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Game schedule, travel demands and contextual factors influence key game-related statistics among the top European male basketball teams

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ABSTRACT

This study examined the effects of game schedule, travel demands and contextual factors on team game-related statistics during a full season. The top 10 teams competing in the 2020–2021 Euroleague basketball season were included where game-related statistics from their respective national competitions and the Euroleague competition were retrieved (761 games). Hierarchical linear regression models were computed to evaluate the effects of distance travelled, game schedule and contextual factors for the previous and current games (league, season phase, opponent level, game outcome, score differential) on key performance indicators (points, shooting, rebounds, assists, turnovers, fouls). Several significant models ($p < 0.05$) yielded R^2 values ranging from 0.05 to 0.22 with *small*-to-*medium* effect magnitudes. Analyses revealed significant associations between longer durations separating games and less free-throws being made and between further distances travelled and worse 3-point shooting, more offensive rebounds and more fouls. Regarding contextual factors, favourable outcomes for shooting, assists, steals, fouling and turnovers were significantly associated with team success. Playing higher-level teams and competing in playoffs or finals was associated with several diminished outcomes. These results emphasize the multi-factorial nature of performance in elite European basketball, with game schedule, travel and various contextual factors requiring consideration in developing holistic operational plans for teams.

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Introduction

Basketball is a court-based team sport in which performance is determined by the complex interactions between physical, technical-tactical, psychological and contextual factors at individual and collective team levels (Esteves et al., 2021; Gasperi et al., 2023; Zhang et al., 2018). Previous research has attempted to determine the most prominent indicators discriminating successful basketball teams from less successful teams, implementing multiple perspectives from different disciplines (Gasperi et al., 2023; Gomez et al., 2013; Palmer et al., 2022). In this regard, it is generally agreed that points, field goals, rebounds and turnovers are the most important game-related statistics discriminating team success across different basketball leagues (Leicht et al., 2017; Sampaio et al., 2006; Zhou et al., 2024). Consequently, considerable attention is given to attentively monitoring game-related statistics among basketball practitioners working in elite competitions to optimize player and team performance (Guo et al., 2022).

In modern and elite basketball competitions, official games are played at a higher frequency than in the past, which is a major concern for practitioners given the various stressors that dense game scheduling imposes on players (Calleja-González et al., 2023). In this way, elite European basketball teams compete in ~3 games per week when considering the overlapping scheduling of domestic league (1 game per week) and European international league games such as the Euroleague or Eurocup (1–2 games per week). This game congestion often inflicts insufficient time for optimal recovery between games (Esteves et al., 2021), which is further exacerbated by the associated international travel demands experienced, which can lead to travel-related fatigue, impaired recovery and disruptions to sleeping behaviours (Calleja-González et al., 2023; Singh et al., 2021; Van Rensburg Dcc et al., 2020). Consequently, increased basketball research has analysed the effects of game scheduling and travel on team performances in elite basketball competitions (Wang et al., 2023; Yang et al., 2021). For instance, playing back-to-back games (i.e., two games in 2 days) in the National Basketball Association (NBA) had a detrimental effect on game outcome, with a greater likelihood of winning with more rest days between games (Esteves et al., 2021). Similarly, playing back-to-back games in the NBA was associated with poorer shooting percentages compared to games with 1–2 rest days between them (Yang et al., 2021). The effects of game scheduling are interrelated with travel-related demands given teams often compete in games played in close succession at away venues. Playing away from home often imposes varied travel demands on players and requires them to sleep in unfamiliar environments (Wang et al., 2023), which may impede optimal player preparation leading into games. In fact, previous studies

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(Calleja-González et al., 2023; Singh et al., 2021) indicate that travel demands may promote fatigue and sleep disruptions among players and in turn accumulate across the season to negatively impact player performance, health and well-being. While existing studies examining the impact of game scheduling on game-related statistics were performed in the NBA, to the best of our knowledge no study has assessed this topic in elite European basketball competitions. Specific examination on this topic is needed in a European context considering the unique overlap between national and international league schedules that many European teams face across the season, which is not apparent in the NBA. Moreover, the different geographical distribution of teams competing in Europe compared to the NBA likely impose unique travel requirements, with the varied playing styles reported between the NBA and Euroleague (Mandić et al., 2019) also likely to elicit unique game demands on players.

In addition to game scheduling and travel, several contextual factors have been identified to impact game-related statistics and ultimately game outcomes among basketball teams (Leota et al., 2022; Sansone et al., 2021; Yang et al., 2021). More precisely, game location is a key contextual factor whereby playing at home has been associated with more favourable game outcomes and performance indicators (i.e., points, assists and shooting percentage) compared to playing away in the NBA (Leota et al., 2022; Wang et al., 2023; Yang et al., 2021) as well as in the premier Spanish league (García-Rubio et al., 2017). Furthermore, given the season phase and opponent level have been shown to influence player loading (Ferioli et al., 2021; Fox et al., 2019) and performance (Sansone et al., 2021) during games with basketball players, they should also be considered as key contextual factors when assessing game-related statistics. Subsequently, basketball practitioners should consider a range of league- and game-related contextual factors to better understand team performance when exploring game-related statistics.

There appears to be potential for travel demands, game scheduling and contextual factors to influence team performance during games in basketball settings. However, to our knowledge, no study has analysed the influence of these factors in combination with performance indicators via game-related statistics in elite European basketball leagues. Therefore, this study aimed to evaluate the effects of game schedule, travel demands, as well as league- and game-related contextual factors on game-related statistics among elite European basketball teams competing in national and international leagues.

Methods

Sample

The 10 teams with the best final rankings at the end of the Euroleague 2020–2021 basketball season were included in the sample. The game-related statistics from all games played for these teams in their respective national leagues and the Euroleague across all season phases (regular season, playoffs and finals) were retrieved for a total of 761 games being included in our analyses. Data were publicly available and retrieved from the official websites of the national leagues for the investigated teams and the Euroleague competition.

Procedures

The following game-related statistics were gathered for each team in all games they completed: 2-point shots made; 2-point shots missed; 2-point shot percentage; 3-point shots made; 3-point shots missed; 3-point shot percentage; free-throws made; free-throws missed; free-throw percentage; offensive rebounds; defensive rebounds; assists; steals; turnovers; blocks; blocks against; fouls committed; and fouls drawn. Additionally, ball possessions were calculated following an established formula as: possessions = field goals attempted − offensive rebounds + turnovers + 0.454 × free-throws attempted (Charamis et al., 2023), where field goals encompass both 2-point and 3-point shots. Game-related statistics were determined as absolute values, and to control for the influence of game pace they were normalized according to the number of possessions teams had in each game (Gomez et al., 2013; Sampaio & Janeira, 2003).

For each game, the following details for factors of interest were collected: i) game schedule indicated by the number of hours from the previous game (calculated from the starting time of the previous game to the starting time of the current game as listed on the official league website); ii) travel determined as the distance travelled (km) between the location of the current game and the location of the previous game; and iii) contextual factors, including league and season phase combined (regular season, playoffs and finals in the national league and in the Euroleague), outcome (win or loss), score differential (absolute positive value indicative of the margin between team scores at the end of the game) and opponent ranking based on the league ranking at the end of the season (with teams classified as either higher, similar or lower as determined via k-means cluster analysis based on their winning percentage at the end of the season) (Yang et al., 2021; Zhang et al., 2020). K-means cluster analyses assigned teams to one of the three clusters so that similarities in winning percentage were evident between teams within each cluster compared to teams assigned to other clusters. Contextual factors were considered for both the previous game played and the current game being played.

Statistical analyses

Statistical analyses were performed with Jamovi software (version 2.3) whereby the α level was set at 0.05 for statistical significance. Hierarchical multiple linear regression models (Gómez et al., 2017) were performed to evaluate the effects of game scheduling, travel and contextual factors on game-related statistical variables. This procedure was done in three steps, including (1) distance travelled and hours since the previous game in the first regression block; (2) factors related to the previous game including outcome, score differential, opponent level and league with season phase in the second regression block; and (3) factors related to the current game including outcome, score differential, opponent level, location and league with season phase in the third block. The first model was computed using score differential as the dependent variable to

consider the dependent variable of points and the closeness in game outcome between teams. The second and third models were performed for all game-related statistics. For each model, R^2, coefficients, p-values and 95% confidence intervals (CI) were determined. Effect sizes (ES) were computed as Cohen's f^2 and interpreted as follows: *null* effect = <0.02; *small* effect = 0.02–0.14; *medium* effect = 0.15-–0.34; and *large* effect = ≥0.35 (Gómez et al., 2017).

Table 1. Descriptive data for the game-related statistical variables assessed in this study.

Variable	Non-normalised	Normalised
Score differential (points)	12.0 ± 9.1	16.7 ± 12.7
2-pt shots made (count)	20.2 ± 4.2	27.9 ± 5.7
2-pt shots missed (count)	16.1 ± 4.7	22.4 ± 6.3
2-pt shots percentage (%)	55.8 ± 8.8	–
3-pt shots made (count)	9.4 ± 3.3	13.0 ± 5.6
3-pt shots missed (count)	14.5 ± 4.3	20.2 ± 5.6
3-pt shots percentage (%)	39.1 ± 11.0	–
Free-throws made (count)	14.4 ± 5.6	19.9 ± 7.6
Free-throws missed (count)	3.8 ± 2.4	5.2 ± 3.3
Free-throw percentage (%)	79.3 ± 12.3	–
Offensive rebounds (count)	8.7 ± 4.1	12.3 ± 6.0
Defensive rebounds (count)	18.9 ± 9.8	26.7 ± 13.9
Assists (count)	18.3 ± 4.7	25.5 ± 6.9
Steals (count)	7.3 ± 2.9	10.1 ± 4.1
Turnovers (count)	12.5 ± 3.9	17.2 ± 5.2
Blocks (count)	2.6 ± 1.7	3.6 ± 2.4
Blocks against (count)	2.3 ± 1.7	2.7 ± 2.5
Fouls committed (count)	19.5 ± 4.0	27.2 ± 5.9
Fouls drawn (count)	20.6 ± 3.8	25.8 ± 10.2

Normalized variables account for game pace and are made relative to 100 ball possessions; dashes indicate variables are not able to be adjusted for game pace.

Results

Table 1 presents the absolute and normalized descriptive data for the game-related statistical variables assessed. Moreover, Table 2 presents the significant effects from the regression models for shooting game-related statistical variables, while Table 3 presents the significant effects for rebounding, assists, defensive and fouling game-related statistical variables. All significant models yielded R^2 values ranging from 0.05 to 0.22 with effect sizes reaching *small* or *medium* magnitudes. Specifically, regarding the effects of game scheduling, longer times between games were associated with less free-throws being made ($p = 0.025$). Concerning travel requirements, greater distances travelled between games were significantly associated with less 3-point shots being made ($p = 0.007$), worse 3-point shooting percentage ($p = 0.009$), more offensive rebounds ($p = 0.021$), more fouls being committed ($p = 0.012$) and more fouls being drawn ($p = 0.002$).

For contextual factors, various significant effects were detected among the models. Regarding game outcome and score differential, more made shots, higher shooting percentages and fewer missed shots, alongside more assists and steals and less fouls being committed, were significantly ($p < 0.05$) associated with winning games and greater margins. Moreover, performing less turnovers ($p = 0.04$) and having fewer blocks against ($p = 0.003$) were significantly associated with winning games, while drawing less fouls ($p = 0.019$) was significantly associated with greater score differentials. Concerning opponent quality in the current game, less assists ($p < 0.001$) and more fouls drawn ($p = 0.03$) were performed when facing higher-level teams compared to playing against similar-level teams. In addition, playing higher-level teams in the previous game was significantly associated with gathering

Table 2. Significant effects found in the regression models for scoring and shooting game-related statistical variables.

	R^2	Effect size (f^2)	Factor	Coefficient	95% CI	p
2PM	0.12	0.13, small	Previous game opponent level (lower-higher)	1.729	0.322–3.136	0.046
			Current game score differential	0.095	0.049–0.140	<0.001
			Current game league	–	–	0.015
			Current game outcome	2.381	1.430–3.333	<0.001
2P missed	0.13	0.15, medium	Current game score differential	−0.102	−0.152–0.051	<0.001
			Current game league	–	–	<0.001
			Current game outcome	−1.294	−2.984–0.865	<0.001
2P%	0.17	0.21, medium	Previous game league	–	–	0.037
			Current game score differential	0.198	0.129–0.267	<0.001
			Current game league	–	–	0.028
			Current game outcome	4.233	2.794–5.671	<0.001
3PM	0.12	0.14, small	Distance travelled	0.001	0.001–0.002	0.007
			Current game score differential	0.112	0.075–0.150	<0.001
			Current game location	0.764	0.073–1.501	0.036
			Current game outcome	1.564	0.751–2.329	<0.001
3P missed	0.06	0.07, small	Current game score differential	−0.054	−0.101–0.008	0.021
			Current game outcome	−2.102	−3.078–1.126	<0.001
3P%	0.13	0.15, medium	Distance travelled	0.001	0.001–0.002	0.009
			Current game score differential	0.238	0.150–0.327	<0.001
			Current game outcome	5.712	3.862–7.563	<0.001
1PM	0.06	0.07, small	Time since previous game	−0.018	−0.034–0.002	0.025
			Current game score differential	−0.101	−0.163–0.039	0.001
			Current game league	–	–	0.016
			Current game outcome	2.332	1.033–3.632	<0.001
1P missed	0.05	0.05, small	Previous game league	–	–	0.027
			Current game score differential	−0.033	−0.060–0.006	0.017
			Current game league	–	–	0.006

Dashes indicate coefficients with confidence intervals were not computed by the statistical software.

Table 3. Significant effects found in the regression models for rebounding, assists, defensive and fouling game-related statistical variables.

Variable	R^2	Effect size (f^2)	Factor	Coefficient	95% CI	p
Offensive rebounds	0.12	0.14, small	Distance travelled	0.001	0.001–13.971	0.021
			Previous game league	–	–	0.037
			Previous game opponent level (lower-higher)	2.641	1.160–4.123	0.001
			Previous game opponent level (similar-higher)	2.103	0.401–3.806	0.016
			Current game league	–	–	<0.001
Assists	0.22	0.28, medium	Current game score differential	0.204	0.152–0.257	<0.001
			Current game location	1.076	0.081–2.070	0.034
			Current game outcome	3.288	2.188–4.388	<0.001
			Current game opponent level (similar-higher)	−2.901	−4.696–1.106	<0.001
			Current game league	–	–	0.013
Steals	0.06	0.06, small	Current game score differential	0.038	0.004–0.071	0.026
			Current game outcome	0.885	0.193–1.579	0.012
Turnovers	0.05	0.05, small	Current game outcome	−0.951	−1.861–0.042	0.040
Blocks	0.05	0.06, small	Previous game league	–	–	0.044
Blocks against	0.05	0.05, small	Previous game league	–	–	0.041
			Current game league	–	–	<0.001
			Current game outcome	−0.647	−1.071–0.223	0.003
Fouls committed	0.14	0.16, medium	Distance travelled	0.001	0.001–0.001	0.012
			Current game score differential	−0.087	−0.134–0.040	<0.001
			Current game league	–	–	<0.001
			Current game outcome	−1.135	−2.109–0.161	0.022
Fouls drawn	0.14	0.17, medium	Distance travelled	0.001	0.001–0.002	0.002
			Previous game score differential	−0.094	−0.173–0.016	0.019
			Previous game league	–	–	<0.001
			Current game score differential	−0.096	−0.177–0.016	0.019
			Current game league	–	–	<0.001
			Current game opponent level (similar-higher)	3.033	0.279–5.788	0.031

Dashes indicate coefficients with confidence intervals were not computed by the statistical software.

less offensive rebounds (lower- and similar-level teams, $p < 0.05$) and less 2-point shots being made (vs. lower-level teams, $p = 0.046$) in the current game. Game location was significantly associated only with 3-point shots made and assists, with more made shots ($p = 0.036$) and assists ($p = 0.034$) when playing at home. Regarding league and season phase for the current game, significant effects were apparent for 2-point shots made ($p = 0.015$, lowest among national finals), 2-point shots missed ($p < 0.001$, lowest among national regular season games), 2-point shot percentage ($p = 0.028$, lowest in finals for both leagues), free-throws made ($p = 0.016$, lowest among Euroleague regular season), free-throws missed ($p = 0.006$, highest in finals for both leagues), offensive rebounds ($p < 0.001$, lowest in national regular season), assists ($p = 0.013$, lowest among Euroleague playoffs), blocks against ($p < 0.001$, highest in Euroleague finals), as well as fouls committed and drawn ($p < 0.001$, lowest in regular seasons for both leagues). In turn, less effects were evident for league and season phase for the previous game, with 2-point shooting percentage ($p = 0.037$, lowest among Euroleague playoffs), free-throws missed ($p = 0.027$, lowest among playoffs for both leagues), offensive rebounds ($p = 0.037$, lowest in national regular season), blocks ($p = 0.044$, lowest in regular seasons for both leagues), blocks against ($p = 0.041$, lowest in regular seasons for both leagues) and fouls drawn ($p < 0.001$, lowest in Euroleague regular season) demonstrating significant associations.

Discussion

This study evaluated the effects of game scheduling, travel and contextual factors on game-related statistics among elite European basketball teams across a full season. The main findings were as follows: (1) less free-throws were made with longer times between games; (2) worse 3-point shooting performance alongside more offensive rebounds and fouls coincided with greater distances travelled between games; (3) shooting performance, assists, steals, fouling and turnovers were important for winning and score differential; (4) playing at home was associated with better 3-point shooting performance; (5) playing higher-level teams in the previous and current games was associated with diminished outcomes for some game-related statistics; and (6) the league and season phase in which games were held had wide-ranging impacts on game-related statistics, particularly when playing in playoffs or finals and within the Euroleague competition.

The reduction in made free-throws with more time between games may be indicative of a change in temperament adopted by players. For instance, competing less frequently has been associated with less aggressive behaviours during game-play in sporting contexts (Widmeyer & McGuire, 1997). Therefore, players of the teams we monitored might not have attacked the basket as aggressively or frequently to score on offence and draw shooting fouls from opponents, but instead may have favoured other scoring options to promote less free-throw opportunities. Indeed, data from the NBA support this notion showing that less contested field-goals are taken with three or more days rest between games (mean ±standard deviation [SD]: 20.6 ± 4.4) compared to shorter durations between games (2 rest days between games: 21.8 ± 3.4; 1 rest day between games: 21.5 ± 2.2; no rest days between games: 21.3 ± 3.1) (Esteves et al., 2021), meaning fewer shooting-related foul situations are likely to occur. Therefore, it appears that the technical-tactical strategies implemented by teams vary depending on the game schedule.

On top of game scheduling, travel requirements are important to consider among international basketball leagues where travel distances can become quite substantial between games.

In our study, travel distances between games varied up to 5353 km and spanned 10 countries. In this regard, the negative associations between travel distance between games and 3-point shooting as well as fouling occurrence might be attributed to possible travel-related fatigue. Indeed, the greater travel distances we observed required air travel, which has been suggested to contribute to player fatigue via various mechanisms such as mild hypoxia, restricted movement, dehydration, sleep disturbances and psychological alterations (Huyghe et al., 2018). Moreover, travel-related fatigue may persist for multiple days when flying across multiple time zones due to circadian rhythm disruptions, impacting subsequent performances during game-play (Van Rensburg Dcc et al., 2020). Indeed, physical (Bourdas et al., 2024) and mental (Cao et al., 2022) forms of fatigue have been shown to diminish 3-point shooting performance, which is characterised by a further distance from the basket than 2-point shots and free-throws. Consequently, 3-point shooting may be particularly susceptible to travel-related effects and associated fatigue, especially given the greater task constraints, unique motor control strategies (Okazaki & Rodacki, 2012) and the stronger influence of physical fitness qualities on performance (Pojskic et al., 2018) compared to other shot types. In fact, air travel has been shown to negatively affect vertical jump performance (Kraemer et al., 2016), which is a key component of the movement sequence when performing the 3-point shooting motion. The poorer 3-point shooting might have also led to more offensive rebound opportunities, which also increased with greater distances travelled between games. The increased number of fouls that teams committed and drew with greater travel distances between games may indicate wider effects of travel and associated fatigue. In this way, travel-related stress may diminish team concentration levels (Taylor et al., 2017), which in turn could lead to defensive breakdowns, poorer decision-making, or players being out of position to promote fouling situations. These findings emphasize the potential importance of safeguarding players against travel-related fatigue via suitable strategies when travelling further distances between games, such as ensuring optimal sleep behaviours (e.g., banking sleep prior to travel and protecting sleep during travel), planning ideal travel schedules, ensuring suitable nutritional behaviours and prescribing appropriate training or preparatory exercises upon arrival (van Rensburg et al., 2021).

Regarding contextual factors, better shooting performance across different shot types was unsurprisingly identified as key game-related statistics associated with winning and score differential. These findings emphasize the importance of shooting accuracy on team success, which is in line with the bulk of existing basketball literature examining European (García-Rubio et al., 2017; Sampaio et al., 2006) and wider (Leicht et al., 2017; Zhou et al., 2024) contexts. Further aligning with the existing research evidence among European basketball settings, we showed that favourable trends in many other game-related statistics were important for team success, including assists (Gryko et al., 2020), steals (Çene, 2018), fouling (Çene, 2018) and turnovers (Gryko et al., 2020). These findings indicate that creating scoring opportunities for teammates, gaining possession and in turn protecting possession of the ball, as well as restricting fouls to potentially limit important players getting into foul trouble as well as free-throw opportunities for opponents are integral for team success in an elite European basketball context. Moreover, given the game scheduling and travel were significantly associated with some of the same game-related statistics possessing significant correlations with game outcome and score differential, our findings may indirectly suggest that these factors could also partially affect team success. Game location was also a key contextual factor in our study, bearing significant associations with 3-point shots made and assists. These findings may be attributed to a home-court effect, where teams may perform better when playing at home due to various reasons (e.g., familiarity with surroundings, crowd support, reduced travel-related fatigue, officiating influences) (Alonso Pérez-Chao et al., 2024) for increased cohesion and effort to promote scoring opportunities from passes alongside better long-range shooting (Leota et al., 2022). Indeed, existing research corroborates our findings by showing 3-point shots made (García et al., 2014) and assists (Gómez et al., 2008) to be key statistics for team success when playing at home among elite European basketball leagues. Our findings further suggest how performance staff need to consider contextual factors when designing game strategies in order to improve the team's chances of success.

In addition to these commonly examined contextual factors in the literature, we also examined some rather novel contextual factors in opposition quality, league and season phase for both the previous and current games. In this regard, we showed playing higher-level teams in the previous and current games was associated with diminished outcomes for some game-related statistics. More precisely, playing a higher-quality opponent in the previous game exhibited some potential residual effects with significantly reduced offensive rebounds and 2-point shots being made in the current game. Playing higher-level opponents likely requires greater physical (Koyama et al., 2024) and tactical (Dong et al., 2021) demands among basketball players to possibly induce greater physiological and mental fatigue carried into subsequent competition, impacting effort (less offensive rebounds) and technical (made shots) elements of play. These interesting findings indicate that facing different opponents has complex and prolonged effects in basketball. Likewise, playing higher-quality opponents in the current game was associated with significantly less assists and more fouls being drawn. It is plausible that defensive strategies may differ across teams of different qualities with existing data from European basketball leagues, indicating that higher-quality teams demonstrate a strong reliance on man-to-man defensive systems with high defensive pressure, which in turn may elevate fouling instances (Gómez et al., 2010) and limit passing opportunities for assists to occur. However, further research is encouraged on this topic considering the defensive strategies employed to better understand its influence as a contextual factor alongside the factors examined in our study.

In addition to opponent quality, league and phase for the previous and current games also influenced several game-related statistical variables. Specifically, worse 2-point shooting

was apparent, more free-throws were missed, and more fouls were evident among finals games in both national and Euroleague competitions. Likewise, more free-throws were missed as well as less blocks and more shots being blocked were evident when competing in playoff or finals games previously across both leagues. In this regard, playoff and final games are characterised by greater game intensities and defensive pressure induced by the increased importance of these games, which might explain the reduction in offensive performance indicators. Consequently, defensive performance seems to acquire greater importance in playoff and final games. Additionally, the importance placed on playoffs and finals games likely elevates the psychological and emotional stress encountered during key game moments such as free-throws, where stoppages in play potentially increase rumination opportunity where more attention is given to the task by the player and others in view (Goldschmied et al., 2022). Indeed, there may also be a residual effect carrying over to the subsequent game due to these factors, with more free-throws continuing to be missed alongside elements of defensive (i.e., blocks) and offensive (i.e., blocks against) play negatively impacted after playing in playoffs or finals games. When considering league-specific findings, the effects of competing in playoffs and finals games may be more pronounced within the higher Euroleague setting, especially regarding the notion that an elevated defensive pressure from opponents may be experienced in these phases. In this way, significantly less assists and more blocks against were evident when competing in the Euroleague playoffs or finals in the current game as well as significantly worse 2-point shooting when competing in the Euroleague playoffs in the previous game compared to the national league and other phases. Certainly, increased emphasis may be placed on team performance in the higher Euroleague as well as in the playoff phases, with players that may feel ill-prepared for competition if experiencing congested scheduling, which has been shown to elevate anxiety levels during basketball game-play (Guillén & Sánchez, 2009). Alongside these potentially heightened psychological demands, increased physical demands accompanying higher-level competition in European basketball leagues (Ferioli et al., 2020) may also contribute to the observed effects specifically within the Euroleague competition. Therefore, it appears evident how the psychophysical demands of more decisive competition phases as well as higher-level leagues affect team performance in elite male basketball.

This study has some limitations that should be noted when interpreting the findings. Specifically, single-season analyses within elite European basketball settings might not allow for the data to be translated across other seasons or other leagues, with further similar analyses encouraged into the future and expanding to other contexts. Furthermore, team-based analyses were performed in our study, with the effects of game schedule, travel and other contextual factors potentially exerting different effects on game-related statistics across players at an individual level. We were also unable to record the mode or direction of travel completed by teams in all instances given inaccessibility to precise travel plans for generation of more specific insight regarding travel-related effects (van Rensburg et al., 2021). Likewise, we did not consider the cumulative impact of travel stress across the season, which might be examined in separate research alongside more specific information regarding travel details and behaviours adopted by players when travelling. Regarding the opposition quality, we considered the final league ranking to classify teams; however, team performances can vary across the season, thus the same team might present different challenges depending on the time in season at which they are faced, which should be considered when interpreting our findings. Future research should also directly assess the effects of game schedule, travel demands and contextual factors by implementing objective (e.g., physical performance, physiological responses) (Pojskic et al., 2018; Sansone, Conte, et al., 2023) and subjective (Sansone, Rago, et al., 2023) monitoring of player performance and well-being. Additionally, other game-related statistics (i.e., offensive and defensive ratings, effective field goal percentages) which were not considered due to their inaccessibility might be relevant to implement in the future research exploring team performance in European basketball settings.

Practical applications

Our findings for less free-throws made with longer times between games suggest practitioners to implement specific shooting-based drills to protect against this reduction when there are gaps in game scheduling, possibly replicating game-like scenarios inducing similar psychological demands (Goldschmied et al., 2022).

Considering the reduction in 3-point shooting performance alongside more offensive rebounds and fouls induced by greater distances travelled between games, practitioners could optimize travel (i.e., ensuring ergonomy, control of muscle activation and intellectual activity, arriving early at the game location) (Calleja-Gonzalez et al., 2020), nutrition (i.e., guaranteeing hydration and proper nutrition) and exercise plans (i.e., implementing warm-up, coordination and agility drills) (van Rensburg et al., 2021) to mitigate any negative effects of travel that may manifest as reduced statistical performance indicators.

Seen that shooting performance, assists, steals, fouling and turnovers were important for winning and score differential, training plans should emphasise the importance of tactical and skills drills that promote scoring opportunities, minimize fouling and protect possession of the ball at the team level.

For away games, strategies that may overcome reduced 3-point shooting performance should be considered, in the form of game-based drills, as well as organising access to away venues to enhance familiarity prior to the game.

Considering that playing higher-level teams in the previous and current games was associated with diminished outcomes for several game-related statistics and the league and season phase in which games were held had wide-ranging impacts on game-related statistics, particularly when playing in playoffs or finals and within the Euroleague competition, varied strategies may need to be developed depending on the previous and current game context, with particular focus on optimizing player recovery and readiness prior to playing better teams and playoffs or finals games.

Conclusions

Our study presents one of the most comprehensive analyses of factors with the potential to impact game-related statistical variables among European basketball competitions. We showed that game scheduling exerted some effect with longer durations between games being significantly associated with less free-throws being made. Likewise, we demonstrated that travel had an impact with greater distances travelled between games being significantly associated with worse 3-point shooting performance alongside more offensive rebounds and fouls. Regarding the various league- and game-related contextual factors we examined, favourable outcomes for shooting performance, assists, steals, fouling and turnovers were significantly associated with team success in games, with playing at home significantly associated with better 3-point shooting performance. Opponent quality in both the previous and current games influenced team performance, with reductions in shooting, assists and rebounds being associated with facing higher-level teams. Moreover, competing in playoff or finals games was significantly associated with worse 2-point and free-throw shooting performance and more fouling across both leagues – with significantly more missed free-throws and blocks against, as well as less blocks completed being apparent in subsequent games after playing in playoffs or finals. Considering these wide-ranging results in combination with the R^2 values (0.05–0.22) and *small*-to-*medium* effect sizes found in the statistical models, our findings emphasize the multifaceted nature of factors that may impact team performance in elite European basketball leagues, with additional factors not investigated in our study likely also contributing.

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