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Entry Status Matters: A Case Study on Running Performance Profiles of Starters and Substitutes in the Initial 15 Min of Professional Football Matches

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Abstract

This study investigated differences in running performance between starters and substitutes during their first 15 min of match play in professional football. The investigation was designed as a retrospective observational study. A time–motion analysis was conducted on one professional football team from the Swiss Challenge League during the 2023–2024 season. The first 15 min of players' match participation were analyzed and divided into three 5 min periods. Running performance variables included total distance covered (TDC), high-speed running (HSR; 19.8–25.2 km·h^{-1}), and sprint distance (>25.2 km·h^{-1}) using GPS technology. Statistical analyses were performed using paired *t*-tests and repeated-measures ANOVA with Bonferroni post hoc corrections. Starters covered significantly greater TDC than substitutes over the 15 min period (p = 0.002), driven by higher values in the 5–10 min and 10–15 min epochs (p = 0.01 and p < 0.001, respectively). No between-group differences were observed for HSR and sprint distance. Within-group analyses revealed a significant decline in TDC during the 10–15 min epoch compared with earlier intervals for both starters and substitutes (p < 0.001 and p = 0.02, respectively). Substitutes also exhibited a reduction in distance covered at HSR after the initial 0–5 min period (p = 0.02). Starters face higher TDC demands than substitutes in the opening 15 min, although HSR and sprint distance remain stable. The results indicate that starters covered greater TDC than substitutes during the first 15 min of play; however, no significant differences were found in HSR and sprint distance between the two conditions.

Keywords: football; soccer; running activity; performance; running performance; GPS technology; starter; substitute; first 15 min; pacing strategies

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1. Introduction

Football is a high-intensity intermittent team sport, characterized by multiple and unpredictable activities [1]. The importance of high-intensity actions in football is underscored by evidence demonstrating that a substantial majority of goals (83%) are preceded by actions such as straight-line sprints, change-of-direction sprints, jumps, or combinations of these [2]. These decisive actions, which frequently occur in critical moments of the match, can also lead to temporary fluctuations in players' external loads [3]. Recent experimental evidence further highlights the role of neuromuscular and balance-related abilities in supporting these high-intensity football actions. For example, previous authors demonstrated

that an integrative balance and plyometric training programme can significantly improve balance, ankle mobility, and jump performance in youth football players [4]. Beyond their direct influence on match outcomes, the prevalence and intensity of such efforts have been increasing over time, reflecting a broader trend in the physical evolution of the game. For instance, a longitudinal analysis of the English Premier League over seven consecutive seasons (2006–2013) revealed a ~30% increase in high-intensity running distance and a 50% rise in the frequency of high-intensity efforts [5]. This gradual progression in physical demands underscores the importance of high-intensity capacity, which is widely recognized as a key performance indicator in modern football [6].

With regard to the nature of physical demands in professional football, it has been demonstrated that football players generally display higher running performance during the first half, especially during the opening 15 min of play [6,7], compared with the second half [8]. Although thresholds vary depending on the article, in general, the last 15 min of each half are characterized by a notable decline in low-, moderate- and high-intensity running distances [9,10]. Dividing matches into 15 min intervals helps identify both gradual and acute declines in running metrics, which are not as easily detected when analyzing halves or full matches alone [11,12]. In addition, shorter intervals (5 min) help distinguish between temporary drops in performance after intense periods and the overall decline across the match [13,14]. These periods also allow for the assessment of contextual factors (e.g., substitutions, interruptions, tactical changes) on performance, clarifying that not all declines are due to physical fatigue alone [11]. Interestingly, several studies have demonstrated that football players tend to perform less high-intensity running during the early stages of the second half compared to the first half of a match [15,16]. Various hypotheses have been proposed to explain this phenomenon, including tactical adjustments, accumulated fatigue, the duration of halftime, environmental temperature, and insufficient physical preparation for the demands of the second half [12,17]. The literature has also reported a short-term drop in high-intensity performance following the most demanding periods of a match, with the distance covered at high intensity in the subsequent 5 min often falling below the average match values [13]. In addition to internal aspects of the game, such as those discussed above, players' behaviour and performance can also be influenced by external factors, including changes in the rules of the game [18].

One of the most significant regulatory changes in recent years occurred when, in response to the COVID-19 pandemic, the Fédération Internationale de Football Association (FIFA®) authorized an increase in the number of substitutions allowed per team, from the traditional three to five per match. Beyond substitutions made due to injuries, coaches and managers began to strategically use this new rule to optimize physical performance and/or adjust team tactics outcomes [19,20]. This regulatory modification has given rise to a new scenario centered on substitute players, which warrants further investigation. A recent study has demonstrated that this new substitution rule does not influence the physical performance of players who complete the entire match [21]. Another investigation reported that the total distance run and distance run between 14 and 21 $km \cdot h^{-1}$ by players involved in a substitution was greater than that by those who played the entire game [22]. Although both early and late substitutes exhibit superior performance metrics in the second half [23], they deliver the greatest relative physical and technical impact when introduced in the second half, especially between the 61st and 75th min [22]. Notably, substitutes generally fail to replicate the high-intensity running levels typically achieved during the first half by the same players when starting matches [19,24]. Moreover, several contextual and individual factors—including playing position [24] and match score-line [11,25]—have been shown to influence substitutes' physical performance.

From a practical perspective, this information is highly relevant for coaches, as it can guide substitution strategies, inform individualized conditioning plans, and optimize in-game load management. By identifying whether players display consistent physical responses across starting and substitute roles, practitioners can better tailor warm-up protocols and tactical decisions to maximize performance impact after substitutions.

Considering that this recent modification has increased the participation of substitute players during matches, it is essential to understand their running performance and how it relates to that of starting players. Moreover, in cases where a player's performances are compared when they play as a starter and when they play as a substitute, this approach is particularly valuable, as it eliminates the possibility that observed differences in performance between starting and substitute roles are due to comparisons between different players rather than to the role itself. Accordingly, this study aimed to achieve three main objectives: (1) to compare the running performance during the first 15 min of the match when the player starts as a substitute versus when starting in the initial line-up; (2) to analyse the running performance across the first three consecutive 5 min intervals under both conditions (as starters vs. as substitutes); (3) to evaluate the differences in running performance between these three 5 min periods, depending on whether the player started the match or entered as a substitute. Based on previous evidence it was hypothesized that players would cover shorter total and high-intensity running distances (HSR and sprinting) when entering as substitutes compared to when starting in the initial line-up.

2. Materials and Methods

2.1. Participants

Throughout the 2023–2024 season, a time–motion analysis was conducted during 28 official league matches involving a professional team competing in the Swiss Second Division (Swiss Challenge League). A total of 18 players were included in the study (age = 26 $\pm$ 4; height = 181 $\pm$ 6 cm, body mass = 75 $\pm$ 6.1 kg), all of whom played matches both as starters and as substitutes.

2.2. Experimental Design

Running performance was recorded from 215 Global Positioning System (GPS) data points, comprising data from starters (n = 133; match observations per player = 6.9 $\pm$ 4.6) and substitutes (n = 82; match observations per player = 4.7 $\pm$ 3.3). Specific exclusion criteria were applied to ensure data integrity: (I) Only outfield players were monitored, with goalkeepers excluded; (II) substitutes during the first half were not considered in the analysis; (III) players with less than 15 min of playing time were not included in the analysis; (IV) matches in which the team finished with fewer than 11 players were excluded from the dataset; and (V) matches with goal differences greater than two were omitted, with only closely contested matches (a difference of two goals or fewer, including draws) retained for analysis. Data used in this study were collected through daily monitoring as part of the team's training regimen throughout the competitive season and informed consent was obtained from all participants prior to their involvement. As such, ethical approval from a committee was deemed unnecessary [26]; however, the study was conducted in accordance with the principles of the Declaration of Helsinki (2013 revision). In compliance with national and international data protection and confidentiality regulations (e.g., EU GDPR 2016/679 Recital 26; Swiss HRA, Art. 2 para. 2; Spanish Law 14/2007 on Biomedical Research), all data were fully anonymized before analysis. As the dataset consisted solely of anonymized information obtained from regular team monitoring, formal ethical committee approval was not required.

Movement patterns were monitored using GPS tracking devices (GPEXE Pro2 units (18.8 Hz)). These devices have been previously validated and widely used in the scientific literature, demonstrating acceptable levels of reliability and validity (distances covered (typical error of estimate: 1.6–8.0%; coefficient of variation: 1.1–5.1%); sprint mechanical properties (typical error of estimate: 4.5–14.3%; coefficient of variation: 3.1–7.5%) [27]. GPS units for the starting players were activated by the staff prior to their entrance onto the field for the warm-up, whereas GPS units for the substitutes were switched on at the onset of their sideline warm-up. At the end of the match, the GPS units were switched off, and the data were subsequently analyzed by the staff. To ensure the consistency of the results, players consistently used the same GPS unit, thereby reducing inter-device variability. Players were categorized as starters or substitutes for the purpose of analyzing match-related running performance. Approximately 40 min prior to kickoff, the entire team participated in an on-field warm-up lasting around 25 min. This team-based warm-up was preceded by a self-managed preparatory phase carried out individually by each player in the gym. Only the starting players completed the entire warm-up protocol, whereas substitutes, after performing two 40 m accelerations, either engaged in technical drills or assisted the starters. Upon completion of the warm-up, players returned to the changing room for final preparations. No reactivation exercises were performed upon re-entering the field prior to kick-off. The substitutes' warm-up protocol consistently began in the 50th min of the second half in the designated sideline corridor, as permitted by competition regulations. The duration of the substitutes' warm-up varied depending on when the player was called to enter the match. The cyclic structure of the substitutes' warm-up was designed to accommodate the unpredictability of substitution timing. Both warm-up protocols shared a common initial phase consisting of mobility and drill exercises. However, due to spatial and temporal constraints, their structure diverged thereafter. Some elements, such as 20 m sprints, were present in both protocols. Throughout both warm-up procedures, staff members actively assisted the players, providing motivation and ensuring correct execution of all exercises. Following the methodology of previous studies [9,28], the running performance from the first 15 min of play was monitored for the same players both when starting the match and when entering as substitutes, allowing performance comparisons between these two match-entry statuses. For starters, this corresponded to the period from the referee's kick-off to the 15th min of the match. For substitutes, monitoring of their movement patterns began at the moment the player entered the field and was only considered if he played for at least 15 min (for example, if a player was introduced in the 72nd min, the load was quantified from min 72 to 87). However, if a player entered in the 88th min and the match ended at the 95th min, his appearance was not considered, since he did not accumulate at least 15 min of play even when accounting for extra time). Substitutes entered the match at an average of 65 $\pm$ 10 min. In addition, and consistent with other studies, this 15 min window was further divided into three 5 min segments (0–5 min, 5–10 min, and 10–15 min), and the running performance of substitute and starting players was analysed during these periods [19,29,30]. Finally, the values obtained for each 5 min segment were compared with one another, differentiating between starters and substitutes. The following running performance variables were collected during these periods: total distance covered (TDC), high-speed running (HSR) distance covered at speeds between 19.8 and 25.2 km·h^{-1}, and sprint distance covered above 25.2 km·h^{-1}.

2.3. Statistical Analysis

The data are presented as means $\pm$ standard deviations (SD). The Shapiro–Wilk test was applied to assess normality. Differences within groups between conditions (starters vs. substitutes) were analyzed using Student's paired *t*-test. To compare the running

performance across three consecutive 5 min periods within groups, normally distributed data were analyzed using a one-way repeated-measures ANOVA. When significant effects were detected, Bonferroni post hoc tests were conducted to identify pairwise differences. The significance level was set at $p < 0.05$. All statistical tests were performed using the Statistical Package for Social Sciences (SPSS V22.0, Inc., Chicago, IL, USA). The effect size (Cohen's *d*) was calculated, with thresholds classified as trivial (0.00–0.19), small (0.20–0.59), moderate (0.60–1.19), large (1.20–1.99), and very large (≥2.00).

3. Results

3.1. Comparison of the Different Periods When Participating as Starters vs. as Substitutes

The comparison of the first 15 min of play between starters and substitutes is presented in Table 1 and Figure 1. TDC was significantly greater when players started the match compared to when they entered as substitutes ($p = 0.002$). No significant differences were observed for HSR or sprint distance between groups.

Table 1. Comparison of the different periods when participating as starters vs. as substitutes.

Running Performance	Period (min)	Starters (m)	Substitutes (m)	*p* Value	d
TDC	0–15	1851.3 ± 138.9	1728.1 ± 126.9	0.00	−0.84
	0–5	631.1 ± 52.1	598.7 ± 56.1	0.08	−0.59
	5–10	633.8 ± 50.2	578.9 ± 55.9	0.01	−1.04
	10–15	589.6 ± 44.1	551.4 ± 64.3	0.00	−0.83
HSR	0–15	116.8 ± 28.9	127.5 ± 35.1	0.12	0.35
	0–5	41.1 ± 12.5	52.5 ± 22	0.07	0.87
	5–10	40.5 ± 10.2	36.9 ± 10.5	0.19	−0.33
	10–15	35.2 ± 11.4	38.1 ± 16.2	0.47	0.25
Sprint Distance	0–15	28.9 ± 14	28.3 ± 18.4	0.91	0.04
	0–5	8.6 ± 6.3	11.7 ± 8.5	0.19	0.48
	5–10	10.7 ± 8.3	9.1 ± 8.8	0.52	−0.18
	10–15	9.8 ± 5.3	8.2 ± 6.7	0.36	−0.27

All data are expressed as mean ± standard deviation; d = Cohen's effect size; m = meters; TDC = total distance covered; HSR = distance covered between 19.8 and 25.2 km·h^{-1}; sprint distance = distance covered above 25.2 km·h^{-1}.

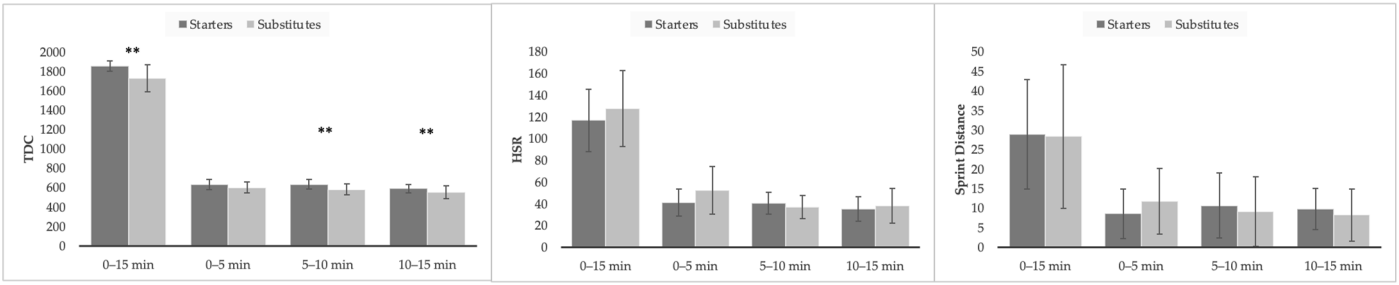


Figure 1. Comparison of the different periods when participating as starters vs. as substitutes. TDC = total distance covered; HSR = distance covered between 19.8 and 25.2 km·h^{-1}; sprint distance = distance covered above 25.2 km·h^{-1}. ** $p \leq 0.01$.

3.2. Comparison of the Different Periods When Participating as Starters vs. as Substitutes

The comparison of the first three 5 min periods between starters and substitutes is presented in Table 1 and Figure 1. TDC showed no differences between groups during the 0–5 min period, whereas during the 5–10 min and 10–15 min periods TDC was significantly greater for starters compared to substitutes ($p = 0.01$ and $p < 0.001$, respectively). No statistical differences were observed for HSR or sprint distance across any of the 5 min periods between starters and substitutes.

3.3. Formatting Comparison of Progression Across Three 5-Min Periods in Starters and Substitutes

The comparison of the running performance across three consecutive 5 min periods for starters is presented in Table 2 and Figure 2. TDC was significantly higher during the 0–5 and 5–10 min periods compared to the 10–15 min period ($p < 0.001$). No statistical differences were observed for HSR or sprint distance across the three periods.

Table 2. Comparison of progression across three 5 min periods in starters and substitutes.

	Running Performance	0–5 (min)	5–10 (min)	10–15 (min)	0–5 vs. 5–10 (min)		0–5 vs. 10–15 (min)		5–10 vs. 10–15 (min)	
					p Value	d	*p* Value	d	*p* Value	d
Starters	TDC	631.1 ± 52.1	633.8 ± 50.2	589.6 ± 44.1	0.74	0.05	0.00	−0.76	0.00	−0.81
	HSR	41.1 ± 12.5	40.5 ± 10.2	35.2 ± 11.4	0.80	−0.05	0.12	−0.45	0.09	−0.40
	Sprint Distance	8.6 ± 6.3	10.7 ± 8.3	9.75 ± 5.3	0.30	0.32	0.58	0.18	0.67	−0.14
Substitutes	TDC	598.6 ± 56.1	578.94 ± 55.9	551.2 ± 64.3	0.24	−0.33	0.02	−0.80	0.13	−0.47
	HSR	52.5 ± 22	36.9 ± 10.5	38.1 ± 16.2	0.02	−0.67	0.02	−0.62	0.74	0.05
	Sprint Distance	11.7 ± 8.5	9.1 ± 8.8	8.2 ± 6.7	0.28	−0.30	0.1	−0.39	0.67	−0.10

All data are expressed as mean ± standard deviation; d = Cohen's effect size; TDC = total distance covered (meters); HSR = distance covered between 19.8 and 25.2 km·h^{-1} (meters); sprint distance = distance covered above 25.2 km·h^{-1} (meters).

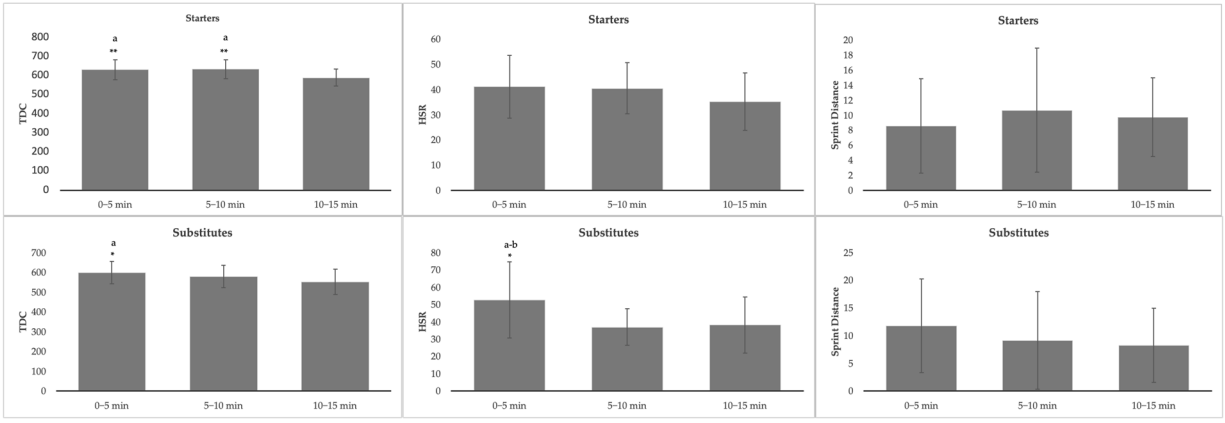


Figure 2. Comparison of 5-Min periods within starters and within substitutes. TDC = total distance covered (meters); HSR = distance covered between 19.8 and 25.2 km·h^{-1}; sprint distance = distance covered above 25.2 km·h^{-1}. a = different from 10–15 period; b = different from 5–10 period. * $p < 0.05$; ** $p \leq 0.01$.

The comparison of the running performance across three consecutive 5 min periods for substitutes is presented in Table 2 and Figure 2. TDC significantly decreased during the 10–15 min period compared to the 0–5 min period ($p = 0.02$), with no statistical differences between the 0–5 and 5–10 min periods or between the 5–10 and 10–15 min periods. HSR showed a significant reduction during the 5–10 min and 10–15 min periods compared to the 0–5 min period ($p = 0.02$), while no differences between periods were observed at sprint distance.

4. Discussion

This study compared the running performance of the same professional football players during their first 15 min of play when starting or entering as substitutes. The results partially supported our hypothesis, as starters covered greater TDC than substitutes during the first 15 min of play; however, no significant differences were found in HSR and sprint distance between the two conditions. The main findings indicated that (i) starters covered a greater TDC than substitutes during the first 15 min, mainly because their distance covered

was significantly higher during the 5–10 and 10–15 min periods without differences in HSR or sprint distance; (ii) TDC decreased significantly during the 10–15 min period compared with earlier periods (for starters, relative to both the 0–5 min and 5–10 min periods, and for substitutes, relative to the 0–5 min period); (iii) substitutes showed a significant reduction in HSR during the 5–10 min and 10–15 min periods compared to the 0–5 min period.

One of the main novelties of this study was that it conducted a direct within-player comparison, thereby eliminating inter-individual variability and providing insight into how match status (starter vs. substitute) influences initial physical performance. This aspect is particularly relevant, as such a comparison allows for the assertion that the differences observed between starting and substitute players were not due to comparisons between different individuals. The players analyzed in this study reported that being selected as starters entailed a greater overall running demand in the first 15 min of play compared with when they entered as substitutes; however, their ability to perform running at speeds exceeding 19.8 km·h^{-1} appeared consistent across both match-entry statuses. The difference in TDC may be partly explained by variations in effective playing time (actual time when the ball is in play, excluding all stoppages) [11,31] and contextual tactical demands [32,33]. The literature has demonstrated that effective playing time is one of the most influential variables in the running demands of football players [11,34] and therefore differences in effective playing time between the two periods could justify these differences, although unfortunately this aspect was not controlled in the present study. They also align with previous reports indicating that substitutes exhibited similar TDC and distance covered above 19.8 km·h^{-1} to their own performance during the equivalent period of the first half, while differences were found when compared with the same period in the second half [19]. Collectively, the findings indicate that the differences observed between starters and substitutes may reflect tactical and contextual factors, as reported by other authors [35], rather than being solely explained by fatigue. Similarly, our results align with previous research that observed midfielders' work rate and high-intensity running during their first 10 min as substitutes were comparable to their performance during the initial 10 min when starting matches, although such a response was not observed in forwards [24]. Unfortunately, the present study did not differentiate running performance by playing position, which prevented the determination of whether both studies might have reported similar results across different positions. Although previous studies have reported differences in the running performance of substitutes compared with starters, these findings largely stem from comparisons with the players they replaced or with those who remained on the field, rather than comparing equivalent time periods [6,24,36].

When examining the initial three 5 min periods of match play, no differences between starters and substitutes were observed in the first 0–5 min period; however, it was noted that starters accumulated more TDC during the 5–10 and 10–15 min periods than the same players did when entering as substitutes. These findings are consistent with previous research reporting that substitutes generally achieve lower peak total distances (greatest distance covered during the most demanding rolling time windows) than starters [14]. These results may reflect the substitutes' awareness of their limited playing time, which could lead them to adopt a more regulated pacing strategy aimed at maximizing their impact on the game. Interestingly, although the first 15 min of a match are considered the most demanding in terms of high-speed running [6,37] and it has been suggested that players are capable of performing more when introduced as substitutes compared with the equivalent period in those completing a full 90 min [13,24,38], our results did not reveal differences between substitutes and starters in variables related to distance covered above 19.8 km·h^{-1}. In our sample, this lack of difference may be partly explained by contextual factors. Match outcome, teams that are trailing may increase high-intensity

efforts to recover the score, while teams in the lead may adopt more conservative strategies, and specific phases of play, transitions from defense to attack often require short bursts of high-intensity running, can influence tactical demands and, consequently, the running performance required of the players [12,30]. In addition, performance during match play is strongly influenced by match momentum, including factors such as opposition quality and ball interaction [8], as well as by the player's tactical role and individual physical capacity [6]. As the same players were examined both as starters and substitutes, their physical profile remained consistent, which is relevant given that player characteristics are recognized as a key determinant of performance in soccer [39,40].

The comparison of the running performance across three consecutive 5 min periods for starters revealed that total distance was higher in the 0–5 and 5–10 min periods than in the 10–15 min period. Previous studies have reported decreases in total distance and distance covered above 19.8 km·h^{-1} as matches progress [8,15], as well as a reduction in player performance following a 5 min period of high-intensity activity during match play [6,38], with these declines primarily attributed to fatigue mechanisms. Our findings indicate that starters' distance covered above 19.8 km·h^{-1} during the first 15 min remained stable over time. Thus, despite a variation in total distance, the distance covered above 19.8 km·h^{-1} remains unchanged over time. These results suggest that, on average, players maintained their high-intensity efforts in the early phase, although individual pacing strategies may still be employed due to the unpredictable duration and type of actions during match-play [41].

Among substitutes, this TDC difference was only found between the 0–5 and 10–15 min periods. Observed reductions in TDC following the first 5 min of match-play by substitutes appear to contrast with earlier findings that reported a progressive increase in TDC and HSR among English Premier League substitutes as the match progressed [19]. The observed differences may be attributable to the methodological approach; Bradley et al. (2014) analyzed physical performance using 5 min epochs aligned with the match kick-off [19], rather than relative to the exact time of player introduction, as applied in our study. In contrast, our findings partially align with those of Hills et al. (2020), who reported a decrease TDC in subsequent match epochs and a decline in HSR between their 0–5 min period of participation and the subsequent two 5 min periods (5–10 and 10–15 min periods) [20]. However, this reduction was not consistently observed across all time intervals in our analysis. The difference in the behavior of starters and substitutes in this variable could be explained by the fact that, while starting players may adopt a 'slow-positive' pacing strategy, conserving energy to mitigate performance declines over the full 90 min duration, substitute players, due to their shorter playing time and motivation to influence match outcomes, are more likely to adopt an 'all-out' approach, which cannot be sustained over time and results in a decline after the first 5 min of action [7].

The present study did not aim to examine the effects of warm-up routines; however, it is important to acknowledge that the substantial differences in duration, intensity, and timing between starters' and substitutes' warm-ups may have influenced players' physiological readiness and subsequent performance upon match entry. Starting players typically complete structured warm-up protocols [20], whereas substitutes face variable and often prolonged periods of inactivity before entering play [19,29]. Therefore, while this aspect was not analyzed in depth in the present study to maintain focus on running performance comparisons, it has been acknowledged as a potential confounding factor.

Although this study provides novel insights into the comparison of running performance profiles between professional soccer players entering matches as starters or substitutes, several limitations should be acknowledged. Substitutes entering late in matches may face different contextual and tactical demands than those entering earlier in the game,

as they must perform alongside fatigued teammates and against opponents who have accumulated match load, which may influence running and tactical performance. Data were collected from a single professional team, whose unique player profile, tactical philosophy, and league level limit the generalizability of the findings. Future research should adopt multi-team and multi-league designs with larger sample sizes. Individualized or relative speed thresholds were not used, and number of accelerations, number of decelerations, and number of sprints were not analyzed, which may limit the sensitivity of the analysis. In addition, only external load measures were analyzed, while internal indicators such as heart rate or perceived exertion were not included. Incorporating these metrics could help clarify whether observed running differences result from physiological fatigue, tactical instructions, or psychological factors and provide a more detailed understanding of player performance. The absence of effective playing time can substantially influence running metrics, and potential differences between starters and substitutes may affect the interpretation of total running distance. Future studies should include effective playing time to provide a more accurate assessment of player performance. Finally, due to the small sample size, all playing positions were pooled together in the analysis without differentiating between positional roles. For this reason, future studies should examine positional effects to provide a more precise understanding of the match behaviors of substitutes and starters.

5. Conclusions

This study compared the running performance of professional football players during their first 15 min as starters or substitutes. The results of this study indicate that starters covered greater TDC than substitutes during the first 15 min of play, primarily due to higher distances recorded in the 5–10 and 10–15 min periods. However, no significant differences were found between conditions in HSR or sprint distance. A progressive decline in total distance was observed across the 15 min period for both starters and substitutes, with the greatest reductions occurring in the final 5 min interval. In addition, substitutes exhibited a significant decrease in HSR between the initial 0–5 min interval and the subsequent 5–10 and 10–15 min periods.

From an applied perspective, the present findings suggest that starters and substitutes exhibit similar behavioral patterns during the early phases of their match participation. Coaches should therefore recognize that substitutes may not necessarily exceed the initial intensity levels they display when starting a match. Consequently, substitution decisions should be primarily guided by tactical requirements and match context, rather than by the assumption that fresh players will automatically enhance the team's physical output. Their first 15 min generally replicate match-start intensity levels, and players do not necessarily produce greater amounts of high-speed running during their first 15 min on the pitch than they do when beginning the match as starters. To maximize performance impact, individualized pre-entry activation protocols that help maintain muscle temperature and neuromuscular readiness are recommended. Moreover, monitoring the early-match physical responses of substitutes can support more informed rotation strategies and contribute to sustaining overall team intensity throughout the game.

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