ORIGINAL ARTICLE

TRENDS in
Sport Sciences
2019; **3**(26): 117-122
ISSN 2299-9590
DOI: 10.23829/TSS.2019.26.3-3

Home advantage effect in Greek basketball leagues at the regular season: males vs. females and home vs. guest teams

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Abstract

Introduction. Home advantage may have an impact on game-related statistics and also on the psychological and behavioral state of competitors, coaches and officials. Aim of Study. The purpose of this study was to examine the home advantage effect in Greek professional basketball leagues and more specifically, to compare the game-related statistics between home and guest teams and between male and female ones in A1 Greek basketball leagues during regular season. Material and Methods. Statistical data from males (A1: N = 182) and from females' (A1: N = 88) basketball leagues were collected during 2014-2015 regular season. Results. Percentage of home wins was 61.5% for A1 males and 61.4% for A1 females' basketball leagues, respectively. One way multivariate analyses of variance (MANOVA) revealed higher scores in free-throws (attempts and made), fouls (drawn), scored points and lower scores in fouls (committed) and turnovers, in-home teams than in guest ones of A1 male's basketball league. Furthermore, home teams demonstrated higher scores in free throws (percentage), steals, scored points and fewer turnovers, compared with the guest ones in A1 female's basketball league. Results also revealed that male teams had significantly better performance in most of the examined variables compared with the female teams playing at their home venue. Conclusions. The results of the present study may be used by Greek basketball coaches in order to prepare their players (physically, technically, tactically and mentally) more effectively.

KEYWORDS: home field, game-related statistics, gender, performance, basketball.

Received: 26 August 2019
Accepted: 16 September 2019

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Introduction

In team sports, the term *home advantage* is widely used to describe the benefit that the home team is said to gain (>50% of the games) over the guest one [4]. The effectiveness of home advantage has been attributed to the five-factor *conceptual framework* that was initially proposed by [4] and then by [3]. Based on this c*onceptual framework*, game location (home or away) influence game location factors such as crowd, learning/familiarity, travel, and rules, which thereafter may affect critical psychological and behavioral states of competitors, coaches and officials [3, 4]. All the above parameters may affect the game performance outcomes that are categorized in primary (e.g. two points percentage in basketball), secondary (e.g. points scored, goals made) and tertiary outcomes (win–loss) [3, 4].

Over the last decades, a large number of researchers have examined the home advantage in various team sports such as soccer or football [18, 19, 25], water polo [24], rugby [27], and basketball [7, 11, 16, 17], demonstrating that home teams' percentage of wins is higher than the guests' ones. There is evidence that home advantage may be influenced by several factors such as the level of competition (i.e. first vs. second division),

gender (males vs. females), region, etc. For example, a previous study [24] that examined and compared home advantage between water polo athletes of first and second division, reported greater home advantage for the athletes of second division (57.95%) compared to the athletes of first division (54.35%). As previously mentioned, another factor that could influence home advantage is gender. Previous studies that have been conducted in water polo and football players reported gender-related differences in home advantage [18, 24].
Concerning the home advantage effect in basketball, an earlier review study from [15], exploring data from nine studies and 13.686 basketball games, found that the home winning percentage was 64.4%. However, most of the previous studies have been conducted in Spanish (ACB) and North American (NBA) basketball leagues [9, 17, 22]. Furthermore, it should be mentioned that the majority of the studies that focused on home advantage effect in basketball have been performed in male athletes; while, to the best of our knowledge, there is only one study that examined home advantage in female's basketball leagues [17]. To the best of our knowledge, only one previous study has compared game-related statistics between male and female teams in basketball leagues referring to home advantage effect [12]. A few years ago, [26] examined gender differences in basketball game-related statistics, but these researchers mainly focused on the *closed* games (less than 12 points difference) and on the level of competition (senior vs. junior), but not on the home advantage effect. In addition, to date only two studies [11, 21] have already examined the home advantage effect in Greek basketball league, presenting data only for males of the first professional division. More specifically, these studies revealed that the mean home advantage was 65.02% from 2003 to 2009 [11] and 65.58% from 2009 to 2012 in A1 Greek male basketball league [21].

Aim of Study

Taking all the above into consideration, the aim of this study was to examine home advantage effect in two Greek professional basketball leagues, and more specifically to compare the game-related statistics between home and guest teams and between male and female ones in A1 basketball leagues during regular season.

Material and Methods

Sample and procedure

Statistical data from A1 male's basketball league in Greece (N = 182) and from A1 female's Greek basketball league (N = 88) during 2014-2015 regular season were collected from two different web domains (www.sportsdata.gr and www.esake.gr) who provide the official statistics for Basketball Championships in Greece. It should be mentioned that males' A1 division in Greece is considered as a professional league, while females' A1 division is considered as a semi-professional one. In 2014-2015 regular season, fourteen teams (N = 14) participated in male's A1 league, while ten teams (N = 10) participated in female's A1 league. In total, two hundred seventy (N = 270) basketball games were analyzed. Percentage of wins, final score and game-related statistics (e.g. free-throws, two and three point's shots, assists, turnovers, steals, rebounds, blocks, fouls and fast breaks) for home and guest teams and for gender differences at home games (males vs. females) were used for statistical analysis.

Statistical analysis

Initially, the normality of data distribution was examined using the Kolmogorov–Smirnov test. Then, separate descriptive statistical analyses (means and standard deviations) were conducted, in order to examine home advantage percentage and game-related statistics of home and guest teams in A1 (males and females) basketball leagues. Moreover, one-way multivariate analyses of variance (MANOVA), taking as an independent variable the basketball teams (home, guest) and dependent variables all the game-related statistics, were conducted in order to explore home and guest game-related statistics separately for A1 male's and female's leagues. Similarly, in order to examine possible differences between male and female teams in game-related statistics at their home venue, we conducted one-way MANOVA. All statistical analyses were conducted using the Statistical Package for Social Sciences (SPSS version 15.0). The level of significance for all statistical tests was set at $p < 0.05$. All the abbreviations used in the results' section and related to one way MANOVA are presented in Table 1 [5].

Table 1. Abbreviations and symbols used in the results' section related to MANOVA

F	*F-ratio (statistical test used in the analysis of variance)* [18, p. xxxii]
P	*Probability (the probability value, p-value or significance of a test are usually denoted by p)* [18, p. xxxii]
Partial η^2	*Partial eta squared is the proportion of variance that a variable explains that is not explained by other variables in the analysis* [18; p. 415]. It is a measure to estimate effect size.

Results

All the examined variables in each group (men/women, home/away) were normally distributed. Descriptive statistics revealed that the percentage of home wins was 61.5% and 61.4% for A1 males and 61.4% for A1 females' basketball leagues, respectively.

In A1 males' basketball league, one way multivariate analysis of variance (MANOVA) revealed significant effect between home and guest teams in free-throws attempts $F(1, 362) = 9.631$, $p < 0.01$, partial $\eta^2 = 0.03$, successful free-throws $F(1, 362) = 10.103$, $p < 0.01$, partial $\eta^2 = 0.03$, fouls committed $F(1, 362) = 10.682$, $p < 0.01$, partial $\eta^2 = 0.03$, fouls drawn $F(1, 362) = 9.056$, $p < 0.01$, partial $\eta^2 = 0.02$, turnovers $F(1, 362) = 13.759$, $p < 0.001$, partial $\eta^2 = 0.04$ and scored points $F(1, 362) = 9.067$, $p < 0.01$, partial $\eta^2 = 0.02$. More specifically,

Table 2. Means, standard deviations and significant differences in game-related statistics between home and guest teams and between male and female ones in A1 Greek basketball league (2014-2015 regular season)

Game-related statistics	A1 (males)		A1 (females)	
	Home	Guest	Home	Guest
	M ± SD	M ± SD	M ± SD	M ± SD
Free throw attempts[a, f]	22.19 ± 6.92	19.97 ± 6.69	19.25 ± 6.92	19.72 ± 7.08
Free throw made[a, g]	15.65 ± 5.43	13.85 ± 5.42	13.09 ± 5.05	13.00 ± 5.61
Free throw %[c]	70.53 ± 11.57	68.67 ± 11.84	68.65 ± 10.05	64.93 ± 12.42
2 point attempts[g]	37.08 ± 6.81	36.55 ± 6.43	44.70 ± 8.11	44.23 ± 7.64
2 point made	18.59 ± 4.37	18.13 ± 4.46	19.69 ± 5.69	18.41 ± 4.50
2 point %[g]	50.36 ± 9.42	49.74 ± 9.21	42.55 ± 8.84	41.30 ± 8.36
3 point attempts[g]	23.15 ± 5.73	22.46 ± 4.93	16.40 ± 5.64	15.18 ± 5.55
3 point made[g]	7.65 ± 2.93	7.40 ± 2.97	4.57 ± 2.61	4.11 ± 2.40
3 point %[g]	33.03 ± 9.71	32.85 ± 11.07	27.23 ± 12.11	26.01 ± 10.23
Defensive Rebounds	25.43 ± 5.29	25.40 ± 4.46	–	–
Offensive Rebounds	10.82 ± 3.66	10.29 ± 3.91	–	–
Total Rebounds[f]	36.25 ± 6.23	35.68 ± 5.87	38.91 ± 7.49	39.27 ± 7.01
Assists[e]	16.25 ± 4.87	15.49 ± 4.52	14.85 ± 5.53	13.62 ± 5.57
Steals[c, g]	6.60 ± 2.52	6.23 ± 2.65	9.10 ± 3.51	8.02 ± 3.02
Turnovers[b, d, g]	12.59 ± 3.58	13.99 ± 3.63	15.38 ± 3.82	17.36 ± 3.99
Block shots[g]	2.77 ± 1.98	2.45 ± 1.83	1.90 ± 1.64	1.66 ± 1.53
Opponent blocks	2.41 ± 1.82	2.76 ± 1.99	–	–
Fast-break attempts	–	–	6.41 ± 3.90	6.18 ± 3.51
Fast-break made	–	–	4.25 ± 2.83	3.83 ± 2.38
Fouls committed[a, f]	21.84 ± 3.83	23.12 ± 3.61	20.14 ± 4.05	19.69 ± 3.64
Fouls drawn[a]	22.70 ± 3.55	21.55 ± 3.76	–	–
Scored points[a, c, g]	75.80 ± 11.38	72.31 ± 10.72	65.73 ± 11.16	62.16 ± 12.24

[a] significant differences in A1 male's league ($p < 0.01$); [b] significant differences in A1 male's league ($p < 0.001$); [c] significant differences in A1 female's league ($p < 0.05$); [d] significant differences in A1 female's league ($p < 0.01$); [e] significant differences in home games between male and female teams ($p < 0.05$); [f] significant differences in home games between male and female teams ($p < 0.01$); [g] significant differences in home games between male and female teams ($p < 0.001$)

home teams revealed higher scores in free-throws (attempts and made), fouls (drawn), scored points and lower number of fouls (committed) and turnovers than the guest ones.

Moreover, one way MANOVA demonstrated significant effect between home and guest teams in free-throws percentage $F(1, 174) = 4.761$, $p < 0.05$, partial $\eta^2 = 0.03$, turnovers $F(1, 174) = 11.387$, $p < 0.01$, partial $\eta^2 = 0.06$, steals $F(1, 174) = 4.792$, $p < 0.05$, partial $\eta^2 = 0.03$ and scored points $F(1, 174) = 4.083$, $p < 0.05$, partial $\eta^2 = 0.02$ in A1 females' Greek basketball league. In particular, home teams revealed higher scores in free-throws (percentage), steals, scored points and lower number of turnovers compared with the guest ones.

Regarding gender differences in game related statistics at home, one way MANOVA revealed significant differences between male and female teams in free throws attempts $F(1, 268) = 10.678$, $p < 0.01$, partial $\eta^2 = 0.04$, free throws made $F(1, 268) = 13.816$, $p < 0.001$, partial $\eta^2 = 0.05$, two points attempts $F(1, 268) = 65.554$, $p < 0.001$, partial $\eta^2 = 0.20$, two points percentage $F(1, 268) = 42.470$, $p < 0.001$, partial $\eta^2 = 0.14$, three points attempts $F(1, 268) = 83.213$, $p < 0.001$, partial $\eta^2 = 0.24$, successful three points $F(1, 268) = 70.442$, $p < 0.001$, partial $\eta^2 = 0.21$, three points percentage $F(1, 268) = = 17.928$, $p < 0.001$, partial $\eta^2 = 0.06$, total rebounds $F(1, 268) = 9.417$, $p < 0.01$, partial $\eta^2 = 0.03$, assists $F(1, 268) = 4.484$, $p < 0.05$, partial $\eta^2 = 0.04$, steals $F(1, 268) = 44.608$, $p < 0.001$, partial $\eta^2 = 0.14$, turnovers $F(1, 268) = 34.372$, $p < 0.001$, partial $\eta^2 = 0.11$, blocks $F(1, 268) = 12.840$, $p < 0.001$, partial $\eta^2 = 0.05$, fouls $F(1, 268) = 11.327$, $p < 0.01$, partial $\eta^2 = 0.04$ and scored points $F(1, 268) = 47.111$, $p < 0.001$, partial $\eta^2 = 0.15$. In all the above game related statistics, male teams showed significantly better performance at their home venue compared with the female ones (Table 2).

Mean values, standard deviations and significant differences in game-related statistics between home and guest teams and between male and female ones in A1 Greek basketball leagues are presented in Table 2.

Discussion

The novel aspect of this study is that it examined the home advantage effect on game-related statistics in A1 (males and females) Greek professional basketball leagues, during 2014-2015 regular season. The main finding of this study was that the percentage of home wins' in Greek basketball leagues was 61.5% and 61.4% for males and females, respectively. The results of the present study are in accordance with previous studies that examined the home advantage effect in Spanish (ACB) and North American leagues (NBA, WNBA), reporting similar percentage (59.86-66.61%) of home wins' [11, 17, 21]. Furthermore, [11] also revealed that the mean percentage of home advantage in A1 Greek basketball league from 2003 to 2009 was 65.02%.

According to the results of the present study, home teams revealed higher scores in free-throws (attempts and made), fouls (drawn), scored points and lower scores in fouls (committed) and turnovers than the guest ones in A1 male's basketball league during the regular season. Furthermore, home teams revealed higher scores in free-throws (percentage), steals, scored points and lower scores in turnovers compared with the guest ones in A1 female's basketball league (regular season). Similar findings have been also reported by other researchers [8, 16]. For example, [8] found that two-points shots, blocks, defensive rebounds, and assists contributed significantly in the discrimination of home and guest teams in ACB Spanish league (season 2007-2008). In the same context, [16] revealed that home teams had higher scores in assists, scored points, steals and lower number of turnovers than guest tones in Euroleague basketball regular season.

Taking all the above into consideration, it is obvious that the performance outcomes in basketball are influenced by the game location factor (home vs away). The significant advantage of the home teams against the guest ones has been attributed by previous researchers to different factors (i.e. environmental, psychological, hormonal, etc.). There is evidence that home teams play harder and more aggressively than the guest ones. This situation may lead to a greater number of steals and defensive rebounds that may produce more fast breaks and more chances for assists and *easy points* for the home team [16], influencing, therefore, the result of the game. The aggressive behavior, and as a result, the higher performance of home teams against the guest ones have been linked by many researchers to the testosterone concentration [1, 2]. In particular, previous studies have reported that home football teams have higher levels of testosterone before the games than the guest ones, influencing possibly their performance [2]. Referees bias and favoritism may be another contributing factor of home advantage that may affect for example the number of fouls (drawn or committed) of the home-team [13, 14].

All the aforementioned parameters may negatively affect the performance of guest teams, increasing, for example, the number of turnovers and fouls, and as a consequence influencing the result of the game. For this reason, it is obvious that coaches of guest teams

should prepare more effectively their players, using specific strategies, in order to reduce the effect of home advantage [23]. For example, basketball coaches could: i) inform and familiarize their players with the *away environment* giving oral information or showing videos with the away stadium, the locker rooms, and the surrounding areas, ii) maintain stable, if it's possible, the travel considerations (i.e. method of transportation, etc.), iii) use artificial noise (loudspeaker with rival fans' slogans) during training in order to prepare their players to maintain their concentration while home fans provoke and swear them, iv) simulate the game conditions during training (i.e. environment, intensity of training etc.) in order to make the defense to play more aggressively, v) use a number of psychological skills such as self-talk, imagery and relaxation techniques in order to improve the self-control and concentration of their athletes, and vi) play more away friendly games, with the presence of opponents' fans if it's possible.

Finally, the results of the present study revealed that male's professional basketball league (A1) are more affected by home advantage compared with the A1 female's league. More specifically, home advantage affected six game-related statistics in male league, while in female league only four game-related statistics were affected. Analyzing further the game-related statistics at home games, researchers found that male teams had significantly better performance in most of the examined variables compared with the female teams playing at their home venue. Although the game-related statistics were different between males and females; the percentage of home wins was similar. In contrast, previous studies that have been conducted in handball and water polo showed greater percentage of home wins in males than in females [20, 24]. The gender-related differences in home advantage or in game-related statistics reported in this and previous studies have been attributed to different factors (i.e. physiological, hormonal, psychological, etc.). For example, there is a notion that the smaller effect of home advantage on female's league is linked to the lower levels of testosterone. Previous studies revealed that home soccer teams have higher levels of testosterone before the game compared with the guest ones, influencing possibly the performance outcomes [1]. This notion has been strengthened by the results of previous study [28] which reported that the levels of testosterone positively affect the performance in males' players of home teams; while the corresponding effects of testosterone levels on performance outcomes are lower in females' players. Another possible explanation that may affect the home advantage in females is the small number of fans. The small number of fans observed on female's basketball league in Greece may probably have as a result a smaller amount of pressure on guest team and referees. This situation may lead to fewer turnovers from the guest team and to less referee's bias, influencing the results of the game. Finally, according to [18], another reason that might affect the differences in home performance indicators between males and females is the *gender equality* within a country. More specifically, [18] found that when *the status of women is closer to that of men within a country*, then the home advantage effect is smaller *between the male's and female's soccer leagues* (p. 77). Based on the above findings of [18], it can be assumed that lower levels of gender equality in a country might lead to significant differences in performance indicators between male's and female's teams when playing at their homes.

Conclusions

In conclusion, it seems that home advantage plays an important role in Greek professional basketball leagues. The percentage of home advantage was similar for male's and female's leagues and did not appear to be affected by gender. Instead, game-related statistics regarding home games were significantly affected by the gender with male teams having better performance in most of the examined variables compared with the female ones. The results of the present study may be used by coaches of guest teams in order to prepare (physically, technically, tactically and mentally) more effectively their players, reducing the home advantage effect. It should be mentioned that the results of the present study are limited to 2014-2015 regular season of Greek professional basketball leagues, and should not be generalized to previous basketball seasons, play-offs or to other basketball leagues (semi-professional or amateur). Another limitation of this study might be the fact that the writers haven't clustered the games into balanced (teams are close to the final score) and unbalanced games (teams are not close to the final score), a technique that has been used by many researchers in the past and seems to affect significantly the basketball performance indicators [6, 7, 10]. For this reason, the results of the present study should be interpreting by caution from other researchers or basketball coaches.

Future researchers should try to longitudinally analyze all the conducted leagues in males and females (first and second division), in order to examine the home advantage *route* in Greek basketball or even try to analyze data from Greek basketball play-off seasons and

compare them with the regular ones. A similar study has already been conducted in the ACB Spanish Basketball league by [6] and found significant differences in performance indicators of the winning teams regarding regular season and play-off games. Furthermore, future studies are needed to examine the home advantage effect in lower semi-professional or amateur basketball leagues or in other age classifications (children and adolescents), giving special consideration in females where the literature reports are limited.

References

1. Boyko RH, Boyko AR, Boyko MG. Referee bias contributes to home advantage in English Premiership football. J Sports Sci. 2007; 25: 1185-1194.
2. Carré JM. No place like home: testosterone responses to victory depend on game location. Am J Hum Biol. 2009; 21: 392-394.
3. Carron AV, Loughead TM, Bray SR. The home advantage in sport competitions: Courneya and Carron's (1992) conceptual framework a decade later. J Sports Sci. 2005; 23: 395-407.
4. Courneya KS, Carron AV. The home-field advantage in sport competitions: a literature review. J Sport Exerc Psychol. 1992; 14: 28-39.
5. Field A. Discovering statistics using SPSS (3rd ed.). London: SAGE Publications; 2009.
6. García J, Ibañez SJ, De Santos RM, et al. Identifying basketball performance indicators in regular season and playoff games. J Hum Kinet. 2013; 36: 163-170.
7. García J, Ibáñez SJ, Gómez MA, Sampaio J. Basketball Game-related statistics discriminating ACB league teams according to game location, game outcome and final score differences. Int J Perform Anal Sport. 2014; 14: 443-452.
8. García J, Sáez J, Ibáñez SJ, et al. Home advantage analysis in ACB league in season 2007-2008. Rev Psic Deporte. 2009; 18: 331-335.
9. Gómez MA, Lorenzo A, Barakat R, et al. Differences in game-related statistics of basketball performance by game location for men's winning and losing teams. Percept Mot Skills. 2008; 106: 43-50.
10. Gómez MA, Lorenzo A, Sampaio J, et al. Game-related statistics that discriminated winning and losing teams from the Spanish men's professional basketball teams. Coll Antropol. 2008; 32: 451-456.
11. Gómez MA, Pollard R. Reduced home advantage for basketball teams from capital cities in Europe. Eur J Sports Sci. 2011; 11: 143-148.
12. Moore JC, Brylinsky J. Facility familiarity and the home advantage. J Sport Behav. 1995; 18: 302-311.
13. Neave N, Wolfson S. Testosterone, territoriality, and the "home advantage". Physiol Behav. 2003; 78: 269-275.
14. Nevill AM, Balmer NJ, Williams AM. The influence of crowd noise and experience upon refereeing decisions in football. Psychol Sport Exerc. 2002; 3: 261-272.
15. Nevill AM, Holder RL. Home advantage in sport: an overview of studies on the advantage of playing at home. Sports Med. 1999; 28: 221-236.
16. Pojskic H, Šeparović V, Užičanin E. Modelling home advantage in basketball at different levels of competition. Acta Kinesiol. 2011; 5: 25-30.
17. Pollard R, Gómez MA. Comparison of home advantage in college and professional team sports in the United States. Coll Antropol. 2015; 39: 583-589.
18. Pollard R, Gómez MA. Comparison of home advantage in men's and women's football leagues in Europe. Eur J Sports Sci. 2014; 14: S77-S83.
19. Pollard R, Gómez MA. Home advantage in football in South-West Europe: long-term trends, regional variation, and team differences. Eur J Sports Sci. 2009; 9: 341-352.
20. Pollard R, Gómez MA. Reassessment of home advantage in Spanish handball: comment on Gutiérrez et al. (2012). Percept Mot Skills. 2012; 115: 937-943.
21. Pollard R, Gómez MA. Variations in home advantage in the national basketball leagues of Europe. Rev Psic Deporte. 2013; 22: 263-266.
22. Pollard R, Pollard G. Long-term trends in home advantage in professional team sports in North America and England (1876-2003). J Sports Sci. 2005; 23: 337--350.
23. Pollard R. Away disadvantage: five steps for coping. Soccer J. 2008; 53: 53-54.
24. Prieto J, Gómez MA, Pollard R. Home advantage in men's and women's Spanish first and second division water polo leagues. J Hum Kinet. 2013; 37: 137-143.
25. Saavedra García M, Gutiérrez Aguilar Ó, Marques PS, et al. Calculating home advantage in the first decade of the 21th century UEFA soccer leagues. J Hum Kinet. 2013; 38: 141-150.
26. Sampaio J, Ibañez SJ, Feu S. Discriminative power of basketball game-related statistics by level of competition and sex. Percept Mot Skills. 2004; 99: 1231-1238.
27. Vaz L, Carreras D, Kraak W. Analysis of the effect of alternating home and away field advantage during the Six Nations Rugby Championship. Int J Perform Anal Sport. 2012; 12: 594-608.
28. Wolfson S, Neave N, Anderson M. Hormones and the home advantage in English football. In: Theodorakis Y, Goudas M, Papaioannou A, editors. Book of long papers, 12th European Congress of Sport Psychology. Halkidiki, Greece: FEPSAC; 2007. pp. 57-60.