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Positional differences in match running performance of women soccer players

Manca Kutnjak [1,2], Dusko Bjelica[3] and Toni Modric [4,5]*

[1] Faculty of Sport, University of Ljubljana, Ljubljana, Slovenia; mancakutnjak@gmail.com
[2] Football Association of Slovenia, Kranj, Slovenia
[3] Faculty for Sport and Physical Education, University of Montenegro, Niksic, Montenegro; dbjelica@ucg.ac.me
[4] Faculty of Kinesiology, University of Split, Split, Croatia
[5] Football club Besiktas JK, Istanbul, Turkey

* Correspondence: (TM) toni.modric@kifst.hr; ORCID: 0000-0003-1652-619X

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Abstract: This study aimed to identify positional differences in the running performance (RP) of professional women soccer players. Seventy match performances were observed during the official matches (n = 13) over the course of half of a season at the highest level of national soccer competition in Slovenia. Players' RP were obtained using global positioning system technology and were classified into five playing positions: central defender (CD; n = 11), fullback (FB; n = 15), central midfielder (CM; n = 9), winger (WM; n = 25) and forward (FW; n = 10). RP variables included total distance, high-intensity running, high-metabolic load distance, high-intensity accelerations and decelerations, and maximal running speed. Univariate and multivariate differences in RP among playing positions were analyzed by one-way analysis of variance and discriminate canonical analysis, respectively. Significant univariate differences were found for all RP variables (f = 3.77 – 8.68, μ = 0.19 – 0.33). Specifically, WMs, FBs, and CMs covered more total distance than CDs or FWs. High-intensity running, high metabolic load distance, high-intensity accelerations, and decelerations were greater for FBs or WMs compared to the players in all other playing positions. Analysis of multivariate differences showed significant differentiation between FBs and CMs, CDs, and FWs in high-intensity running distance, high-metabolic load distance, and high-intensity decelerations (CanR= 0.4 – 0.77, all $p < 0.01$), respectively, with higher occurrence in FBs. These findings demonstrated the differing physical demands placed on national-level women's soccer players in different playing positions, offering valuable insights for their preparation.

Keywords: football, women's competition, playing positions, physical performance, multivariate differences

1. Introduction

Women's soccer has experienced substantial global growth and development in the last decade (Beissel, Postlethwaite, Grainger, & Brice, 2023). There has been an increase in participation rates, increased provision and support for developing talented youth players, increased professionalization of elite playing standards, and subsequently increased audiences for elite senior competitions (Nassis et al., 2022). Recent research suggested that such growth and development increased the professionalization of the game and consequently led to increased physical match-play performances (Vescovi, Fernandes, & Klas, 2021).

Detailed knowledge about the physical performance of professional soccer match-play is required to construct optimal training programs to respond to these needs (Sausaman, Sams, Mizuguchi, DeWeese, & Stone, 2019). For example, the distances covered by players in a match, according to their positions, can be used to prescribe more specific training or to consider new ways to improve the efficiency of team training (Modric, Versic, & Sekulic, 2020). For these reasons, match analysis of soccer with the primary objective being to record and analyze the physical demands of the players has increased over the last three decades (Rico-González, Oliveira, Palucci Vieira, Pino-Ortega, & Clemente, 2022; Vescovi et al., 2021). Currently, analysis of physical demands in soccer is usually undertaken by quantification of running performance (RP) such as total distance, distance covered in different speed zones, and acceleration frequencies (Harkness-Armstrong, Till, Datson, Myhill, & Emmonds, 2022).

Although most of the previous studies quantifying physical demands in soccer typically analyzed male soccer players (Kirkendall, 2020; Martínez-Lagunas, Niessen, & Hartmann, 2014), the volume of literature focusing on women's soccer increases (Harkness-Armstrong et al., 2022). The focus of the literature to date has predominantly surrounded injury and strength and conditioning of women's soccer players, with limited research quantifying the match characteristics of women's soccer (Panduro et al., 2022; Vescovi et al., 2021). Available research consistently showed that elite female players cover a total distance of 9–11 kilometers (Gonçalves et al., 2021; Martínez-Lagunas et al., 2014). Regarding high-intensity running (e.g., high-speed running and sprinting), which may be a more suitable marker of physical demands because of its relationship with training status (Choice, Tufano, Jagger, Hooker, & Cochrane-Snyman, 2022), recent studies showed that elite-level female players can 349–666 m of high-speed running and 82–255 m of sprinting (Mäkiniemi, Savolainen, Finni, & Ihalainen, 2023).

These wide ranges in RP are determined by multiple factors (Palucci Vieira, Carling, Barbieri, Aquino, & Santiago, 2019), with playing position as the most influential factor (Barrett, McLaren, Spears, Ward, & Weston, 2018). Therefore, to appropriately describe and characterize physical demands in soccer, RP should be analyzed considering the specific playing positions of the players during the match. The existing knowledge shows that central midfielders cover the greatest and central defenders the lowest total distance (Mäkiniemi et al., 2023; Panduro et al., 2022). Central defenders additionally cover the lowest high-intensity running distance, while wingers typically perform the greatest (Panduro et al., 2022). Fullbacks and forwards also cover a greater high-intensity running distance than central defenders and central midfielders (Winther et al., 2022).

However, it should be emphasized that the authors of the aforementioned studies drew their conclusions while observing players competing in the Norwegian, Finnish, and Danish women's football leagues. Considering the possible geographical, cultural, historical, and social influence of the observed competitions (Sapp, Spangenburg, & Hagberg, 2018; Sarmento, Barbosa, Anguera, Jorge, & José, 2013), their findings cannot be generalized. In other words, the applicability of such findings is limited to the players from the observed competitions and cannot be applied to players from other competitions (Choice et al., 2022). Furthermore, most of the previous studies analyzed univariate differences in RP among playing positions (Harkness-Armstrong et al., 2022), which limits current knowledge for constructing optimal training programs required to respond to match-play needs. On the other hand, multivariate differences in RP for players in different playing positions have rarely been investigated in women's soccer. The findings from research utilizing multivariate techniques to analyze RP may reveal specific performance that differentiates the most among specific playing positions (Moura, Martins, & Cunha, 2014). This can be of great help to soccer coaches in their decision-making process when optimizing physical preparation strategies for players in specific playing positions. Finally, it has recently been indicated that scientific literature is still lacking research on women's national-level position-specific match demands (Mäkiniemi et al., 2023).

For all these reasons, additional research analyzing position-specific RP from women's national level matches, combined with a more complex statistical approach aimed to determine multivariate differences in RP among playing players in different playing positions, is arguably warranted. The results from such research may provide novel findings that could serve to soccer coaches for tailoring position-specific physical training programs, which is essential in contemporary soccer (Griffin et al., 2021). Therefore, this study aimed to identify positional differences in RP of women's players from the highest national soccer division in Slovenia. As this study will enable for the first time the RP in Slovenian women's soccer to be determined, a foundation for understanding the physical demands placed on women's players in Slovenia will be enabled.

2. Materials and Methods

Sample and design —The participants (n = 8) in this study were professional soccer players from Slovenia mean ± SD, age: 24.95 ± 3.94 years; body height: 165.75 ± 4.71cm; body mass: 60.88 ± 3.8kg). All were members of a single team competing at the highest level of national women's soccer competition, and all of them represented national youth teams, while three of them represented the national senior team. This characterizes players as "elite". Players were observed over the season 2022/23 during all matches (n = 14) that the team played in the regular part (i.e., the season include regular and playoff part). The team played 7 home and 7 away matches, achieving 9 wins and 5 losses. All matches were played in the customary formation 4-2-3-1.

Of all observed matches, one match is excluded from the analysis due to the red card. Due to methodological reasons, only the results of players who participated in the whole match were analyzed, while goalkeepers were not included in the analysis due to the specificity of the position (Modric et al., 2023). As a result, the final sample included 70 match observations obtained from 13 matches. Match observations were classified into five positional subsets based on their tactical role in the team: central defender (CD; 11 observations), fullback (FB; 15 observations), central midfielder (CM; 9 observations), winger (WM; 25 observations) and forward (FW; 10 observations), are were used as cases in this study.

The data analyzed in this study were derived from routinely measured player activities over the course of the competitive season, which did not require obtaining written informed consent (Rago, Rebelo, Krustrup, & Mohr, 2021). However, verbal consent was obtained from the club and the players if anonymity was ensured. Therefore, all data were de-identified in accordance with the declaration of Helsinki to ensure player confidentiality. The investigation was approved by the local university ethics board.

Procedures —Players' RP was measured using a 10-Hz global positioning system (GPS) (Apex, STATSports, Newry, Northern Ireland) with a 3-axis accelerometer, gyroscope, and magnetometer. Previous investigations have demonstrated that distance and speed data reported by this system showed good levels of accuracy and reliability (Beato, Coratella, Stiff, & Iacono, 2018). To avoid inter-unit errors, the players wore the same device for each match. In accordance with the manufacturer's instructions, all devices were consistently activated ~30 minutes before the pre-match warm-up to allow the acquisition of satellite signals. Raw data files were exported after the conclusion of each match using system-specific software. Files were trimmed on an individual player basis to ensure that only data pertaining to each specific match were retained for analysis (Modric et al., 2023).

In line with previous studies (Harkness-Armstrong et al., 2022), the data collected from GPS included recording the distances covered (m) for the following: over the total match duration and from high-intensity running at speeds greater than 5.5 m/s. In addition, the number (frequency) of high-intensity accelerations (>3 m/s2) and decelerations (less than –3 m/s2), high-metabolic load distance (m) (i.e., the total amount of HIR an athlete does, coupled with the total distance of accelerations and decelerations), and maximal running speed (MRS) (km/h) were collected for each player.

Statistics —The Kolmogorov–Smirnov test was used to evaluate the normality of distributions, while homoscedasticity was tested using Levene's test. All variables were normally distributed, so descriptive statistics included means and standard deviations. The univariate differences in RP among playing positions were analyzed via one-way analysis of variance (ANOVA). Scheffe's post hoc analysis was calculated to identify the differences between specific playing positions. Effect size (ES) differences among playing positions were established using ANOVA-derived partial eta-squared (>0.02, small; >0.13, medium; >0.26, large) (Modric, Versic, Sekulic, & Liposek, 2019). To determine the power of the sample size, a post hoc power analysis was calculated (G*Power software version 3.1.9.2; Heinrich Heine University, Düsseldorf, Germany) where significant differences were found. Cohen's d (d) was used to identify ES between specific playing positions, and interpreted as follows: trivial (<0.2), small (≥0.2–0.5), moderate (≥0.5–0.8), and large (>0.8) (Cohen, 2013). Multivariate differences in RP were analyzed via canonical discriminant analysis. This technique allows a study of the differences among five playing positions with respect to several physical performance variables simultaneously. Statistica (version 14; TIBCO Software, Palo Alto, CA, USA) was used for all analyses. The significance level was set at 0.05.

3. Results

The values obtained in the post hoc power analysis were: 0.99 to total distance, high-intensity running, high metabolic load distance, maximal running speed and high-intensity decelerations, and 0.90 to high-intensity accelerations.

Tables 1 and 2, and Figure 1 present descriptive statistics and differences among playing positions for match RP. Significant ANOVA differences were found for total distance, high-intensity running, high metabolic load distance, maximal running speed, high-intensity accelerations, and high-intensity decelerations (all large ES; F = 3.77 – 8.68).

Table 1. Descriptive statistics for match running performance (data are given as mean (95%CI) ± sd)

	Total	**CD**	**FB**
TD (m)	9418 (9092–9745) ± 1369	7951 (7285–8617) ± 991	10254 (9781–10726) ± 853
HIR (m)	241 (217–265) ± 101	214 (153–275) ± 91	335 (279–391) ± 101
HMLD (m)	1350 (1279–1422) ± 300	1017 (893–1142) ± 186	1588 (1470–1705) ± 213
MRS (km/h)	25.9 (25.6–26.3) ± 1.5	27.6 (26.3–28.8) ± 1.8	26 (25.3–26.7) ± 1.2
HIA (#)	40 (37–43) ± 11	41 (35–47) ± 8	40 (37–43) ± 6
HID (#)	54 (51–57) ± 13	47 (40–54) ± 10	59 (52–65) ± 12
	CM	**WM**	**FW**
TD (m)	10341 (9559-11123) ± 1017	9326 (8699–9953) ± 1518	9180 (8755–9606) ± 595
HIR (m)	22 (150-293) ± 93	233 (196–270) ± 90	169 (142–197) ± 39
HMLD (m)	1319 (1111-1527) ± 271	1392 (1263–1522) ± 313	1284 (1201–1367) ± 116
MRS (km/h)	26.3 (25,3-27,3) ± 1.3	25.7 (25,2–26,1) ± 1.2	24.7 (24,2–25,3) ± 0.7
HIA (#)	31 (25-37) ± 8	45 (39–51) ± 15	35 (32–38) ± 4
HID (#)	54 (50-58) ± 6	60 (54–65) ± 14	39 (32–46) ± 10

TD – total distance, HIR – high-intensity running, HMLD – high metabolic load distance, MRS – maximal running speed, HIA - high-intensity accelerations, high-intensity decelerations; CD – central defenders, FB – fullback, CM – central midfielders, WM – wide midfielders, FW – forwards; CI – confidence interval.

Table 2. Differences among playing positions for match running performance determined by analysis of variance (ANOVA), with Scheffe post-hoc test differences.

	ANOVA			Post-hoc				
	f-test	p-value	μ	CD	FB	CM	WM	FW
TD (m)	7.97	0.001	0.33	FB, CM, WM	CD	CD	CD	-
HIR (m)	6.39	0.001	0.28	FB	CD, WM, FW	-	FB	FB
HML (m)	8.68	0.001	0.35	FB, WM	CD	-	CD	-
MRS (km/h)	7.33	0.001	0.31	WM, FW	-	-	CD	CD
HIA (count)	3.77	0.008	0.19	-	-	WM	CM	-
HID (count)	7.61	0.001	0.32	-	FW	-	FW	FB, WM

TD – total distance, HIR – high-intensity running, HMLD – high metabolic load distance, MRS – maximal running speed, HIA - high-intensity accelerations, high-intensity decelerations; CD – central defenders, FB – fullback, CM – central midfielders, WM – wingers, FW – forwards; Superscripted letters indicate significant post-hoc differences when compared to specific playing position; μ - partial eta squared.

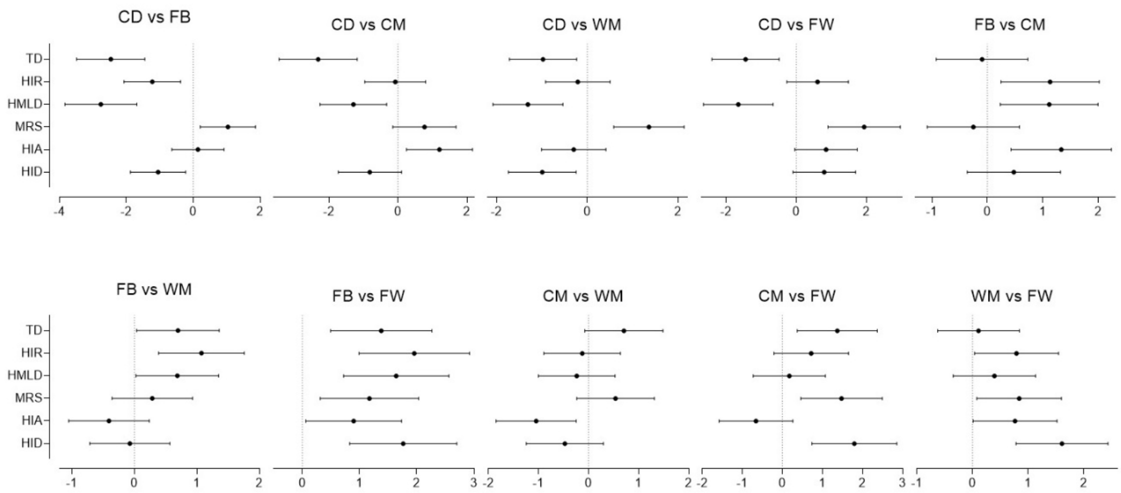

Figure 1. Standardized mean differences in match running performance between specific playing positions (data are given Cohen's d; error bars indicate 95% confidence interval).

Specifically, total distance was significantly greater for FBs, CMs, and WMs compared to CDs (all large ES). FBs performed significantly greater high-intensity running distance compared to CDs, WMs, and FWs (all large ES). High-metabolic load distance was significantly greater for FBs and WMs compared to CDs (all large ES). CDs demonstrated greater maximal running speed compared to WMs and FWs (all large ES). The frequency of high-intensity accelerations was greater for WMs compared to CMs (large ES), while FBs and WMs demonstrated greater high-intensity decelerations compared to the FWs (all large ES).

Table 3 presents a discriminant canonical analysis of multivariate differences among playing positions in RP. Four discriminant roots reached statistical significance. The first discriminant root (CanR = 0.77, p < 0.001) shows significant differentiation between CDs and FBs. The high-metabolic load distance (correlation with the discriminant function r = 0.56) most greatly contributed to the differentiation, with higher occurrence in FBs. The second discriminant root (CanR = 0.64, $p < 0.001$) shows significant differentiation between CMs and WMs. The total distance (correlation with the discriminant function r = 0.52) most greatly contributed to the differentiation, with higher occurrence in CMs. The third discriminant root (CanR = 0.62, $p < 0.001$) shows significant differentiation between FBs and FWs. The high-intensity decelerations (correlation with the discriminant function r = 0.76) most greatly contributed to the differentiation, with higher occurrence in FBs. The fourth discriminant root (CanR = 0.40, p = 0.011) shows significant differentiation between CMs and FBs. The high-intensity running (correlation with the discriminant function r = 0.46) most greatly contributed to the differentiation, with higher occurrence in FBs. Correct classifications were obtained for 82% CDs, 73% FBs, 66% CMs, 76% WMs, and 90% FWs (77% correctly classified in total).

Table 3. Multivariate differences among playing positions in match running performance defined by discriminant canonical analysis.

	Root 1	**Root 2**	**Root 3**	**Root 4**
TD (m)	-0.45	-0.52	0.09	-0.14
HIR (m)	-0.22	-0.26	0.56	0.67
HMLD (m)	-0.56	-0.17	0.31	0.20
MRS (km/h)	0.47	-0.23	0.39	0.23
HIA (#)	-0.02	0.43	0.41	-0.03
HID (#)	-0.23	-0.07	0.76	-0.46
Can R	0.77	0.64	0.62	0.40
Wilks Lambda	0.13	0.30	0.52	0.84
p-value	0.01	0.01	0.01	0.01
C: CD	2.52	0.20	0.17	0.29
C: FB	-1.01	-0.57	0.56	0.58
C: CM	0.31	-1.73	-0.40	-0.58
C: WM	-0.40	0.67	0.41	-0.35
C: FW	-0.54	0.51	-1.70	0.22

TD – total distance, HIR – high-intensity running distance, HMLD – high metabolic load distance, MRS – maximal running speed, HIA - high-intensity accelerations, high-intensity decelerations; CD – central defenders, FB – fullback, CM – central midfielders, WM – wingers, FW – forwards; Can R – canonical correlation; Root – structure of the discriminant function/root; C – centroid.

4. Discussion

This study aimed to identify positional differences in RP of elite national-level women's players. Results indicated significant differences among playing positions in all RP variables, showing that players experienced different physical demands on different positions in the matches. These findings warrant the implementation of position-specific training programs for women players involved in elite-level soccer, offering valuable insights for their preparation.

Sports scientists and performance analysts use data on match RP to aid practitioners in decision-making processes for structuring the elements of training and subsequent match preparation (Aquino et al., 2017). The most commonly used variable is the total distance covered (Bradley, Dellal, Mohr, Castellano, & Wilkie, 2014; Di Salvo et al., 2006). Players in the current study on average covered 9418 m in total, which is slightly less compared to the other national and elite-level matches (Mäkiniemi et al., 2023), and similar to international friendlies (Hewitt, Norton, & Lyons, 2014). Analysis of total distance covered according to playing positions shows significantly greater values (all large ES) for FBs, CMs, and WMs (10254 m, 10341m, and 9326m, respectively) compared to CDs (7951m). This shows that playing in midfield (e.g., as CMs) and on the side (e.g., FBs and WMs) of the pitch may be physically more demanding than playing as CDs. Although possible causes can only be speculated, it is most likely that this is a consequence of different players' match roles in specific playing positions (Memmert, Raabe, Schwab, & Rein, 2019; Modric et al., 2022). Specifically, midfield and side players are more involved in attacking activities compared to CDs (Yi, Jia, Liu, & Gómez, 2018), which certainly enables them to cover greater overall distance. Similar findings were demonstrated for other elite-level women's competitions. Briefly, midfield and/or side players from Finnish (Mäkiniemi et al., 2023), Norwegian (Winther et al., 2022), and Danish (Panduro et al., 2022) women's first divisions were found to cover the greatest total distance, while the lowest total distance has been covered by CDs. Taking all into account, it is highly recommended that a training process for elite-level women players should be created to enable midfield and side players to cover a larger total distance compared to CDs.

Another important parameter to consider in the process of structuring a training program is high-intensity running distance. Due to its relationship with training status (Bradley et al., 2009; Modric, Versic, & Sekulic, 2021; Mohr, Krustrup, & Bangsbo, 2003; Rey, Costa, Corredoira, & Sal de Rellán Guerra, 2023; Varley & Aughey, 2013), such a parameter may be an even more suitable marker of physical demands. In most of the previous studies analyzing elite women players, the longest distance high-intensity running distance was typically performed by WMs, while the lowest was by CDs (Mäkiniemi et al., 2023; Panduro et al., 2022). In contrast, our results show that high-intensity running distance was ~ 30-50% greater for FBs compared to all other playing positions. Specifically, FBs' high-intensity running distance (>5.5m/s) was 335m, while CDs, WMs, CMs, and FWs performed 214m, 221m, 233m, and 169m, respectively. The possible explanation for these inconsistencies may be found in the evolving nature of the game, which has been emphasized in previous studies (Mäkiniemi et al., 2023). The modern FBs, although primarily defenders, frequently participate in attacking activities (Yi et al., 2018). Therefore, they should be positioned deep into the opponent's half of the pitch (i.e., to participate more easily in attacking actions) but also deep into their half of the pitch (i.e., to participate in defensive actions) (Modric et al., 2022). Irrespective of causality, it is obvious that FBs experienced greater physical demands compared to the players in other positions. This can be additionally supported by analysis of high-metabolic load distance, which was the greatest for FBs, but also with the analysis of multivariate differences among playing positions in match RP. Briefly, results showed significant differentiation between FBs and CMs, CDs, and FWs in high-intensity running distance, high-metabolic load distance, and high-intensity decelerations, respectively, with higher occurrence in FBs. Therefore, the physical conditioning of the FB should be at a higher level compared to players in other playing positions, especially in terms of anaerobic endurance due to the association between anaerobic threshold and high-intensity activities (Modric et al., 2021).

Analysis of high-intensity acceleration/deceleration frequencies supported our previous considerations that playing by the side (e.g., as FBs and WMs) is physically more demanding than playing in central positions (e.g., as CDs, CMs, and FWs). Specifically, we found that WMs performed the highest number of high-intensity accelerations (n = 45), followed by CDs and FBs (n = 41 and 40, respectively). The highest number of high-intensity decelerations were executed also by WMs (n = 60), followed by FBs and CMs (n = 59 and 54, receptively). Given that accelerations and decelerations are related to the changes in velocity which heighten physiological and neuromuscular demand (Vescovi et al., 2021), these results emphasize WMs as one of the most demanding playing positions. The possible cause of such increased acceleration/deceleration frequencies is WMs' frequent participation in attacking actions, which are directly related to high-intensity efforts (Andrzejewski, Chmura, Konefał, Kowalczuk, & Chmura, 2017; Chmura et al., 2018; Di Salvo, Gregson, Atkinson, Tordoff, & Drust, 2009). Our findings are in line with research analyzed Finnish women's first-division players which reported the highest high-intensity acceleration/deceleration frequencies among WMs (Mäkiniemi et al., 2023) but in contrast with the study analyzed Danish women's first-division players which indicated the highest amount of high-intensity acceleration/deceleration among CMs (Panduro et al., 2022). However, it should be taken into account that detailed comparison is possible only to a limited extent due to the usage of different kinds of accelerometer units, different thresholds, and the ways the data are mathematically treated (Mallo, Mena, Nevado, & Paredes, 2015).

Considering that this study was the first to evaluate position-specific RP in Slovenian women's soccer, some important implications for coaches, players, and researchers involved in this and similar competitions may be observed. Firstly, the current findings enabled valuable insights into the physical demands placed on elite-level women's players in Slovenia. This can facilitate the decision-making process for soccer coaches when creating the team, selecting the players for the matches, and designing specific physical conditioning regimes (Aquino et al., 2017; Bradley et al., 2009; Carling, 2010; Jerome et al., 2023). Secondly, the results from the current study can be used as normative data which shows players itself physical requirements for specific playing positions for participation in women's first-division competition (Altmann et al., 2021). Finally, this study can reinforce the importance of utilizing multivariate techniques among sports scientists when analyzing physical performance in soccer, which may be particularly helpful in their better understanding (Moura et al., 2014).

Limitations and strengths —The main limitation of this study is derived from the fact that data were collected from only one team. Therefore, the results are generalizable only to similar samples of subjects and levels of competition. In addition, only players who played entire matches during one half-season were analyzed, which could have affected the RP results. The influence of contextual factors that can affect RP (Lago-Peñas, 2012), such as team quality, quality of the opponent, match location, or team formation, was not considered in the current study. Also, multiple observations from the players were not accounted due to the insufficient sample. On the other hand, this study also offers several strengths. To the best of our knowledge, this study is the first to evaluate RP in the highest level of national women's soccer competition in Slovenia, which may be great foundation for understanding physical demands placed on women's players in Slovenia. Also, this study examined differences in RP utilizing a multivariate technique, which has not been done so far in analyzing women soccer players. In addition, clustering of the players into soccer-specific playing positions provides information to the coaches regarding whether the players respond to the physical demands of the specific playing position or not. However, future studies should analyze a larger sample of matches played by multiple teams to confirm current findings.

5. Practical Applications.

This study demonstrated that elite national-level women's players experienced different physical demands in different positions in the matches. Specifically, WMs, FBs, and CMs covered more total distance than CDs or FWs. High-intensity running, high metabolic load distance, high-intensity accelerations, and decelerations were greater for FBs or WMs compared to the players in all other playing positions. Furthermore, analysis of multivariate differences showed significant differentiation between FBs and CMs, CDs, and FWs in high-intensity running distance, high-metabolic load distance, and high-intensity decelerations, respectively, with higher occurrence in FBs. Taking all into account, it seems that playing by the side of the pitch is physically more demanding compared to all other playing positions.

This warranted the implementation of position-specific training programs for women players involved in elite-level soccer. Firstly, weekly pre-match training programs should be designed to enable side players (e.g. FBs and WMs) to perform increased high-intensity activities, such as covering distance at high speeds and utilizing intensive decelerations. This will enable them to better adapt to the high physical demands which they experience during the matches. Secondly, high-intensity activities are well-known to be associated with greater blood lactate accumulation (Modric et al., 2021). Considering side players' increased high-intensity activities during the matches, these players may require extended periods of recovery or supplementary practices during the post-match training protocols such as ice submersions and/or massage.

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