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More Matches, Less Time: How Load Ratios Reveal Gaps Between Training and Competition in Football

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Abstract

Galiano, C, Nakamura, FY, Ribeiro, J, Asín-Izquierdo, I, and Asian-Clemente, JA. More matches, less time: How load ratios reveal gaps between training and competition in football. *J Strength Cond Res* 40(5): e500–e505, 2026—The aim of this study was to analyze the external load ratios of professional football players across microcycles of different lengths and to compare the distribution of external load in each of these types of microcycles. Twenty-eight professional outfield soccer players were monitored daily using GPS for 2 seasons (2022/2023 to 2023/2024). Players participated in a total of 105 matches (regular season: 68, European competition: 20, national cup: 17) throughout the 2 analyzed seasons. Total distance, high-speed running (HSR), sprinting distance, number of sprints, and the number of accelerations/decelerations $>3\ \mathrm{m{\cdot}s^{-2}}$ were recorded during both training sessions and matches. Microcycles of 3, 4, 5, and 6 days were analyzed. An individual training-to-match ratio was calculated for each external load measure in each microcycle. All external load ratios showed differences across microcycle lengths ($p < 0.001$; $\eta^2_p > 0.364$) with larger ratio values for longer microcycle durations. Regardless of the microcycle duration, accelerations $>3\ \mathrm{m{\cdot}s^{-2}}$ showed higher values than the other variables ($p < 0.013$; ES > 0.29), while those related to high-speed activity displayed lower values than the rest ($p < 0.001$; ES > 0.37). This "overstimulation" of accelerations $>3\ \mathrm{m{\cdot}s^{-2}}$ shows greater differences than the other variables as the microcycle lengthens. This insight can guide coaches in optimizing training periodization, ensuring a better balance between undervalued and overvalued variables, particularly for HSR and sprint performance in different microcycle structures.

Key Words: training load, football, ratio, high-speed running, monitoring

Introduction

Contemporary soccer teams are subject to continuous assessment of their training and match performances, resulting in the generation of vast amounts of data (6). These data assist the coaching staff in making more informed and objective decisions (18), allowing for precise evaluation of the workload dose required for players to achieve and maintain optimal performance (12). As a result, evaluating soccer load has become paramount for planning and structuring training in professional soccer teams (19). Proper planning of training facilitates optimal recovery for players after matches, while also ensuring the maintenance and improvement of physical qualities throughout the competitive season (8).

Soccer training planning refers to the distribution and organization of the external load throughout the microcycle, which is defined as the period from the day after a match to the following match (17). Therefore, when monitoring a microcycle, it is essential to consider the external load of both competition and training sessions performed by players between the current match and previous matches. Traditionally, the microcycle has been defined as a 1-week period, with a match typically played on the weekend (1). However, this structure is becoming increasingly less common. The increase in the number of competitions in modern soccer has led to teams participating in more tournaments, which, in turn, reduces the number of training sessions between them (14,15). This shift results in weeks where teams may play up to 3 matches per week (1), leading to the emergence of different types of microcycles. Depending on the type of competitive schedule, the length of the microcycle can vary, directly affecting the external load on soccer players (7,17). Previous studies have confirmed that shorter microcycles typically result in lower external load, because they prioritize recovery and tactical preparation due to time constraints. In contrast, longer microcycles allow for a more balanced distribution of external load, integrating both recovery periods and high-intensity training sessions (9,16,17). Similarly, the external load fluctuates throughout the microcycle depending on the training day. Each training session and its objectives are determined based on the time elapsed since the previous match and the time remaining until the next one (9).

To appropriately adjust the external load of training sessions, it is essential to understand its relationship with the competitive

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load (20). This relationship results in a ratio that quantifies the magnitude of the training external load stimulus relative to match demands (7). Previous studies have demonstrated that this ratio varies depending on the specific external load variable analyzed (7,11,13,20). In prior research, the reported ratios for different external load variables vary depending on the metric analyzed: total distance covered ranges from 1.86 to 2.8, high-speed distance from 0.92 to 2.60, sprint distance from 0.59 to 2.90, accelerations from 2.01 to 4.45, and decelerations from 0.59 to 2.90 (7,11,13,20). In professional soccer, understanding the ratios of key external load variables across different types of microcycles is crucial for optimizing player performance. Although previous research has provided insights into these ratios across various populations and competitive contexts, to the best of the authors' knowledge, no study has examined professional players competing in European competitions by comparing the load ratios of different microcycle types while accounting for the demands of each external load variable. Therefore, the aim of this study was to analyze the external load ratios of professional football players across microcycles of different lengths and to compare the distribution of external load in each of these types of microcycles. Describing and comparing these ratios in elite athletes are not aimed at establishing normative data, but rather at contributing to the potential for such data to be developed in the future, particularly in contexts involving microcycles with such varying durations.

Methods

Experimental Approach to the Problem

This study used a retrospective observational cohort design to examine the external load ratios of professional football players across 2 seasons. GPS technology was used to monitor daily external load during training and matches, measuring total distance, high-speed running, sprinting distance, number of sprints, and accelerations/decelerations >3 $\mathrm{m \cdot s^{-2}}$. Players participated in microcycles of 3, 4, 5, and 6 days, with external load ratios calculated by dividing accumulated training load by match load. Only players who completed all training sessions and matches were included. This design allowed for the analysis of how varying microcycle lengths influence load ratios, providing insights into training and competition load distributions.

Subjects

Data were collected from 28 outfield professional football players (age: 25.7 ± 4.7 years; height: 180.1 ± 8.0 cm; body mass: 73.5 ± 6.3 kg) who played at least 20 matches for a single top-five club in Portugal during the seasons 2022/2023 and 2023/2024. The players participated in a total of 105 matches (regular season: 68, European competition: 20, national cup: 17) throughout the 2 analyzed seasons. Data were collected from daily workload monitoring during team training sessions and official matches. This study was approved by the local university ethics committee (210/2024) and conducted in accordance with the Declaration of Helsinki.

Design

An observational cohort study was implemented with a professional soccer team during 2 full seasons. The external training load data were recorded as part of the regular monitoring routine of the club, and a retrospective analysis was conducted afterward. Data collection started, in both seasons, from the first training session of the initial competitive week until the last official match. The participation data consisted of 1,426 player training days and 542 player match days. Training sessions were categorized by their proximity to MD, using M +/- notation. The team's training schedule maintained a similar structure in both seasons to manage workload distribution. On a regular 7-day microcycle, the day after the match, nonselected players or those with minimal participation (participating fewer than 45 minutes in the game) performed a pitch training session. This session focused on increasing the load for these players, while the other players who accumulated more minutes in the match performed a recovery session, which included 10 minutes of cycle-ergometer at a self-paced speed, followed by 5 minutes of joint mobility and 10 minutes of muscle foam-rolling. On M+2, the squad had a full rest day. During the central days of the microcycle (M-4 and M-3), the entire squad participated in training sessions aimed at increasing workload by raising both volume and intensity. Finally, in the days leading up to the match (M-2 and M-1), all players participated in a tapering session designed to decrease training volume while maintaining intensity. External load of all the training sessions and MD during the competitive period was monitored using global positioning system (GPS) technology. External load was measured during each on-pitch session using 10-Hz GPS units (Vector S7; Catapult Innovations) worn in fitted vests between the scapulae, which included 100-Hz triaxial accelerometers, gyroscopes, and magnetometers. Data were downloaded and stored using the manufacturer's software. The monitored variables included total distance (TD), high-speed running (HSR: 19.8–25.1 $\mathrm{km \cdot h^{-1}}$), sprinting distance (Sprint_M: >25.2 $\mathrm{km \cdot h^{-1}}$), number of sprints (Sprint _N), accelerations >3 $\mathrm{m \cdot s^{-2}}$ (ACC >3), and decelerations (DEC >3) (3,11). For MD, warm-up data were excluded, using only data from the +90 minutes of the game.

Measurements

The ratio was calculated following the approach proposed by previous studies (Clemente et al., 2019).(7) Specifically, we calculate the ratio as the accumulated load in the microcycle divided by the match load in competition. For example, in a 4-day microcycle, the external load ratio was determined by summing the training sessions (M+1 + M-2 + M-1) and dividing this value by the external load of MD. Only players who completed the entire match and all the sessions of the microcycle were included in the analysis. Reflecting the competitive demands of professional football, the team participated in 3 competitions most months during the 2 seasons, resulting in a variety of microcycles ranging from 3 to 7 days. In the 7-day microcycles, players who played 90 minutes in the previous match did not train on the field on M+1 or during the rest day (M+2). Similarly, in the 6-day microcycles, players who played the full match did not train on M+1. Therefore, in both the 6-day and 7-day microcycles, the players included in the study participated in 4 training sessions plus the match. Figure 1 provides a graphical representation of the composition of the different microcycles. Thus, the ratios examined in this study range from 3-day to 6-day microcycles. As a result, 13 3-day microcycles, 30 4-day microcycles, 19 5-day microcycles, and 22 6-day microcycles were analyzed. Ratios were calculated for each external load variable analyzed in the study.

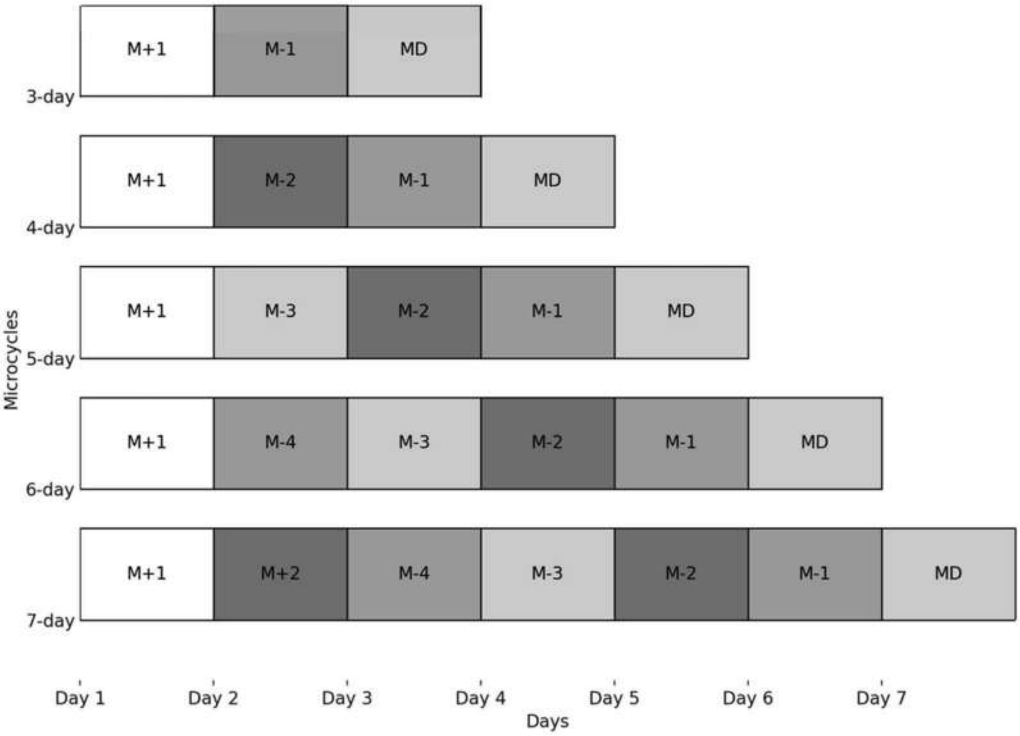

Figure 1. Representation of the composition of the different microcycles based on their length.

Statistical Analyses

Values are reported as mean ± *SD*. Before starting the data analysis, outliers were removed. Outliers were detected using the interquartile range (IQR) method: upper limit (Q3+1.5*IQR) and lower limit (Q3-1.5*IQR); any data points that fall outside these limits were considered outliers. The normality of distribution of the variables and the homogeneity of variance were assessed using the Shapiro–Wilk test and Levene's test, respectively. A repeated-measures ANOVA, followed by Bonferroni post hoc tests, was used to analyze the differences in each external load variable ratio across microcycles of different lengths. In addition, a repeated-measures ANOVA was conducted to compare the different ratios of external load variables within microcycles of equal length. When a variable did not meet the assumption of homogeneity of variances, a Kruskal–Wallis test was applied, followed by Dunn's post hoc test to assess the differences between microcycles. Mauchly's test was performed, and in cases of sphericity violation, the Greenhouse–Geisser correction was applied. For all analyses, statistical significance was set at $p < 0.05$. Partial eta-squared (η^2_p) was used to determine effect sizes, with the following thresholds: ≤0.01 (trivial), 0.01–0.06 (small), 0.06–0.15 (moderate), and >0.15 (large). The magnitude of Cohen's effect size (ES) was interpreted as follows: ≤0.2 (trivial), >0.2 (small), >0.5 (moderate), and >0.8 (large) (10). Statistical analyses were performed using JASP software (JASP Team 2019, Version 0.11.1, University of Amsterdam).

Results

The comparison of the ratios for each variable, according to the length of the microcycle, is presented in Figure 2. In 3-day microcycles, there were significant differences between ratios ($p < 0.001$; $\eta^2_p = 0.611$), where HSR, Sprint_M, and Sprint_N ratios were significantly lower than the others ($p < 0.001$; ES > 0.96). TD and ACC >3 ratios were significantly larger than the others ($p < 0.013$; ES > 0.66). In 4-day microcycles, there were significant differences between variables ($p < 0.001$; $\eta^2_p = 0.611$), where Sprint_M and Sprint_N ratios were significantly lower than the rest ($p < 0.001$; ES > 0.37). HSR exhibited lower ratios than the other variables ($p < 0.001$; ES > 0.72), except for the sprint variables. ACC >3 ratios was significantly larger than the others ($p < 0.001$; ES > 0.29), followed by TD, which was greater than the other ratios ($p < 0.001$; ES > 0.60). In 5-day microcycles, there were significant differences between variables ($p < 0.001$; $\eta^2_p = 0.592$). HSR, Sprint_M, and Sprint_N ratios were significantly lower than the others ($p < 0.001$; ES > 0.80). ACC >3 ratio was significantly larger than the others ($p < 0.001$; ES > 0.61), followed by TD, which was greater than the other ratios ($p < 0.001$; ES > 0.37). In 6-day microcycles, there were significant differences between variables ($p < 0.001$; $\eta^2_p = 0.573$). HSR, Sprint_M, and Sprint_N ratios were significantly lower than the others ($p < 0.01$; ES > 0.87). ACC >3 ratio was significantly larger than the others ($p < 0.001$; ES > 0.74), followed by TD ($p < 0.001$; ES > 0.33).

Discussion

The aim of this study was to analyze the external load ratios of professional football players across microcycles of different lengths and to compare the distribution of external load in each of these types of microcycles. The main results indicated that the variables describing high-speed movement tended to exhibit lower ratios, whereas TD and ACC >3 displayed higher ratios than other studied variables, regardless of microcycle length. In addition, our findings showed that the magnitude of the external load ratio increased proportionally with the duration of the microcycle for all the analyzed variables.

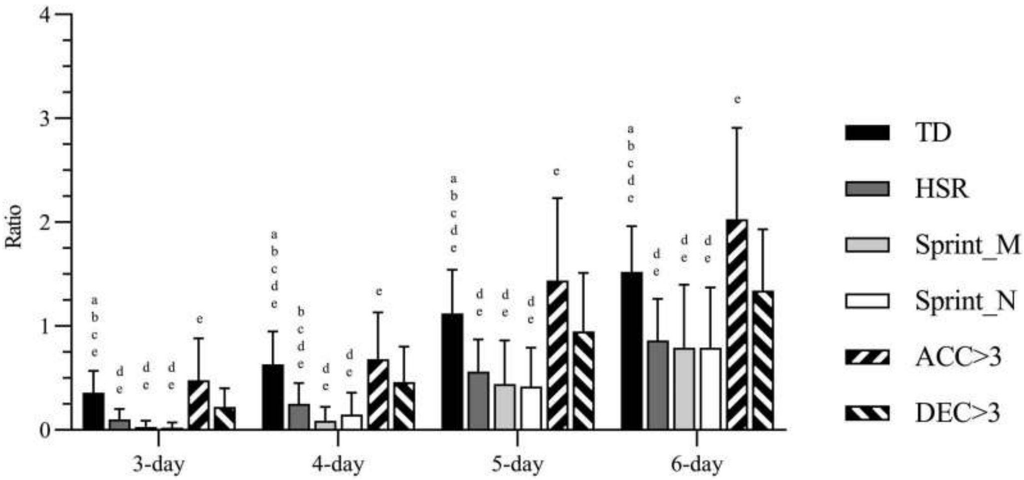

Figure 2. Comparison of external load ratio values in the microcycle. Notes: TD: Total distance, HSR: high-speed running; Sprint_M: total distance covered at sprinting speed; Sprint_N: number of sprinting speed activity; ACC/DEC>3: number of accelerations and decelerations >3 $m \cdot s^{-2}$. a: significant differences with HSR; b: significant differences with Sprint_M; c: significant differences with Sprint_N; d: significant differences with ACC>3; e: significant differences with DEC>3.

Although the literature provides descriptive values of external load ratios between training sessions and matches within the competitive microcycle (7,11,13,20), it remains unclear whether certain external load ratios are predominantly higher at specific points within the microcycle and whether these differences are consistent across microcycles of varying lengths. Our data show that, for 3-day microcycles, TD and ACC>3 are more prominently demanded during training sessions compared with matches, relative to the other variables, while high-speed activity is less frequently reproduced. For 4-, 5-, and 6-day microcycles, ACC >3 shows significantly higher ratios than the other variables, with ratios reaching ~2.03 in the 6-day microcycle (Figure 2). This "overstimulation" of ACC>3 shows greater differences than the other variables as the microcycle lengthens. In contrast, high-speed activity remains less demanded, with maximum ratios of ~0.86 in the 6-day microcycles. These findings are not surprising, because the observed ratios may be partially attributed to the type of drills commonly used in training, where small-sided games are typically favored by most coaches (4,7). Owing to the reduced playing area, these games encourage frequent accelerations and decelerations. However, their ability to trigger HSR actions is limited by the confined space. This situation could create a framework of risk and issues for the performance and health of football players, because there has also been an increase in the demands for HSR and sprinting in professional football (5). To minimize this effect, some authors have proposed the use of specific drills rather than transition games drills (2). Therefore, we may be overloading variables such as TD and ACC/DEC, while undervaluing the training for faster speeds than HSR, which could enhance the preparation of football players. In fact, a recent study indicates that regularly exposing football players to high sprinting speeds is one of the most recommended strategies for reducing hamstring injury incidence (4). Unfortunately, there is no scientific evidence regarding the optimal training-to-match ratio. However, the low stimulus provided by high-speed activities is evident, with a maximum weekly accumulation of only 86% compared with match demands, even in a 6-day microcycle. In contrast, ACC >3 reaches up to 203% of match values (Figure 2).

Soccer training "periodization" refers to the distribution and organization of external load across the microcycle, which is defined as the period from the day after a match until the following match (17). Depending on the competitive schedule, the length of the microcycle can vary, directly affecting the external load experienced by soccer players (7,17). To appropriately adjust the training load, it is essential to understand its relationship with match load (20). Our findings indicate that the magnitude of the external load ratio increases proportionally with the microcycle length for all analyzed variables (Figure 3). In this regard, we observed that TD ratio increased from 0.36 to 1.52 as the microcycle lengthened from 3 to 6 days. A similar pattern was observed for the other variables: HSR (from 0.1 to 0.86), Sprint_M (from 0.03 to 0.79), Sprint_N (from 0.02 to 0.79), ACC >3 (from 0.48 to 2.03), and DEC >3 (from 0.22 to 1.34). These findings align with previous studies indicating that this ratio varies depending on the analyzed variable (11,13,20) and the microcycle length (7). In this regard, a study conducted with Croatian professional players reported higher ratio values for TD and ACC/DEC (ratio ~2), while the ratios for HSR and sprint were lower (ratio ~0.92) (13). Similarly, a study with Dutch professional players analyzing 5-day microcycles found larger ratios for TD and ACC/DEC (~3.1 and ~3.9, respectively), whereas the ratio for HSR was lower (~2.1) (20). Another study involving elite U17 players observed higher ratios for TD (~2.4), but lower values for HSR and sprint (~1.69 and ~1.54, respectively) in 6-day microcycles (11).

In terms of the length of the microcycles, a study conducted with Portuguese professional players showed that as the number of sessions and the duration of the microcycle increase, the external load ratios also rise (7). In this case, the observed ratio values ranged from 1.8 to 3.5 for microcycles of 4–6 days in TD, from ~2 to ~3.7 for ACC/DEC values, and from 1.1 to 2.3 for HSR. These findings reinforce the idea that a higher number of training sessions leads to an increase in practice time, which subsequently raises the accumulated external training load and, consequently, increases the ratios of the measured parameters. In highly congested competitive schedules (microcycles of 3 or 4 days), training priorities shift toward tactical preparation and recovery sessions (1), prioritizing player recovery and avoiding overloading sessions. Consequently, for a starting player, the workload performed on MD becomes critical because of the

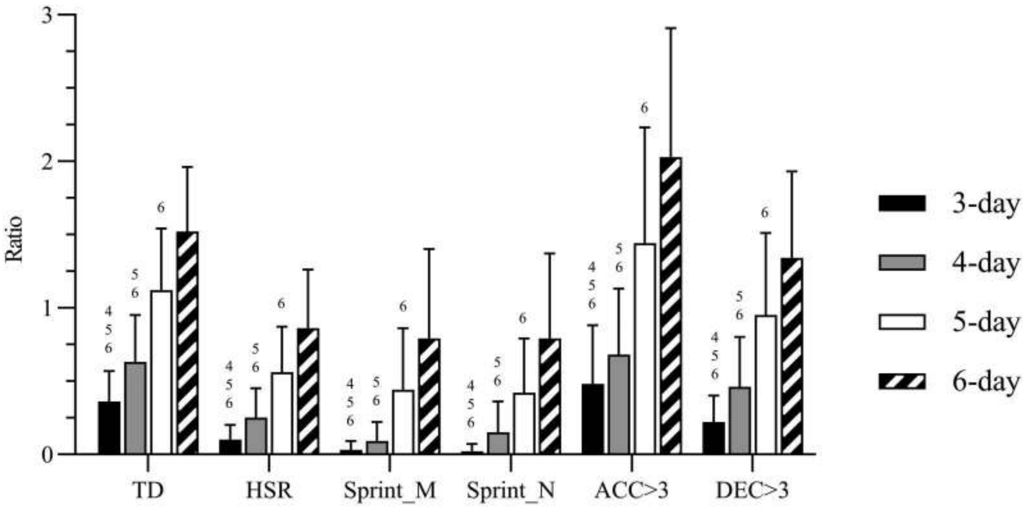

Figure 3. Representation of the ratios for each external variable across different microcycle durations. Notes: TD: total distance, HSR: high-speed running; Sprint_M: total distance covered at sprinting speed; Sprint_N: number of sprinting speed activity; ACC/DEC>3: number of accelerations and decelerations >3 m·s^{-2}. 4: significant differences with 4-day microcycles; 5: significant differences with 5-day microcycles; 6: significant differences with 6-day microcycles.

limited time available for additional training. This is particularly relevant in elite football, where the increase in the number of matches played leads to the accumulation of more microcycles of this type (1,14,15). As a result, the accumulated training load decreases (Table 1), and match load values are higher than those of training, leading to ratios lower than 1 (Figure 3). Despite the consistency of the data with the literature, the ratios obtained in our study are significantly lower than those previously reported, which are sometimes 2 or 3 times higher. These differences may be attributed to several factors, such as sample size or inclusion criteria used in the cited studies. In this regard, some of the reviewed studies included players who participated in at least 45 minutes, while others, with a minimum threshold of 60 minutes, extrapolated external load values to a total duration of 90 minutes (7,20). This aspect is very important, considering that previous research has indicated that extrapolating external load values may lead to an overestimation of data during matches (20). Moreover, given that players cover ~10.5 km per match (Table 1), the inclusion of players who played, for example, 50 minutes, may result in a potential reduction in the average TD, with a potential difference of up to ~6 km compared with those who played the full match. This could, in turn, potentially increase the value of their ratios. The inclusion criteria in our study, which selected players who participated in all training sessions and the entire match, reduced the sample size but ensured a more accurate measurement of match external load, eliminating these limitations and increasing data accuracy.

Although the results of this study provide novel data on the external load ratios of professional football players, these findings should be interpreted with caution. First, it is important to note that, as explained throughout the study, the research was conducted within a very specific context (a professional team participating in 3 competitions). Therefore, extrapolating these results to other populations, such as players not involved in international competitions, female football players, or elite youth players, should be done with caution. For this reason, it would be valuable for future studies to report external load ratios for these populations to gain a better understanding of external load in different competitive contexts. In addition, this study only analyzed the external load of players without considering internal load variables, meaning that the exact impact of each ratio on the players cannot be determined. Furthermore, no measurements were taken to assess player readiness or fatigue. Given these limitations, future research should investigate the internal load ratios and assess player fatigue during each microcycle.

In conclusion, external load ratios indicate the relationship between training load and competition, varying with microcycle structure and the analyzed variable in professional football. Ratios increased proportionally with the duration of the microcycle for all the variables analyzed. The ratios do not show similar values across different external load variables as the microcycle duration increases, indicating the "overstimulation" of certain variables regardless of microcycle length, with lower ratios in HSR activity and higher ratios in ACC >3 and TD. This

Table 1

Descriptive values of weekly accumulated external load (excluding games) and match load.*

	TD	HSR	Sprint_M	Sprint_N	ACC>3	DEC>3
MD	10,418.4 ± 1,333.8	654.5 ± 214.2	126.2 ± 78.7	7.2 ± 4.2	28.3 ± 10.2	39.4 ± 10.9
3-day	3,738.7 ± 2,000.9	103.4 ± 128.3	13.7 ± 26.8	0.7 ± 1.2	12.5 ± 10.1	12.3 ± 11.9
4-day	6,477.4 ± 3,126.0	195.1 ± 189.5	33.6 ± 51.6	1.9 ± 2.8	21.1 ± 15.4	18.7 ± 14.9
5-day	11,568.5 ± 4,433.9	384.6 ± 210.9	63.1 ± 57.2	3.9 ± 3.4	39.2 ± 21.8	37.9 ± 23.4
6-day	15,920.6 ± 4,678.9	545.1 ± 258.3	96.5 ± 78.7	5.4 ± 4.3	52.2 ± 20.9	53.2 ± 23.9

*Data are presented as mean ± *SD*. TD: total distance; HSR: high-speed running; Sprint_M: sprint running distance (in meters); Sprint_N: sprint running actions (number); ACC>3: number of accelerations above 3 m·s^{-2}; DEC>3: number of decelerations above 3 m·s^{-2}; MD: match day; 3-day: cumulative external load of 3-day microcycle (only training sessions data); 4-day: cumulative external load of 4-day microcycle (only training sessions data); 5-day: cumulative external load of 5-day microcycle (only training sessions data); 6-day: cumulative external load of 6-day microcycle (only training sessions data).

information may be useful for coaches when designing and "periodizing" training in football and could have implications for understanding which variables are undervalued or overvalued in different microcycle structures. The basic 6–8-day weekly structure seems to allow for higher ratios and facilitates the organization of training load, a factor that is limited in shorter microcycles. This may suggest adjustments in training design to better prepare professional athletes for the demands of competition, particularly in terms of HSR and sprint variables. Future studies should determine whether these ratios are appropriate for the preparation of football players in microcycles of different durations.

Practical Applications

The findings of this study provide valuable insights for optimizing training load management in professional football. Coaches and performance staff can use the external load ratios identified in different microcycle lengths to better tailor training sessions to match demands. Specifically, the higher external load ratios for high-intensity accelerations suggest an "overstimulation" of this component during training, particularly in longer microcycles. This highlights the need for coaches to assess whether this variable is being excessively targeted and consider reducing its emphasis to avoid potential overloading. In contrast, the lower ratios for HSR suggest a need for more focused training on sprinting and high-speed activities, which are often underrepresented in typical training schedules. By adjusting training periods based on these ratios, coaches can ensure a more balanced approach, mitigating the risk of overtraining certain variables while promoting essential aspects such as sprint performance. In addition, these findings can guide decisions around recovery strategies and tapering in congested fixture periods to maximize player readiness and minimize fatigue.

Acknowledgments

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References

1. Anderson L, Orme P, Di Michele R, et al. Quantification of training load during one-two- and three-game week schedules in professional soccer players from the English Premier League: Implications for carbohydrate periodisation. *J Sports Sci* 34: 1250–1259, 2016.
2. Asian-Clemente JA, Asín-Izquierdo I, Requena B, Galiano C. External and internal loads of transition games are affected by the presence of an opposing team and their initial positions. *J Hum Kinet* 97: 115–126, 2025.
3. Asín-Izquierdo I, Gutiérrez-García L, Galiano C. Application of technology for the analysis of small-sided games in football. From complexity to chaos in training design: Reference to number of players, playing space, orientation, time distribution, directionality with goalkeepers, and feedback. *Proc Inst Mech Eng P J Sport Eng Technol* 238: 117–125, 2024.
4. Buchheit M, Settembre M, Hader K, McHugh D. Exposures to near-to-maximal speed running bouts during different turnarounds in elite football: Association with match hamstring injuries. *Biol Sport* 40: 1057–1067, 2023.
5. Bush M, Barnes C, Archer DT, Hogg B, Bradley PS. Evolution of match performance parameters for various playing positions in the English Premier League. *Hum Mov Sci* 39: 1–11, 2015.
6. Clemente FM, Owen A, Serra-Olivares J, Nikolaidis PT, van der Linden CMI, Mendes B. Characterization of the weekly external load profile of professional soccer teams from Portugal and the Netherlands. *J Hum Kinet* 66: 155–164, 2019.
7. Clemente FM, Rabbani A, Conte D, et al. Training/match external load ratios in professional soccer players: A full-season study. *Int J Environ Res Public Health* 16: 3057, 2019.
8. Douchet T, Paizis C, Carling C, Babault N. Influence of a modified versus a typical microcycle periodization on the weekly external loads and match day readiness in elite academy soccer players. *J Hum Kinet* 93: 133–144, 2024.
9. Gualtieri A, Vicens-Bordas J, Rampinini E, Ferrari Bravo D, Beato M. Three-four-and five-day microcycles: The normality in professional football. *Int J Sports Physiol Perform* 19: 987–995, 2024.
10. Hopkins WG, Marshall SW, Batterham AM, Hanin J. Progressive statistics for studies in sports medicine and exercise science. *Med Sci Sports Exerc* 41: 3–13, 2009.
11. Kanaras V, Michailidis Y, Mandroukas A, et al. Weekly external load correlation in season microcycles with game running performance and training quantification in elite young soccer players. *Sensors* 24: 4523, 2024.
12. Mandorino M, Tessitore A, Lacome M. Loading or unloading? This is the question! A multi-season study in professional football players. *Sports* 12: 148, 2024.
13. Modric T, Versic S, Sekulic D. Relations of the weekly external training load indicators and running performances in professional soccer matches. *Sport Mont* 19: 31–37, 2021.
14. Morgans R, Orme P, Anderson L, Drust B, Morton JP. An intensive winter fixture schedule induces a transient fall in salivary IgA in English Premier League soccer players. *Res Sports Med* 22: 346–354, 2014.
15. Noor D, McCall A, Jones M, et al. Transitioning from club to national teams: Training and match load profiles of international footballers. *J Sci Med Sport* 22: 948–954, 2019.
16. Oliva Lozano JM, Muyor JM, Pérez-Guerra A, et al. Effect of the length of the microcycle on the daily external load, fatigue, sleep quality, stress, and muscle soreness of professional soccer players: A full-season study. *Sports Health* 15: 695–699, 2023.
17. Oliva-Lozano JM, Gómez-Carmona CD, Rojas-Valverde D, Fortes V, Pino-Ortega J. Effect of training day, match, and length of the microcycle on the worst-case scenarios in professional soccer players. *Res Sports Med* 30: 425–438, 2022.
18. Oliva-Lozano JM, Muyor JM, Fortes V, McLaren SJ. Decomposing the variability of match physical performance in professional soccer: Implications for monitoring individuals. *Eur J Sport Sci* 21: 1588–1596, 2021.
19. Rebelo A, Brito J, Seabra A, Oliveira J, Drust B, Krustrup P. A new tool to measure training load in soccer training and match play. *Int J Sports Med* 33: 297–304, 2012.
20. Stevens TGA, de Ruiter CJ, Twisk JWR, Savelsbergh GJP, Beek PJ. Quantification of in-season training load relative to match load in professional Dutch Eredivisie football players. *Sci Med Footb* 1: 117–125, 2017.