Original Article

Quantification of high speed actions across a competitive microcycle in professional soccer

MIGUEL ANGEL CAMPOS-VAZQUEZ[1] ✉, ASIER ZUBILLAGA[2], FRANCISCO JAVIER TOSCANO-BENDALA[3], ADAM LEE OWEN[4,5], ALFONSO CASTILLO-RODRÍGUEZ[6]

[1]*Faculty of Sport, Pablo de Olavide University, Sevilla, Spain*
[2]*University of the Basque Country (UPV/EHU), Spain*
[3]*Catholic University (UCAM), Murcia, Spain*
[4]*BenficaLAB, S.L. Benfica, Lisbon, Portugal*
[5]*Sports Research and Innovation Center (CRIS), Claude Bernard University Lyon 1, Villeurbanne, France*
[6]*Department of Physical Education and Sports, University of Granada, Spain*

ABSTRACT

The main aim of this study was to compare the high-speed training session (TRs) and competitive match (OMs) demands induced on professional soccer players across an in-season microcycle. Maximum velocity (MV) and the number of actions and distance performed at high (N-HV > 14.4 km·h^{-1}), very high velocity (N-VHV > 19.8 km·h^{-1}) and sprint (N-SP > 25.2 km·h^{-1}), in different distance zones (0–5, 5–15, 15–30, >30 m) were evaluated. Twelve professional soccer players competing within the Spanish 1st Division were the participants of the study. TRs were categorised according to days leading to the match day (MD-5, MD-4, MD-3, MD-1). The results showed significant differences between OMs and TRs across all analysed variables, except for N-HV, N-VHV, and N-SP 15–30m in the comparisons between OMs and MD-4. In addition, N-SP 15–30 m in MD-4 and MD-3 were significantly higher than in MD-1 (ES = 0.87 and 0.80, respectively) without differences in MV highlighting a tapering strategy. To conclude, the current investigation revealed a potential tapering strategy in professional soccer in conjunction to highlighting a way of maintaining MV and high speed actions across low-distance ranges (<15 m). Therefore, it would be necessary to further induce task with high-velocity actions in high-distance ranges (>30 m) across the TRs in order to replicate the velocity peaks occurred in OMs.
Keywords: Sprinting; Fitness; Injury prevention; Training; GPS; Football.

Cite this article as:
Campos-Vazquez, M.A., Zubillaga, A., Toscano-Bendala, F.J., Owen, A.L., & Castillo-Rodríguez, A. (2023). Quantification of high speed actions across a competitive microcycle in professional soccer. *Journal of Human Sport and Exercise*, *18*(1), 21-33. https://doi.org/10.14198/jhse.2023.181.03

✉ **Corresponding author.** *Faculty of Sport, Pablo de Olavide University, Utrera road, Km1. Sevilla-41013, Spain.*
E-mail: macamvaz@upo.es
Submitted for publication December 17, 2020.
Accepted for publication April 16, 2021.
Published January 01, 2023 *(in press* May 10, 2021).
JOURNAL OF HUMAN SPORT & EXERCISE ISSN 1988-5202.

doi:10.14198/jhse.2023.181.03

INTRODUCTION

Physiologically, soccer at the elite level is predominantly an aerobic sport which induces very high-intensity efforts interspersed across its duration along with other types of submaximal efforts (Bangsbo, 1994; Bloomfield, Polman, & O'Donoghue, 2007; Stolen, Chamari, Castagna, & Wisloff, 2005) and with shorts breaks (Siegle & Lames, 2012). These effects and demands imposed on players are known to cause high levels of fatigue related issues during competition (Marshall, Lovell, Jeppesen, Andersen, & Siegler, 2014).

Recently, an increase in research surrounding the physical demands of matches and the characteristics of efforts required at the top level of competition has been reported (Bloomfield et al., 2007; Bradley et al., 2009; Di Salvo et al., 2010; Mohr, Krustrup, & Bangsbo, 2003; Suarez-Arrones et al., 2015). Findings from these investigations reveal how elite soccer players cover distances between from 9 to 12km per game (Di Salvo et al., 2007; Di Salvo, Pigozzi, Gonzalez-Haro, Laughlin, & De Witt, 2013; Stolen et al., 2005), with an intermittent exercise pattern (Orendurff et al., 2010). In this context, the distance travelled at high velocity is presented as a crucial variable in the performance of players during matches (Mohr et al., 2003), ranging between ~700m and ~1000m (Di Salvo, Gregson, Atkinson, Tordoff, & Drust, 2009). Many variables effect these specific distances and demands such as: playing formations (Tierney, Young, Clarke, & Duncan, 2016), opposition quality (Rampinini, Coutts, Castagna, Sassi, & Impellizzeri, 2007), or game location (Lago, Casais, Dominguez, & Sampaio, 2010). More specifically, during periods of maximum intensity, players sprint between 1% and 11% of their total distance (Stolen et al., 2005), leading them to cover approximately between 3.3 and 7.6m per minute ($m \cdot min^{-1}$) (Suarez-Arrones et al., 2015) at maximum efforts.

The importance this type of action may have within the game combined with the sprint distance travelled, may have a certain impact on the outcome of the matches, based on the fact that most goals scored are preceded by a straight sprint (Faude, Koch, & Meyer, 2012). Additionally, results of matches may be suggested to be as a result the sprint activity of the players as highlighted through recent research suggesting greater sprint distances travelled for strikers and midfielders in games won vs. games lost (Andrzejewski, Chmura, Konefal, Kowalczuk, & Chmura, 2017).

Recent research has found that both the distance covered at high velocity and sprint distance have increased in recent years in professional leagues (Barnes, Archer, Hogg, Bush, & Bradley, 2014; Bush, Barnes, Archer, Hogg, & Bradley, 2015). These increased high speed running (HSR) demands should be taken into account when designing training sessions (TRs), since understanding the load imposed on players during matches is necessary to develop specific training (Di Salvo et al., 2007; Owen, Djaoui, Newton, Malone, & Mendes, 2017). Coaches and fitness coaches should have the primary objective to reproduce during the TRs both the density and the characteristics of the HSR actions demanded by the competition. If the TRs do not simulate or even intensify the demand for the high-velocity effort demanded by the competition, the physical performance during matches could be compromised (Di Salvo et al., 2007) and the risk of injury during competition could even increase (Gabbett, 2016; Malone, Roe, Doran, Gabbett, & Collins, 2017). However, despite the importance of knowing if the high-velocity actions performed during the competition are replicated in the training, few studies that have analysed the differences between physical match demands and those TRs usually performed during the competitive microcycle (Owen et al., 2017).

Traditionally, multi-camera devices have been used to assess physical performance in official matches (OMs) (Castellano, Alvarez-Pastor, & Bradley, 2014), and global positioning system (GPS) technology has been used to assess external load in tasks and/or TRs (Malone et al., 2015) and in friendly matches (Casamichana, Castellano, & Castagna, 2012). However, data derived from video analysis and GPS should not be used interchangeably (Randers et al., 2010). Since FIFA authorised the use of GPS devices in OMs in 2015 (Al Haddad, Mendez-Villanueva, Torreno, Munguia-Izquierdo, & Suarez-Arrones, 2017), this technology could be considered as an ideal way to assess in a valid and reliable way the physical demands in both training and competition matches (Suarez-Arrones et al., 2015).

The objective of the research was to compare the distance covered at high velocity and very high velocity during OMs, with the values reached in such variables during the TRs usually held throughout the competitive microcycle in professional football players. In addition, a comparison of the number of actions performed at high and very high velocity in different distance zones between competition and the different TRs was assessed.

METHODS

Participants

Twelve professional soccer players (six defenders, four midfielders, and two forwards) participated in this study (age: 28.1 ± 4.7 years; height: 179.7 ± 4.1 cm; weight: 78.2 ± 7.2 Kg; sum of six skinfolds: 51.0 ± 8.6; % fat [Faulkner]: 12.1 ± 1.6). All the players were competing in the same team within the Liga BBVA (1st Division Spanish League, season 2015-16). All subjects were previously informed about the purpose of the study and types of tests they would undergo and gave their informed consent following the indications of the Declaration of Helsinki (2013). The study was approved by the ethics committee of the researching university.

Design

In this study, a descriptive design was used. The study was conducted over a 10-weeks period during the first half of the competitive season. However, only TRs performed during those microcycles with one OM per week and five TRs before the match (six microcycles) were included in the analysis. These TRs had an average duration of ~ 85 minutes (range: 75 to 95 minutes).

The TRs were grouped into different types according to the distance in days to the competition match (Owen et al., 2017): 6xMD-5, 6xMD-3, 6xMD-2, 6xMD-1. The MD-2 sessions were not monitored, since their objective was physiological recovery from the efforts made in the previous sessions, and they were performed in the gym. Individual records of players who did not complete a TR due to injury or manipulated training load due to fatigue management, were excluded from the analysis. Finally, a total of 24 TRs and 222 individual records met all the requirements and were used for evaluation and analysis. The usual content of each type of TR was as follows:

- MD-5. These sessions were held five days before the OM. They used to start with functional strength training in the field (muscle strengthening exercises with elastics, CORE exercises, and eccentric exercises for hamstrings and adductors). Subsequently, medium- and large-sided game situations (8vs8–10vs10) were performed in medium pitch (∽90m^2 per player).
- MD-4. These sessions were held four days before the competition match. They used to start with general or functional strength training. Subsequently, physical conditioning tasks were performed, such as high-intensity interval training (HIIT), physical-technical circuits, or small-sided games (SSG).
- MD-3. These sessions were held three days before the OM. After the warm-up, ball possession games in small pitch (∽60 m^2 per player) were performed. Subsequently, various conditioned tasks with an 11 vs. 11 setup played in moderately large areas (70 x 65 m, length and width, respectively) were performed to improve the team model of gameplay.

- MD-1. These sessions were held the day before a match. After the warm-up period, finishing actions executed at maximum velocity were performed. Then, players performed 15 to 20 minutes of an 11 vs. 11 match played on a 70 x 65 m area. The session typically ended with 30 minutes of set pieces.

During the study, nine OMs were played. The formation used by the team in all monitored OMs was 1–5–3–2, i.e., a goalkeeper, five defenders, three midfielders, and two forwards. To reduce the influence of possible fatigue, tactical changes, substitution, as well as the influence of the results on physical performance, only the first half of the games was analysed (45 minutes plus the added time) (Suarez-Arrones et al., 2015). The records of players who did not complete at least the first 45 minutes of the OM, due to injury or substitution, were excluded from the analysis. A total of 69 individual records met all the requirements and were used for evaluation and analysis.

All players were monitored in each TR and OM through a GPS device. The players were familiar with the use of these devices, wearing them usually in both games and TRs. Fifteen minutes before each game and TR, the GPS devices were activated to get a better connection to the satellites. To reduce the inter-unit error, each player carried the same device throughout the entire investigation period. The device used (Minimax S4; Catapult Innovations, Melbourne, Australia) operates at a sampling frequency of 10 Hz. This device has been shown to have an acceptable reliability and validity to estimate the accelerations and sprints usually performed in competition in team sports (Akenhead, French, Thompson, & Hayes, 2014; Castellano, Casamichana, Calleja-Gonzalez, Roman, & Ostojic, 2011; Varley, Fairweather, & Aughey, 2012). The average number of satellites during the TRs and OMs was 9.5 ± 2.0. After completion of each game and TR, the data were downloaded and analysed using the software Openfield v.1.10.0. (Catapult®, Camberra). All records in which signal errors were detected were excluded from analyses.

Time-motion analysis

The external load in each TR and OM was evaluated considering the following variables: maximum velocity (MV), total distance covered (TD), distance at high velocity (DHV: >14.4 $Km \cdot h^{-1}$), distance at very high velocity (DVHV: >19.8 $Km \cdot h^{-1}$), and sprint distance (DSP: >25.2 $Km \cdot h^{-1}$). All variables were similar to those used in previous investigations (Bradley, Di Mascio, Peart, Olsen, & Sheldon, 2010; Bradley et al., 2009; Rampinini et al., 2007). In order to carry out the comparison between the competition matches and the different types of TRs analysed, the values of all these variables (except MV) were relativised to the minute of participation ($m \cdot min^{-1}$).

The number of efforts of more than 1 second performed at high velocity (N-HV>14.4 $Km \cdot h^{-1}$), at very high velocity (N-VHV>19.8 $Km \cdot h^{-1}$) and the number of sprints (N-SP>25.2 $Km \cdot h^{-1}$) in four different distance zones — 0–5 m, 5–15 m, 15–30 m, >30 m— were also recorded (Table 1). The values of all these variables were relativised at the time of participation (number of actions per hour).

Table 1. Number of efforts in different distance zones analysed.

	Distance zones (m)			
	0-5	5-15	15-30	>30
N-HV	N-HV 0-5	N-HV 5-15	N-HV 15-30	N-HV >30
N-VHV	N-VHV 0-5	N-VHV 5-15	N-VHV 15-30	N-VHV >30
N-SP	N-SP 0-5	N-SP 5-15	N-SP 15-30	N-SP >30

Note. N-HV: number of high velocity efforts (>14.4 $Km \cdot h^{-1}$); N-VHV: number of very high velocity efforts (>19.8 $Km \cdot h^{-1}$); N-SP: number of sprint efforts (>25.2 $Km \cdot h^{-1}$).

Finally, for each TR and OM the number of repeated high-intensity efforts (N-RHIE), defined as the performance of at least three efforts (> 1 second) at a velocity higher than 14.4 $Km \cdot h^{-1}$ with a recovery less than 21 seconds (Casamichana et al., 2012), was recorded. This variable was also relativised at the time of participation to make comparisons (number of actions per hour).

Statistical analysis

The results are presented as mean ± standard deviation (SD). The normality of the data of the different variables was checked before carrying out the analyses. In order to compare the possible differences in each variable between the different TRs and OMs, the one-way ANOVA test was used. In addition, the Levene test was performed to assess whether the homoscedasticity assumption was met. Eta-squared values were calculated to estimate the effect size (ES) of ANOVA. An eta-squared effect size of $\eta^2 = 0.02$ was considered a small effect size, an effect size of $\eta^2 = 0.13$ was considered a medium effect size, while $\eta^2 = 0.26$ was considered a large effect size (Abbott, Brickley, & Smeeton, 2017). Subsequently, Bonferroni *Post Hoc* tests were used to perform the pairwise comparison if the homoscedasticity and Games–Howell requirement were met otherwise. In addition, Cohen's *d* ES was used. Ranges for ES analysis were set at <0.2 (trivial), 0.2–0.6 (small), 0.6–1.2 (moderate), 1.2–2 (large), and >2 (very large) (Hopkins, Marshall, Batterham, & Hanin, 2009). All statistical analyses were performed with the statistical package IBM SPPS for Windows V 24. The level of significance was established as $p < .05$.

RESULTS

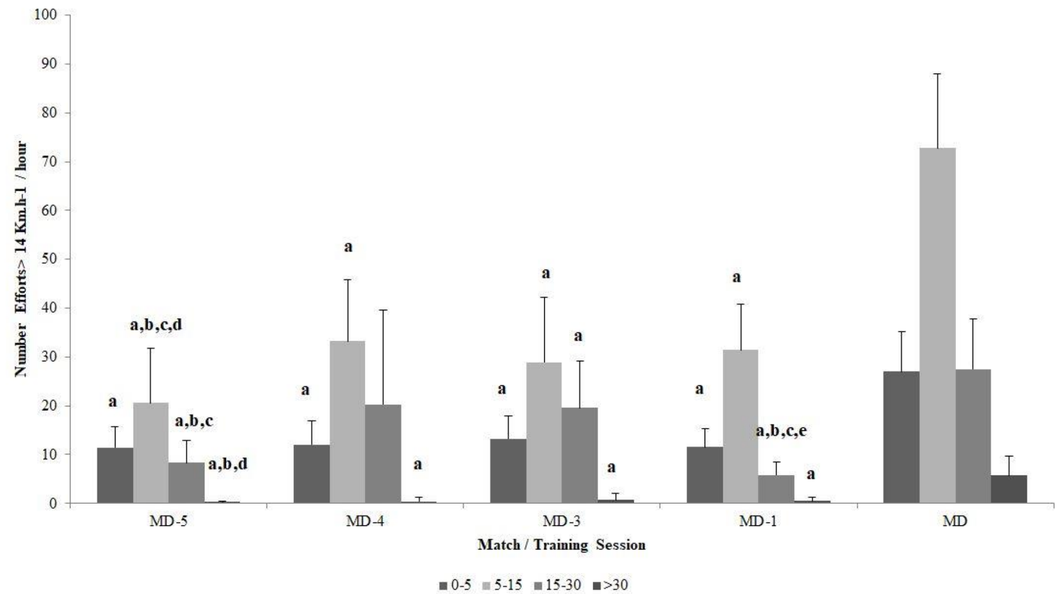
ANOVA results showed statistically significant differences ($p < .05$) between the OMs and the different TRs in all the variables analysed (Table 2 and Figures 1, 2, 3).

Table 2. Comparison of distances covered at different speed ranges between matches and training sessions during the competitive microcycle. Mean ± Standard Deviation (coefficient variation in %).

	MD-5	MD-4	MD-3	MD-1	MD	η^2
Total distance/min	55.6 ± 6.8 (12.3)^{a,b,c}	62.3 ± 7.8 (12.3)^{a,c}	68.6 ± 8.8 (12.8)^{a}	56.6 ± 5.9 (10.4)^{a,b,c}	118.7 ± 11.8 (10.0)	0.89
Distance > 14.4 Km^{h-1}/min	5.8 ± 2.2 (37.7)^{a,b,c,d}	12.1 ± 5.5 (45.2)^{a}	11.1 ± 3.9 (34.8)^{a}	7.6 ± 2.2 (29.3)^{a,b,c}	25.8 ± 7.1 (27.5)	0.70
Distance > 19.8 Km^{h-1}/min	1.2 ± 1.1 (87.0)^{a,b,c,d}	4.2 ± 2.5 (60.1)^{a}	2.8 ± 1.7 (60.2)^{a,c}	2.0 ± 1.0 (51.1)^{a,b,c}	7.5 ± 3.0 (40.0)	0.54
Distance > 25.2 Km^{h-1}/min	0.1 ± 0.2 (173.6)^{a,b,c}	0.6 ± 0.7 (112.0)^{a}	0.4 ± 0.4 (103.6)^{a}	0.1 ± 0.3 (264.3)^{a,b,c}	1.5 ± 1.2 (75.2)	0.38
Maximum velocity	25.6 ± 2.0 (7.9)^{a,b,c,d}	27.3 ± 2.6 (9.5)^{a}	28.0 ± 2.5 (8.8)^{a}	26.9 ± 2.1 (7.9)^{a}	29.5 ± 2.5 (8.6)	0.21
No RHIE	3.6 ± 2.7 (75.5)^{a,b,c}	5.4 ± 2.8 (52.9)^{a,b}	7.6 ± 3.3 (43.9)^{a}	4.9 ± 2.3 (47.9)^{a,b}	19.1 ± 6.1 (31.5)	0.70

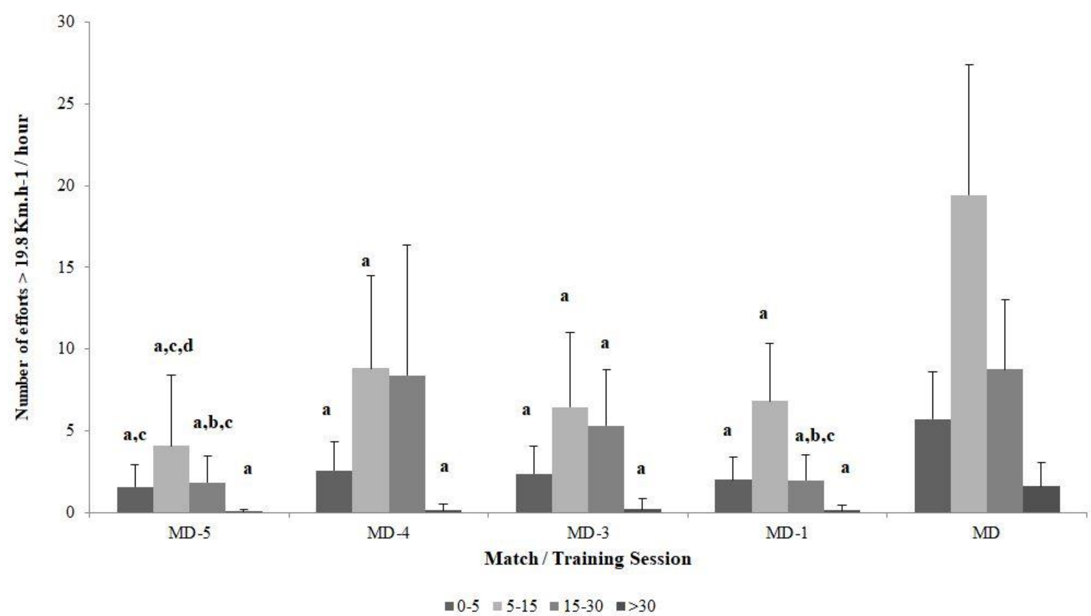
Note. MD: match day: official match; MD-(1,3,4,5): training sessions held the days before the match; min: minute; No: number; RHIE: repeated high-intensity efforts. ^{a} significantly lower than OM; ^{b} significantly lower than MD-3: ^{c} significantly lower than MD-4; ^{d} significantly lower than MD-1; η^2: eta-squared (effect size).

Specifically, pairwise comparison revealed that N-VHV 0–5 in MD-4 was significantly higher ($p < .05$) than performed in MD-5 (ES = 0.61) (Figure 2).



Note. [a] significantly lower than MD; [b] significantly lower than MD-3: [c] significantly lower than MD-4; [d] significantly lower than MD-1; [e] significantly lower than MD-5; MD: match day: official match; MD-(1,3,4,5): training sessions held the days before the match.

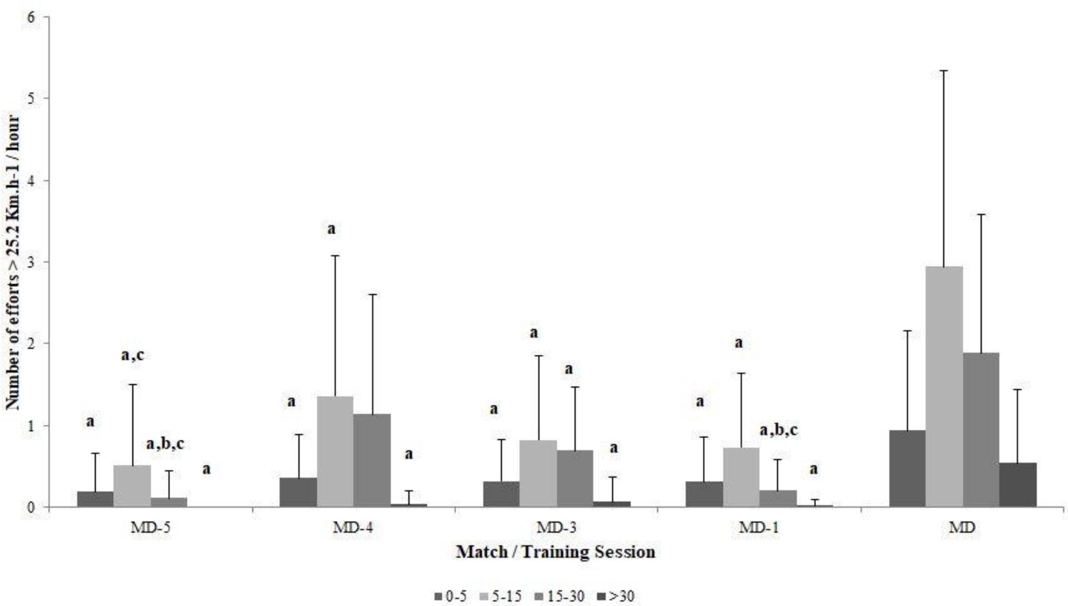
Figure 1. Number of high-velocity efforts (>14.4 Km·h^{-1}) in different distance zones during the competitive microcycle.



Note. [a] significantly lower than MD; [b] significantly lower than MD-3: [c] significantly lower than MD-4; [d] significantly lower than MD-1; MD: match day: official match; MD-(1,3,4,5): training sessions held the days before the match.

Figure 2. Number of very high-velocity efforts (>19.8 Km·h^{-1}) in different distance zones during the competitive microcycle.

On the other hand, N-HV 5–15 in MD-4, MD-3, and MD-1, was significantly higher than in MD-5 (ES = 1.03, 0.66 and 1.06 respectively) (Figure 1). N-VHV 5–15 in MD-4 and MD-1 was significantly higher than in MD-5 (ES = 0.90 and 0.70, respectively) (Figure 2). Finally, N-SP 5–15 in MD-4 was significantly higher than in MD-5 (ES = 0.57) (Figure 3).



Note. [a] significantly lower than MD; [b] significantly lower than MD-3: [c] significantly lower than MD-4. MD: match day: official match; MD-(1,3,4,5): training sessions held the days before the match.

Figure 3. Number of sprint efforts (>25.2 Km·h^{-1}) in different distance zones during the competitive microcycle.

In addition, N-HV 15–30 in MD-4 and MD-3 was significantly higher than in MD-1 (ES = 1.06 and 1.96, respectively); N-HV 15–30 in MD-5 was significantly higher than in MD-1 (ES = 0.70); and N-HV 15–30 in MD-4 and MD-3 was significantly higher than in MD-5 (ES = 0.77 and 1.39, respectively) (Figure 1). Besides, the N-VHV 15–30 recorded in MD-4 and MD-3 was significantly higher than in MD-1 (ES = 1.12 and 1.25, respectively) (Figure 2), and the N-VHV 15–30 recorded in MD-4 and MD-3 was significantly higher than in MD-5 (ES = 1.02 and 1.20, respectively) (Figure 2). Finally, the N-SP 15–30 demanded in MD-4 and MD-3 was significantly higher than in MD-1 (ES = 0.87 and 0.80, respectively) (Figure 3), and the N-SP 15–30 recorded in MD-4 and MD-3 was significantly higher than in MD-5 (ES = 0.87 and 0.91, respectively) (Figure 3).

The results of the investigation also showed that the N-HV>30 in MD-3 and MD-1 was significantly higher than in MD-5 (ES = 0.54 and 0.64, respectively) (Figure 1).

DISCUSSION AND CONCLUSIONS

The main objective of the investigation was to compare the activity performed at high velocity and very high velocity during the official competition matches, with the activity demanded in the TRs usually held during the competition standard microcycle in professional soccer players. The results obtained showed that both the

MV and the distance travelled in high- and very high-velocity zones were significantly greater during the matches than the values demanded in those variables in any of the sessions held during the competition microcycle. In addition, when the efforts made at high velocity were analysed in different distance zones, the differences between matches and TRs were also significant, except for the range 15–30 between matches and the MD-4 sessions.

Due to the difference between the duration of the OM and the different TRs performed during the competitive microcycle, the values of all the analysed variables (except MV) were relativised to the time of participation (Suarez-Arrones et al., 2015). In this way, the results obtained reflect the intensity of both the game and the different TRs (Owen, et al., 2017) and allow comparisons between matches and TRs. Thus, the DHV travelled by the players in the TRs performed during the competitive microcycle ranged from 5.8 $m·min^{-1}$ in the MD-5 sessions to 12.1 $m·min^{-1}$ in the MD-4 sessions. In the same way, during these MD-4 sessions, the highest values of the microcycle were reached for the DVHV (4.2 $m·min^{-1}$) and DSP (0.6 $m·min^{-1}$). However, these values were significantly lower than those demanded in the competition (DHV: 25.8 $m·min^{-1}$; DVHV: 7.5 $m·min^{-1}$; and DSP: 1.5 $m·min^{-1}$) (Table 2). Therefore, none of the TRs analysed managed to reach the relative intensity obtained during the competition, as happened in previous research (Owen, et al., 2017; Scott et al., 2014).

The ability to produce high velocities is considered an important performance factor (Al Haddad, Simpson, Buchheit, Di Salvo, & Mendez-Villanueva, 2015). Soccer players should be exposed regularly during TRs to periods of high and very high velocity with the aim of preparing them optimally for the demands of competition (Malone, Roe, Doran, Gabbett, & Collins, 2017). However, and based on the results obtained in both our research and previous investigations, the activity carried out at high velocity to which the players are subjected during the different TRs is not enough to match that demanded by the competition. This fact could have a special impact on the risk of injury, since a reduced dose of DVHV and DSP accumulated during the competitive microcycle seems to increase the risk of injury in football players (Malone et al., 2018).

During the TRs, there are usually breaks between tasks and between repetitions (Scott et al., 2014) that could condition the reduced relative intensity shown by the TRs in regards to the OMs. However, these pauses should not condition the MV reached by the players during the TRs. Nevertheless, the MV reached during the matches (29.5 $Km·h^{-1}$) was significantly higher than the one demanded in any of the TRs analysed (Table 2), indicating that the training tasks proposed during the TRs do not allow the players to reach the peaks of velocity that are achieved in competition. Based on the results obtained, it could be speculated that certain muscle injuries (hamstrings) that occur during MV efforts in matches may be a result of not stimulating players adequately during the TRs (Ekstrand, Walden, & Hagglund, 2016).

The analysis of high- and very high-velocity efforts in different distance zones revealed the distribution of these efforts along the competitive microcycle in detail. In both training and matches, there is a clear tendency for N-HV, N-VHV, and N-SP to be performed over distances with the range 5–15 m (Figures 1–3). Previous investigations have analysed the distribution of efforts made at very high speed (>25.2 $Km·h^{-1}$) in different distance zones during official competition matches, but not during TRs. Thus, Di Salvo et al. (2009) and Di Salvo et al. (2010) found a greater number of efforts made during the competition in the zone 0–5 m than in the upper ranges. The different results obtained in our research could reflect an increase in the average distance at which the high-velocity efforts are made in competition, which could be related to the increase in the distance travelled at high velocity during the past years in official competition matches (Barnes et al., 2014; Bush et al., 2015).

In addition, an important finding of our research was the absence of significant differences between OMs and the MD-4 sessions for N-HV 15–30, N-VHV 15–30, and N-SP 15–30. During these sessions, players usually performed tasks to improve physical condition such as HIIT, which demanded activity at high velocity in the zone 15–30 m. However, the proposed training did not match the activity at high velocity demand during the competition in the range >30 m. Previous research has shown how *the maximum running speed during a sprint is reached between 20 and 40m (Di Salvo et al., 2010; Suarez-Arrones et al., 2015). Therefore, fitness coaches should include analytical tasks to improve speed over distances >30m, with the aim of reaching maximum velocities similar to those required by the competition.

Regarding the distribution of activity at high velocity during the microcycle, the results of our research show how the central sessions of the week (MD-4 and MD-3) demanded higher values than sessions MD-5 and MD-1 in various variables (Table 2). The MD-5 sessions were clearly the sessions with lower demands for high-velocity activity (Table 2). These sessions are held barely 48 hours after the last official competition match, so players may not be fully recovered from the efforts required by the competition. For this reason, the technical staff usually designs tasks in the MD-5 with lower demands at high velocities in order to facilitate recovery and avoid the accumulation of fatigue in the introductory phase of the competitive microcycle. On the other hand, during MD-1 sessions there was a significant decrease with respect to the central sessions of the weeks of the DHV, DVHV, DSP, and N-RHIE, but not of the MV (Table 2). In addition, the decrease in activity at high velocity during these sessions compared to the central sessions of the week is a consequence of a smaller number of actions performed in the range 15–30m, but not in the other ranges (Figures 1–3). These results help to understand the *tapering* strategies that coaches usually perform in the final part of the microcycle (Malone et al., 2015; Owen, et al., 2017), decreasing the activity related to high velocity, but maintaining the MV, and the number of actions performed at high velocity in low-distance zones (<15 m).

In conclusion, maximum velocities similar to those induced by official competition matches were not reached in any of the TRs during the competitive microcycle. The distances covered at high and very high velocity during the TRs also could not simulate the values recorded during the competition. If the tasks and/or TRs do not simulate or even intensify the high-speed effort demanded by the competition, the physical performance during the matches could be compromised (Di Salvo et al., 2007) and the risk of injury during the competition could be increased (Gabbett, 2016).

In addition, only the MD-4 TRs managed to reach the density of efforts of high and very high velocity for the zone 15–30m that the competition demands, but not for the distances greater than 30 m, where the maximum velocities are most frequently reached (Di Salvo et al., 2010). Therefore, fitness coaches should include specific training to improve speed over distances greater than 30m (Al Haddad et al., 2015), due to the fact that within this tapering strategy and training methodology assessed does not induce high speeds replicating competitive match situations (Djaoui, Chamari, Owen, & Dellal, 2017).

Limitation of the investigation

The small number of players used (one squad) and the only method used is a potential limitation of the study. Would be interesting to compare in future research different methods or same methods and different squads. Besides, looking at the effects of results and match data, would be interesting to see changes in weekly loads and match data for future research.

AUTHOR CONTRIBUTIONS

MACV, AZ, and ACR conceived and designed the experiments; FJTB, MACV and ALO performed the experiments; MACV and AZ analysed the data; All the authors wrote the paper and approve the final submission.

SUPPORTING AGENCIES

This study has been funded by the project PPJIA2020.04, of the Precompetitive Research Projects program for Young Researchers of the Own Plan 2020, of the University of Granada.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

ACKNOWLEDGMENTS

We thank the Department of Physical Education and Sport of the Faculty of Physical Activity and Sports Sciences (University of Granada), for the collaboration in the development of this research, the result of a stay for research purposes at the centre.

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