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Abstract

Purpose: The objectives of the present study were a) to analyse the internal and external load profile of the training and competition sessions carried out by semi-professional soccer players during a period of 27 weeks, and b) examine the possible link between this type of periodization and players' fitness status and their readiness to compete. **Methods:** Training and match data was obtained from 26 semi-professional soccer players belonging to the reserve squad of a Spanish La Liga club during the 2018/19 season. For the purpose, the distribution of external and internal load during a typical training microcycle with 6 or 7 days between matches was analysed. Five types of sessions were considered: STR (strength), DUR (duration), VEL (velocity), PreOM (Pre-official match) and OM (official match). **Results:** The results showed a different internal and external load profile for each type of session, with the load being consistently higher during matches when compared to all training sessions ($p<0.01$), showing significant differences in all the variables studied. There was a clear tapering strategy in the last days of the week to arrive with enough freshness to the competition, shown by the decrease of the values in the two days before the match ($p<0.01$). Furthermore, the horizontal alternation of the load, allowed the players to maintain their fitness level during the analysed 27-week period. **Conclusions:** Our findings suggest that this weekly periodization approach could help achieve a double conditional target, allowing a short tapering strategy to face the match with enough freshness, and serving as a strategy for maintaining or optimizing players' physical performance along the season.

Keywords: Soccer, internal load, external load, horizontal alternation, physical fitness.

1. Introduction

Monitoring the training load imposed to the athletes is essential to understand individual responses and to determine whether they are adapting to the training program. Assessing fitness status and fatigue is key to minimize the risk of non-functional overreaching (fatigue lasting weeks to months), injury, and illness[1-3]. In the context of team sports, knowledge of the workloads that players receive is crucial to adjust the organization of training sessions. Additionally, selecting the most representative variables that will make a clear picture, avoiding redundancy[4] and encompassing the information involved in all training dimensions (e.g., locomotor, energetic and neuromuscular) is mandatory for an adequate approach to the monitoring and management of the training process[5].

In the last ten years, a new approach for periodization in football (e.g., tactical periodization) has been proposed[6,7]. This framework has been well received in teams' staff, firstly because the focus is on tactical learning, but also because simultaneously technical, physical, and psychological elements are stimulated. From this approach, daily training components are structured considering the distance in days between two consecutive games, and the type of quality targeted each day differs (from a biological framework). To accomplish this approach, coaches require an adequate distribution of training activities from the previous match to the next one[8], in order to achieve enough freshness to avoid fatigue that can affect players' performance in competition[9]. As it has been evidenced[5,10], load metrics are lower in the session/s before competition, confirming the concept of short tapering in team sports. Previous studies[7,11,12] have suggested that in a one-game week, there is availability to implement three main/acquisition training sessions, allowing the successive development or at least maintenance of the physical capacities such as strength, endurance, and speed. After the horizontal alternation of physical components proposed in the central days of the week[6,13], it is essential to reduce the amount of load imposed. Despite the aforementioned information, it would be of great value a more detailed description of the features (e.g. constrains proposed in the different type of the game tasks) related to the content of the training sessions of acquisition (sessions with the objective of improving fitness) and tapering phase (last days before the match), in order to improve the understanding of the weekly distribution of training loads and the characterization of the weekly training profile of soccer teams[13].

In addition to the above, one of the main objectives of the staff working in elite football is to optimize the fitness levels of the players, loading them enough to produce positive adaptations without raising the risk of injury[14,15]. The assessment of the training process and the competition outcome, will allow the verification of the effectiveness of training programmes, searching for the best periodization strategies to compete fit and fresh. The evaluation of the data generated during the training process involves assessing markers related to quality, quantity and organization of the training load[16]. With all, it would be interesting to know how effective a weekly periodization (short term strategy) is for match preparation and also to assess the effect on conditional capacities (medium-large term strategy). Considering that players have to respond week to week to match requirements in the best conditions, it is important to control training load to ensure that the players are in optimal relation between fitness (e.g., chronic load) and fatigue (acute load), so they can achieve a high performance in the game[9]. Studies that have investigated the dose–response relationship between training load and training outcomes in professional football training are not usual[17-19]. Knowledge of the training load measures that demonstrate a strong dose-response relationship could provide practitioners with a valuable information about how athletes respond to a given loading pattern and show and example of a specific training approach[17].

Therefore, the aims of this study were to (a) analyse the external and internal workloads of a typical week, and compare the different sub-dynamics (e.g., targeting strength, endurance, and speed qualities) within a tactical periodization approach and (b) examine the possible link between this type of periodization and players' fitness status and their readiness to compete.

2. Methods

2.1. Subjects

Twenty-six professional football players competing in the third Spanish Division (age = 20.8 ± 1.1 years; height = 182.1 ± 4.9 cm; body mass = 74.3 ± 5.4 kg) from the same reserve team of a Spanish La Liga club took part in the study during the 2018-2019 in-season competition period (27 weeks). Four central backs, five fullbacks, six midfielders, three wingers and four forwards were recruited. Goalkeepers were not included in the study.

All the players involved in the study signed an informed consent form. All participants, including team's coaching staff were informed about the procedure and possible risks and benefits of the study. Furthermore, the procedures used in this project were in accordance with the Declaration of Helsinki and the Ethics Committee of the University of the Basque Country (UPV/EHU) which also gave its institutional approval of the study.

2.2. Training load assessment

Internal training load

The internal training load was quantified on a daily basis by means of the rating of perceived exertion (RPE) using Borg's 1–10 arbitrary unit scale[20]. To ensure that the perceived exertion rating was reflective of the entire session rather than the last effort, data was collected 15–20 min following each training session. All players were familiarized with the Borg scale.

External training load

Activity profile of the players was monitored during each training session and competition match, using portable GPS devices (Catapult S5, Australia), which function at a sampling frequency of 10 Hz and contain a 100 Hz triaxial accelerometer. The reliability and validity of the devices have been reported in previous studies[21,22]. Each unit was placed inside the pocket of a special harness that was attached to the upper back of the player. The GPS devices were activated 10-15 min before the start of each session or match, in accordance with the manufacturer's instructions. To avoid interunit error, each player used the same device during the study[21].

The following physical variables were studied: total and effective duration of training session (TTw/Teffec); total distance (TD); distance in different intensity zones: D14 (>14km/h), D21 (>21km/h); number of "Repeated High Intensity Efforts" (RHIE: ≥3 high intensity [>14km/h] or high acceleration/deceleration [>3ms^2/<-3ms^2] efforts with less than 21 seconds recovery between); distance above 85% of individual velocity threshold: D>85%; number of low/medium/high accelerations/decelerations: AD12 (1-2m/s^2) / AD23 (2-3m/s^2) / AD3 (>3m/s^2); arbitrary units of Player Load (PL).

2.3. Fitness assessment

Before and after the 27-week period, participants were tested to determine their physical fitness performance. Testing sessions included the evaluation of jumping performance in the vertical axis (e.g., countermovement jump, countermovement jump with dominant/non-dominant leg); jumping performance in the horizontal axis (e.g., long jump, long jump with dominant/non-dominant leg); sprinting performance (e.g., 0-40 m time); change of direction performance (e.g., MATfree time) and intermittent fitness performance (e.g., final velocity achieved in the 30-15 IFT test).

Each test was performed according to the orientation of the training session, implemented as an auxiliary oriented content in the first part of the session. First evaluation series were performed between weeks 4 to 6, while second series were performed between weeks 30 to 33. The objective when performing the tests in this way was to ensure that each of the tests served as a conditional stimulus related to the orientation of the training, instead of performing all the tests in a single session. Each test was repeated in the same order from the first to the second evaluation series, at the same time (10:30 a.m.), in the same place and trying to maintain common weather conditions. Before the tests, players performed a warm up (same for series 1 and 2) directed by the physical trainer, consisting of a progressively test oriented movement preparation sequence[23].

2.4. Readiness assessment

The readiness of the players was quantified on a daily basis by a psychometric questionnaire used to assess a general indicator of player wellness (Wll), asking about muscle soreness and fatigue, reporting the most limiting one, using Borg's 1–10 arbitrary unit scale[24,25]. Data was collected 15–30 min before the starting of each training session. All players were familiarized with the scale.

2.5. Types of the training sessions

The training sessions are contextualized in a typical week that includes four main type of days (three acquisition and one tapering training session), according to the features of the tasks implemented (Table 1). It supposes a different activity profile for each of the days (sub-dynamic) attending to its structure (elements included) and effort dynamic. The different type of tasks are fitness tasks (without ball), technical task (including ball but without opponents) and tactical-technical tasks (including ball and opponents), considering the following variables to configure small, medium and large –sided games: number of players (small is 1 to 3; medium is 4 to 6; large is 7 or more per team), relative space (less than 100 m^2 is small; 100 to 199 m^2 is medium; 200 m^2 and more is large) and game orientation (no oriented is without goals; oriented is with multi-goals; polarized is with goals placed face to face).

All the training sessions were based mainly on tactical-technical tasks, set up attending to the effort dynamic attributed to structural variables that characterized each day. In this way, strength (STR) day is the first acquisition day, placed three or four days after the last match and four before the next competition day (D+3 or D+4 and D-4). From a conditional point of view, STR is focused on neuromuscular stimulation using small-sided games configured by: small/medium players, small space and free (oriented/no-oriented/polarized) game orientation. Duration (DUR) is the central day (D+4 or D+5 and D-3) and it aims to stimulate the endurance component of training, with large-sided games designed by large players, large space and polarized game orientation. Velocity (VEL) is the third acquisition day (D+6 or D+7 and D-2), linked to games designed by variable number of players playing in a polarized, large spaces. Finally, pre-official match day (PreOM) is configured by large players, in small, medium or large spaces and polarized orientation, according to a tapering strategy.

Complementing these structural variables that set up tactical-technical games, sessions were supplemented by fitness tasks (without ball) according to the content of each day. Finally, training time management also contributes to characterize each sub-dynamic. Total training time was longer for acquisition days (specially, STR, and DUR) compared to PreOM. In relation to effective time, DUR session was the most continuous activity day compared to STR and VEL, characterized by a lower density (shorter effort and longer rest).

****Please insert table 1 here**

2.6. Methodology

Data was collected during the first 27 in-season weeks of the 2018-19 season, following five pre-season weeks (from 6^{th} to 33^{th} week). Internal (via RPE and Wll) and external training loads (via GPS), and training tasks structure (via own software) were recorded after each training session and match during the studied period. All the players were familiarized with the use of both GPS and Wll/RPE questionnaire before starting the study.

Two time points were stablished to determine the start and the end of the study period, coinciding with the first and last testing weeks, T1 (in the 6th week, the first of the in-season period) and T2 (in the 34th week).

Due to the possible combinations in terms of the number of days between matches, only those weeks with six or seven days between official matches were included in the present study. The type of content of the training session (e.g., strength [STR, n = 53], duration [DUR, n = 66], velocity [VEL, n = 118] and pre-match [PreOM, n = 149]), and its location in the microcycle (e.g., with respect to the number of days before and after a match, day plus, D+, and minus, D-) was recorded, in addition to the matches (n = 97) played in this period.

The training duration was recorded including the warm-up, tasks, recovery or explanation periods and cool-down. For the effective time, the time in which the players were in motor practice was considered. Data from players who did not complete all the training session or match were removed for analysis. Each player always used the same device during the study period[21]. Once the session finished, GPS data were extracted using proprietary software (OpenField 1.21.1 Build #39598, Catapult Innovations, Victoria, Australia). This technology has previously been shown to be a reliable and valid way of monitoring different speed ranges[26].

2.6. Statistical Analysis

Results are expressed as means and standard deviations (sd). The statistical analyses were performed using Statistical Package for Social Sciences for Windows version 24.0 (SPSS Inc. Chicago) and Excel for Windows.

All included variables (e.g., training load variables and fitness variables) were tested for linearity, normality of distribution and homogeneity of variances. Due to their non-meeting criteria, Kruskal-Wallis test was implemented to evaluate the differences in dependent variables across the different days of the microcycle. In the event of a difference, Dunnett's T3 was used to identify any localized effect. Significant differences were assumed when $p<0.05$.

The coefficient of variation (CV) was calculated in order to know the inter-player variation in the external and internal variables during the different type of training sessions and matches[27].

The between-group comparison of the physical fitness tests, from T1 to T2, was assessed implementing a Wilcoxon test for paired samples. In addition, effect sizes (ES) were calculated using an ad-hoc configured excel spreadsheet. Based on recommendations by Batterham and Hopkins[28], ES between <0.2, 0.2–0.6, 0.6–1.2, 1.2–2 and 2.0–4.0 were considered trivial, small, moderate, large and very large, respectively.

3. Results

Training load, internal response and wellness

The external loads recorded during the different type of training sessions and matches are shown in Table 2. Without exception, all external load variables were greater in OM than in any of the week sub-dynamic. The external load recorded in the two days prior to the match (VEL and preOM) was lower in all the variables when compared with STR and DUR.

****Please insert table 2 here**

Figure 1 shows the values related to Wellness (Wll) and Rate of Perceived Exertion (RPE) in each type of the sub-dynamics analysed, as well as in the competition. As can be seen, the reported values for wellness are significantly lower in STR and especially in OM, indicating better player availability these days. In relation to the RPE, the official match (OM) shows significantly higher values than the rest of the days, revealing it as the toughest session of the week. On the other hand, PreOM is shown as the day with the lowest internal load.

****Please insert figure 1 here**

Regarding the information related to fitness assessment, no significant differences were found between T1 and T2 in CMJ, CMJDom, CMJnoDom, HJ, HJDom, HJnoDom, MATfree and VIFT tests. However, significant differences were found between the first and second test of T0.40 ($V = 33$, $p = 0.042$), showing an improvement in the results obtained.

4. Discussion

The aims of this study were to analyse the external and internal workloads of a typical week, comparing the training load between different days within the tactical periodization approach and examine the possible link between this type of periodization and players' fitness status (medium-large strategy) and their readiness to compete (short term tapering). The novelty of the current study lies in the possibility of evaluating the effects that this game-based training approach had in players' fitness level, over an extended period of 27 weeks. The results suggest that the horizontal alternation in programming proposed in the current study (e.g., strength-, endurance-, velocity-oriented) elicited the achievement of an optimal load that enabled the players to maintain their fitness level and minimize the accumulation of fatigue throughout the week, allowing them to reach the competition in a state of freshness.

Different authors[7,13] have proposed the convenience of focusing the training stimulus on a main target each day, with a double objective of maximizing the given conditional quality and allowing the other qualities to recover. This process may also decrease physiological interferences between them, which may lead to greater adaptations[29,30].

While the current study shows an alternation in the load applied for each type of training session, it reveals to be significantly lower than the one of the competition for all the external and internal variables analysed. Stevens et al.[31], Martín-García et al.[12] and recently, Castillo et al.[13] seem to display the same tendency; even if the first two do not show data of the direct comparison between training and competition, data presented as the percentage of match activity shows the aforementioned trend. Martín-García et al.[12] indicated that a major finding of their study was that training loads were the greatest 4 days before competition (D-4), with selected metrics approaching competition loads. The comparison with the present study is complicated, due to the difference in the nomenclature established for each day. In spite of this, when analysing the sub-dynamics that form D-4 in the present study (DUR and STR), the same tendency exposed by the authors can be observed. Stevens et al.[31] acknowledged that the number of medium and high accelerations and decelerations during training were, in general, closer to whole match values than the total distance, running and high-speed running. This assertion seems to be contrary to our findings, as OM shows significantly higher values for AD12, AD23 and AD3 than training sessions. Finally, Castillo et al.[13] showed that, even relativizing their data to a minute of play, external loads were higher in competition than in the different type of training sessions analysed, emphasizing that official matches are the most demanding sessions during the microcycle, which is in accordance with our findings.

Contrary to the exposed by Malone et al.[32], were training load remained similar across all days with the exception of pre-match (when the load was significantly reduced compared with the other training days), in the present study, significant differences were shown in the activity performed by the players in each day of the week, showing a different activity profile for each of the days (sub-dynamic), attending to its structure and effort dynamic. STR day is characterized by a value of AD1 significantly higher than the rest of the days, with the exception of DUR. In addition, the RPE value is the highest (even higher than DUR day, partly influenced by the ∼30’ strength work done in the gym before entering the field), showing significant differences from the rest of sub-dynamics, except for DUR. On DUR day, the effective time is the highest, and variables such as TD and D14 show significantly higher values than the rest of the days, due to the type of game-based tasks proposed for this day (high dimension [>200 m^2 per player] and high number of players per team [>7 players]). In the case of VEL, it is the variables D85%, RHIE and AD3 that characterize this type of sub-dynamic, showing values significantly higher than the rest of the days. Clemente et al.[11] noted that D-2 had a smaller load than D-5, D-4 and D-3 in total distance covered and player load, but similar high intensity distances, thus suggesting a decrease in the volume, while maintaining intensity. Although the comparison is complicated, in the case of the present study VEL sub-dynamic is usually placed on days D-2 or D-3, indicating the same trend shown by the authors. Finally, the preOM day is characterized by the lowest effective time and significantly lower values in all the variables analysed, with the exception of D21 and AD3. These results are in accordance with the ones reported by Malone et al.[32], who showed a significant reduction in training load on D-1 compared to the other training days.

As stated previously, different authors have shown a progressive decrease in external load variables until D-1[8,11,31-33]. Malone et al.[32] explained that the load reduction found in D-1 clearly indicated a tapering strategy, being an attempt by the coaches to unload the players with the objective of increasing their readiness for the match. Nevertheless, they add that it is currently not noted in the literature whether this unloading process will lead to the dissipation of fatigue and optimize readiness. In the present study, a readiness/wellness scale was used to elucidate this issue. The results show that as the day of the competition approaches, the average value of Wll tends to decrease, displaying significantly lower values in competition day compared to the rest of the week (except for TEN, which is placed after the resting day). The data found seems to indicate that the subjective feeling of fatigue and muscle pain associated with the work of the week decreases as the game approaches, indicating that the discharge made in the last days of the week manages to improve the availability or subjective well-being of the players in order to face the competition.

Various authors have used game-based approaches to improve the physical performance of their athletes[34-38]. In most cases, an intervention period of 4-10 weeks was established, in which the players were divided into running-based or small sided game-based group, assessing their fitness level pre- and post-intervention through various tests related to the neuromuscular, cardiovascular or locomotor components. The authors concluded that game-based approaches are equally effective in improving the fitness level of the players, being more recommended training methods for the development of their technical skills. The present study goes one step further, raising the hypothesis of whether a periodization based on the game can maintain or improve the physical condition of the players. As the results of the physical tests show, the periodization proposed allows to maintain fitness values over an extended period of time. This indicates that a training system based on the game can maintain the physical qualities of the players, allowing the coaching staff to fully focus on improving team play, without neglecting the physical part.

An important aspect to highlight within this work was the variability found within the same type of session in the external load variables analysed. The CV found in each type of training and competition was generally large for all the variables (especially in those of greater intensity: AD3, D21, D85% and RHIE), finding especially high values in the central sessions (STR and DUR) and in competition. The high variability found across sessions seems to be a combination of the inherent unpredictable nature of game-based training and the strategies used by coaches to vary the stimulus for players to create training adaptations[12].

The current analysis has certain aspects that must be considered when interpreting the findings. The information shown reflects the particular training philosophy of the club, as well as the training status of the players analysed. Consequently, generalization to other teams and populations should be carried out with caution. Nevertheless, the data presented here add to the growing body of applied research and provides an alternative perspective when planning and analysing the distribution of training load within elite football.

5. Practical applications

- An adequate distribution of the training load considering the days after the game and the days before the next game seems an appropriate strategy for players to arrive in a state of freshness to the competition.
- An adequate distribution of the type of training content on each day of the microcycle, aimed at stimulating different conditional components, could avoid overloading the players in the same energetic dimension (neuromuscular, cardiovascular or locomotor). In addition, distributing the stimuli of the different energy systems throughout the week in different proportions, would allow replicating and/or overloading the demands of the competition in a segmented way and, therefore, attending to the recovery and supercompensation processes.
- Finally, the horizontal alternation proposed throughout the week does not seem to neglect the fitness level of the players in the medium-long term, which guarantees an adequate condition to face the competition for a long period (27 weeks).

6. Conclusions

In summary, the present study demonstrated (a) the existence of an alternation in the load applied for each type of training session, showing a different activity profile for each of the days (sub-dynamic), (b) the workload recorded in each type of session was significantly lower than the one of the competition for all the external and internal variables analysed, and (c) the horizontal alternation in programming proposed in the current study (e.g., strength-, endurance-, velocity-oriented) elicited the achievement of an optimal load that enabled the players to maintain their fitness level and minimize the accumulation of fatigue throughout the week, allowing them to reach the competition in a state of freshness.

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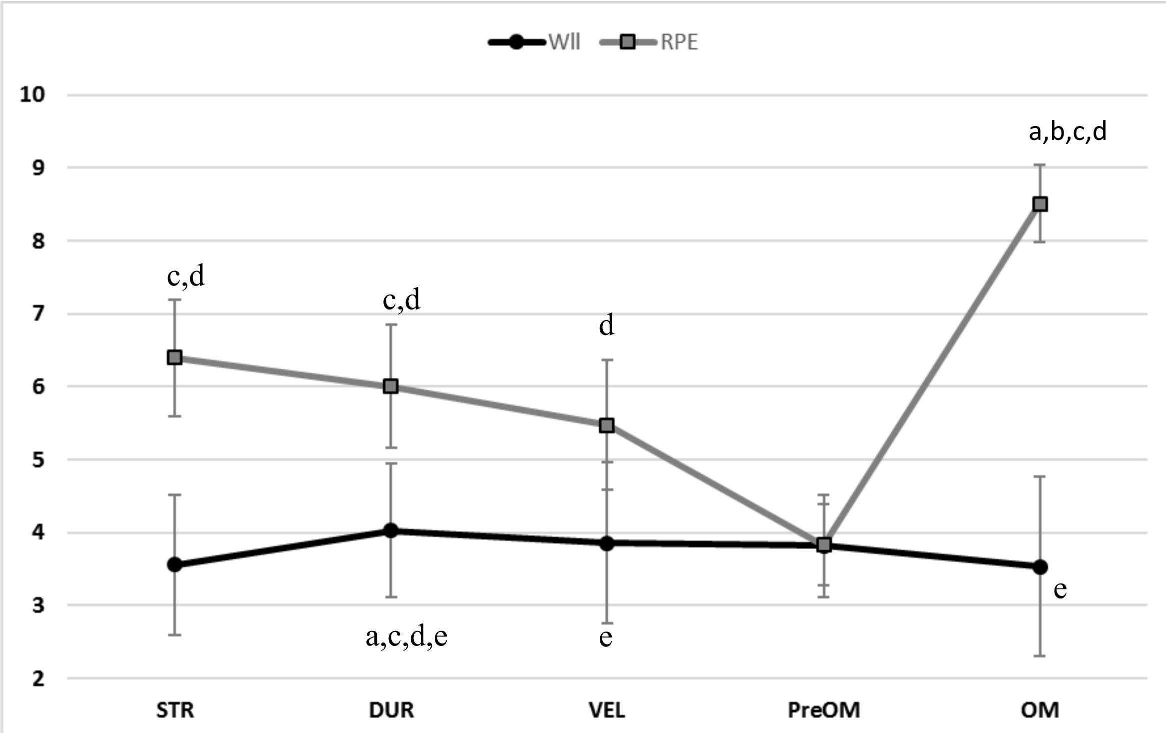


Figure 1. Wellness (Wll) and Rated of Perceived Exertion (RPE) of the players in the different types of training sessions: STR is strength day, DUR is duration day VEL is velocity and PreOM is pre-official match day, and official match (OM).

There were significant differences ($p<0.01$) for: a is more than STR, b is more than DUR, c is more than VEL, d is more than PreOM and e is more than official matches (OM).

Table 1. Description of the four main type of days (three acquisition and one tapering training session), according to the features of the tasks implemented. All in minutes.

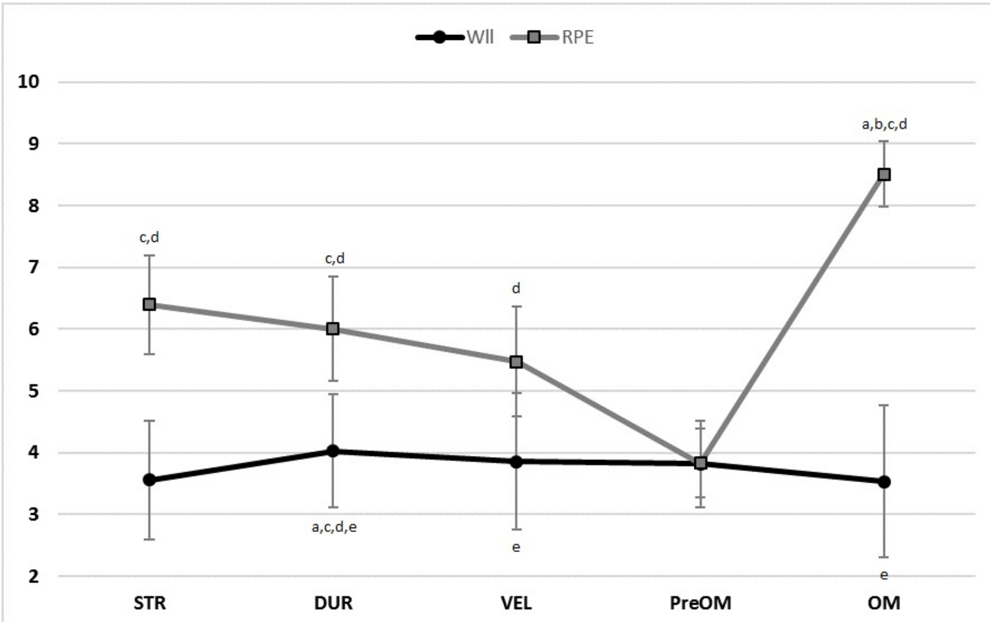
		STR		DUR		VEL		PreOM	
Variables		Mean	±*sd*	Mean	±*sd*	Mean	±*sd*	Mean	±*sd*
Total training time		89.4	13.7	96.1	11.1	83.0	11.2	69.3	12.9
Effective training time		65.3	10.0	73.0	9.6	60.8	10.1	53.2	6.2
Tasks without ball		30.7	7.8	17.7	9.4	25.3	7.0	9.7	8.6
Tasks with ball		35.8	7.3	44.1	5.5	35.3	7.2	33.8	5.5
Without opponents		1.3	1.7	2.5	2.6	2.2	3.6	4.2	5.8
With opponents		34.5	6.9	41.7	5.8	32.3	8.4	22.4	8.8
Players	1-3	5.9	6.8	0.8	2.6	10.8	9.9	5.3	6.1
	4-6	17.4	7.5	6.6	8.4	7.3	8.5	5.5	6.8
	>6	9.9	8.6	32.4	11.4	12.3	10.3	7.4	7.6
Relative space	<100	23.0	5.6	0.6	1.7	0.4	1.5	0.4	1.6
	100-199	4.9	5.5	1.2	3.5	0.5	2.4	0.8	2.5
	≥200	5.3	8.2	37.5	8.2	28.9	8.6	17.0	8.4
Game orientation	No oriented	0.0	0.0	0.1	0.6	0.0	0.0	0.3	1.4
	Oriented	1.1	3.5	0.7	2.5	0.2	1.2	0.0	0.0
	Polarized	31.1	10.8	35.3	10.3	14.0	9.3	9.7	7.3

Note: 1-3 players is a small-sided game, configured by 1 to 3 players per team; 4-6 is a medium-sided game, configured by 4-6 players per team, and >6 is a large-sided game, configured by more than 6 players per team; <100 is a small relative space, shorter than 100 m^2 per player; 100-199 is a medium relative space, more than 99 and less than 200 m^2 per player; >200 is a large relative space, longer than 199 m^2 per player; no oriented is a game without goals; oriented is a game with multi-goals; polarized is a game with goals facing each other. STR is strength day, DUR is duration day, VEL is velocity day and PreOM is pre-official match day.

Table 2. Mean, ±standard deviation and coefficient of variation (%, in parenthesis) of the external load variables in the different types of training sessions and official match.

	Type of session				
Variable	STR	DUR	VEL	PreOM	OM
Teffec	65.3 ±10.1^{cd}	73 ±9.6^{acd}	60.8 ±10.1^{d}	53.2 ±6.2	110.0 ±0^{abcd}
(min)	(15%)	(13%)	(17%)	(12%)	(0)
PL	429.2 ±85.6^{cd}	512.3 ±99.4^{acd}	348.7 ±69.3^{d}	288.7 ±57.8	982.5 ±144.5^{abcd}
(AU)	(2%)	(19%)	(2%)	(2%)	(15%)
AD12	119.9 ±34.3^{cd}	148.5 ±25.3^{acd}	94.9 ±29.6^{d}	82.2 ±19.9	239.2 ±54.1^{abcd}
(n)	(29%)	(17%)	(31%)	(24%)	(23%)
AD23	14.6 ±6.2^{d}	17.6 ±6.5^{d}	16.9 ±5.7^{d}	11 ±4.7	30.5 ±10 ^{abcd}
(n)	(42%)	(37%)	(34%)	(43%)	(33%)
AD3	1.5 ±1.6	2 ±1.6	3.2 ±2.5^{abd}	1.7 ±1.7	4.5 ±4.2^{abcd}
(n)	(107%)	(83%)	(78%)	(97%)	(94%)
TD	4081.4 ±864.9^{cd}	5269 ±980.8^{acd}	3563.3 ±662.7^{d}	2954.3 ±562.4	10606.5 ±1106.1^{abcd}
(m)	(21%)	(19%)	(19%)	(19%)	(10%)
D14	809.3 ±369.2^{d}	1021.6 ±404.7^{acd}	851.6 ±233.1^{d}	531 ±236.4	2357.3 ±672.1^{abcd}
(m)	(46%)	(40%)	(27%)	(45%)	(29%)
D21	72.2 ±102.6	108.2 ±157^{d}	72.9 ±122.8	25.8 ±44	169.6 ±249.2^{acd}
(m)	(142%)	(145%)	(169%)	(17%)	(147%)
D85%	6.1 ±14.5	18.2 ±22.8	28.8 ±31.4^{ad}	3.1 ±6.3	51.5 ±47.4^{abcd}
(m)	(237%)	(125%)	(109%)	(201%)	(92%)
RHIE	81.9 ±89.9	124.7 ±126.6^{ad}	219.7 ±163.5^{abd}	91.2 ±91	415.6 ±329^{abcd}
(n)	(110%)	(102%)	(74%)	(100%)	(79%)

Note: Teffec is effective training time, PL is player load, AD12, AD23 and AD3 are number of low, medium and high accelerations/decelerations, TD is total distance, D14 and D24 are distance above 14 km/h and 21 km/h, D85% is distance above 85% of individual velocity threshold, and RHIE is number of repeated high intensity efforts. STR is strength day, DUR is duration day, VEL is velocity day and PreOM is pre-official match day. a is more than STR, b is more than DUR, c is more than VEL, and d is more than PreOM.



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Variables		STR Mean	STR ±*sd*	DUR Mean	DUR ±*sd*	VEL Mean	VEL ±*sd*	PreOM Mean	PreOM ±*sd*
Total training time		89.4	13.7	96.1	11.1	83.0	11.2	69.3	12.9
Effective training time		65.3	10.0	73.0	9.6	60.8	10.1	53.2	6.2
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	4-6	17.4	7.5	6.6	8.4	7.3	8.5	5.5	6.8
	>6	9.9	8.6	32.4	11.4	12.3	10.3	7.4	7.6
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