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The effect of contextual factors on ınternal and external load in professional football players: a microcycle analysis

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Summary. Background. Contextual factors such as match location, opponent quality, and match outcome are known to influence performance in professional football. However, limited evidence exists regarding their impact on both internal and external load within a microcycle. **Methods.** Twenty-two professional players (age 26.45 ± 3.35 years) were monitored over 15 competitive weeks. External load was measured using 10 Hz GPS devices, including total distance, high-speed running distance and sprint distance and number of sprints (≥25.2 km·h^{-1}), accelerations/decelerations and zonal distances Internal load was assessed via session-RPE. Repeated-measures ANOVA and paired t-tests were used to examine the effects of contextual factors. **Results.** Training loads were significantly higher before matches against medium-level opponents in terms of high-speed running distance ($p<0.01$) and number ($p=0.006$). Match performance did not differ significantly across opponent quality. Away matches imposed greater external load than home matches, with higher high-speed running ($p=0.016$), number of high-speed runs ($p=0.006$), and decelerations ($p=0.042$). In training, the number of sprints was significantly higher in weeks that ended in a draw ($p<0.003$). Zonal analysis showed significant differences in zone-3 distances while zone-1 and 2 were unaffected. **Conclusıons.** Contextual factors, particularly match location and opponent quality, significantly shape weekly training and match demands in professional football. Coaches should adjust training loads and recovery strategies in anticipation of increased demands in away matches and matches against medium-level opponents.

Key words. Football, contextual factors, training load, GPS, microcycle.

L'influenza dei fattori contestuali sul carico interno ed esterno nei calciatori professionisti: un'analisi dei microcicli

Riassunto. Background. È noto che fattori contestuali quali la sede della partita, la qualità dell'avversario e l'esito della partita influenzano le prestazioni nel calcio professionistico. Tuttavia, esistono prove limitate riguardo al loro impatto sul carico sia interno che esterno all'interno di un microciclo. **Metodi.** Ventidue calciatori professionisti (età 26,45 ± 3,35 anni) sono stati monitorati per 15 settimane di competizione. Il carico esterno è stato misurato utilizzando dispositivi GPS a 10 Hz, includendo la distanza totale, la distanza percorsa ad alta velocità e il numero di sprint (≥25,2 km·h^{-1}), le accelerazioni/decelerazioni e le distanze zonali. Il carico interno è stato valutato tramite RPE di sessione. Sono state utilizzate l'ANOVA a misure ripetute e i test t appaiati per esaminare gli effetti dei fattori contestuali. **Risultati.** I carichi di allenamento erano significativamente più elevati prima delle partite contro avversari di livello medio in termini di distanza percorsa ad alta velocità ($p<0,01$) e numero di sprint ($p=0,006$). Le prestazioni in partita non differivano in modo significativo a seconda della qualità dell'avversario. Le partite in trasferta hanno imposto un carico esterno maggiore rispetto alle partite in casa, con una corsa ad alta velocità più elevata ($p=0,016$), un numero maggiore di corse ad alta velocità ($p=0,006$) e decelerazioni ($p=0,042$). In allenamento, il numero di sprint era significativamente più alto nelle settimane che si sono concluse con un pareggio ($p<0,003$). L'analisi zonale ha mostrato differenze significative nelle distanze della zona 3, mentre le zone 1 e 2 non sono state influenzate. **Conclusioni.** I fattori contestuali, in particolare la sede della partita e la qualità dell'avversario, influenzano in modo significativo le esigenze settimanali di allenamento e di partita nel calcio professionistico. Gli allenatori dovrebbero adeguare i carichi di allenamento e le strategie di recupero in previsione di un aumento delle esigenze nelle partite in trasferta e nelle partite contro avversari di livello medio.

Parole chiave. Calcio, fattori contestuali, carico di allenamento, GPS, microciclo.

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Introduction

Football has become one of the most physically and technically demanding sports in the modern era. Over the past decade, studies have demonstrated that elite-level football is characterized by repeated high-intensity actions such as sprints, frequent accelerations and decelerations, and sudden changes of direction[1-5].These demands make it essential to monitor and manage training and match loads in a systematic and scientific manner.

Objective data play a critical role in performance monitoring and load management in football. By analyzing training microcycles across different playing positions, coaches and sport scientists aim to optimize performance while reducing injury risk[6,7]. In addition to physical requirements, contextual factors such as match location (home or away), opponent quality, match outcome, fixture congestion, league standing, and environmental conditions have been shown to significantly influence player performance[8-11].

Research examining the effects of contextual factors has reported that players cover greater distances and perform more high-speed activities in away matches, while home matches are often associated with psychological advantages and more favorable performance outcomes[1-15]. For example, a study demonstrated that contextual variables had a significant impact on match running performance in a Portuguese professional football team[16]. These findings suggest that contextual factors influence not only match-day performance but also training load distribution across the microcycle.

Training load is generally classified into two dimensions: external load, quantified by GPS-based measures of physical activity such as total distance, speed zones, sprints, accelerations, and decelerations; and internal load, reflecting the physiological and psychophysiological responses to external demands, such as heart rate, blood lactate, and ratings of perceived exertion[17-20]. Understanding how internal and external loads fluctuate according to contextual factors is crucial for sustaining performance and optimizing recovery strategies.

Previous research has mainly focused on global parameters such as total distance, high-speed running, sprint counts, and acceleration-deceleration events[21,22]. However, detailed assessments of running performance across specific speed zones (e.g., zone-1: 0–7.2 km·h^{-1}, zone-2: 7.2–14.4 km·h^{-1}, zone-3: 14.4–19.8 km·h^{-1}) in relation to contextual factors remain scarce. This gap is particularly evident in developing football leagues, such as the Azerbaijan League, where scientific evidence is still limited[23].

Therefore, the purpose of the present study was to examine the effects of match location, opponent quality, and match outcome on internal and external loads across a 15-week microcycle in professional football players from the Azerbaijan League. By addressing this gap in the literature, the study aims to provide practical insights for coaches and sport scientists, emphasizing the need to incorporate contextual factors into microcycle planning (figure 1).

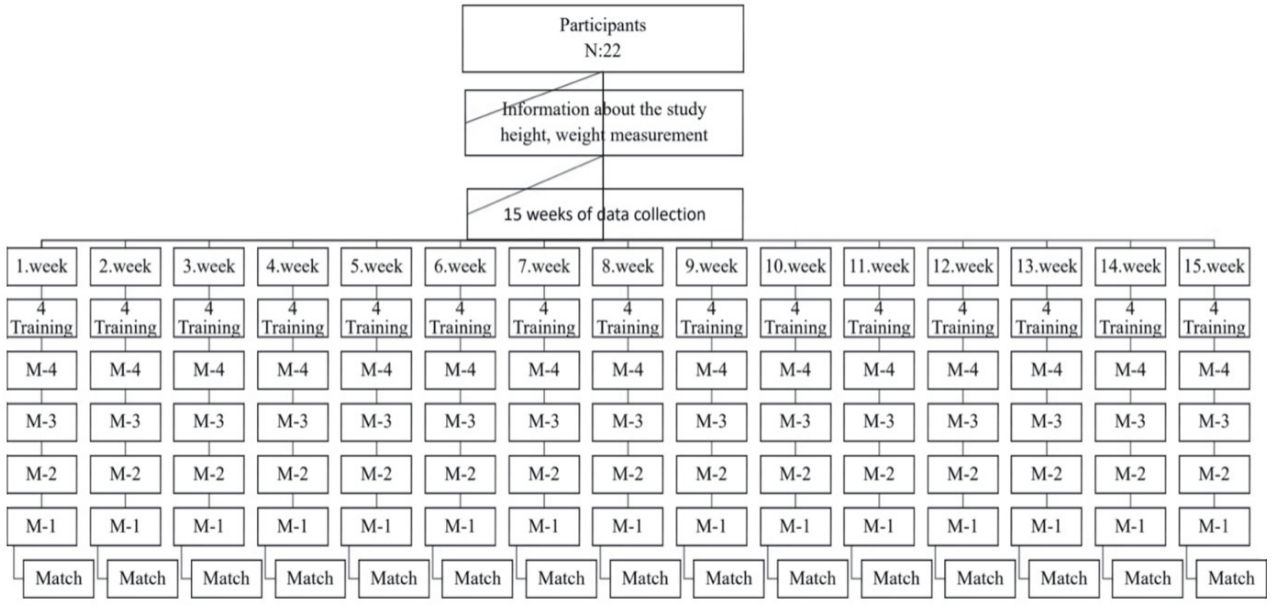

Figure 1. Study Flow Chart.

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Materials and methods

Participants

A convenience sample was obtained from twenty-two professional male soccer players (age: 26.45±3.35 years; height: 180.4±5.89 cm; body mass: 72.54±5.48 kg; belonged to same soccer team of the Azerbaijan League. Goalkeepers were not included in the study. Matches in the second half of the league, in weeks that included 4 days of training and 1 match per week, were included in the study. The week that included the three days of 1 match per week was not included in the study. Training hours and match hours were different. The sample size was estimated using the F test category in G Power 3.1.9.7 software [power (1-β) = 0.75, effect size (V) = 0.75, type-1 error (β) = 0.05. It was approved by the Medicine Medical Research Ethics Committee [no: 23-7T/51) that the research structure was in compliance with the 'Declaration of Helsinki on Ethical Principles in Medical Research on Humans'. Each participant was informed about the research structure and possible risks, and written and signed consents were obtained from the participants through the "Informed Form".

Study design and procedure

The study was conducted during the 2022–2023 competitive season. Data collection was carried out in the second half of the season over a 15-week microcycle, including 4 training sessions and 1 official match per week, resulting in a total of 15 matches and 60 training sessions. The study was performed with a professional football team competing in the Azerbaijan League. Data were collected under the supervision of experienced physical preparation staff. Eligible participants were licensed professional players of the club, attending all four training sessions and one match per week, and free from any medical condition. Players who sustained injuries, played less than 70 minutes, or had GPS recording errors during training or matches were excluded.

Before the study, familiarization sessions were conducted to instruct players on the use of GPS units and the measurement of perceived exertion. Session-RPE (CR-10 scale) was recorded 30 minutes after the end of each training and match by asking the players individually, "How intense was the training/match?" to avoid peer influence. Session-RPE was calculated separately for training and matches as an indicator of internal load[24-26].

External load was measured using wearable micro-technology devices (OhCoach Cell B, Fitogether, 10 Hz GPS, South Korea). The units were placed in a custom vest positioned between the players' scapulae before each training and match[16,20,27]. To ensure optimal satellite reception, GPS devices were activated 30 minutes before all sessions.

Performance data from training and matches were recorded for all outfield players; goalkeepers were excluded[16,28]. In total, 15 weeks of training and match data were collected and analyzed. Each microcycle consisted of one match day (MD) and four training sessions on MD-4, MD-3, MD-2, and MD-1, respectively. The dataset comprised observations collected over a total of 15 competitive microcycles, with each cycle encompassing a period of four days, commencing four days prior to the designated match day[18,29]. Weeks that did not include four training sessions prior to a match day were excluded, as they did not meet the minimum criteria for training load evaluation.

All training and matches were preceded by a standardized 15-25 minute warm-up[18,29]. To ensure reliability and validity, only data from players who completed the full training sessions and played at least 70 minutes in matches were included[17,29]. Players were already familiar with the use of GPS technology and the experimental procedures.

Only matches played during weeks with four training sessions and one match were analyzed. Weeks including three or fewer training sessions were excluded. Training and match schedules varied across the season. This study was designed as a quantitative and experimental investigation aimed at examining the effects of contextual factors (match location, opponent quality, and match outcome) on internal and external loads in professional football players.

Measures

All external load variables were measured using GPS technology (Fitogether – OhCoach Cell B, 10 Hz). Based on thresholds adapted from previous studies, eleven locomotor categories were recorded during training sessions and matches: total distance (m), maximum speed ($km \cdot h^{-1}$), high-speed running distance (m; ≥19.8–25.2 $km \cdot h^{-1}$), number of high-speed runs (≥19.8–25.2 $km \cdot h^{-1}$), sprint distance (m; ≥25.2 $km \cdot h^{-1}$), number of sprints (≥25.2 $km \cdot h^{-1}$), number of accelerations (≥3 $m \cdot s^{-2}$), number of decelerations (≥3 $m \cdot s^{-2}$), zone-1 distance (0–7.2 $km \cdot h^{-1}$), zone-2 distance (7.2–14.4 $km \cdot h^{-1}$), and zone-3 distance (14.4–19.8 $km \cdot h^{-1}$)[11,18].

To ensure accurate satellite reception, all GPS units were activated 30 minutes prior to training sessions and matches. Following data collection, values were uploaded and processed via the OhCoach digital platform.

Internal load was assessed daily using the CR-10 Borg scale. Players were familiarized with the concept of session-RPE before the study. Thirty minutes after each training session and match, players were

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individually asked: *"How intense was the training/match?"* to avoid peer influence. Responses were rated on a 1–10 scale and recorded in an Excel database[24-26].

In line with existing literature, contextual factors were categorized into three independent variables: (i) match location (home vs. away), (ii) opponent quality, classified according to league standings as high-level (1st–4th place), medium-level (5th–8th place), and low-level (9th–10th place)[30,31] and (iii) match outcome (win, draw, or loss)[28,32,33]. No neutral-site games were included in the analysis.

Statistical Analyses

Data were expressed as mean ± standard deviation. The normality of the data distribution was assessed using the Shapiro-Wilk test. As all dependent variables exhibited a normal distribution ($p \geq 0.05$), it was deemed appropriate to utilise parametric statistical tests. Comparisons across opponent quality (high, medium, low) and match outcomes (win, draw, loss) were analyzed using repeated-measures ANOVA. Homogeneity of variances was also confirmed using Mauchly's test of sphericity. When significant main effects were detected, Bonferroni post hoc tests were applied to identify . A comparative analysis was conducted across three distinct categories of opponent quality (high, medium, low) and match outcomes (win, draw, loss). This analysis was facilitated by the implementation of a repeated-measures ANOVA statistical approach. The homogeneity of variances was confirmed using Mauchly's test of sphericity. In instances where a significant main effect was identified, the subsequent analysis involved the implementation of Bonferroni post hoc tests to facilitate the identification of specific differences.

Results

This study analyzed the effects of contextual factors (match location, opponent quality, and match outcome) on internal and external loads in professional football players. The findings demonstrated that contextual factors had significant effects on specific load parameters, as detailed below. Descriptive data are presented in table 1.

When comparing high-level (HL), medium-level (ML), and low-level (LL) opponents in matches, repeated-measures ANOVA revealed no significant differences in total distance (TD), high-speed running distance/number (HSRD/HSRN), sprint distance (SD), accelerations (ACCN), decelerations (DECN), or rate of perceived exertion (RPE) ($p > 0.05$).

In contrast, training performance differed according to opponent quality (table 2). Significant differences were observed in HSRD ($p < 0.01$) and HSRN ($p = 0.006$). Post hoc comparisons indicated that HL–ML

Table 1. Descriptive statistics of contextual factors.

Contextual factors	Number of matches (n)	Match duration (min)	Ss
High level	5	86.75	11.28
Medium level	5	90.18	11.98
Low level	5	92.05	10.06
Wins	4	93.60	8.82
Draws	4	90.06	10.43
Loses	7	86.4	11.18
Home	8	85.11	10.19
Away	7	87.83	11.01

Values are mean ± SD (m). *t* and *p* are from two-tailed independent-samples t-tests (df = 14). *d* = Cohen's d (Skilled – Non-skilled).

Table 2. Training performance according to opponent quality (mean ± standard deviation).

Contextual factors	High level	Medium level	Low level	ANOVA p
HSRD (m)	208.44 ± 80.52	300.75 ± 99.77	146.20 ± 46.39	0.01*
HSRN (n)	12.55 ± 4.36	15.05 ± 4.81	9.20 ± 2.93	0.006*
SD (m)	40.09 ± 25.32	28.79 ± 20.94	15.61 ± 6.82	0.02
RPE(point)	4.37 ± 0.34	4.88 ± 0.37	4.38 ± 0.65	0.007*

*$p \leq 0.05$; HSRD: high speed running distance meter (m): (≥19.8 km.h-1-25.2 km.h^{-1}); HSRN: Number of high speed running (≥19.8 km.h^{-1}-25.2 km.h^{-1}) SD: Sprint distance meter (m); (≥25.2 km.h^{-1}), RPE: Rate of perceived exertion (0-10).

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and ML–LL differed in HSRD, while ML–LL differed in HSRN. Sprint distance showed no significant difference ($p > 0.05$). Although ANOVA for RPE was non-significant ($p > 0.05$), pairwise analysis revealed a difference between HL and ML ($p < 0.007$).

Regarding zonal training performance (table 3), significant differences were found for zone-3 running distances (14.4–19.8 km·h^{-1}) across opponent quality ($p < 0.036$), whereas zone-1 and zone-2 distances showed no significant differences ($p > 0.05$). Match performance across outcomes (win, draw, loss) is presented in table 4, where ANOVA indicated a significant effect only in zone-3 distance ($p < 0.03$). However, no significant pairwise differences were detected after correction ($p > 0.05$). TD, HSRD/HSRN, SD, ACCN, DECN, and RPE showed no significant outcome-related differences ($p > 0.05$).

Analysis of training loads according to match outcomes (table 5) revealed a significant difference only in the number of sprints ($p < 0.001$). Pairwise comparisons showed higher sprint counts in win–draw (W–D, $p < 0.003$) and loss–draw (L–D, $p < 0.006$) comparisons. No significant differences were found for TD, HSRD/HSRN, SD, ACCN, DECN, or RPE ($p > 0.05$).

Comparison of match performances between home and away games (table 6) showed significant differences in HSRD ($p < 0.016$), HSRN ($p < 0.006$), and number of decelerations ($p < 0.042$), with higher values observed in away matches. Other variables did not differ significantly ($p > 0.05$).

Similarly, training performance comparisons between home and away contexts (table 7) showed significant differences in HSRD ($p < 0.007$) and number of decelerations ($p < 0.039$). No other parameters differed significantly ($p > 0.05$).

In summary, training weeks preceding matches against medium-level opponents were characterized by greater high-speed running activity, away matches imposed higher external loads compared to home matches, and training sprint demands were greater during weeks that ended in a draw. Zone-3 distances consistently showed sensitivity to contextual factors, whereas low- and moderate-speed activities were less affected (figure 2).

The findings indicated that training loads were higher during weeks preceding matches against medium-level opponents, particularly in terms of high-speed running distance and number of high-speed runs. External load parameters were also greater in away matches compared with home matches. In addition, the number of sprints in training was higher during weeks that ended in a draw compared with weeks ending in wins or losses. Finally, significant differences were observed in zone-3 running performance, while lower-speed zones were unaffected. Collectively, these results clearly demonstrate that contextual factors significantly influence the physical load parameters of professional football players.

Discussion

The main finding of this study was that away matches imposed greater physical demands on professional football players compared with home matches. In particular, high-speed running distance, number of high-speed runs, and number of decelerations were significantly higher, indicating that contextual factors play a crucial role in shaping both internal and external loads across a weekly microcycle.

Training loads prior to matches against medium-level opponents showed significantly higher high-speed running distance and number of high-speed runs compared with other opponent groups. This finding aligns with a study that reported higher training loads in the weeks preceding matches against lower- and mid-ranked teams in La Liga[34]. Similarly, a study observed greater high-intensity running distances during preparation weeks against mid-ranked opponents[35]. A possible explanation is that players perceive medium-level opponents as more "beatable" yet still competitive, thereby increasing motivation and physical effort. However, the results differ from studies reporting greater weekly loads prior to matches against stronger or lower-ranked opponents[30,36]. These discrepancies may be explained by differences in league competitiveness, cultural playing styles, or training periodization strategies.

The interpretation of the present findings should also take into account the contextual characteristics of the Azerbaijan League. Compared with major European competitions, this league is characterized by longer travel demands, potential variability in

Table 3. Training performance according to the quality of the opponent (Mean ± Standard Deviation) zonal running performance (Mean ± Standard Deviation).

Zones	High level	Medium level	Low level	ANOVA p
Zone-1 (m)	2526.00 ± 144.81	2225.21 ± 192.83	2358.77 ± 336.83	0.059
Zone -2 (m)	1643.14 ± 236.97	1736.14 ± 207.49	1784.69 ± 321.98	0.43
Zone-3 (m)	427.71 ± 99.82	504.35 ± 91.89	404.95 ± 84.33	0.036*

*$p \leq 0.05$; Zone -1 meter (m) (0-7.2 km/s),; Zone -2 meter (m) (7.2-14.4 km/s); Zone-3 meter (m) (14.4-19.8 km/s).

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Table 4. Match performance ANOVA results for win, lose and draw situations.

Parameters	ANOVA $F_{(2,16)}$	ANOVA p	Bonferroni p	Load ($\bar{X}$±SS.) W–L / W–D / L–D	Different	Bonferroni p
TD(m)	3.47	0.053	0.27	9852.52±568.021-9574.68±763.46	277.84	0.94
				9852.52±568.021-9050.22±925.50	802.30	0.06
				9574.68±763.46-9050.22±925.50	524.46	0.56
Maximal Speed (km.s^{-1})	0.87	0.43	0.88	29.84±1.53-30.70±1.07	0.85	0.78
				29.84±1.53-30.47±1.60	0.62	1.00
				30.70±1.07-30.47±1.60	0.23	1.00
HSRD (m)	0.23	0.79	0.02	752.71±308.21-695.50±281.18	57.20	1.00
				752.71±308.21-686.48±244.89	66.23	1.00
				695.50±281.18-686.48±244.89	9.02	1.00
SD(km.s^{-1}) (m)	0.012	0.98	0.001	156.20±105.73-159.80±100.85	3.59	1.00
				156.20±105.73-153.33±87.58	2.87	1.00
				159.80±100.85-153.33±87.58	6.47	1.00
HSRN (km.s^{-1})	0.81	0.45	0.08	45.02±14.56-39.44±12.38	5.58	1.00
				45.02±14.56-40.01±12.51	5.01	0.72
				39.44±12.38-40.01±12.51	0.57	1.00
SN(km.s^{-1})	0.05	0.94	0.006	8.97±5.88-9.41±5.28	0.44	1.00
				8.97±5.88-8.69±4.91	0.27	1.00
				9.41±5.28-8.69±4.91	0.72	1.00
ACCN (m.s^{-2})	0.46	0.63	0.04	31.54±13.09-27.99±9.08	3.55	0.90
				31.54±13.09-28.30±12.40	3.23	1.00
				27.99±9.08-28.30±12.40	0.31	1.00
DECN (m.s^{-2})	1.31	0.29	0.12	41.48±11.50-35.25±9.81	6.23	0.53
				41.48±11.50-37.06±8.92	4.41	0.50
				35.25±9.81-37.06±8.92	1.81	1.00
Z-1 Distance(km.s^{-1}) (m)	0.96	0.39	0.09	3691.13±383.93-3743.58±497.35	52.45	1.00
				3691.13±383.93-3493.29±576.71	197.83	0.86
				3743.58±497.35-3493.29±576.71	250.28	1.00
Z-2 Distance (km.s^{-1}) (m)	1.57	0.23	0.14	3796.38±654.76-3740.57±506.13	55.81	1.00
				3796.38±654.76-3502.13±385.03	294.24	0.15
				3740.57±506.13-3502.13±385.03	238.43	0.90
Z-3 Distance (km.s^{-1}) (m)	3.91	0.03*	0.30	1629.61±297.16-1411.88±331.67	217.72	0.12
				1629.61±297.16-1355.04±256.41	274.56	0.08
				1411.88±331.67-1355.04±256.41	56.84	1.00
RPE (point)	1.43	0.26	0.13	7.83±0.71-8.13±0.31	0.35	0.60
				7.83±0.71-7.83±0.45	0.002	1.00
				8.13±0.31-7.83±0.45	0.34	0.28

TD: Total distance meter (m); Maximal speed (km.s^{-1}); HSRD: High speed running distance meter (m) (≥19.8 km.s^{-1}-25.2 km.s^{-1}) meter (m); SD: Sprint distance (≥25.2 km.s^{-1}) meter (m), HSRN (km.s^{-1}): Number of high speed runs (≥19.8 km.s^{-1}- 25.2 km.s^{-1}); Number of sprint (≥25.2 km.s^{-1}),ACCN: Acceleration number (≥3 m.s^{-2}); DECN: Deceleration number (≥3 m.s^{-2}) Z-1:Zone 1 distance meter (m) (0.-7.2 km.s^{-1}); Z-2:Zone 2 distance meter (m) (7.2 -14.4 km.s^{-1}); Z:3 Zone 3 distance meter (m) (14.4-19.8 km.s^{-1}), RPE: Rate of perceived exertion (0-10).

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Table 5. Training ANOVA results for win, draw and loss situations.

Parameters	ANOVA $F_{(2,16)}$	ANOVA p		Load ($\bar{X}$±SS.) W–L / W–D / L–D	Different	Bonferroni p
TD(m)	1.03	0.37	0.10	4522.73±242.97-4670.81±1660.48	148.07	1.00
				4522.73±242.97-3892.95±2055.12	629.77	1.00
				4670.81±1660.48-3892.95±2055.12	77.85	0.50
Maximal Speed (km.s-1)	1.46	0.25	0.14	25.84±1.43-22.89±8.18	2.95	0.94
				25.84±1.43-20.71±10.95	5.13	0.46
				22.89±8.18-20.71±10.95	2.17	1.00
HSRD (m)	1.66	0.21	0.15	242.76±88.23-165.02±92.03	77.74	0.39
				242.76±88.23-194.18±119.26	48.58	0.64
				165.02±92.03-194.18±119.26	29.16	1.00
SD(km.s-1) (m)	0.68	0.51	0.07	29.89±20.49-20.45±17.33	9.43	1.00
				29.89±20.49-28.83±22.79	1.05	1.00
				20.45±17.33-28.83±22.79	8.38	1.00
HSRN (km.s-1)	0.30	0.73	0.03	12.52±4.41-11.03±6.12	1.49	1.00
				12.52±4.41-10.68±6.39	1.84	1.00
				11.03±6.12-10.68±6.39	0.35	1.00
SN(km.s-1)	19.41	0.001*	0.68	1.71±1.09-1.44±,1.17	0.27	1.00
				1.71±1.09-10.68±6.39	8.96	0.003*
				1.44±,1.17-10.68±6.39	9.24	0.006*
ACCN ($m.s^{-2}$)	0.56	0.57	0.05	14.69±5.22-15.83±9.08	1.14	1.00
				14.69±5.22-12.51±8.71	2.18	1.00
				15.83±9.08-12.51±8.71	3.32	1.00
DECN ($m.s^{-2}$)	0.83	0.45	0.08	11.12±4.73-12.48±8.45	1.35	1.00
				11.12±4.73-8.78±5.95	2.34	0.59
				12.48±8.45-8.78±5.95	3.70	0.92
Z-1 Distance(km.s-1) (m)	0.53	0.59	0.05	2210.18±136.92-2260.22±817.38	50.03	1.00
				2210.18±136.92-1986.10±1053.60	224.07	1.00
				2260.22±817.38-1986.10±1053.60	274.11	1.00
Z-2 Distance (km.s-1) (m)	2.47	0.11	0.21	1678.98±128.93-1809.52±665.46	130.54	1.00
				1678.98±128.93-1352.17±721.31	326.81	0.64
				1809.52±665.46-1352.17±721.31	457.35	0.07
Z-3 Distance (km.s-1) (m)	0.77	0.47	0.07	431.61±71.01-439.63±174.77	8.02	1.00
				431.61±71.01-366.31±199.86	65.30	0.97
				439.63±174.77-366.31±199.86	73.32	0.83
RPE (point)	4.10	0.03	0.31	5.05±0.44-4.22±1.55	0.83	0.39
				5.05±0.44-3.59±1.91	1.46	0.12
				4.22±1.55-3.59±1.91	0.62	0.43

TD: Total distance meter (m); Maximal speed ($km.s^{-1}$); HSRD: High speed running distance meter (m) (≥19.8 $km.s^{-1}$-25.2 $km.s^{-1}$) meter (m); SD: Sprint distance (≥25.2 $km.s^{-1}$) meter (m); HSRN ($km.s^{-1}$): Number of high speed runs (≥19.8 $km.s^{-1}$- 25.2 $km.s^{-1}$); Number of sprint (≥25.2 $km.s^{-1}$); ACCN: Acceleration number (≥3 $m.s^{-2}$); DECN: Deceleration number (≥3 $m.s^{-2}$) Z^{-1}: Zone 1 distance meter (m) (0.-7.2 $km.s^{-1}$); Z-2: Zone 2 distance meter (m) (7.2 -14.4 $km.s^{-1}$); Z:3: Zone 3 distance meter (m) (14.4-19.8 $km.s^{-1}$); RPE: Rate of perceived exertion(0-10); W: Winner; D: Draw; L: Lose.

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environmental and infrastructural conditions, and differences in competitive balance, all of which may influence weekly training planning and load distribution across the microcycle. Previous research has demonstrated that contextual and environmental constraints, including travel requirements, competition level, and organizational structure, can affect training periodization and match-related physical demands[37,38]. In leagues with relatively limited squad depth and resources, coaching staff may adopt more opponent-oriented or conservative load management strategies to maintain player availability and performance. Therefore, although the present data were collected from a single team, the observed load patterns may reflect adaptive practices typical of football environments with similar logistical and competitive constraints. No significant differences in match performance parameters were found across opponent quality. This finding is consistent with studies that have reported similar results; however, it is at odds

Table 6. Paired t-test results of performance parameters of home and away matches.

Parameters	Home-Away (X̄±SS.)	*t(10)*	P	EB
TD(m)	8856.08±814.26-9189.09±814.26	-1.450	0.178	0.437
Maximal speed (km.s^{-1})	30.48±1.43-30.08±1.47	2.221	0.051	0.670
HSRD (m)	626.28±245.16-719.81±237.44	-2.892	0.016*	0.872
SD(km.s^{-1}) (m)	133.77±85.03-157.31±85.16	-1.786	0.104	0.539
HSRN (km.s^{-1})	37.36±11.88-42.19±11.68	-3.483	0.006*	-1.050
SN(km.s^{-1})	7.78±4.62-9.11±4.57	-1.683	0.123	0.507
ACCN (m.s^{-2})	27.71±8.90-29.67±11.03	-1.170	0.269	0.353
DECN (m.s^{-2})	35.11±8.95-38.73±9.88	-2.329	0.042*	0.702
Z-1 (km.s^{-1}) (m)	3438.31±591.09-3431.27±596.16	0.058	0.955	0.017
Z-2 (km.s^{-1}) (m)	3429.08±386.16-3578.51±428.40	-1.357	0.205	0.409
Z-3 (km.s^{-1}) (m)	1376.40±278.03-1476.60±302.77	-1.447	0.178	0.436
RPE (point)	7.89±0.45-7.64±0.47	1.759	0.109	0.530

TD: Total distance meter (m), Maximal speed (km.s^{-1}), HSRD: High speed running distance meter (m) (≥19.8 km.s^{-1}-25.2 km.s^{-1}) meter (m), SD: Sprint distance (≥25.2 km.s^{-1}) meter (m), HSRN (km.s^{-1}): Number of high speed runs (≥19.8 km.s^{-1}- 25.2 km.s^{-1}), Number of sprint (≥25.2 km.s^{-1}),ACCN: Acceleration number (≥3 m.s^{-2}), DECN: Deceleration number (≥3 m.s^{-2}) Z-1: Zone 1 distance meter (m) (0.-7.2 km.s^{-1}), Z-2: Zone 2 distance meter (m) (7.2 -14.4 km.s^{-1}), Z-3: Zone 3 distance meter (m) (14.4-19.8 km.s^{-1}), RPE: Rate of perceived exertion (0-10).

Table 7. Paired t-test result of home and away trainings.

Parameters	Home-Away (X̄±SS.)	*t(10)*	P	EB
TD(m)	4046.42±2011.78-4368.31±1461.50	0.745	0.473	0.225
Maximum Speed (km.s^{-1})	21.04±10.47-23.61±7.90	-1.146	0.278	0.346
HSRD (m)	171.76±106.58-242.46±11.76	-3.345	0.007*	-1.009
SD(km.s^{-1}) (m)	25.59±21.67-29.83±20.77	-1.456	0.176	0.439
HSRN (km.s^{-1})	10.51±6.59-12.39±5.92	-1.804	0.101	0.544
SN(km.s^{-1})	1.50±1.28-1.76±1.16	-1781	0.105	0.537
ACCN (m.s-2)	12.59±8.49-15.38±7.45	-1.371	0.200	0.413
DECN (m.s-2)	8.97±6.66-12.29±6.92	-2.376	0.039*	0.716
Z-1 Distance(km.s^{-1}) (m)	2007.89±1001.66-2144.73±723.04	0.603	0.560	0.182
Z-2 Distance(km.s^{-1}) (m)	1480.18±747.02-1575.36±537.43	0.610	0.555	0.184
Z-3 Distance(km.s^{-1}) (m)	390.42±209.05-426.55±150.64	0.879	0.400	0.265
RPE (point)	3.80±1.90-4.18±1.43	0.737	0.478	0.222

TD: Total distance meter (m); Maximal speed (km.s^{-1}); HSRD: High speed running distance meter (m) (≥19.8 km.s^{-1}-25.2 km.s^{-1}) meter (m); SD: Sprint distance (≥25.2 km.s^{-1}) meter (m); HSRN (km.s^{-1}): Number of high speed runs (≥19.8 km.s^{-1}- 25.2 km.s^{-1}); Number of sprint (≥25.2 km.s^{-1}),ACCN: Acceleration number (≥3 m.s-2); DECN: Deceleration number (≥3 m.s-2) Z-1: Zone 1 distance meter (m) (0.-7.2 km.s^{-1}); Z-2: Zone 2 distance meter (m) (7.2 -14.4 km.s^{-1}), Z.3: Zone 3 distance meter (m) (14.4-19.8 km.s^{-1}); RPE: Rate of perceived exertion(0-10)

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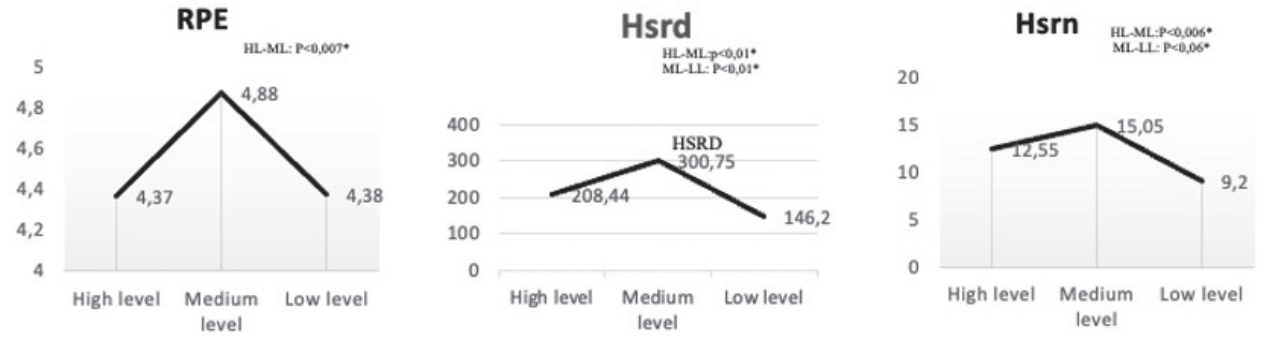

Figure 2. Training performance according to opponent quality (mean ± standard deviation) - Rate of Perceived Exertion, High Speed Running Distance and Number of High Speed Running.

with other studies that have reported an increase in high-speed running against stronger opponents. Thus, the influence of opponent quality appears to depend on league level and tactical context[19,39,40].

Our findings consistently showed that away matches generated higher external loads compared with home matches, with significant increases in high-speed running and decelerations. Consistent with prior research, these findings indicate that away matches necessitate greater physical exertion, likely mediated by travel fatigue, unfamiliar environments, and increased psychological loads. Moreover, zone-3 (14.4-19.8 km·h^{-1}) running distances were higher in away matches, suggesting the use of counter-attacking or more intense tactical strategies[41]. In contrast, no significant differences were found in zone-1 and zone-2 running, consistent with previous findings, indicating that low- to moderate-intensity activities are less influenced by match location[35].

In terms of training loads, the number of sprints was significantly higher during weeks ending in a draw compared with wins or losses. This finding is in accordance with studies reporting an increase in sprint activity during balanced contests. Preparing for tightly contested matches may naturally require sprint-intensive tactical training[8,19,34]. By contrast, no significant differences in match performance parameters were found between wins, draws, and losses. This is consistent with Kalapotharakos et al., but differs from Lago et al. who reported greater physical demands in winning matches. Such differences may reflect tactical priorities, competitive level, or league-specific dynamics[39,41].

The analysis revealed significant differences in zone-3 running distances, but not in zone-1 or zone-2. The literature has emphasised that high-intensity activities exhibit heightened sensitivity to contextual factors, in contrast to the relative stability observed in low- and moderate-intensity activities[40].

These findings highlight the importance of considering contextual factors when planning weekly microcycles in professional football. Coaches should carefully manage recovery strategies and adjust training loads following away matches, where physical demands are greater. Furthermore, the increased sprint demands observed in weeks ending in a draw suggest the need to prepare teams for counter-attacking or balanced match scenarios.

This study was limited to a single professional team competing in the Azerbaijan League, which restricts the generalizability of the findings to other leagues with different competitive levels or cultural playing styles. Future research should include larger samples across multiple teams and leagues, incorporate positional analyses, and examine additional contextual variables such as fixture congestion, environmental conditions, and travel distance.

Conflict of interests. The authors declare there is no conflict of interest.

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