

More Time in Play, Not More High-Intensity; The Influence of Effective Playing Time on Match Running Performance in Elite Soccer

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Abstract

This study aimed to examine the influence of effective playing time (EPT) on match running performance (MRP) in elite soccer players competing in the UEFA Champions League (UCL), while controlling for contextual factors. In total, 1371 individual observations, involving 437 outfield players, participating in 32 teams, were collected from 122 matches using an optical tracking system. The MRP variables included total distance (TD), low- (LIR), moderate- (MIR), and high-intensity running (HIR). Linear mixed models were applied, with match outcome, match location, and opponent quality included as fixed effects, and player and team identity as random effects. The results showed that EPT significantly influenced TD ($f=5.01-14.20$, all $p<0.01$) and LIR ($f=3.23-21.93$, all $p<0.05$) across most playing positions, with players covering 9–10% greater distances in matches with very long EPT compared to very short EPT. In contrast, no significant effects of EPT were observed for MIR and HIR across any playing position. These findings indicated that longer EPT primarily increased overall activity, mainly through low-intensity activities, while moderate- and high-intensity activities remained relatively stable. Importantly, this pattern was consistent across players from multiple national contexts. From a practical perspective, EPT should be considered when planning and monitoring overall load, whereas moderate- and high-intensity activities should be systematically developed and maintained through training independent of EPT.

Keywords: ball in play, physical performance, playing positions, football, UEFA Champions League

Introduction

Match running performance (MRP) represents a key component of physical demands in soccer, providing objective insight into the external load imposed on players during match-play (Freire et al., 2022; Modric et al., 2025; Pranjic, Modric, & Uljevic, 2022). Typically, MRP is quantified through variables such as total distance covered, distances covered at different intensity thresholds, as well as accelerations and decelerations (Castellano, Huarte, & Casamichana, 2025; Kilci et al., 2025; Martín-Castellanos et al., 2024). These metrics are widely used to inform training prescription and load management (Šunjić, Veršić, Modrić, Marin, & Zalatel, 2024). However, MRP is not a fixed construct, as it is influenced by multiple contextual and situational factors (Trewin,

Meylan, Varley, & Cronin, 2017). Understanding the determinants of MRP is therefore essential for accurately interpreting match demands and designing ecologically valid training interventions (Aquino et al., 2017).

One factor that has recently attracted attention in this context is effective playing time (EPT) (Altmann, Forcher, Woll, & Härtel, 2023; Rey et al., 2024; Zhao & Zhang, 2021). Unlike the official match duration, EPT refers to the actual time the ball is in play, excluding all stoppages such as fouls, injuries, substitutions, and delays (Siegle & Lames, 2012). This distinction is important, as players are only physically engaged during active phases of the game. Given that matches can differ substantially in EPT (Linke, Link, Weber, & Lames, 2018), two matches of the same official match duration may impose

very different external loads. Therefore, EPT may play an important role in shaping the overall external load (i.e., MRP) experienced by players during a match. However, to the best of our knowledge, only one study directly examined the effect of EPT and MRP.

Altmann et al. (2023) in their study investigated German Bundesliga elite players, and reported that players covered on average 10% more total distance and performed 13% more accelerations, while sprinting 7–10% less in matches with long (> 65 min) compared to short (<50 min) EPT. Despite the valuable knowledge provided in this study, there were some limitations that open up possibilities for further research. First, MRP was obtained from teams participating in the single national league. Therefore, the results are undoubtedly influenced by geographical, cultural, historical, and social aspects of the country (Sapp, Spangenburg, & Hagberg, 2018; Sarmiento et al., 2013). Second, a relatively simple methodological approach was utilized. Specifically, contextual factors, such as match location, match outcome, or opponent quality, which have been shown to influence physical performance (Kádár et al., 2025; Plakias & Michailidis, 2024; Wang et al., 2026), were not statistically controlled for, raising questions about the relevance of the findings.

For all these reasons, additional research analysing the effect of EPT on MRP of teams from multiple countries utilizing a more complex statistical approach is arguably warranted. The most elite soccer competition that includes teams from multiple countries is the UEFA Champions League (UCL) (Lago-Peñas, Lago-Ballesteros, & Rey, 2011). Analyzing data from such a competition has the potential to provide novel insights about the influence of EPT on MRP. The results could facilitate the interpretation of MRP in relation to ETP, and consequently improve load management practices and training design in elite soccer. Therefore, this study aimed to examine the effect of EPT on the MRP of UCL players. We hypothesized that MRP would be affected by EPT for players in all playing positions.

Methods

Sample and design

Players' MRP were analysed in all UCL matches ($n=125$) over the course of the 2022/23 season. Three matches were subsequently excluded owing to poor-quality data. Only the results of players who participated in the whole match were analysed, while goalkeepers were not included due to the specificity of this position. As a result, the final sample included 1371 individual observations obtained from 122 matches, in which a total of 437 players from 32 teams participated. To ensure confidentiality, all players' identities were anonymised in accordance with the principles of the Declaration of Helsinki. The investigation was approved by the Ethical Board of the University of Split, Faculty of Kinesiology (approval number: 2181-205-02-05-19-0020).

The players' observations were classified according to the EPT into the five groups: (i) <50'; very short EPT (VSEPT; 33 observations), (ii) 50–55'; short EPT (SEPT; 274 observations), (iii) 56–60'; moderate EPT (MEPT; 598 observations),

(iv) 61–65'; long EPT (LEPT; 308 observations), (v) >65'; very long EPT (VLEPT; 158 observations) (Altmann et al., 2023). In addition, players' observations were classified according to their playing positions: central defenders (CD; 471 observations), central midfielders (CM; 376 observations), fullbacks (FB; 283 observations), forwards (FW; 104 observations), and wingers (WM, 137 observations). Match outcome (win, draw, lose), match location (home, away), and opponent quality (five-season UEFA club coefficient) were included in the study as covariates to control for the potential influence of contextual factors.

Procedure

The MRP data were obtained using an optical tracking system (Player & Ball Tracking System, Hawk-Eye Innovations Limited, Basingstoke, England). The system's reliability and validity have been previously evaluated in accordance with the official Fédération Internationale de Football Association (FIFA) test protocol for Electronic Performance and Tracking Systems (EPTS). This validation process involved comparisons with a gold-standard motion capture system (Vicon, Vicon Motion Systems, Oxford Metrics, UK) across five velocity ranges (0–7 km/h, 7–15 km/h, 15–20 km/h, 20–25 km/h, and >25 km/h). The system met the required criteria, confirming a high level of reliability and validity (Modric et al., 2025). The MRP variables included total distance covered (m), low-intensity running (LIR) (m) (≤ 15 km/h), moderate-intensity running (MIR) (m) (15–20 km/h), and high-intensity running (HIR) (m) (≥ 20 km/h) (Modric et al., 2025).

Statistical analysis

A linear mixed model was fitted, with match outcome, match location, and opponent quality included as fixed effects, to examine the influence of EPT (i.e., main effect) on MRP of elite soccer players. Players' and teams' identities were modelled as random effects to account for the hierarchical structure of the data. When the significant main effect was detected, post-hoc pairwise comparisons were conducted using the Bonferroni adjustment. Model adequacy was assessed through visual inspection of residuals versus fitted values and normal Q–Q plots. All statistical analyses were performed using SPSS software (IBM SPSS Statistics, version 25.0), with statistical significance set at $p < 0.05$ level.

Results

The average EPT was 59.18 ± 4.58 min, with a minimum of 49 min and a maximum of 70 min. The results of the linear mixed model examining the influence of EPT on position-specific MRP, while controlling for contextual factors, are presented in Table 1. EPT significantly affected TD for CDs, CMs, FBs, and WMs ($f=5.01-14.20$, all $p < 0.01$), with post-hoc comparisons showing significantly greater TD in matches with VLEPT compared to the matches with VSEPT and SEPT. Also, EPT had a significant influence on LIR for CDs, CMs, FBs, and WMs ($f=3.23-21.93$, all $p < 0.05$), with post-hoc comparisons showing significantly greater LIR in

match with VLEPT compared to the matches with VSEPT, SEPT, and MEPT. Although a significant main effect of EPT was observed for LIR among FWs, post hoc comparisons revealed no significant pairwise differences between matches with different EPT. In contrast, no influence of EPT on MIR and HIR was found for players in all playing positions. Finally,

as covariates match outcome influenced (i) TD of players on all playing positions, (ii) LIR of CD, CM, FB, and FW, (iii) MIR of CD, and (iv) HIR of CD and WM. Match location had an impact on TD of CD and WM, CD's MIR, and CM's LIR. Opponent quality affected the LIR and HIR of CM.

Table 1. The influence of EPT on MRP while controlling for the contextual factors.

	VSEPT (A)	SEPT (B)	MEPT (C)	LEPT (D)	VLEPT (E)	EPT	MO	ML	OQ	
	Mean±SE									
	f (p)									
CD	TD	9608±164 ^{BCDE}	10178±94 ^{AE}	10145±85 ^{ADE}	10335±91 ^{AGE}	10601±103 ^{ABCD}	14.20 (<0.01)	7.62 (<0.01)	6.32 (0.01)	1.40 (0.25)
	LIR	7851±116 ^{BCDE}	8224±64 ^{ADE}	8236±57 ^{ADE}	8440±62 ^{ABCE}	8643±71 ^{ABCD}	21.93 (<0.01)	20.77 (<0.01)	0.38 (0.54)	0.57 (0.57)
	MIR	1215±70	1325±38	1287±33	1283±36	1353±42	1.99 (0.10)	5.12 (0.01)	13.69 (<0.01)	0.73 (0.48)
	HIR	556±50	636±21	624±17	619±20	603±25	0.87 (0.48)	12.56 (<0.01)	1.79 (0.18)	0.73 (0.48)
CM	TD	11247±169 ^{DE}	11639±98 ^{DE}	11640±85 ^{DE}	11894±91 ^{ABCE}	12178±113 ^{ABCD}	12.18 (<0.01)	5.75 (<0.01)	0.41 (0.52)	1.62 (0.20)
	LIR	8401±124 ^{CDE}	8743±59 ^{DE}	8766±47 ^{ADE}	8992±54 ^{ABCE}	9223±74 ^{ABCD}	15.88 (<0.01)	6.75 (<0.01)	3.89 (0.05)	3.73 (0.03)
	MIR	1990±101	2021±55	1994±47	2015±51	2059±65	0.39 (0.82)	2.35 (0.10)	0.85 (0.36)	1.57 (0.21)
	HIR	874±63	874±29	885±22	885±26	881±37	0.04 (1.00)	1.08 (0.34)	0.34 (0.56)	2.96 (0.05)
FB	TD	10526±189 ^{DE}	10817±100 ^E	10850±84 ^{DE}	11069±92 ^{AC}	11216±110 ^{ABC}	6.63 (<0.01)	6.15 (<0.01)	0.65 (0.42)	0.54 (0.58)
	LIR	8044±135 ^{DE}	8237±67 ^{DE}	8267±54 ^{DE}	8525±61 ^{ABC}	8580±75 ^{ABC}	11.36 (<0.01)	12.35 (<0.01)	3.55 (0.06)	1.68 (0.19)
	MIR	1464±83	1550±39	1560±31	1539±35	1580±45	0.54 (0.71)	2.04 (0.13)	0.51 (0.47)	0.82 (0.44)
	HIR	1027±77	1031±35	1023±27	1017±31	1059±40	0.28 (0.89)	1.63 (0.20)	2.35 (0.13)	0.16 (0.85)
FW	TD	10214±414	10628±230	10699±189	10870±198	11158±238	1.96 (0.11)	4.30 (0.02)	0.17 (0.69)	0.28 (0.76)
	LIR	7764±267	8117±144	8300±116	8459±122	8565±150	3.23 (0.02)	4.07 (0.02)	0.11 (0.74)	0.16 (0.85)
	MIR	1393±164	1535±88	1473±70	1532±74	1597±91	0.91 (0.47)	2.16 (0.12)	0.31 (0.58)	0.90 (0.41)
	HIR	1044±111	967±57	924±44	875±47	971±59	1.22 (0.31)	1.92 (0.15)	0.03 (0.85)	1.41 (0.25)
WM	TD	10363±382 ^E	10868±194 ^E	11110±157	11322±168	11560±195 ^{AB}	5.01 (<0.01)	4.03 (0.02)	0.02 (0.90)	0.74 (0.48)
	LIR	7830±271 ^E	8033±127 ^{DE}	8346±96 ^E	8537±106 ^B	8695±128 ^{ABC}	7.62 (<0.01)	0.72 (0.49)	1.50 (0.22)	0.83 (0.44)
	MIR	1615±181	1717±85	1691±65	1732±71	1790±86	0.49 (0.75)	0.96 (0.39)	0.32 (0.57)	0.22 (0.81)
	HIR	907±128	1127±55	1087±37	1041±43	1060±55	1.14 (0.34)	8.07 (<0.01)	0.34 (0.56)	0.73 (0.49)

MO – match outcome, ML – match location, OQ – opponent quality. Superscripted letters indicate significant mean differences when compared to specific EPT categories (A=VSEPT, B=SEPT, C=MEPT, D=LEPT, E=VLEPT)

Discussion

This study aimed to examine the influence of EPT on MRP in elite soccer players competing in the UCL while controlling for contextual factors. The EPT significantly affected TD and LIR across most playing positions, whereas no meaningful influence of EPT on MIR and HIR was observed. These findings suggest that EPT represents an important determinant of overall and low-intensity activities in elite soccer. As not all MRP variables were affected by EPT, our hypothesis that MRP would be affected by EPT for players on all playing positions can only be partly accepted.

The previous study investigating the influence of EPT on MRP reported that German Bundesliga players covered on average 10% more TD in matches with long (>65 min) compared to short (<50 min) EPTs (Altmann et al., 2023). The current study, which included players from multiple countries and controlled for contextual factors that repeatedly have been shown to shape MRP (Trewin et al., 2017), revealed similar findings. Specifically, 9-10% greater TD and LIR were found in matches with VLEPT compared to those with VSEPT for CDs, CMs, FBs, and WMs. Although no significant differences in TD were observed between EPT categories for FWs, descriptive data indicated a similar trend for these players as well. This suggests that the absence of statistical significance is most likely attributable to the smaller sample size for this position, and the consequently reduced statistical power (Cohen, 2013), rather than the absence of a true effect. Therefore, current findings indicated that EPT exerted a consistent and position-independent increase of TD and LIR.

This is most likely a consequence of the structural characteristics of match-play, where longer EPT is associated with fewer interruptions and more continuous phases of play (Zhao & Zhang, 2021). As a result, players spend more time actively engaged in the game. Given that players spend the majority of match-play performing low-intensity activities (Kilci et al., 2025; Wang et al., 2026), these activities inevitably accumulate to a greater extent as EPT increases. Irrespective of the causality, it is more important to highlight similar findings observed across studies (Altmann et al., 2023). In this context, the present study extends previous evidence by demonstrating that the relationship between EPT and MRP remains evident even after controlling for contextual factors known to influence MRP, such as match outcome, match location, and opponent quality (Trewin et al., 2017). Consequently, EPT can be considered a robust and independent determinant of TD and LIR in elite soccer.

In contrast to TD and LIR, EPT in the current study was not found to influence MIR or HIR across any playing position. This indicates that increases in EPT were reflected in greater overall activity, primarily through low-intensity running, while moderate- and high-intensity activities remained relatively unchanged. A possible explanation is that higher-intensity actions are not simply accumulated over time, but are instead driven by specific tactical situations such as transitions, runs in behind, or pressing actions (Chmura et al., 2018; Filter et al., 2023). Therefore, even when matches involve longer uninterrupted play, the frequency of these actions may not increase proportionally. Similar patterns have

been reported in previous research, where extended EPT did not lead to meaningful increases in high-intensity outputs. In particular, Altmann et al. (2023) in their study reported that in matches with longer EPT, irrespective of an increase in TD, higher-intensity actions remained unaffected by EPT.

Importantly, the current study extends such findings (i.e., that EPT influences TD and LIR but not MIR and HIR) by demonstrating that this pattern is consistent across teams competing in different national contexts. This is particularly relevant, as previous research has typically been limited to a single domestic league (Altmann et al., 2023), meaning that findings may be influenced by geographical, cultural, and tactical characteristics specific to that competition (Sapp et al., 2018; Sarmento et al., 2013). By including players from multiple countries, the current study reduces the likelihood that the observed relationships are context-specific, thereby strengthening the generalisability of the results. Therefore, from a practical perspective, soccer practitioners should consider EPT when planning and monitoring overall load irrespective of the context. At the same time, given that MIR and HIR appeared relatively stable, these should be systematically developed and maintained through training independent of EPT.

This study has several limitations. For methodological reasons, only players who completed the whole match were included, which reduced the number of observations and may have affected MRP outputs. Moreover, match observations for playing positions were unequal in their sample sizes, and this discrepancy likely also influenced the findings. Although most influential contextual factors were controlled, additional situational, environmental, and individual factors which have a strong theoretical background related to MRP, such as team formation, competitive level, phase of the season, temperature, humidity, players' fitness level, should be considered in future studies (Jerkovic, Modric, & Versic, 2022; Oliveira et al., 2025). For a more comprehensive understanding of the MRP-associated with EPT, future studies should analyse acceleration, deceleration, and sprint frequencies, which are valid and key metrics commonly used to assess physical demands in soccer (Dalen, Lorås, Hjelde, Kjøsnes, & Wisløff, 2019).

Conclusion

This study examined the influence of EPT on MRP in elite soccer players competing in the UCL while controlling for contextual factors. The main findings indicate that EPT significantly affects TD and LIR across most playing positions, whereas no meaningful influence was observed for MIR and HIR. These results suggest that longer EPT primarily increases the overall physical output of players, mainly through low-intensity activities, while higher-intensity actions remain relatively stable. These findings were consistent across players competing in different national contexts, highlighting that the observed relationships are not specific to a single competition.

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Conflict of interest

The authors report there are no competing interests to declare.

Data availability statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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References

- Altmann, S., Forcher, L., Woll, A., & Härtel, S. (2023). Effective playing time affects physical match performance in soccer: An analysis according to playing position. *Biology of Sport*, 40(4), 967-973. <https://doi.org/10.5114/biol-sport.2023.123320>
- Aquino, R., Vieira, L. H. P., Carling, C., Martins, G. H. M., Alves, I. S., & Puggina, E. F. (2017). Effects of competitive standard, team formation and playing position on match running performance of Brazilian professional soccer players. *International Journal of Performance Analysis in Sport*, 17(5), 695–705 <https://doi.org/10.1080/24748668.2017.1384976>
- Castellano, J., Huarte, X., & Casamichana, D. (2025). Match physical performance profiles in professional football: a comparative analysis among players' positions in the European five top leagues. *International Journal of Performance Analysis in Sport*, 25(1), 108–128. <https://doi.org/10.1080/24748668.2024.2393034>
- Chmura, P., Konefał, M., Chmura, J., Kowalczyk, E., Zajac, T., Rokita, A., & Andrzejewski, M. (2018). Match outcome and running performance in different intensity ranges among elite soccer players. *Biology of Sport*, 35(2), 197-203. <https://doi.org/10.5114/biol-sport.2018.74196>
- Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. Cambridge: Academic Press.
- Dalen, T., Lorås, H., Hjelde, G. H., Kjøsnes, T. N., & Wisløff, U. (2019). Accelerations – a new approach to quantify physical performance decline in male elite soccer? *European Journal of Sport Science*, 19(8), 1015–1023. <https://doi.org/10.1080/17461391.2019.1566403>
- Freire, L. A., Brito, M. A., Muñoz, P. M., Pérez, D. I. V., Kohler, H. C., Aedo-Muñoz, E. A., ... Miarka, B. (2022). Match Running Performance of Brazilian Professional Soccer Players according to Tournament Types. *Montenegrin Journal of Sports Science and Medicine*, 11(1), 53–58. <https://doi.org/10.26773/mjssm.220306>
- Filter, A., Olivares-Jabalera, J., Dos'Santos, T., Madruga, M., Lozano, J. M., Molina, A., ... Loturco, I. (2023). High-intensity actions in elite soccer: Current status and future perspectives. *International Journal of Sports Medicine*, 44(8), 535–544. <https://doi.org/10.1055/a-2013-1661>
- Jerkovic, Z., Modric, T., & Versic, S. (2022). Analysis of the Associations between Contextual Variables and Match Running Performance in Croatian First Division Soccer. *Sport Mont*, 20(2), 125-130. doi: 10.26773/smj.220619
- Kádár, L., Révész, L., Sáfár, S., Géczi, G., Bognár, J., & Csáki, I. (2025). Elite U17 football players' physical parameters: focus on contextual variables during training and matches. *International Journal of Performance Analysis in Sport*, 25(4), 753–767. <https://doi.org/10.1080/24748668.2024.2444794>
- Kilci, A., Koç, M. E., Peker, A. T., McAuley, A. B. T., Binokay, H., & Kelly, A. L. (2025). The influence of age category and relative age on match running performance at the men's U17 and U20 World Cups. *International Journal of Performance Analysis in Sport*, 1–15. <https://doi.org/10.1080/24748668.2025.2579340>
- Lago-Peñas, C., Lago-Ballesteros, J., & Rey, E. (2011). Differences in performance indicators between winning and losing teams in the UEFA Champions League. *Journal of Human Kinetics*, 27, 135–146. <https://doi.org/10.2478/v10078-011-0011-3>
- Linke, D., Link, D., Weber, H., & Lames, M. (2018). Decline in Match Running Performance in Football is affected by an Increase in Game Interruptions. *Journal of Sports Science & Medicine*, 17(4), 662–667. PMID: PMC6243615 PMID: 30479536
- Martín-Castellanos, A., Flores, M. R., Solana, D. M., Del Campo, R. L., Garrosa, F. N., & Mon-López, D. (2024). How do the football teams play in LaLiga? Analysis and comparison of playing styles according to the outcome. *International Journal of Performance Analysis in Sport*, 24(1), 18–30. <https://doi.org/10.1080/24748668.2023.2262813>
- Modric, T., Carling, C., Lago-Peñas, C., Sarmiento, H., Veršič, S., Pa-jonková, F., & Sekulic, D. (2025). It is not (all) about running faster, opponent also plays; the effect of opposition team formation on running performance in professional soccer match-play. *International Journal of Performance Analysis in Sport*, 25(4), 595–609. <https://doi.org/10.1080/24748668.2024.2430099>
- Oliveira, R., Ceylan, H. İ., Fernandes, R., Morgans, R., Nobari, H., Nalha, M., & Brito, J. P. (2025). Do contextual factors influence running and accelerometry GPS based variables in professional women soccer players? A case study about the effect of match location and result. *Proceedings of the Institution of Mechanical Engineers, Part P: Journal of Sports Engineering and Technology*, 239(1), 61-69. <https://doi.org/10.1177/17543371231194004>
- Plakias, S., & Michailidis, Y. (2024). Factors Affecting the Running Performance of Soccer Teams in the Turkish Super League. *Sports*, 12(7), 196. <https://doi.org/10.3390/sports12070196>
- Pranjic, T., Modric, T., & Uljevic, O. (2022). Match Running Performance in UEFA Champions League: Do More Successful Teams Really Run Less?. *Sport Mont*, 20(3), 9-13. <https://doi.org/10.26773/smj.221002>
- Rey, E., Kalén, A., Lorenzo-Martínez, M., López-Del Campo, R., Nevado-Garrosa, F., & Lago-Peñas, C. (2024). Elite soccer players do not cover less distance in the second half of the matches when game interruptions are considered. *Journal of Strength and Conditioning Research*, 38(4), 709–713. <https://doi.org/10.1519/JSC.0000000000003935>
- Sapp, R. M., Spangenburg, E. E., & Hagberg, J. M. (2018). Trends in aggressive play and refereeing among the top five European soccer leagues. *Journal of Sports Sciences*, 36(12), 1346–1354. <https://doi.org/10.1080/02640414.2017.1377911>
- Sarmiento, H., Pereira, A., Matos, N., Campaniço, J., Anguera, T. M., & Leitão, J. (2013). English Premier League, Spain's La Liga and Italy's Seriés A – What's Different? *International Journal of Performance Analysis in Sport*, 13(3), 773–789. <https://doi.org/10.1080/24748668.2013.11868688>
- Siegle, M., & Lames, M. (2012). Game interruptions in elite soccer. *Journal of Sports Sciences*, 30(7), 619–624. <https://doi.org/10.1080/02640414.2012.667877>
- Šunjić, I., Versic, S., Modric, T., Corlučka, M., & Zaletel, P. (2024). The Comparison of Position-Specific Match Performance between the Group and Knockout Stage of the UEFA Champions League. *Sport Mont*, 22(2), 9-17. <https://doi.org/10.26773/smj.240702>
- Trewin, J., Meylan, C., Varley, M. C., & Cronin, J. (2017). The influence of situational and environmental factors on match-running in soccer: a systematic review. *Science and Medicine in Football*, 1(2), 183–194. <https://doi.org/10.1080/24733938.2017.1329589>
- Wang, X., Yuan, B., Pan, P., Ren, D., Qin, S., & Liu, T. (2026). Comparative analysis of positional running demands in the 2025 FIFA Club World Cup: influence of team strength and confederation. *International Journal of Performance Analysis in Sport*, 1–16. <https://doi.org/10.1080/24748668.2026.2620258>
- Zhao, Y., & Zhang, H. (2021). Effective playing time in the Chinese Super League. *International Journal of Sports Science & Coaching*, 16(2), 398-406. <https://doi.org/10.1177/1747954120965751>