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Original Article

Match running performance in male professional soccer players: Interactive effect of score-line and playing position.

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Abstract:
Time-motion analysis has grown substantially in recent decades with the aim of monitoring players' work rate profiles during a match. This study investigated how current score-line (i.e. winning, drawing, losing) and playing position interact to influence match running performance (i.e. total distance, and the distances covered at different intensities) in male professional soccer players. A total of 193 individual match observations of 42 outfield players (goalkeepers excluded) from the Brazilian national leagues were analyzed. The players were categorized into four positions: central defenders (n = 10), full-backs (n = 9), midfielders (n = 14), and forwards (n = 9). The following running variables were retained: total distance (TD), walking (0 to 6 km·h^{-1}), jogging (6.1 to 12 km·h^{-1}), low (LIR: 12.1 to 15 km·h^{-1}), medium (MIR: 15.1 to 19 km·h^{-1}), and high intensity running (HIR: 19.1 to 23 km·h^{-1}), sprint (> 23 km·h^{-1}), and high intensity activity (HIA: sum of MIR + HIR + sprint). Overall, drawing status decreased distances walking and increased TD, jogging, LIR, MIR, HIR, and HIA compared to winning and losing status. Forwards and full-backs covered greater sprint distance during drawing than losing status. Central defenders accumulated less sprint distances during drawing and winning conditions than other positions. Lastly, full-backs and forwards when drawing and winning, respectively, covered longer sprint distances than midfielders. These findings may help coaches to better understand the influence of contextual factors on running performance of Brazilian elite-level soccer players, in addition to offering relevant information for the development of individualized training programs.
Key Words: **Performance analysis; match status; football association; global positioning system; match external load**

Introduction

In football, physical demands have increased considerably in recent decades (Bradley & Ade, 2018) due to the dynamism and unpredictability of the workload during the match, especially in matches with a busy schedule and in decisive matches during the competition (Clemente et al., 2021). In order to reduce the risk of injuries and promote match preparedness, head coaches and strength and conditioning coaches have been monitoring the physical performance of their players during matches in order to obtain relevant information to create effective training and recovery strategies (Hader et al., 2019). With the advancement of technology and the development of computerized tracking devices (Pons et al., 2019; Castellano, Alvarez-Pastor & Bradley, 2014), time-motion analysis has become more applicable for monitoring players' work rate profiles (Teixeira et al., 2021), becoming a data collection approach capable of quantifying their running performance during the match (Bradley & Ade, 2018).

Time-motion analysis is a topic of current interest in team-sports and is seen as a valuable tool that allows coaches to objectively assess the performance of their teams at an individual and collective level throughout the match (Castells et al., 2016). In a soccer context, time-motion analysis has contributed considerably to our understanding of the physical demands experienced by players in elite-level competition (Chmura et al., 2018; Aquino et al., 2018; Modric et al., 2019). Given that soccer is dominated by strategic factors, a large portion of the studies with time-motion analysis have reported the effects of positional and contextual factors (Paul et al., 2015) such as playing position (Redwood-Brown et al., 2018; Di Salvo et al., 2007), quality of opposition (Aquino et al., 2017), match location (Paraskevas et al., 2020), and match outcome

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(i.e., the final result of the match) (Aquino et al., 2017). Another situational variable that has received some attention from soccer professionals and specialists is the influence of the score-line state (also described as match status) on different aspects of match-related performance (Paul et al., 2015; Redwood-Brown et al., 2018).

The score-line can be viewed as a measure of performance accomplishment and hence, it may influence the player's physical effort and technical/tactical performance as a goal is conceded or scored throughout the match (O'donoghue & Tenga, 2001). There are two main approaches to investigate the effects of score-line in soccer. The first approach considers score-line in relation to the match status during the game (e.g. whether a team is winning, drawing, or losing) (O'donoghue & Tenga, 2001; Bloomfield et al., 2005; Lago-Peñas et al., 2010), while the second investigates the number of goals that have been scored by each team (e.g. 1-0, 2-0, 2-1, and so on) or goal difference (GD) (-2, -1, 0, +1, +2) (Redwood-Brown et al., 2018; Buchheit et al., 2018).

There have been controversial findings among studies regarding effects of score-line state on match running performance in soccer players, with some studies supporting that score-line affects running performance (Redwood-Brown et al., 2018; Buchheit et al., 2018) while other studies do not (Bloomfield et al., 2005; Redwood-Brown et al., 2012). Lago et al. (2010) reported no association between total distance (TD) and score-line during Spanish Premier League matches (2005-2006 season). In contrast, O'Donoghue and Robinson (2016) and Redwood-Brown et al. (2018) showed that players covered longer TD when drawing than when winning or losing during English Premier League matches (2011-2012 and 2013-2014 seasons). For low intensity activities, Lago et al. (2010) observed that for each minute drawing compared with losing, the distance covered walking and jogging (0 to 11 $km.h^{-1}$) and at low-speed running (11.1 to 14.0 $km.h^{-1}$) increased by 3.7 m and 1.7 m, respectively. For high intensity activities (HIA), O'Donoghue and Tenga (2001) observed that players performed significantly more HIA when drawing than when winning or losing. This finding is supported by Redwood-Brown et al. (2018) and Buchheit et al. (2018) who found an inverted "U" shaped association between HIA (> 14.4 $km{\cdot}h^{-1}$) and score-line state, with greater distances covered when goal difference was zero (i.e., drawing) and reduced distances covered when goal difference was either positive (i.e., winning: +1, +2) or negative (i.e., losing: -1, -2). Conversely, earlier studies did not show an effect of score-line state on the percentage of time spent at HIA (Bloomfield et al., 2005), distance covered at moderate-speed running (14.1 to 19.1 $km.h^{-1}$), distance covered at high-speed running (above 14.4 $km.h^{-1}$) (Lago-Peñas et al., 2010; Redwood-Brown et al., 2012), and sprinting actions (> 23.0 or 25.2 $km.h^{-1}$) (Lago-Peñas et al., 2010; Redwood-Brown et al., 2018; O'donoghue & Robinson, 2016) in elite professional soccer players.

A key positional variable to be considered along with score-line state is the playing position (Bloomfield et al., 2005; Redwood-Brown et al., 2018). Findings on the independent effect of playing position on match running performance are robust and well-documented in the soccer literature (Di Salvo et al., 2007; Paul et al., 2015). Nonetheless, the interactive effect between score-line and playing position on match running performance in soccer has not received much attention in the literature. Bloomfield et al. (2005) and Redwood-Brown et al. (2018) did not find any interaction effect between score-line and playing position. Redwood-Brown et al. (2012) and Lago-Peñas et al. (2021) reported that forwards and defenders displayed higher work-rate when their teams were winning and losing, respectively. Of interest, these previous studies (with the exception of Lago-Peñas et al. (2021)) are limited to 3 positional roles (defenders, midfielders, and forwards), while players serving tactical roles on the side regions of the pitch were not analyzed. To date, studies addressing the independent and interactive effects of score-line and playing position on match running performance in Brazilian soccer players are unknown. This is of practical relevance, as evidence suggests that different leagues in distinct countries exhibit unequal physical demands (Dellal et al., 2011). Therefore, data collected in England, Spain, and Asia cannot be generalized to other national league matches or other tournaments.

Given the importance of understanding how contextual factors can affect physical demand in soccer match-play from different leagues outside the European continent, the current study was designed to examine the interactive effect of score-line and playing position on match running performance in male professional soccer players during home matches in the main Brazilian national leagues. Unlike previous works, this study used the global positioning system (GPS) as a data collection device and applied a manual approach to data processing so that it was possible to make time cuts with greater precision in the different match status, which is extremely important since fluctuations in the players' activities may occur according to moments of win, draw, or lose.

Material & methods

Participants and Match Data

Match performance data were collected during 17 and 12 official matches of the first and second division of the Brazilian National League, respectively, during the 2017 season. The sample included 18 and 24 professional outfield soccer players who were playing for a single professional soccer team from each division in this respective season. The final league positions of the teams were 18^{th} and 12^{th} at the end of the season in the first and second division, respectively. We did not find any significant differences between the divisions for the match running performance outcomes. Thus, all match performance data were pooled, yielding a total sample composed of 42 outfield soccer players. A total of 193 individual match observations (average of 4.60

observations per player [minimum = 1; maximum = 16]) were made of outfield players (goalkeepers excluded). All players were classified into four positional roles: central defenders (n=10; 53 individual observations), full-backs (n=9; 42 individual observations), midfielders (n=14; 57 individual observations), and forwards (n=9; 41 individual observations). Players who did not play for the full match time (i.e., on the pitch for the whole 90 min) were excluded from the subsequent analyses. In addition, in order to minimize the known effects of the match location on running performance metrics (Aquino et al., 2017), only home matches were considered for this study. All players gave their written consent after a full explanation of the purpose of the study and the experimental design. This study was approved (number: 2.572.259) by the research ethics committee of the Federal University of Santa Catarina (CAAE: 46455015.3.0000.0121) according to resolution 466/2012 of the National Health Council for research with human beings.

Experimental Procedures

This is an observational study, with post-hoc analysis. Matches were divided into three episodes based on evolving match status. These episodes were classified as ‘‘winning’’, ‘‘drawing’’, or ‘‘losing’’ according to the score-line at the time: ahead, level, or behind, respectively. During a match, the maximum and minimum number of episodes observed was six and one (i.e., when the reference team analyzed in this study was drawing throughout the 90 min of the match), respectively. The total number of episodes for the 29 sampled matches was 77 [44 drawing, 17 winning, and 16 losing]. Of these 29 matches, the reference teams analyzed in this study won 3 and 6 matches, drew 9 and 2 matches, and lost 5 and 4 matches for the first and second division national league, respectively. The total relative time spent in a score-level state equal to +3, +2, +1, 0, -1, -2, and -3 during the sampled matches is illustrated in Figure I. Match running performance was measured by a global positioning system (GPS) during all matches. All running performance metrics for each of these match episodes were downloaded post-match to a computer and analyzed using a customized software package (Prozone kinetics 1.02.033, Leeds, England). The moments when goals were scored in each match were computed using the match reports available on the website of the Brazilian Football Confederation (CBF) to determine the score-level state of the reference teams in each of the episodes (i.e., whether drawing, winning, or losing).

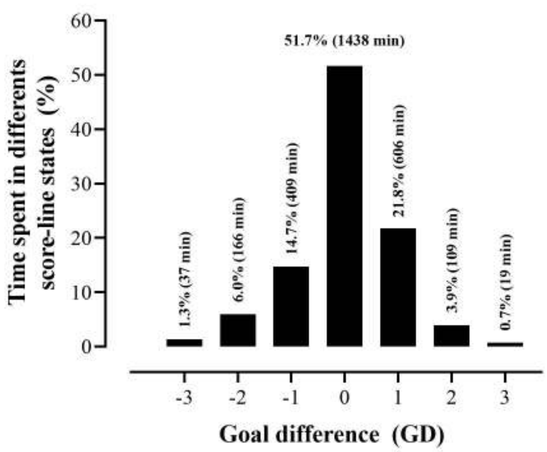

Figure I. Time spent (%) in different score-line states. Relative values (absolute values in minutes)

Match Running Performance

Player match performance was tracked using a GPS system with an operational sampling frequency of 10 Hz (K-Gps; K-Sport, Montelabbate, Italy). The reliability and validity of the GPS have been described in detail elsewhere (Castagna et al., 2019; Riboli et al., 2020). During the matches, all players wore the same GPS devices, inserted into a purpose-built backpack and positioned on the upper part of their back. Each device was turned on between 15-30 min before each match to allow acquisition of the satellite signal. All match data were initially analyzed using a customized software package (Prozone kinetics 1.02.033, Leeds, England) and then inserted into a custom-made Microsoft Excel spreadsheet designed to provide all measures of match running performance. The GPS outputs used for analysis in this study were as follows: total distance covered (TD), walking (speed from 0 to 6 $km.h^{-1}$); jogging (speed from 6.1 to 12 $km.h^{-1}$); low intensity running (LIR: speed from 12.1 to 15 $km.h^{-1}$); medium intensity running (MIR: speed from 15.1 to 19 $km.h^{-1}$); high intensity running (HIR: speed from 19.1 to 23 $km.h^{-1}$); sprint (SPR: speed > 23 $km.h^{-1}$); and high intensity activity (HIA: sum of MIR + HIR + sprint) (Di Salvo et al., 2007). All these variables were expressed as relative distance covered in one minute ($m.min^{-1}$). Furthermore, the number of sprints (NS > 23 $km.h^{-1}$) and absolute peak match speed (PMS) were retained for subsequent analyses.

Statistical Analysis

Data are presented as mean ± standard deviation. The Shapiro Wilk test was used to test the normality of the data. When the normality assumption was violated, a Box-Cox transformation was performed. To examine the independent and combined effects of score-line and playing position, repeated measures two-way ANOVA was performed for all running performance metrics, assuming score-line (drawing, winning, or losing) and playing position (central defender, full-back, midfielder, and forward) as fixed factors and participants as a random factor. Whenever a significant F-value was obtained, a post hoc test with a Tukey's adjustment was performed for multiple comparison. The effect size (ES) was calculated for all ANOVAs using partial eta-squared and classified as: > 0.01 (small), > 0.06 (moderate), and > 0.15 (large) (Cohen, 1988). In addition, effect sizes (Cohen's *d*) were calculated for all paired comparisons between score-line states and playing positions, and judged according to the following scale: ≤0.20 (trivial), >0.2 to 0.6 (small), >0.6 to 1.2 (moderate), >1.2 to 2.0 (large), >2.0 to 4.0 (very large) (Batterham & Hopkins, 2005). Statistical analysis was carried out using the R Commander i386 4.0.2 program and the significance level was set at $p < 0.05$.

Results

The distances covered in each running speed zone for the different score-line states and playing positions are shown in Table I. There was a significant main effect of score-line for TD ($\eta^2 = 0.07$, moderate), walking ($\eta^2 = 0.07$, moderate), jogging ($\eta^2 = 0.07$, moderate), LIR ($\eta^2 = 0.07$, moderate), MIR ($\eta^2 = 0.09$, moderate), HIR ($\eta^2 = 0.10$, moderate), and HIA ($\eta^2 = 0.11$, moderate) (Table I), with players accumulating less distances walking ($p = 0.01$; $d = 0.57$, small) and covering significantly greater TD ($p = 0.05$; $d = 0.46$, small), distances jogging ($p \leq 0.05$; $d = 0.53$ and 0.52, small), distances at LIR ($p = 0.03$; $d = 0.40$, small), MIR ($p = 0.01$; $d = 0.49$, small), HIR ($p = 0.03$; $d = 0.58$, small), and HIA ($p \leq 0.05$; $d = 0.45$ and 0.52, small) when drawing than when they were winning or losing, respectively.

There was also a significant main effect of playing position for all running performance variables ($\eta^2 = 0.19$ to 0.61, large) (Table I). Post-hoc analysis indicated that central defenders covered significantly lower TD compared to all other positions ($p \leq 0.01$; $d = 1.23$ to 2.43, large to very large), while midfielders covered significantly greater TD than full-backs ($p = 0.04$; $d = 0.58$, small). Central defenders also covered significantly longer distances walking ($p < 0.01$; $d = 1.40$ to 1.99, large) and shorter distances at LIR ($p < 0.01$; $d = -1.49$ to -2.70, large to very large), MIR ($p < 0.01$; $d = -1.91$ to -2.96, large to very large), HIR ($p < 0.01$; $d = -1.88$ to -2.56, large to very large), sprints (in terms of distance and number) ($p < 0.01$; $d = -0.96$ to -1.83, moderate to large), and HIA ($p < 0.01$; $d = -2.58$ to -3.20, very large) than all other playing positions. Midfielders covered significantly longer distances jogging ($p \leq 0.03$; $d = 0.67$ to 1.20, moderate to large) than central defenders and full-backs, and longer distances at LIR ($p < 0.01$; $d = 1.29$ to 2.70, large to very large) and MIR ($p < 0.01$; $d = 0.96$ to 2.91, moderate to very large) compared to all other playing positions. Finally, forwards and full-backs reached higher PMS than central defenders and midfielders ($p \leq 0.01$; $d = 0.86$ to 1.83, moderate to large).

Table I. Descriptive statistics (mean ± SD) for the match running performance variables according to the different score-line states and playing position. F and p-value for the main effects and interaction effects are also indicated (repeated measures two-way ANOVA outputs).

	Repeated Measures Two-Way ANOVA									
	Playing Position				Score-Line			Position Effect	Score-Line Effect	Interaction Effect
Running Variables	Central Defender	Full-Back	Midfielder	Forward	Drawing	Winning	Losing	F [p-value]	F [p-value]	F [p-value]
TD ($m.min^{-1}$)	81.57 ± 6.05[a]	93.69 ± 12.59[b]	99.99 ± 9.02[c]	95.13 ± 5.08[bc]	96.05 ± 10.51[+]	90.78 ± 12.12	91.52 ± 9.92	**24.71 [< 0.01]**	**3.98 [0.02]**	0.61 [0.72]
walking ($m.min^{-1}$)	30.31 ± 2.73[a]	26.42 ± 2.80[b]	24.81 ± 2.81[b]	26.47 ± 2.75[b]	26.02 ± 3.54[*]	26.96 ± 3.24	27.99 ± 3.41	**20.71 [< 0.01]**	**3.87 [0.02]**	0.29 [0.93]
jogging ($m.min^{-1}$)	31.98 ± 4.82[a]	34.48 ± 5.34[a]	38.04 ± 5.28[b]	35.80 ± 4.19[ab]	37.03 ± 5.57[#]	34.24 ± 4.92	34.18 ± 5.40	**7.91 [< 0.01]**	**3.95 [0.02]**	0.21 [0.97]
LIR ($m.min^{-1}$)	9.35 ± 2.11[a]	12.91 ± 2.63[b]	17.31 ± 3.60[c]	13.66 ± 1.75[b]	14.39 ± 3.86[+]	12.81 ± 3.98	13.60 ± 4.45	**48.62 [< 0.01]**	**3.57 [0.03]**	0.77 [0.59]
MIR ($m.min^{-1}$)	6.13 ± 1.36[a]	9.99 ± 2.51[b]	12.55 ± 2.81[c]	10.28 ± 1.44[b]	10.70 ± 3.45[+]	9.15 ± 2.91	9.81 ± 3.32	**51.55 [< 0.01]**	**4.92 [< 0.01]**	0.26 [0.95]

HIR ($m.min^{-1}$)	2.56 ± 0.79[a]	4.84 ± 1.52[b]	5.11 ± 1.73[b]	5.55 ± 1.45[b]	5.07 ± 2.08[*]	4.22 ± 1.63	4.03 ± 1.47	**24.77 [< 0.01]**	**5.32 [< 0.01]**	1.69 [0.13]
SPR ($m.min^{-1}$)	1.22 ± 0.73[a]	3.38 ± 1.66[b]	2.15 ± 1.16[c]	3.36 ± 1.48[b]	2.82 ± 1.81	2.36 ± 1.48	1.90 ± 0.83	**23.10 [< 0.01]**	2.11 [0.12]	**2.65 [0.02]**
HIA ($m.min^{-1}$)	9.92 ± 2.24[a]	18.22 ± 3.43[b]	19.82 ± 4.95[b]	19.19 ± 3.43[b]	18.60 ± 6.27[#]	15.97 ± 5.25	15.74 ± 4.69	**45.57 [< 0.01]**	**6.22 [< 0.01]**	1.01 [0.42]
NS (n)	3.09 ± 1.70[a]	7.61 ± 3.76[b]	5.44 ± 2.93[b]	7.89 ± 6.17[b]	6.26 ± 5.29	5.54 ± 3.60	5.57 ± 2.98	**11.09 [< 0.01]**	0.15 [0.85]	1.36 [0.23]
PMS ($km.h^{-1}$)	27.41 ± 2.32[a]	29.66 ± 1.97[b]	27.73 ± 2.25[a]	30.29 ± 2.43[b]	28.56 ± 2.08	28.63 ± 3.21	28.52 ± 2.22	**10.29 [< 0.01]**	0.01 [0.98]	1.70 [0.12]

TD: total distance; LIR: low intensity running; MIR: medium intensity running; HIR: high intensity running; SPR: sprint; HIA: high intensity activities; NS: number of sprints, PMS: peak match speed; Different letters (abc) indicate significant differences between positions; + significantly different from winning; * significantly different from losing; # significantly different from all other score-line states.

The statistical analysis revealed a significant score-line-by-playing position interaction effect for sprint distance ($\eta^2 = 0.14$, moderate), with forwards (3.86 ± 1.63 $m.min^{-1}$ vs. 1.95 ± 0.40 $m.min^{-1}$; $p = 0.04$; $d = 1.61$, large) and full-backs (4.33 ± 1.96 $m.min^{-1}$ vs. 2.26 ± 0.96 $m.min^{-1}$; $p = 0.02$; $d = 1.34$, large) covering greater sprint distance when they were drawing than when they were losing, respectively (Figure II). In addition, central defenders covered significantly lower sprint distances during drawing and winning conditions when compared to all other positions ($p \leq 0.04$ for all comparisons; d = -0.98 to -2.55, moderato to very large). It was also observed that full-backs when drawing (4.33 ± 1.96 $m.min^{-1}$ vs. 2.43 ± 1.12 $m.min^{-1}$; $p = 0.02$; $d = 1.19$, large) and forwards when winning (3.66 ± 1.27 $m.min^{-1}$ vs. 2.07 ± 1.33 $m.min^{-1}$; $p = 0.01$; $d = 1.22$, large) covered greater sprint distances than midfielders, respectively (Figure II). No other interaction effect was reported for the other running performance variables ($p > 0.05$).

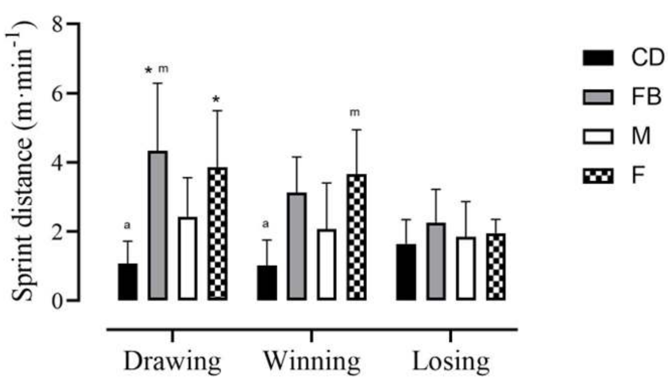

Figure II. Sprint distance for the different score-line state for each playing position. The values are presented in mean ± standard deviation. [*] Significantly different from losing; [m] significantly different from Midfielder; [a] significantly different from all other positions.

Dicussion

The current study investigated the independent and interactive effects of score-line and playing positions on match running performance in elite professional Brazilian soccer players. The main results were: i) in general, drawing status resulted in greater running outputs compared to winning or losing status; ii) central defenders presented lower distances covered at different speed zones than all other playing positions, with the exception of distances walking; iii) midfield players demonstrated the highest values of running demands, with the exception of PMS; iv) interaction effects showed that forwards and full-backs covered greater sprint distances when they were drawing compared to losing. Furthermore, central defenders covered lower sprint distances in the drawing and winning status than all other positional roles. Finally, full-backs in drawing status and forwards in winning status covered greater sprint distances than midfielders.

A myriad of previous studies have investigated match running performance in professional players (Hands & Jonge, 2020). In top division teams of national leagues, the average TD ranged from 10,274 meters (Australia) to 11,389 meters (Italy), including average high-speed distances (i.e., > 19.8 km·h^{-1}) from 559 meters (Poland) to 1,224 meters (Italy) (Hands & Jonge, 2020). In the elite level Brazilian context (e.g., First Division), few studies have reported these data (Augusto et al., 2021; Barros et al., 2007). In First Division Championship matches (editions 2001 to 2004), players covered an average TD of 10,012 meters, including an average high-speed distance (≥ 19 km·h^{-1}) of 1,128 meters (Barros et al., 2007). During the 2017 season of the same national division, the average TD was 9,623 meters, including an average high-speed distance (≥ 18.1 km·h^{-1}) of 1,033 meters (Augusto et al., 2021). In Second Division Brazilian Championships (editions 2019 and 2020), previous studies reported TD values ranging from 9,688 to 10,111 meters and distances in high-speed running (> 18.1 km·h^{-1}) from 920 to 1,020 meters (Aquino et al., 2021; Gonçalves et al., 2020). In this study, we verified values of TD per minute ranging from ~82 m·min^{-1} (central defenders) to ~100 m·min^{-1} (midfielders) and values of HIR+SPR (≥ 19.1 km·h^{-1}) ranging from ~4 m·min^{-1} (central defenders) to ~9 m·min^{-1} (forwards), demonstrating reduced running outputs compared to other national divisions around the world and previous editions of the First and Second Brazilian National Championship. Additional contextual factors (e.g., playing formation, physical fitness level, environmental conditions) and idiosyncrasies of each competition could explain, at least in part, these discrepancies between studies (Aquino et al., 2019; Krustrup et al., 2003; Mohr et al., 2012).

The running demands of each playing position are well-documented in the scientific literature. A previous systematic review with elite level national leagues showed that the lowest average TD was covered by central defenders (10,178 meters), while the greatest TD was covered by wide midfielders (11,654 meters) (Hands & Jonge, 2020). The distances covered in high-speed running varies according to the speed threshold defined by each study; however, the general trend was for central defenders to cover the least distance (621 meters > 19.8 km·h^{-1}), and wide midfielders to cover the greatest distance (1,216 meters > 19.8 km·h^{-1}). In our study, we also verified these responses. The position-specific profiles reported have benefits in the applied context, allowing insights into the positional requirements dependent on the player role (Bradley & Ade, 2018).

The score-line is an additional contextual factor that influences the match running performance in professional players (Lago-Peñas, 2012). The importance of this situational variable is reflected in changes in team and player strategies in response to the score-line (Bloomfield et al., 2005). Previous studies suggested that high-speed running increases when teams are losing a match compared to winning, in the hope of getting back into the match (Castellano et al., 2011; Lago-Peñas et al., 2010). For every minute losing, players covered an extra meter of high-speed running (> 19.1 km·h^{-1}) compared to when winning; and conversely, winning increased low-speed movements (Lago-Peñas et al., 2010). Our results (in agreement with Redwood-Brown et al., 2018 and Buchheit et al., 2018) showed that players covered greater distances in various speed zones when drawing than when winning or losing matches. This may be partially attributed to the fact that both teams when drawing are trying to make a difference in score-line, likely through transitional play (Buchheit et al., 2018). Furthermore, these findings suggest that players do not always use their maximal fitness capacity during the entire match (Trewin et al., 2017). In addition, few studies have investigated the interactive effects of playing position and score-line on match running performance. In the English FA Premier League, midfielders covered a longer distance at high speed running when drawing, defenders longer when losing, and attackers longer when winning (Redwood-Brown et al., 2012). Similar patterns were observed by Bradley and Noakes (2013) who found that central defenders performed 17% less and attackers 15% more high speed running during matches that were heavily won vs heavily lost (score differential ≥ 3 goals). In a large sample of elite soccer players in the Spanish La Liga (individual observations = 4,249; matches = 297), losing status increased the running outputs (e.g., TD, HIR, sprints) by defenders, while attacking players showed the opposite trend (Lago-Peñas et al., 2021). Our data demonstrated that forwards and full-backs covered ~100% more sprint distance in drawing vs. losing status (large effect size). Collectively, these findings support the idea that running demands (particularly sprint distance in this study) of playing positions should be examined according to the score-line. Additionally, coaches and practitioners should consider these contextual factors to interpret the match running outputs and to prepare their players for the most intense periods of match-play.

Our study presents some limitations. No control and/or assessment was carried out for other confounding match factors, such as quality of opposition, playing formation, effective playing time, and coaches' ideas (e.g., strategies when winning, drawing, and losing status). In addition, the technical and tactical skills were not investigated. Further studies should include this analysis. On the other hand, our study has some strengths. For example, to the best of our knowledge, this is the first study to investigate the independent and interactive effects of playing position and score-line in a Brazilian National Championship.

Conclusions

This study shows that the score-line affects the match running performance of outfield soccer players depending on their playing position. Forwards and full-backs covered greater sprint distances when they were drawing compared to losing. In addition, drawing status resulted in greater running outputs compared to winning or losing. The least running distances were covered by central defenders (except for walking), while the greatest distances were covered by midfielders (except for PMS). These findings may help coaches to better understand the influence of contextual factors on match running performance of Brazilian elite-level soccer players, as well as provide important information for individualizing additional training load for different positions.

Finally, future research should consider the position of the game and the score of the match to better understand the factors that influence the variation in physical demand during the game. However, more complex assessments are needed to understand how these contextual variables may also affect technical and tactical aspects.

Conflicts of interest No potential conflict of interest was reported by the author(s).

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