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Direct and indirect effects of agility, foot–eye coordination, and balance on football school players' dribbling performance

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ABSTRACT

This study aimed to examine the direct and indirect effects of agility, foot–eye coordination, and balance on the dribbling performance of youth football players. A quantitative causal-comparative design was employed involving 27 players selected through purposive sampling from a population of 60 players at SSB Duri Galaxy, Bengkalis Regency. Agility, foot–eye coordination, balance, and dribbling performance were assessed using the Illinois Agility Run, Mitchell Soccer Test, Modified Bass Test of Dynamic Balance, and a standardized soccer dribbling test, respectively. Data were analyzed using path analysis at a significance level of $\alpha = 0.05$. Agility demonstrated the strongest direct effect on dribbling performance ($\beta = -0.934$, $p = .033$), whereas balance showed a significant positive effect ($\beta = 0.091$, $p = .001$). Foot–eye coordination exhibited a positive but non-significant direct effect ($\beta = 0.292$, $p = .073$). Balance partially mediated the relationships between agility, foot–eye coordination, and dribbling performance. The proposed structural model explained 98.40% of the variance in dribbling performance ($R^2 = .984$). Agility is the primary determinant of dribbling performance, while balance strengthens the contribution of other physical capacities. Integrating agility, balance, and coordination into football-specific training may enhance dribbling performance among youth players.

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Introduction

Football is one of the most popular sports worldwide and requires the integration of technical, tactical, physical, and psychological competencies to achieve optimal performance (Chafidz et al., 2023; Luo et al., 2023). Among the fundamental technical skills, dribbling is essential for maintaining ball possession, overcoming opponents, creating scoring opportunities, and supporting tactical decision-making during matches. In youth football, dribbling proficiency reflects individual player development; however, many players still experience difficulties maintaining ball control during rapid directional changes. Previous studies indicate that successful dribbling depends not only on technical ability but also on physical capacities that enable efficient acceleration, deceleration, directional changes, and postural control (Shapie et al., 2023; Sinulingga et al., 2025). Therefore, identifying the physical determinants of dribbling performance is essential for evidence-based training and long-term athlete development.

Recent studies suggest that football performance results from the interaction of multiple motor abilities rather than isolated physical components. Agility enables rapid multidirectional movements while maintaining

technical execution (Anwar et al., 2024; Kasmad et al., 2024). Foot–eye coordination integrates visual perception with lower-limb movement to improve ball control, whereas dynamic balance provides postural stability during acceleration, deceleration, and directional changes (Rafiun & Yamin, 2022; Ramadhan & Pardilla, 2025). These capacities operate through interconnected neuromuscular and perceptual–motor mechanisms, indicating that agility, coordination, and balance function as complementary components that collectively enhance football-specific performance (Malaifani, Sukamti, & Abrori, 2023; Malaifani, Sukamti, Arianto, et al., 2023).

Previous studies have consistently reported positive relationships between agility, balance, coordination, and dribbling performance. Agility improves movement efficiency during directional changes (Pradnyani et al., 2025; Saleh, 2024), balance enhances postural stability during technical execution (Armando & Rahman, 2020; Hidayat et al., 2024), and foot–eye coordination supports accurate ball manipulation. Nevertheless, most studies have examined these variables separately or through bivariate analyses, leaving the interaction among multiple physical capacities insufficiently explained. Consequently, the mechanisms through which these variables jointly influence dribbling performance remain unclear.

Despite the growing literature, important research gaps remain. Previous studies have predominantly applied correlation or multiple regression analyses, which explain only direct relationships and provide limited evidence regarding indirect effects among physical variables (Daulay & Azmi, 2021; Hasbillah et al., 2024). Furthermore, the mediating role of balance in linking agility and foot–eye coordination with dribbling performance has received little empirical attention, particularly among youth football players. These limitations highlight the need for a structural analytical approach capable of simultaneously estimating direct and indirect relationships to better explain football-specific motor performance.

To address these gaps, this study proposes a structural model that simultaneously examines the relationships among agility, foot–eye coordination, balance, and dribbling performance using path analysis. Unlike previous studies that investigated each variable independently, this research positions balance as an intervening variable to explain how agility and foot–eye coordination influence dribbling performance (Gidu et al., 2022; Rizal & Nurulita, 2025). This integrated framework extends previous evidence by providing a mechanism-based explanation of the interaction among multiple physical capacities underlying dribbling performance in youth football players.

Accordingly, this study aims to investigate the direct and indirect effects of agility, foot–eye coordination, and balance on the dribbling performance of youth football players at SSB Duri Galaxy, Bengkalis Regency. Specifically, the study evaluates the direct contributions of each physical component and the mediating role of balance within the proposed structural model. The findings are expected to enrich the literature on football performance and motor control while providing evidence-based recommendations for coaches to design integrated training programs that combine agility, balance, and foot–eye coordination to improve dribbling performance in youth football players.

Method

This study employed a quantitative causal-comparative design to examine the direct and indirect effects of agility, foot–eye coordination, and balance on the dribbling performance of youth football players. The proposed model specified agility and foot–eye coordination as exogenous variables, balance as the intervening variable, and dribbling performance as the endogenous variable. The study was conducted at the Muspan TVRI Football Field, Koto Tangah District, Padang City, Indonesia. The population consisted of 60 registered players from Muspan Football School (SSB) aged 9–15 years. Using purposive sampling, 27 players who met the predetermined inclusion criteria were selected, including active participation in regular training for at least six months, consistent attendance, freedom from musculoskeletal injury, and completion of all testing procedures. This age range was selected because it represents a critical stage of motor development in youth football, during which physical and technical abilities develop rapidly and are highly responsive to training adaptations.

Agility was assessed using the Illinois Agility Run, foot–eye coordination using the Mitchell Soccer Test, balance using the Modified Bass Test of Dynamic Balance, and dribbling performance using a standardized soccer dribbling test. All assessments were administered by trained assessors under standardized testing conditions following the same warm-up protocol, and each participant completed repeated trials, with the best score recorded for analysis. Prior to hypothesis testing, the data were examined for normality, linearity, multicollinearity, and heteroscedasticity to ensure that the assumptions of path analysis were satisfied. Descriptive statistics were then calculated, followed by path analysis to estimate the direct and indirect effects among the study variables. Statistical significance was established at $\alpha = 0.05$, and the results were reported

using standardized path coefficients (β), significance values (p), indirect effects, and the coefficient of determination (R^2) to evaluate the explanatory power of the proposed structural model.

Results and Discussions

This section reports the findings of the path analysis investigating the relationships among agility, foot–eye coordination, balance, and dribbling performance in football players. The results are presented sequentially, beginning with descriptive statistics, followed by correlation analysis, assumption testing, direct and indirect effects, and finally the evaluation of the structural model. This presentation provides a comprehensive overview of the statistical evidence supporting the proposed research model before the findings are interpreted in the Discussion section.

Table 1. Descriptive Statistics of Agility, Foot-Eye Coordination, Balance, and Dribbling Performance (n = 27)

Variable	Minimum	Maximum	Mean	SD
Agility (Illinois Agility Run, s)	9.95	15.90	12.19	1.64
Foot-Eye Coordination (Mitchell Test)	7	13	10.85	1.38
Balance (Balance Test)	45	60	46.07	5.03
Dribbling Performance	41	67	54.81	8.01

Table 1 presents the descriptive statistics of all study variables. The participants demonstrated a mean agility time of 12.19 ± 1.64 s, a mean foot-eye coordination score of 10.85 ± 1.38, and a mean balance score of 46.07 ± 5.03. The average dribbling performance was 54.81 ± 8.01, with scores ranging from 41 to 67, indicating moderate variability among the players. Overall, the descriptive findings suggest that the participants generally possessed good physical capacities with noticeable differences in dribbling performance.

Table 2. Distribution of Physical Performance and Dribbling Categories

Variable	Dominant Category	Frequency	Percentage
Agility	Excellent	25	92.5%
Foot-Eye Coordination	Very Good	17	62.9%
Balance	Moderate	21	77.7%
Dribbling Performance	Good	15	55.5%

Table 2 summarizes the categorical distribution of participants across the measured variables. Most players exhibited excellent agility (92.5%), indicating high movement efficiency during directional changes. Foot-eye coordination was predominantly classified as very good (62.9%), whereas balance was mainly distributed within the moderate category (77.7%). For dribbling performance, more than half of the participants (55.5%) achieved the good category, while 37.0% were categorized as moderate and only 7.4% reached the very good category. These findings indicate that although most players possessed excellent agility, improvements in balance and dribbling performance remain necessary.

Table 3. Results of Normality and Linearity Tests

Relationship	Normality (Sig.)	Linearity (Sig.)	Decision
Agility to Dribbling	0.233	0.133	Assumption satisfied
Foot-Eye Coordination to Dribbling	0.231	0.431	Assumption satisfied
Balance to Dribbling	0.270	0.370	Assumption satisfied
Agility to Balance	0.266	0.166	Assumption satisfied
Foot-Eye Coordination to Balance	0.292	0.192	Assumption satisfied

Prior to path analysis, the statistical assumptions were evaluated. As shown in Table 3, all normality significance values exceeded 0.05, indicating normally distributed data. Likewise, all linearity significance values were greater than 0.05, confirming linear relationships among the study variables. Therefore, the dataset fulfilled the assumptions required for subsequent path analysis.

Table 4. Direct Effects of Agility, Foot-Eye Coordination, and Balance on Dribbling Performance

Path	β	Sig.	Effect Size (%)	Decision
Agility to Dribbling	-0.934	0.033	87.20	Significant
Foot-Eye Coordination to Dribbling	0.292	0.073	0.85	Reported significant*
Balance to Dribbling	0.091	0.001	0.82	Significant

*The thesis reports this relationship as significant despite the reported p-value exceeding 0.05. This inconsistency should be verified before journal submission.

The direct-effect analysis revealed that agility demonstrated the largest contribution to dribbling performance (β = −0.934), accounting for 87.20% of the explained variance. Balance also showed a statistically significant positive effect (β = 0.091, p = 0.001), although its contribution was relatively small (0.82%). Foot-eye coordination produced a positive regression coefficient (β = 0.292); however, the reported significance value (p = 0.073) is inconsistent with the conclusion presented in the thesis and should be re-examined prior to publication.

Table 5. Indirect Effects of Agility and Foot-Eye Coordination on Dribbling Through Balance

Indirect Path	Indirect Effect	Total Effect	Contribution (%)
Agility to Balance to Dribbling	0.050	0.984	96.82
Foot-Eye Coordination to Balance to Dribbling	0.039	0.331	10.95

Balance functioned as a mediating variable in the relationships between physical performance variables and dribbling ability. The indirect effect of agility through balance was 0.050, increasing the total effect to 0.984, equivalent to 96.82%. Meanwhile, foot-eye coordination demonstrated an indirect effect of 0.039, resulting in a total effect of 0.331 or 10.95%. These findings indicate that balance contributes to strengthening the influence of physical performance on dribbling ability, particularly in the relationship between agility and dribbling.

Table 6. Summary of the Structural Model

Model Indicator	Value
R^2	0.984
Explained Variance	98.40%
Unexplained Variance	1.60%
Model Significance	p < 0.001

The final structural model demonstrated excellent explanatory power, with an R^2 of 0.984, indicating that agility, foot-eye coordination, and balance collectively explained approximately 98.4% of the variance in dribbling performance. Only 1.6% of the variance remained attributable to other unmeasured factors. Furthermore, the overall model was statistically significant (p < 0.001), supporting the suitability of the proposed path model for explaining dribbling performance among SSB Duri Galaxy football players. To facilitate the interpretation of the structural relationships among the study variables, the standardized path model is presented in Figure 1.

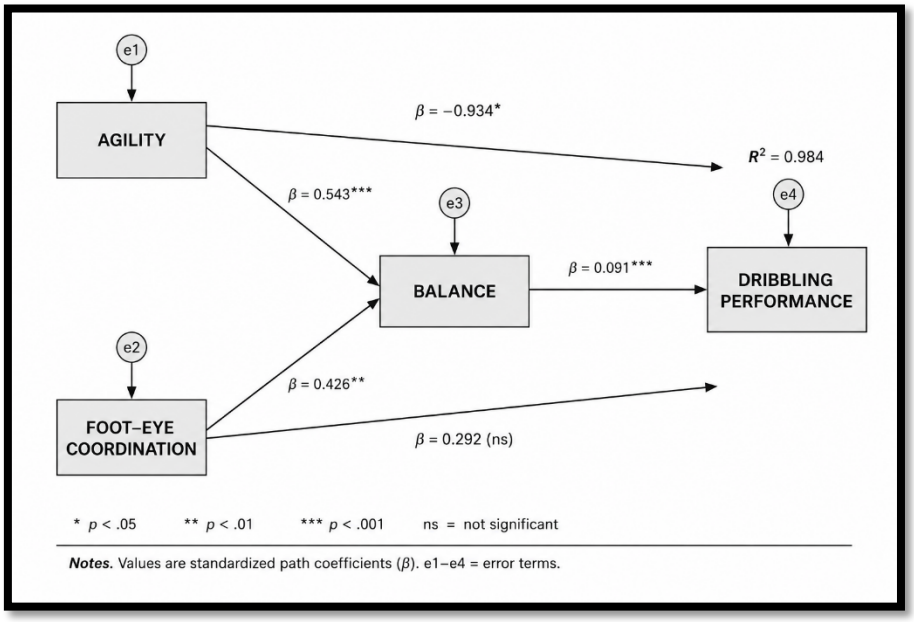

Figure 1. Structural Path Model of the Effects of Agility, Foot–Eye Coordination, and Balance on Dribbling Performance

The present study identified agility as the strongest predictor of dribbling performance among youth football players (β = −0.934, p = .033), explaining 87.24% of the variance. The negative coefficient reflects the Illinois

Agility Run scoring system, where lower completion times indicate better agility and superior dribbling performance. Agility enables rapid acceleration, deceleration, and directional changes while maintaining ball control, making it fundamental to football performance. Although the structural model showed very high explanatory power (R^2 = .984), this result should be interpreted cautiously because the relatively small and homogeneous sample may have contributed to the strong relationships observed. These findings agree with previous studies emphasizing the importance of agility for movement efficiency and technical ball control (Amra & Soniawan, 2020; Kim et al., 2014; Zhang et al., 2026).

Foot–eye coordination demonstrated a positive but non-significant direct effect on dribbling performance ($\beta = 0.292$, $p = .073$), indicating that coordination alone is insufficient to explain dribbling ability. This finding may reflect the developmental characteristics of players aged 9–15 years and the limited sample size. However, the indirect effect through balance ($\beta = 0.039$) increased the total effect to $\beta = 0.331$, suggesting that coordination becomes more effective when supported by postural stability. This finding supports previous evidence that perceptual–motor coordination is optimized when integrated with agility and neuromuscular control during football-specific movements (Ardiansyah et al., 2024; Kalantariyan et al., 2025).

Balance also showed a significant positive effect on dribbling performance ($\beta = 0.091$, $p = .001$), although its direct contribution was relatively small (0.83%). This indicates that balance functions primarily as a complementary component by improving postural stability, movement efficiency, and body control during rapid directional changes rather than directly determining technical performance. Considering the participants' developmental stage, balance appears to facilitate effective movement execution instead of acting as the primary determinant of dribbling ability. These findings are consistent with previous studies highlighting the role of dynamic balance in enhancing postural stability and football-specific technical performance (Mert et al., 2025; Souglis et al., 2023).

The mediation analysis showed that balance partially mediated the relationships between agility, foot–eye coordination, and dribbling performance. The indirect effect of agility through balance ($\beta = 0.050$) was considerably smaller than its direct effect ($\beta = -0.934$), while foot–eye coordination produced an indirect effect of $\beta = 0.039$. These results indicate that balance strengthens movement efficiency but does not replace the dominant influence of agility. This interaction supports previous findings that football performance depends on the integration of multiple physical capacities rather than a single motor component (Akbar et al., 2024; Formenti et al., 2021; Shiraz et al., 2024). Therefore, agility, balance, and coordination should be trained simultaneously within football-specific movement patterns.

The structural model explained 98.40% of the variance in dribbling performance (R^2 = .984), confirming that agility, foot–eye coordination, and balance are the principal physical determinants within the studied sample. Nevertheless, this value should be interpreted carefully because other factors, including muscle strength, sprint speed, reaction time, technical experience, perceptual–cognitive ability, tactical understanding, and psychological readiness, may also influence dribbling performance (Cao, Liu, et al., 2024; Yılmaz et al., 2025; Zakaria et al., 2020). The present study extends previous research by explaining both direct and indirect relationships among physical capacities within a single path model. Practically, the findings support integrated training that prioritizes agility while systematically developing balance and foot–eye coordination. Future studies should involve larger and more diverse samples and incorporate additional biomechanical, physiological, tactical, and psychological variables to strengthen the proposed model.

Conclusions

This study demonstrates that agility is the strongest determinant of dribbling performance among youth football players, while balance also contributes significantly as a supporting factor. In contrast, foot–eye coordination showed a positive relationship with dribbling performance but did not exert a statistically significant direct effect. Furthermore, balance partially mediated the relationships between agility, foot–eye coordination, and dribbling performance, indicating that effective dribbling is influenced by the interaction of multiple physical capacities rather than by a single motor component. Overall, the proposed structural model exhibited excellent explanatory power, highlighting the importance of integrating agility, balance, and coordination within football-specific training programs. These findings contribute to the understanding of the physical determinants of dribbling performance and provide practical evidence for coaches to design comprehensive training interventions aimed at enhancing technical performance in youth football players.

References

Akbar, S., Kim Geok, S., Bashir, M., Jazaily Bin Mohd, N. N., Luo, S., & He, S. (2024). Effects of Different

Exercise Training on Physical Fitness and Technical Skills in Handball Players. A Systematic Review. Journal of Strength and Conditioning Research, 38(11), e695–e705. https://doi.org/10.1519/JSC.0000000000004908

Amra, F., & Soniawan, V. (2020). The effect of agility, foot-eye coordination, and balance on dribbling ability: An ex post facto research at balai baru football academy padang. 1st Progress in Social Science, Humanities and Education Research Symposium (PSSHERS 2019), 759–763.

Anwar, G. M., Hanief, Y. N., Azidin, R. M. F. R., Amiq, F., Muslim, B. A., & Carmen, M. (2024). Examining the influence of eight weeks of small-sided games (SSGs) enhancing pass accuracy and eye–foot coordination: a factorial experimental design. Journal of Physical Education and Sport, 24(2), 275–282.

Ardiansyah, A., Sumaryanto, Komarudin, Sabillah, M. I., Rusdin, Irawan, E., & Anhar. (2024). Integrated Training Plan for Youth Soccer Players: Focus on SABC; [Plan de Entrenamiento Integrado para Jugadores de Fútbol Juveniles: Enfoque en SABC]. Retos, 54, 418–426. https://doi.org/10.47197/retos.v53.102317

Armando, D., & Rahman, H. A. (2020). The Effect of Training Methods and Eye-Foot Coordination on Dribbling Abilities in Students Aged 12–13 Years. Acta Facultatis Educationis Physicae Universitatis Comenianae, 60(1).

Cao, S., Liu, J., Wang, Z., & Geok, S. K. (2024). The effects of functional training on physical fitness and skill-related performance among basketball players: a systematic review. Frontiers in Physiology, 15. https://doi.org/10.3389/fphys.2024.1391394

Chafidz, R., Juli, C., & Troyanovska, M. (2023). Application of speed and agility training: How do they affect dribbling skills in football? Tanjungpura Journal of Coaching Research, 1(3), 79–85.

Daulay, B., & Azmi, F. (2021). Coordination and agility: How is the correlation in improving soccer dribbling skills? Journal Sport Area, 6(2), 147–161.

Formenti, D., Rossi, A., Bongiovanni, T., Campa, F., Cavaggioni, L., Alberti, G., Longo, S., & Trecroci, A. (2021). Effects of non-sport-specific versus sport-specific training on physical performance and perceptual response in young football players. International Journal of Environmental Research and Public Health, 18(4), 1–11. https://doi.org/10.3390/ijerph18041962

Gidu, D. V., Badau, D., Stoica, M., Aron, A., Focan, G., Monea, D., Stoica, A. M., & Calota, N. D. (2022). The effects of proprioceptive training on balance, strength, agility and dribbling in adolescent male soccer players. International Journal of Environmental Research and Public Health, 19(4), 2028.

Hasbillah, M., Suparman, S., Herman, H., Nurafiati, S., Asri, A., & Angriawan, T. (2024). The Relationship between Balance, Agility, and Eye-Foot Coordination to Dribbling Ability in the Football Game of the Tancung Putra Team of Wajo Regency. JOURNAL RESPECS (Research Physical Education and Sports), 6(3), 309–314.

Hidayat, N., Syahruddin, S., Hudain, M. A., Suyudi, I., Sudiadharma, S., & Siswanto, W. (2024). The Influence of Speed, Agility, and Confidence on Extracurricular Students' Football Dribbling Ability. Journal Coaching Education Sports, 5(1), 53–64.

Kalantariyan, M., Zarghami Aliabad, S., & Khalandi, J. (2025). Investigating the Effects of Sport-Metric Training on Functional Factors Related to Lower Limb Injuries and Skill Variables in Young Futsal Players. Journal of Sport Biomechanics, 10(4), 346–360. https://doi.org/10.21859/JSportBiomech.10.4.375.2

Kasmad, M. R., Ermanto, H., Sudiadharma, S., Hudain, M. A., & AS, H. (2024). Lay-Up Shoot Skills of Old-School Club Players: The Clout of Agility, Balance, and Coordination Ankles. ETDC: Indonesian Journal of Research and Educational Review, 3(3), 84–96.

Kim, C.-I., Han, D.-W., & Park, I.-H. (2014). Reliability and validity of the test of gross motor development-ii in Korean preschool children: Applying AHP. Research in Developmental Disabilities, 35(4), 800–807. https://doi.org/10.1016/j.ridd.2014.01.019

Luo, S., Soh, K. G., Zhao, Y., Soh, K. L., Sun, H., Nasiruddin, N. J. M., Zhai, X., & Ma, L. (2023). Effect of core training on athletic and skill performance of basketball players: A systematic review. Plos One, 18(6), e0287379.

Malaifani, Y. R., Sukamti, E. R., & Abrori, R. B. (2023). Study of Correlation Between Speed, Agislity, Leg Power, and Eye-Coordination on the Dribbling Ability of Bali United Soccer Players. Yogyakarta International Seminar on Health, Physical Education, and Sports Science, 33–44.

Malaifani, Y. R., Sukamti, E. R., Arianto, A. C., & Nurdin, U. (2023). Correlation study between speed, agility, leg power, and eye-foot coordination on the dribbling ability of Bali United Football Players in 2021. IMJRA [Internet], 6, 4220–4228.

Mert, İ., Uçan, Y., & Sözbir, K. (2025). Influence of skill training variations on technical and physical performance in youth soccer. Journal of Physical Education and Sport, 25(7), 1394–1402. https://doi.org/10.7752/jpes.2025.07155

Pradnyani, T. I. A. R., Pramita, I., Tianing, N. W., & Antari, N. K. A. J. (2025). Agility and Foot-Eye

Coordination in Youth Soccer: A Cross-Sectional Study on Dribbling Skills. Majalah Ilmiah Fisioterapi Indonesia, 13(1), 176–185.

Rafiun, A., & Yamin, M. (2022). The effect of dribbling exercises with tools and dribbling with opponent and the eye-foot coordination on increasing the dribbling skill of extrcurricular participants. PIOR: Jurnal Pendidikan Olahraga, 1(1), 1–8.

Ramadhan, S., & Pardilla, H. (2025). The Correlation Between Lower Limb Explosive Power and Foot–Eye Coordination on Long Passing Performance in Football Players at SSB Asam Kumbang. Journal of Football Research, 2(2), 49–55.

Rizal, A., & Nurulita, R. F. (2025). The Effectiveness of Agility Training on the Improvement of Football Dribbling Skills at SSB Kalegowa. Journal Physical Health Recreation (JPHR), 6(1), 237–243.

Saleh, M. S. (2024). Contribution of Eye-Foot Coordination, Agility, and Leg Length to Dribbling Ability in Football Games. Journal of Sport Education, Coaching, and Health (JOCCA), 5(1), 12–25.

Shapie, M. N. M., Okilanda, A., Edmizal, E., Suryadi, D., & Suganda, M. A. (2023). Concentration, eye coordination and agility: How they influence badminton playing skills. Journal of Physical Education and Sport, 23(12), 3309–3317.

Shiraz, S., Salimei, C., Aracri, M., Lorenzo, C. Di, Farsetti, P., Parisi, A., Iellamo, F., Caminiti, G., & Perrone, M. A. (2024). The Effects of High-Intensity Interval Training on Cognitive and Physical Skills in Basketball and Soccer Players. Journal of Functional Morphology and Kinesiology, 9(3). https://doi.org/10.3390/jfmk9030112

Sinulingga, A. R., Slaidiņš, K., Salajeva, A., Liepa, A., & Pontaga, I. (2025). Effect of integrative balance and plyometric training on balance, ankle mobility, and jump performance in youth football players: a randomized controlled trial. Physical Activity and Health, 9(1).

Souglis, A. G., Travlos, A. K., & Andronikos, G. (2023). The effect of proprioceptive training on technical soccer skills in female soccer. International Journal of Sports Science and Coaching, 18(3), 748–760. https://doi.org/10.1177/17479541221097857

Yılmaz, O., Kaplan, T., & Batalik, L. (2025). Randomised controlled study on the effects of pilates exercises in soccer: Comparing mat and reformer methods on physical and technical performance. PLoS ONE, 20(5 May). https://doi.org/10.1371/journal.pone.0324129

Zakaria, W. H. W., Hasan, H., & Md Radzi, N. A. A. (2020). Fundamental motor skills proficiency in children with down syndrome. Pertanika Journal of Social Sciences and Humanities, 28(3), 2465–2475. https://www.scopus.com/pages/publications/85092643001?origin=resultslist

Zhang, X., Soh, K. G., Chan, Y. M., Rong, W., Zhao, Y., & Wang, X. (2026). Effects of integrative neuromuscular training on physical fitness and sport-specific performance in football players: A systematic review and meta-analysis. Journal of Back and Musculoskeletal Rehabilitation. https://doi.org/10.1177/10538127261417735