (years)	20.21±0.92
Soccer experience (years)	6.21±0.85
Height (cm)	170.74±4.52
Body mass (kg)	62.37±6.65
BMI (kg/m2)	20.21±0.92
Defenders (n)	7
Midfielders (n)	7
Attackers (n)	5
Adherence (%)	93.42

Values are expressed as Mean ± SD

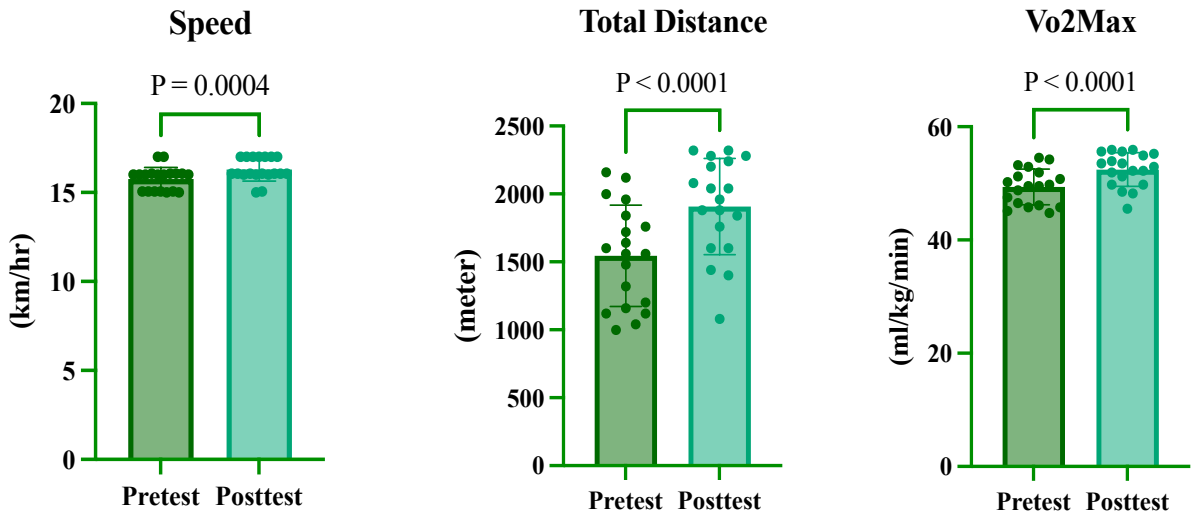
Table 1 presents the characteristics of the sample, comprising soccer players with detailed information on age, playing experience, height, weight, BMI, and player position distribution. The average age of the players is approximately 20 years, with more than six years of soccer experience. Their average height and weight are within ranges that support optimal physical performance. The Body Mass Index (BMI) indicates an ideal body category for soccer players. Furthermore, the distribution of player positions includes defenders, midfielders, and forwards. The level of adherence to the training program was exceptionally high, reflecting the players' commitment to the research.

Table 2. Normality test result

Variable	Statistic	df	Sig.
Pretest Speed	.8077	19	.0015
Posttest Speed	.7980	19	.0011
Pretest Total Distance	.9439	19	.3096*
Posttest Total Distance	.9261	19	.1466*
Pretest Vo2max	.9429	19	.2976*
Posttest Vo2max	.9261	19	.1466*

Table 2 presents the results of the normality test for the variables tested. The results of the normality test show the statistical values and significance (Sig.) for each pretest and posttest variable. For the Pretest Speed and Posttest Speed variables, the significance values are less than 0.05, indicating that the data are not normally distributed. In contrast, for Pretest TD, Posttest TD, Pretest Vo2max, and Posttest Vo2max, the significance values are greater than 0.05, indicating that the data are normally distributed (*). Subsequently, the pretest and posttest differences were tested using the Wilcoxon test for the speed variable, while the paired sample test was used to analyze Total Distance and Vo2max.

JSES: Journal of Sport and Exercise Science
ISSN 2615-8744



Note: Significance values < 0.05

Figure 2. Comparison of Pretest and Posttest Results for Speed, Total Distance, and VO2max Variables

Figure 2 presents the comparison test results using the Wilcoxon and paired-samples tests, which indicate significant differences between pretest and posttest values for the speed, total distance, and VO2max variables (p-values < 0.05).

DISCUSSION

The results of this study indicate that combining SET with technical drill training significantly enhances the aerobic capacity of university-level soccer players. This approach integrates structured high-intensity interval training with repeated technical exercises, such as passing and dribbling, offering comprehensive benefits for players' physical and technical development. These findings align with previous research, which demonstrated that SET improves VO2max, aerobic metabolism efficiency, and running economy, key indicators of physical performance in soccer players (Iaia & Bangsbo, 2010).

Similarly, previous researchers examined the effects of combined training with maximum aerobic speed and small-sided games on the development of aerobic capacity in soccer players (Arslanoglu et al., 2024). The study highlighted that combining maximum aerobic speed drills with small-sided games and high-speed aerobic training effectively improves aerobic capacity during pre-season preparations. Additionally, findings by Zago et al. (2016) revealed that combined technical and agility training programs enhance soccer players' performance in direction-change tasks and control and passing skills. The integration of technical drills and training supports physical adaptation (Haleva & Meckel, 2020) and enhances technical skills (Baydemir & Alp, 2018). Aligns with theories asserting that combined training is more effective in fostering holistic player development (Karahan, 2020; Kinnerk et al., 2018; Sáez De Villarreal et al., 2015).

Physiologically, we attribute the observed improvement in aerobic capacity to cardiovascular adaptations induced by SET, including increased stroke volume, enhanced muscle oxidative capacity, and improved capillarization. These adaptations allow the aerobic energy system to function more efficiently during active recovery and support repeated high-intensity activities. Furthermore, repeated technical drill training improves motor efficiency, enabling players to execute movements more effectively (Prasetya et al., 2020). High-intensity interval training models further enhance these adaptations, as they have been shown to elicit similar or

even superior adaptations compared to conventional aerobic training, particularly in developing players (Kusuma et al., 2024; Nyberg et al., 2016).

These findings highlight the importance of integrating physical and technical training. Traditional training often separates these two elements, leading to a less efficient use of time and focus. By adopting a more holistic approach, players who are still developing their technical skills can significantly enhance their physical attributes while simultaneously refining their technical abilities through structured repetition. This study has significant implications, particularly in time-constrained training contexts such as universities or amateur clubs. The proposed training combination is time-efficient and yields substantial improvements in both aerobic and technical aspects. This method can be easily adapted for coaches to address the challenge of limited training time while positively impacting player performance. However, further research is needed to implement this approach at the professional or elite level, including more extended training periods, a more diverse population, and performance measurements in competitive match contexts.

CONCLUSION

Combining SET training with technical drill exercises improves the aerobic capacity of university-level soccer players. This approach, which integrates structured high-intensity interval training with repeated technical exercises such as passing and dribbling, provides comprehensive benefits that encompass both the physical and technical aspects of the players.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

REFERENCES

Ade, J. D., Drust, B., Morgan, O. J., & Bradley, P. S. (2020). Physiological characteristics and acute fatigue associated with position-specific speed-endurance soccer drills: production vs. maintenance training. *Science and Medicine in Football*, 6–17. https://doi.org/10.1080/24733938.2020.1789202

Arslanoglu, C., Celgin, G. S., Arslanoglu, E., Demirci, N., Karakas, F., Dogan, E., Cakaloglu, E., Sahin, F. N., & Kucuk, H. (2024). An effective method of aerobic capacity development: Combined training with maximal aerobic speed and small-sided games for amateur football players. *Applied Sciences (Switzerland)*, *14*(19).1-11. https://doi.org/10.3390/app14199134

Barrett, S., Varley, M. C., Hills, S. P., Russell, M., Reeves, M., Hearn, A., & Towlson, C. (2020). Understanding the influence of the head coach on soccer training drills—an 8-season analysis. *Applied Sciences (Switzerland)*, *10*(22), 1–13. https://doi.org/10.3390/app10228149

Baydemir, B., & Alp, M. (2018). The effects of specific training applied to 14-year-old male soccer players on their balance, sprint, and technical skills. *Journal of Education and Training Studies*, *6*(11), 1-15. https://doi.org/10.11114/jets.v6i11.3415

Bharlaman, M. B. F., Kusuma, I. D. M. A. W., Kusnanik, N. W., Prianto, D. A., & Pranoto, A. (2024). Physiological adaptations in small-sided games combined with speed-endurance training: analyzing heart rate and rate of perceived exertion. *Pedagogy of Physical Culture and Sports*, *28*(5), 407–414. https://doi.org/10.15561/26649837.2024.0509

Dellal, A., Jannault, R., Lopez-Segovia, M., & Pialoux, V. (2011). Influence of the numbers of players in the heart rate responses of youth soccer players within two vs. 2, 3 vs. 3, and 4 vs. 4 small-sided Games. *Journal of Human Kinetics*, *28*, 107–114. https://doi.org/10.2478/v10078-011-0027-8

Fahrudin, M. F., Siantoro, G., Kusuma, I. D. M. A. W., Syafii, I., Prianto, D. A., Pramono, B. A., & Fajar, M. K. (2024). Enhancing anaerobic endurance in student futsal players through small-sided games combined with high-intensity interval training. *Physical Education Theory and Methodology*, *24*(2), 232–236. https://doi.org/10.17309/tmfv.2024.2.06

ISSN 2615-8744

Garcia-Tabar, I., Rampinini, E., & Gorostiaga, E. M. (2019). Lactate equivalent for maximal lactate steady state determination in soccer. *Research Quarterly for Exercise and Sport*, *90*(4), 1-12. https://doi.org/10.1080/02701367.2019.1643446

González-Rodenas, J., Aranda-Malavés, R., Tudela-desantes, A., de Matías-Cid, P., & Aranda, R. (2021). Different pitch configurations constrain playing tactics and the creation of goal-scoring opportunities during small-sided games among youth soccer players. *International Journal of Environmental Research and Public Health*, *18*(19), 1-14. https://doi.org/10.3390/ijerph181910500

Haleva, Y., & Meckel, Y. (2020). The effect of basic technical training on performance capabilities of young soccer players. *Advances in Physical Education*, *10*(01), 1-12. https://doi.org/10.4236/ape.2020.101003

Iaia, F. M., & Bangsbo, J. (2010). Speed endurance training is a powerful stimulus for physiological adaptations and performance improvements of athletes. In *Scandinavian Journal of Medicine and Science in Sports*, *20*, 1-12. https://doi.org/10.1111/j.1600-0838.2010.01193.x

Karahan, M. (2020). Effect of skill-based training vs. small-sided games on physical performance improvement in young soccer players. *Biology of Sport*, *37*(3), 305–312. https://doi.org/10.5114/biolsport.2020.96319

Kinnerk, P., Harvey, S., MacDonncha, C., & Lyons, M. (2018). A review of the game-based approaches to coaching literature in competitive team sport settings. *Quest*, *70*(4), 401–418. https://doi.org/10.1080/00336297.2018.1439390

Kunz, P., Engel, F. A., Holmberg, H. C., & Sperlich, B. (2019). A meta-comparison of the effects of high-intensity interval training to those of small-sided games and other training protocols on parameters related to the physiology and performance of youth soccer players. *Sports Medicine - Open*, *5*(1), 1-10. https://doi.org/10.1186/s40798-019-0180-5

Kusuma, I. D. M. A. W., Kusnanik, N. W., Lumintuarso, R., Setijono, H., Muhammad, Muhammad, H. N., Kartiko, D. C., Siantoro, G., & Phanpheng, Y. (2024). Does short-term speed endurance soccer training improve physical performance? *Physical Education Theory and Methodology*, *24*(2), 270–275. https://doi.org/10.17309/tmfv.2024.2.11

Makhlouf, I., Castagna, C., Manzi, V., Laurencelle, L., Behm, D. G., & Chaouachi, A. (2016). Effect of sequencing strength and endurance training in young male soccer players. *Journal of Strength and Conditioning Research*, *30*(3), 1-11. https://doi.org/10.1519/JSC.0000000000001164

Mendes, D., Travassos, B., Carmo, J. M., Cardoso, F., Costa, I., & Sarmento, H. (2022). Talent Identification and Development in Male Futsal: A Systematic Review. *International Journal of Environmental Research and Public Health*, *19*(17), 907–931. https://doi.org/10.3390/ijerph191710648

Nayıroğlu, S., Yılmaz, A. K., Silva, A. F., Silva, R., Nobari, H., & Clemente, F. M. (2022). Effects of small-sided games and running-based high-intensity interval training on body composition and physical fitness in under-19 female soccer players. *BMC Sports Science, Medicine and Rehabilitation*, *14*(1), 119. https://doi.org/10.1186/s13102-022-00516-z

Nyberg, M., Fiorenza, M., Lund, A., Christensen, M., RØmer, T., Piil, P., Hostrup, M., Christensen, P. M., Holbek, S., Ravnholt, T., Gunnarsson, T. P., & Bangsbo, J. (2016). Adaptations to speed endurance training in highly trained soccer players. *Medicine and Science in Sports and Exercise*, *48*(7), 1-12. https://doi.org/10.1249/MSS.0000000000000900

Otero-Saborido, F. M., Aguado-Méndez, R. D., Torreblanca-Martínez, V. M., & González-Jurado, J. A. (2021). Technical-tactical performance from data providers: A systematic review in regular football leagues. *Sustainability (Switzerland)*, *13*(18). 1-12. https://doi.org/10.3390/su131810167

Prasetya, B. A., Doewes, M., & Riyadi, S. (2020). Differences in the influence of drill, small-sided games, and combination methods of two-method skills on beginner football players. *Health, Sport, Rehabilitation*, *6*(2), 1-11. https://doi.org/10.34142/HSR.2020.06.02.01

Sáez De Villarreal, E., Suarez-Arrones, L., Requena, B., Haff, G. G., & Ferrete, C. (2015). Effects of plyometric and sprint training on physical and technical skill performance in adolescent soccer players. *Journal of Strength and Conditioning Research*, *29*(7), 1-11. https://doi.org/10.1519/JSC.0000000000000838

Shan, G., & Zhang, X. (2022). Soccer scoring techniques—A biomechanical re-conception of time and space for innovations in soccer research and coaching. *Bioengineering*, *9*(8), 1-10. https://doi.org/10.3390/bioengineering9080333

Slimani, M., Znazen, H., Miarka, B., & Bragazzi, N. L. (2019). Maximum oxygen uptake of male soccer players according to their competitive level, playing position, and age group: Implications from a network meta-analysis. *Journal of Human Kinetics*, *66*(1), 1-11. https://doi.org/10.2478/hukin-2018-0060

Sulistiyono, S., Sumaryanto, S., Sumarjo, N., Primasoni, N., & Yudhistira, D. (2024). Longitudinal analysis of physical abilities and fundamental skills among the Real Madrid Foundation UNY football players. *Pedagogy of Physical Culture and Sports*, *28*(3), 184–191. https://doi.org/10.15561/26649837.2024.0303

Suryadi, D., Okilanda, A., Yanti, N., Suganda, M. A., Mashud, M., Santika, I. G. P. N. A., V., K. D., & Hardianta, R. (2023). Combination of varied agility training with small-sided games: How does it influence football dribbling skills? *Pedagogy of Physical Culture and Sports*, *27*(3), 190–197. https://doi.org/10.15561/26649837.2023.0302

Wilson, R. S., Smith, N. M. A., Melo de Souza, N., & Moura, F. A. (2020). Dribbling speed predicts goal-scoring success in a soccer training game. *Scandinavian Journal of Medicine and Science in Sports*, *30*(11), 2070–2077. https://doi.org/10.1111/sms.13782

Wiranata, F. A., Kusuma, I. D. M. A. W., Phanpheng, Y., Bulqini, A., & Prianto, D. A. (2023). The effect of 6 weeks of a combination of three cone exercise using a ball and high-intensity interval training on the agility and dribbling ability of student futsal athletes. *Physical Education Theory and Methodology*, *23*(5), 686–691. https://doi.org/10.17309/tmfv.2023.5.05

Yi, Q., Jia, H., Liu, H., & Gómez, M. Á. (2018). Technical demands of different playing positions in the UEFA Champions League. *International Journal of Performance Analysis in Sport*, *18*(6), 926–937. https://doi.org/10.1080/24748668.2018.1528524

Zago, M., Giuriola, M., & Sforza, C. (2016). Effects of a combined technique and agility program on youth soccer players' skills. *International Journal of Sports Science and Coaching*, *11*(5), 710–720. https://doi.org/10.1177/1747954116667109

INFORMATION ABOUT THE AUTHORS

Febry Noeh Cahya Prasetya; https://orcid.org/0009-0001-8692-3337; febrynoeh13@gmail.com; Department of Sports Coaching Education, Faculty of Sports and Health Sciences, Universitas Negeri Surabaya, Surabaya, Indonesia.

Yanyong Phanpheng; https://orcid.org/0000-0002-9290-2479; yanyong.pha@lru.ac.th; Sports and Exercise Science Program, Department of Applied Science, Faculty of Science and Technology, Loei Rajabhat University, Thailand.

CITE THIS ARTICLE AS

Prasetya, F. N. C., & Phanpheng, Y. (2025). A Holistic Approach to Soccer Training: Combining Speed Endurance Training and Technical Drills. JSES : Journal of Sport and Exercise Science, 8(2), 87–94. https://doi.org/10.26740/jses.v8n2.p87-94