

Profiling of the positional running performance among FIFA confederations: Analysis of the FIFA World Cup 2022

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Aim: This study aimed to identify positional differences in running performance among national teams from different FIFA confederations during the 2022 FIFA World Cup.

Methods: Data were obtained from the official FIFA Training Centre and included players who completed full matches (642 observations from 59 matches without extra time). Players were classified into six positional groups, and nine running performance metrics were analyzed. Teams were grouped according to FIFA confederation (Asian Football Confederation, AFC; Confederation of African Football, CAF; Confederation of North, Central America and Caribbean Association Football, CONCACAF; South American Football Confederation, CONMEBOL; and Union of European Football Associations, UEFA). Positional differences were assessed using one-way ANOVA with Scheffe post-hoc tests.

Results: Significant differences in running performance were identified across FIFA confederations. CONMEBOL players generally exhibited lower values in several running performance metrics, particularly among central defenders, defensive midfielders, and forwards. In contrast, CONCACAF players, especially defensive midfielders and full-backs, demonstrated greater high-intensity running performance and higher top speeds. Differences were also observed between CAF and CONMEBOL central midfielders, whereas no significant differences were found for wide midfielders.

Conclusion: The findings indicate distinct positional running performance profiles among FIFA confederations. These results may contribute to a better understanding of inter-confederation differences and support future research integrating physical, technical, and tactical aspects of elite football.

Keywords: FIFA confederations; FIFA World Cup 2022; high-intensity activity; positional analysis; running performance

Introduction

Football is the world's most popular sport, played by more than 250 million active players in over 200 countries (1). It is also the most extensively researched sport in sports science (2). Numerous studies have examined matches from major elite competitions to identify the characteristics of successful teams (3-6), with the FIFA World Cup representing the highest level of international football competition (7).

Consequently, running performance (RP) has become one of the most extensively investigated aspects of elite football (8). Elite players typically cover between 9 and 14 km per match, with 5% to 15% of the total distance performed at high intensity, while high-intensity running demands have generally increased over time (9, 10). RP is influenced by numerous factors, including playing position, match result, competition, tactics, match location, period of play, opponent quality, team quality disparity, environmental conditions, and other contextual variables (3-5, 11).

Geographic, cultural, historical, and social diversity contribute to differences in playing styles and RP among football teams worldwide (6). Previous research has primarily examined these differences across professional leagues, suggesting that cultural factors influence football characteristics (12-14). For example, English football has been described as more physically demanding and direct, Spanish football as more technically oriented and possession-based, and Italian football as more tactically structured and defense-oriented (12). Differences have also been reported in players' age, body height, body mass, and body mass index across the four major European leagues, with position-specific anthropometric characteristics likely reflecting league-specific playing styles and physical demands (13). However, studies comparing leagues from different continents remain limited, particularly those focusing on RP during match play (15).

The FIFA World Cup provides a unique opportunity to compare teams from different continents under the same competitive conditions. However, previous studies have primarily focused on match performance outcomes (16, 17). Only a limited number of studies have examined intercontinental differences in RP during FIFA World Cups. For example, one study grouped teams into three geographic regions during the 2018 FIFA World Cup (18), whereas others compared teams across all FIFA confederations but did not include positional analyses, reporting only overall differences in RP (6, 19).

To our knowledge, no previous study has simultaneously examined running performance across FIFA confederations while accounting for playing position and including only players who completed the full match. Therefore, the aim of this study was to identify positional differences in RP among national teams from different FIFA confederations during the 2022 FIFA World Cup. We hypothesized that running performance characteristics would differ significantly among FIFA confederations according to playing position.

Methods

Participants

Running performance (RP) data were obtained from the official FIFA Training Centre website (20). The sample included professional football players who completed full matches. A total of 59 matches played without extra time were analyzed, yielding 642 player-match observations. Each player-match observation was treated as a separate unit of analysis; therefore, players who completed multiple full matches could contribute more than one observation to the dataset. Players were classified into six positional groups: central back (CB), full-back (FB), defensive midfielder (DM), central midfielder (CM), wide midfielder (WM), and forward (FW). As the data were derived from official FIFA Training Centre post-match reports, contextual variables such as match status, opponent strength, and tournament stage were unavailable at the player level and could not be included in the analysis. Therefore, the present study focused exclusively on positional running performance during full-match participation.

Variables

The RP variables included total distance covered (TD, m), Zone 1 running (0–7 km/h), Zone 2 running (7–15 km/h), Zone 3 running (15–20 km/h), Zone 4 running (20–25 km/h), Zone 5 running (>25 km/h), number of high-intensity runs (HI; runs in Zone 4), number of sprints (S; runs in Zone 5), and top speed (TS). Goalkeepers were excluded because of the specific physical demands of their playing position. Data were obtained from the official post-match summary reports for the FIFA World Cup Qatar 2022, publicly available on the FIFA Training Centre website (20).

The 32 participating teams were grouped according to their FIFA confederation: Asian Football Confederation (AFC; 6 teams), Confederation of African Football (CAF; 5 teams), Confederation of North, Central America and Caribbean Association Football (CONCACAF; 4 teams), South American Football Confederation (CONMEBOL; 3 teams), and Union of European Football Associations (UEFA; 13 teams).

Data analysis

Statistical analyses were performed separately for each playing position. Descriptive statistics are presented as mean $\pm$ standard deviation. One-way analysis of variance (ANOVA) was used to examine differences in running performance among FIFA confederations for each playing position. When a significant main effect was observed, Scheffe post-hoc tests were performed to identify differences between FIFA confederations. Statistical analyses were performed using Statistica 14.0.0.15. The significance level was set at $\alpha = 0.05$ ($P < 0.05$). ANOVA results are reported as F values with corresponding degrees of freedom and p values.

Results

Table 1 presents running performance variable among FIFA confederations players.

Among central defenders, players from the CONMEBOL confederation covered a significantly shorter total distance and Zone 2 distance than those from the UEFA confederation; in contrast, CAF central defenders covered a greater Zone 1 distance than AFC central defenders.

Table 1. Running performance variables among FIFA confederations players*

Variable		$F_{(df1, df2)}$	$P^†$	Post-hoc comparison (mean ± standard deviation)
Central backs	Total distance covered (m)	$F_{(4, 233)} = 5.15$	0.002	UEFA (9915 ± 700) > CONMEBOL (9264 ± 1101)
	Zone 1 (m)	$F_{(4, 233)} = 2.91$	0.043	CAF (3936 ± 323) > AFC (3717 ± 336)
	Zone 2 (m)	$F_{(4, 233)} = 4.70$	0.036	UEFA (4359 ± 620) > CONMEBOL (3940 ± 840)
Full backs	Total distance covered (m)	$F_{(4, 134)} = 4.06$	0.038	CONCACAF (33.50 ± 1.69) > UEFA (31.87 ± 1.80)
Defensive midfielders	Zone 4 (m)	$F_{(4, 53)} = 3.00$	0.039	CONCACAF (813.37 ± 210.91) > CONMEBOL (495.72 ± 128.34)
	Zone 5 (m)	$F_{(4, 53)} = 3.92$	0.023 to 0.030	CONCACAF (259.58 ± 130.40) > AFC (100.86 ± 78.13); CONCACAF (259.58 ± 130.40) > CONMEBOL (91.45 ± 69.70)
	Number of sprints	$F_{(4, 53)} = 3.87$	0.019	CONCACAF (62.00 ± 15.30) > CONMEBOL (38.00 ± 7.95)
	Top speed (km/h)	$F_{(4, 53)} = 6.06$	0.001 to 0.020	CONCACAF (32.35 ± 0.43) > AFC (28.97 ± 1.29); CONCACAF (32.35 ± 0.43) > CONMEBOL (29.22 ± 0.95); CONCACAF (32.35 ± 0.43) > UEFA (30.09 ± 1.60)
Central midfielders	Total distance (m)	$F_{(4, 95)} = 3.27$	0.028	CAF (11739.09 ± 774.24) > CONMEBOL (10679.23 ± 917.74)
	Zone 3 (m)	$F_{(4, 95)} = 3.98$	0.031	CAF (1905.54 ± 349.71) > CONMEBOL (1511.43 ± 281.50)
Forwards	Total distance (m)	$F_{(4, 36)} = 4.42$	0.013–0.047*	AFC (10822.42 ± 1186.28) > CONMEBOL (9111.72 ± 1197.78); UEFA (10450.55 ± 365.08) > CONMEBOL (9111.72 ± 1197.78)
	Zone 2 (m)	$F_{(4, 36)} = 6.03$	0.002–0.030*	AFC (4614.94 ± 788.16) > CONMEBOL (2899.53 ± 1192.26); CAF (4229.97 ± 605.48) > CONMEBOL (2899.53 ± 1192.26); UEFA (4367.89 ± 481.79) > CONMEBOL (2899.53 ± 1192.26)
	Zone 3 (m)	$F_{(4, 36)} = 4.45$	0.033	CONCACAF (1854.35 ± 530.97) > CONMEBOL (991.17 ± 391.37)

*Abbreviations: AFC – Asian Football Confederation, CAF – Confederation of African Football; CONCACAF – Confederation of North, Central America and Caribbean Association Football, CONMEBOL – South American Football Confederation; UEFA – Union of European Football Associations. Values are presented as mean $\pm$ standard deviation.

†One-way ANOVA (statistical significance set at $\alpha = 0.05$; $P < 0.05$), followed by Scheffe's post-hoc test. Only variables with statistically significant differences are presented.

Among full-backs, CONCACAF players achieved a significantly higher top speed than UEFA players.

Among defensive midfielders, CONCACAF players covered a greater distance in Zone 4 than their CONMEBOL counterparts. In Zone 5, they also covered a greater distance than AFC and CONMEBOL players. In addition, CONCACAF defensive midfielders performed more sprints than CONMEBOL players and achieved a higher top speed than players from the AFC, CONMEBOL, and UEFA confederations.

Among central midfielders, CONMEBOL players covered a significantly shorter total distance and Zone 3 distance than CAF players.

Among forwards, CONMEBOL players covered a significantly shorter total distance than AFC and UEFA players. They also covered a shorter Zone 2 distance than players from the AFC, CAF, and UEFA confederations. In addition, CONMEBOL forwards covered a shorter Zone 3 distance than CONCACAF forwards.

Discussion

The present study identified significant differences in running performance among FIFA confederations across playing positions during the 2022 FIFA World Cup. The most pronounced differences were observed among forwards, followed by central midfielders, defensive midfielders, full-backs, and central backs. Overall, players from the CONMEBOL confederation generally covered shorter distances than players from other confederations, particularly in total distance and moderate-intensity running variables, whereas CONCACAF defensive midfielders exhibited the highest values in several high-intensity running parameters.

The generally lower running performance observed among CONMEBOL players may reflect differences in tactical approaches and match demands between confederations. This pattern was particularly evident among forwards and central midfielders and may be partly explained by the composition of the CONMEBOL sample, in which Brazil and Argentina accounted for 9 of the 15 analyzed matches. Given their competitive quality and tournament success, these teams may have spent more time in possession and the attacking phase of play, potentially reducing the need for extensive positional movement; however, possession and tactical behavior were not assessed in the present study. This interpretation is supported by previous studies showing that players from more successful teams covered less distance across different speed zones than players from less successful teams (21). Similarly, Premier League players demonstrated lower running performance than players from the lower English divisions despite competing at a higher standard (22), while teams achieving greater success in the English Premier League and UEFA Champions League performed less high-intensity running than less successful teams (5, 23). Conversely, other studies have reported no association between running performance and team quality (16, 17, 24, 25). These inconsistencies may be explained by differences in study design, competition format, performance classification, statistical approach, and contextual factors influencing match running performance (3-5, 11).

The greatest differences in high-intensity running performance were observed among defensive midfielders, with CONCACAF players recording the highest values across several

variables. This finding may reflect differences in defensive demands or playing style between confederations, although these factors were not assessed in the present study. This interpretation is further supported by the significantly higher maximum speed recorded by CONCACAF full-backs, who typically perform the greatest amount of high-intensity running during matches (4). In contrast, the higher low-intensity running observed among CAF central backs may reflect differences in tactical approaches or pacing strategies, although this remains difficult to interpret based on running performance alone (26, 27). No statistically significant differences were observed among wide midfielders.

The main strength of the present study is the position-specific comparison of running performance across FIFA confederations during the 2022 FIFA World Cup using only players who completed the entire match, thereby minimizing the confounding effect of unequal playing time. Nevertheless, running performance alone provides only a partial understanding of match demands. Previous studies have shown that combining running performance with ball possession and technical-tactical variables enables a more comprehensive interpretation of match performance (24, 25). Indeed, players from more successful teams have demonstrated greater technical involvement, including more successful passing, dribbling, tackling, and shooting actions (21), while players competing at the highest level of English football exhibited superior technical performance despite lower running outputs (22). Similarly, South American players competing in European leagues have shown greater proficiency in passing and shooting, possibly reflecting long-term developmental and cultural influences (28-30). These findings suggest that the lower running performance observed among CONMEBOL players in the present study could be related to differences in technical-tactical characteristics; however, such an interpretation remains speculative because technical-tactical performance was not assessed in the present study. A further limitation is the exclusion of contextual variables known to influence running performance, including match outcome, tactical approach, opponent quality, environmental conditions, and team quality (3-5, 11). In addition, the dataset included repeated player-match observations, as individual players could contribute data from multiple matches. The statistical analysis did not account for the potential within-player dependence of these observations. Future studies should consider statistical approaches that account for repeated observations within players.

In conclusion, the present study demonstrated positional differences in running performance among FIFA confederations during the 2022 FIFA World Cup, supporting the study hypothesis. The observed differences, including the generally lower running performance among CONMEBOL players, should be interpreted with consideration of technical-tactical and contextual factors that were not assessed in the present study. Future research should integrate technical-tactical and contextual variables with running performance to provide a more comprehensive understanding of match performance.

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References

1. Batmunkh E. Role of Football in International Business and Economy. *Manag Sci Bus Decis.* 2021;1:39–56. <https://doi.org/10.52812/msbd.20>
2. Millet GP, Brocherie F, Burtcher J. Olympic sports science—bibliometric analysis of all summer and winter olympic sports research. *Front Sports Act Living.* 2021;3:772140. <https://doi.org/10.3389/fspor.2021.772140>
3. Chmura P, Konefał M, Andrzejewski M, Kosowski J, Rokita A, Chmura J. Physical activity profile of 2014 FIFA World Cup players, with regard to different ranges of air temperature and relative humidity. *Int J Biometeorol.* 2017;61:677–84. <https://doi.org/10.1007/s00484-016-1245-5>
4. Di Salvo V, Baron R, Tschan H, Montero FC, Bachl N, Pigozzi F. Performance characteristics according to playing position in elite soccer. *Int J Sports Med.* 2007;28:222–7. <https://doi.org/10.1055/s-2006-924294>
5. Modrić T, Veršić S, Stojanović M, Chmura P, Andrzejewski M, Konefał M, et al. Factors affecting match running performance in elite soccer: Analysis of UEFA Champions League matches. *Biol Sport.* 2023;40:409–16. <https://doi.org/10.5114/biolsport.2023.116453>
6. Tuo Q, Wang L, Huang G, Zhang H, Liu H. Running performance of soccer players during matches in the 2018 FIFA World Cup: Differences among confederations. *Front Psychol.* 2019;10:1044. <https://doi.org/10.3389/fpsyg.2019.01044>
7. Acar MF, Yapicioglu B, Arikan N, Yalcin S, Ates N, Ergun M. Analysis of goals scored in the 2006 World Cup. In: *Science and Football VI*. London: Routledge; 2008. p. 261-8.
8. Bradley PS, Sheldon W, Wooster B, Olsen P, Boanas P, Krstrup P. High-intensity running in English FA Premier League soccer matches. *J Sports Sci.* 2009;27:159–68. <https://doi.org/10.1080/02640410802512775>

9. Barnes C, Archer DT, Hogg B, Bush M, Bradley PS. The evolution of physical and technical performance parameters in the English Premier League. *Int J Sports Med*. 2014;35:1095–100. <https://doi.org/10.1055/s-0034-1375695>
10. Jerković Z, Modrić T, Veršić S. Analysis of the associations between contextual variables and match running performance in Croatian First Division Soccer. *Sport Mont*. 2022;20:125–30. <https://doi.org/10.26773/smj.220619>
11. Andrzejewski M, Chmura P, Konefał M, Kowalczyk E, Chmura J. Match outcome and sprinting activities in match play by elite German soccer players. *J Sports Med Phys Fitness*. 2018;58:785–92. <https://doi.org/10.23736/S0022-4707.17.07352-2>
12. Sarmiento H, Pereira A, Matos N, Campaniço J, Anguera TM, Leitão J. English Premier League, Spain's La Liga and Italy's Serie A – What's different? *Int J Perform Anal Sport*. 2013;13:773–89. <https://doi.org/10.1080/24748668.2013.11868688>
13. Bloomfield J, Polman R, Butterly R, O'Donoghue P. Analysis of age, stature, body mass, BMI and quality of elite soccer players from 4 European Leagues. *J Sports Med Phys Fitness*. 2005;45:58–67.
14. Dellal A, Chamari K, Wong DP, Ahmaidi S, Keller D, Barros R, et al. Comparison of physical and technical performance in European soccer match-play: FA Premier League and La Liga. *Eur J Sport Sci*. 2011;11:51–9. <https://doi.org/10.1080/17461391.2010.481334>
15. Izquierdo JM, Redondo JC. Offensive difference styles and technical situational variables between European and South American elite football leagues. *MHSalud*. 2022;19:25–37. <https://doi.org/10.15359/mhs.19-2.3>
16. Dufour M, Phillips J, Ernwein V. What makes the difference? Analysis of the 2014 World Cup. *J Hum Sport Exerc*. 2017;12:616–29. <https://doi.org/10.14198/jhse.2017.123.06>
17. Alves DL, Osiecki R, Palumbo DP, Moiano-Junior JV, Oneda G, Cruz R. What variables can differentiate winning and losing teams in the group and final stages of the 2018 FIFA World Cup? *Int J Perform Anal Sport*. 2019;19:248–57. <https://doi.org/10.1080/24748668.2019.1593096>
18. Kvas-Cabral VC, Martins H, Oneda G, Enes A, Moraes IF, Leonel DF. Physical, technical, and tactical differences between continental soccer teams participating in the 2018 FIFA World Cup. *J Phys Educ Sport*. 2022;22:1507–15. <https://doi.org/10.7752/jpes.2022.06190>
19. Ju W, Cost R, Oliva-Lozano JM. Analysis of match performance of elite soccer players across confederations during the Men's and Women's World Cup. *Sci Med Footb*. 2025;9:369–81. <https://doi.org/10.1080/24733938.2024.2409679>
20. FIFA Training Centre. Post Match Summary Reports. [Internet]. FIFA Training Centre; 2022. [cited 2026 May 7]. Available from: <https://www.fifatrainingcentre.com/en/fwc2022/post-match-summaries/post-match-summary-reports.php>
21. Rampinini E, Impellizzeri FM, Castagna C, Coutts AJ, Wisløff U. Technical performance during soccer matches of the Italian Serie A league: Effect of fatigue and competitive level. *J Sci Med Sport*. 2009;12:227–33. <https://doi.org/10.1016/j.jsams.2007.10.002>
22. Bradley PS, Carling C, Gomez Diaz A, Hood P, Barnes C, Ade J, et al. Match performance and physical capacity of players in the top three competitive standards of English professional soccer. *Hum Mov Sci*. 2013;32:808–21. <https://doi.org/10.1016/j.humov.2013.06.002>
23. Di Salvo V, Gregson W, Atkinson G, Tordoff P, Drust B. Analysis of high intensity activity in Premier League soccer. *Int J Sports Med*. 2009;30:205–12. <https://doi.org/10.1055/s-0028-1105950>
24. Asian Clemente JA, Requena B, Jukic I, Nayler J, Hernández AS, Carling C. Is physical performance a differentiating element between more or less successful football teams? *Sports (Basel)*. 2019;7:216. <https://doi.org/10.3390/sports7100216>
25. Hoppe MW, Slomka M, Baumgart C, Weber H, Freiwald J. Match running performance and success across a season in German Bundesliga soccer teams. *Int J Sports Med*. 2015;36:563–6. <https://doi.org/10.1055/s-0034-1398578>
26. Forcher L, Waesche H, Jekauc D, Woll A, Altmann S. The influence of tactical formation on physical and technical match performance in male soccer: A systematic review. *Int J Sports Sci Coaching*. 2023;18:1820–49. <https://doi.org/10.1177/17479541221101363>
27. Edwards AM, Noakes TD. Dehydration: cause of fatigue or sign of pacing in elite soccer? *Sports Med*. 2009;39:1–13. <https://doi.org/10.2165/00007256-200939010-00001>

28. Jamil M. Where do the best technical football players in the world come from? Analysing the association between technical proficiency and geographical origin in elite football. *J Hum Sport Exerc.* 2022;17:244–60. <https://doi.org/10.14198/jhse.2022.172.02>
29. Berdejo-del-Fresno D. A review about futsal. *Am J Sports Sci Med.* 2014;2:70. <https://doi.org/10.12691/ajssm-2-3-0>
30. Hoffmann R, Ging LC, Ramasamy B. The socio-economic determinants of international soccer performance. *J Appl Econ.* 2002;5:253–72. <https://doi.org/10.1080/15140326.2002.12040579>