

Home court advantage is declining in Brazilian National Basketball League

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Abstract

Problem Statement: Home court advantage (HCA) is a well-documented phenomenon in sports, where teams tend to perform better when playing in front of their home fans, often resulting in higher success rates. However, when assessing an entire season, outcomes can be distorted by matches between teams with different technical and tactical capabilities. To accurately evaluate the effect of HCA, analyses must account for team quality, especially in contests between top-tier teams. **Purpose:** This study examined the presence and magnitude of HCA over 16 seasons in the Brazilian National Basketball League (NBB). **Materials and Methods:** Data from 4,374 games were collected from the official NBB website (www.lnb.com.br), including total games, home games, home wins, away wins, and total wins. These were used to calculate the percentage of home wins relative to total wins and total home games. Teams were stratified into five performance levels: contenders, high, mid-high, mid-low, and low. Games were categorized as close, balanced, unbalanced, or very unbalanced. The season was divided into the regular season and playoffs. Non-parametric statistical analyses were performed to compare groups, examine the association between HCA and team performance levels, and calculate the odds of a home win. **Results:** Playing at home increases the odds of winning, although this advantage has been declining in recent seasons. HCA is inversely associated with team performance level, and the odds of a home win are three times higher in very unbalanced games. In the playoffs, the home win rate is less than 4% higher than during the regular season. **Conclusion:** HCA is present in the NBB, although its magnitude has declined in recent seasons. It is more pronounced for lower-ranked teams, in very unbalanced games, and during the playoffs.

Keywords: Team Sports, Audience Influence, Performance Analysis, Game-related statistics, Competitive behavior

Introduction

Home court advantage (HCA) is a well-established phenomenon in sports, where teams tend to perform better when playing in front of their home fans, often resulting in higher success rates. In team sports, the alternating roles of home and away teams during a season consistently lead to more than 50% of victories being secured by the home team (Allen & Jones, 2014; Courneya & Carron, 1992; Tauer et al., 2009). This effect is regarded as one of the most consistent and robust findings in sports science, having been documented over several decades and across a wide range of disciplines (Pollard & Pollard, 2005).

According to research by Gómez et al. (2011), teams competing in Spanish rugby enjoyed a significant 67% home advantage between 2005 and 2010. The study also analyzed eight additional team sports—including baseball, basketball, handball, indoor soccer, roller hockey, soccer, water polo, and volleyball—all of which demonstrated comparable results. In European basketball leagues, HCA ranged between 56% and 65% (Gómez & Pollard, 2011), while NBA teams demonstrated consistent results over time, averaging $63\% \pm 4\%$ from 1946 to 2002 (Pollard & Pollard, 2005), followed by a gradual decline (Harris & Roebber, 2019; Ribeiro et al., 2016). Despite the robustness of data from the United States and Europe, there is limited information on HCA in other regions, particularly in Brazil.

Researchers have extensively explored various factors to explain the home advantage phenomenon, focusing on social, environmental, and psychological influences. One key factor is the familiarity with the playing environment, which increases athletes' comfort and confidence levels when competing in a known setting (Loughhead et al., 2003; Pollard, 2002). The impact of the home crowd is significant because it not only improves the motivation of the home team but also creates an intimidating atmosphere for visiting teams (Alonso et al., 2022; Leota et al., 2022). Additionally, travel-induced fatigue and disruptions to regular routines can substantially affect away teams, especially in nations with vast geographic territories (Carter, 2017; McHill & Chinoy, 2020). Another important factor is refereeing bias because officials may be unconsciously influenced by crowd reactions or social pressure, leading them to favor the home team in close or subjective decisions (Morgulev et al., 2018; Nevill & Holder, 1999).

However, when analyzing an entire season, some matches will inevitably involve teams with significantly different technical and tactical levels, increasing the likelihood of a predictable outcome regardless of the venue. Specifically in basketball, a team's technical-tactical superiority greatly improves its likelihood of

winning (García et al., 2013; Lorenzo et al., 2010; Madarame, 2017) regardless of whether the game is played at home or away (Gómez et al., 2009). Consequently, such analyses must account for the relative quality of competing teams because higher-quality teams tend to perform better at home more frequently than their lower-quality counterparts (Madrigal & James, 1999).

The majority of existing research on home advantage has been performed in the United States and European countries, with limited data available from other regions (Mochales Cuesta et al., 2024). Given the global increase in basketball's popularity, there is a clear need to examine the presence and extent of HCA internationally. Notably, even after 16 seasons of competition, research on the Brazilian National Basketball Championship (NBB) remains scarce, focusing primarily on specific areas such as the relative age effect (Ribeiro Junior et al., 2021), evaluative analysis (Canuto et al., 2022; Meneses et al., 2016; Ziani et al., 2019), and analysis of factors differentiating wins from losses (Carvalho et al., 2017; Prochnow et al., 2017). Despite the lack of previous research on HCA in the NBB, our study investigated both the existence and extent of this phenomenon across all seasons from 2008/09 to 2023/24. The research encompasses a comprehensive analysis including aggregate data from all seasons, detailed examination of each season individually, assessment of different competition phases, evaluation of performance levels, and analysis of match score differentials.

Materials and methods

Sample

Using a longitudinal and descriptive research design, we assessed the home team advantage across 16 NBB seasons spanning from 2008/09 to 2023/24. The 2019/20 season was interrupted owing to the COVID-19 pandemic restrictions, with 85% of the regular season games already completed. As a result, no playoff phase was held, and no champion was declared. Data from this season were included in all analyses except for comparisons between the regular and playoff phases. In the 2020/21 season, also owing to COVID-19 restrictions, there were no designated home or away teams because teams were grouped and played in different host cities to minimize travel and reduce external contact. Additionally, all games during the 2020/21 season were played behind closed doors, with no fan attendance permitted. Consequently, this season was excluded from the analysis. Furthermore, across the 16 seasons, three games were terminated early owing to disciplinary issues and were not eligible for analysis.

Data collection and analysis

The dataset comprised 8748 teams (4374 games) and was collected from the official open-access website of the Brazilian National Basketball League (www.lnb.com.br). For each team in every season, the following metrics were recorded: total games played during the season, home games played, home wins, away wins, and total wins. This information was entered into a Microsoft Excel spreadsheet (version 365, Microsoft, USA), where the subsequent variables were calculated. Home court advantage percentage (HCA%) and home win percentage (HW%) were calculated for each team in each season using Equations 1 and 2 below:

$$\text{Equation 1: } HCA\% = \frac{\text{Home Wins}}{\text{Total Wins}} \times 100$$

$$\text{Equation 2: } HW\% = \frac{\text{Home Wins}}{\text{Home Games}} \times 100$$

Because the Kolmogorov–Smirnov test indicated that the distributions of total home wins, total away wins, HCA%, and HW% were not normal ($p < 0.05$ for all), non-parametric tests were used for comparisons and correlations. Descriptive statistics included the median, interquartile range (IQR), and effect size. The effect size was calculated according to Tomczak and Tomczak (2014), as shown in Equation 3:

$$\text{Equation 3: } r = \frac{Z}{\sqrt{n}}$$

Where r is the correlation coefficient, Z is the standardized value of the U statistic, and n is the total number of observations.

The effect size for the 2×2 contingency chi-square test was measured using Phi (ϕ), calculated as follows (Equation 4):

$$\text{Equation 4: } \phi = \sqrt{\chi^2/n}$$

Where χ^2 is the chi-square statistic, and n is the number of observations. Effect size interpretation followed Cohen's (1988) guidelines: <0.1 (trivial), <0.3 (small), <0.5 (moderate), <0.8 (large), and ≥ 0.8 (very large). Group comparisons were performed using the Mann–Whitney, Wilcoxon, and Kruskal–Wallis tests, with Dunn's post hoc test applied where necessary. The chi-square test analyzed home and away win counts according to team performance levels and competition phases. The relationship between HCA% and Season Wins % was assessed using Spearman-rank correlation, with effect sizes interpreted as follows: values <0.10 indicating a

negligible correlation, <0.40 representing a weak correlation, <0.70 signifying a moderate correlation, <0.90 indicating a strong correlation, and ≥ 0.90 reflecting a very strong correlation, according to Schober et al. (2021).

Teams were categorized based on their season performance level, measured by the percentage of games won during the season. Using K-means cluster analysis, five different performance levels were established: contender (with $\geq 79.5\%$ wins), high ($57.3\%–79.4\%$ wins), mid-high ($36.6\%–57.2\%$ wins), mid-low ($14.5\%–36.5\%$ wins), and low performance level ($<14.5\%$ wins). Additionally, teams were compared based on their home and away win distribution, specifically analyzing the HCA% and HW%.

To analyze game intensity, we categorized matches into four groups according to the score differential, using percentiles 75, 50, and 25: close games (with a differential of ≤ 5 points), balanced games ($6–9$ points), unbalanced games ($10–16$ points), and very unbalanced games (≥ 17 points).

Because playoff games exhibit higher intensity compared to regular-season matches (Ferioli et al., 2021), particularly during elimination rounds (Morgulev et al., 2022), we examined potential differences in HCA% and HW% across various competition phases.

Finally, we performed binary logistic regression analysis to determine the likelihood of a home team winning. The team's status (home or away) was the independent variable; season, competition phase (regular vs. playoffs), and scoring differential were moderating variables; and the match outcome (win or loss) was the dependent variable.

All analyses were performed using SPSS version 24.0 (IBM, USA), with the significance level set at 5%.

Results

Overall analysis

We analyzed the performance of 238 teams across 15 NBB seasons. Only 6 of the 39 clubs or associations participated in every season. The teams represented 11 states, with 16 based in capital cities, and seven were prominent Brazilian football clubs.

Although no team experienced a completely undefeated or winless season, one team recorded only a single victory out of 28 games—a home win—during the 2011/12 season. Additionally, only one team won all of its home games, regardless of the competition phase, in the 2021/22 season.

Since the inception of the NBB, there have been 2,586 home wins (59.2%) and 1,785 away wins (40.8%), with home teams winning significantly more games than away teams (median: 10; IQR: 6–14 vs. 7; IQR: 3–10, respectively; $p < 0.001$; ES = 0.76). Home teams also won by a larger point margin compared to away teams (median: 11; IQR: 6–18 vs. 8; IQR: 4–14, respectively; $Z = -9.076$; $p < 0.001$; ES = 0.14). The overall HCA% was 59.6% (IQR: 54.5%–66.7%), with an odds ratio (OR) of 2.1 (95% CI: 1.9–2.3; $p < 0.001$), and the HW% was 60.0% (IQR: 41.2%–75.0%).

Season-by-season analysis

The odds of winning a home game fluctuated over the years, ranging from 1.1 in the 2019/20 season to 4.1 in the 2009/10 season, a decade earlier. During the first four seasons, home teams were three to four times more likely to win than away teams, but this advantage declined in subsequent years. In the last eight seasons, the odds never exceeded 2.3, reaching their lowest point in 2019/20 when home advantage nearly disappeared. This season was also the only one with a non-significant odds ratio ($p = 0.768$), as shown in Figure 1.

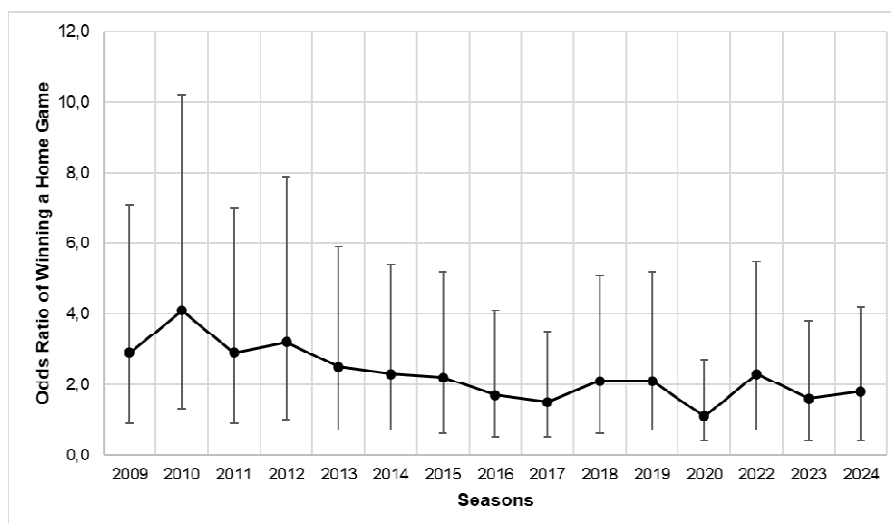


Fig 1. Odds ratio of winning a home game in each NBB season. Error bars represent 95% confidence intervals (CI).

Kruskal–Wallis test showed a significant difference between seasons for HCA% ($\chi^2_{(14)} = 37.848$; $p = 0.001$). The 2019/20 season (46.4%; IQR: 44.8%–60.6%) differed significantly with a large effect size from the 2009/10 (66.7%; IQR: 63.6%–75.0%; $p = 0.007$; ES = 0.70), 2010/11 (66.7%; IQR: 58.3%–76.45%; $p = 0.042$; ES = 0.72), and 2011/12 (66.7%; IQR: 60.4%–71.8%; $p = 0.006$; ES = 0.71) seasons (Figure 2A). In contrast, no significant differences were found for HW% ($\chi^2_{(14)} = 7.502$; $p = 0.914$) (Figure 2B).

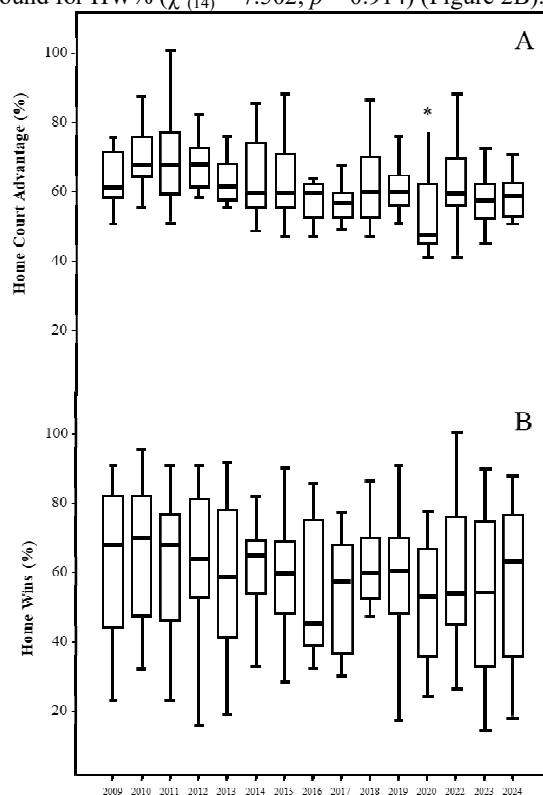


Fig 2. Season-by-season home court advantage (panel A) and percentage of home wins (panel B) across the 15 NBB seasons. * $p < 0.001$ compared to the 2009/10, 2010/11, and 2011/12 seasons.

Season performance level analysis

HCA% was higher among teams with lower performance levels, with a Spearman rank correlation indicating a weak negative association between HCA% and total win percentage ($\rho = -0.39$; $p < 0.001$). However, season-by-season analysis identified two different periods of interest: from 2008/09 to 2014/15 and from 2015/16 to 2023/24. In the first period, six seasons showed moderate negative correlations ($\rho = -0.41$ to -0.68 ; $p < 0.05$ for all, except the 2010/11 season with $p = 0.126$), and one season exhibited a strong negative correlation ($\rho = -0.82$; $p < 0.001$). However, from 2015/16 onward, correlations weakened, ranging from weak negative ($\rho = -0.18$ to -0.36 ; $p > 0.05$) until 2021/22, and became negligible in the last two seasons ($\rho = 0.07$ and 0.09 ; $p > 0.05$) (Figure 3).

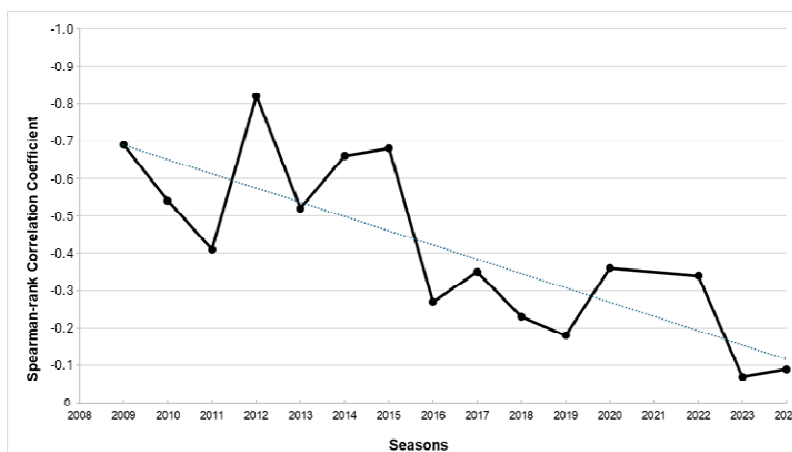


Fig 3. Yearly variations in the Spearman rank correlations between home court advantage percentage and season win percentage across the 15 NBB seasons. Years indicate the season-ending year.

Kruskal–Wallis test revealed a significant difference in HCA% ($\chi^2_{(4)} = 36.478$; $p < 0.001$), with Dunn's post hoc test showing differences between the most successful teams (contender and high) and the least successful ones (Figure 4A). Effect sizes were very large for contender versus mid-high and mid-low teams ($ES = 0.84$ and 0.83 , respectively) and moderate versus low teams ($ES = 0.30$). High-performance teams showed a large effect size compared to mid-low teams ($ES = 0.63$) but a negligible effect size compared to low-performance teams ($ES = 0.07$).

Kruskal–Wallis test also revealed a significant difference in HW% ($\chi^2_{(4)} = 184.086$; $p < 0.001$). Dunn's post hoc test found differences between all pairwise performance levels except for low vs. mid-low and high vs. contender teams. Mid-high performance teams showed large effect sizes compared to low, mid-low, and high teams ($ES = 0.68$, 0.77 , and 0.73 , respectively). All other comparisons exhibited very large effect sizes, ranging from 0.65 to 2.86 . Unlike HCA%, the HW% increased with higher performance levels (Figure 4B).

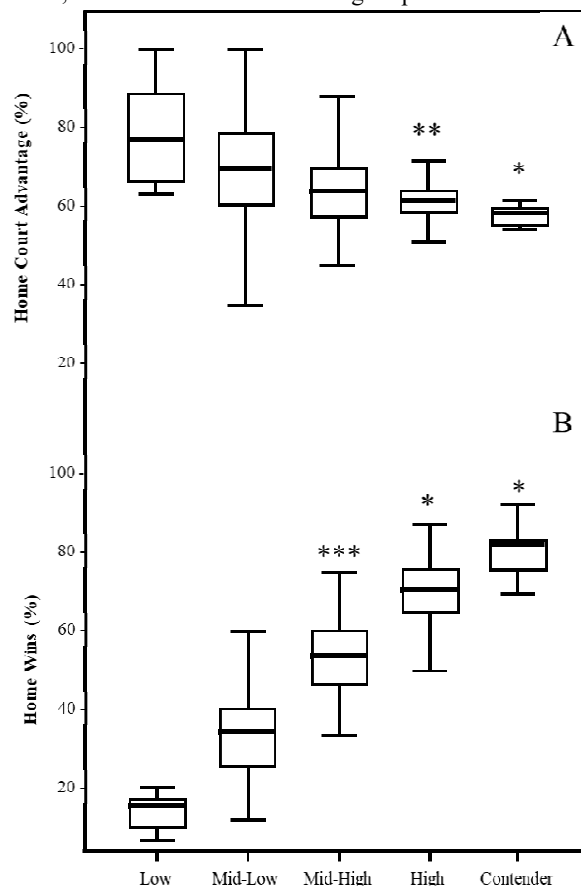


Fig 4. Home court advantage (panel A) and percentage of home wins (panel B) by team season performance level. * $p < 0.001$ compared to low, mid-low, and mid-high performance levels; ** $p < 0.05$ compared to low and mid-low; *** $p < 0.001$ compared to low performance level

We identified 24 teams (10%) that won more away games than home games. Mann–Whitney U tests revealed significant differences between these teams and the others in HCA% and HW%, but not in season win percentage (Wins%) (Table 1).

Table 1. Comparison of home court advantage, home win percentage, and season performance between teams with more home wins than away wins and those with more away wins than home wins. Data are presented as median (interquartile range).

	HW > AW (n = 214)	AW > HW (n = 24)	<i>p</i>	ES
HCA%	60.0% (56.0%–68.4%)	44.4% (40.0%–46.2%)	<0.001	0.52 (large)
HW%	62.5% (42.9%–75.0%)	37.5% (24.5%–52.9%)	<0.001	0.29 (small)
Wins%	48.5% (31.3%–63.5%)	43.2% (30.5%–55.9%)	0.334	0,06 (trivial)

HW: home wins; AW: away wins; HCA%: home court advantage percentage; HW%: home win percentage; Wins%: season win percentage; ES: effect size

Score differential analysis

The chi-square test revealed a significant difference between the number of home and away wins in each match scoring differential category ($\chi^2_{(1)} = 293.37$; $p < 0.001$), except in close games, where home teams won only approximately 4% more matches than away teams ($\chi^2_{(1)} = 3.16$; $p = 0.075$). Home wins were considerably more frequent in unbalanced and very unbalanced games, with home teams winning more than twice as many matches, as shown in Figure 5.

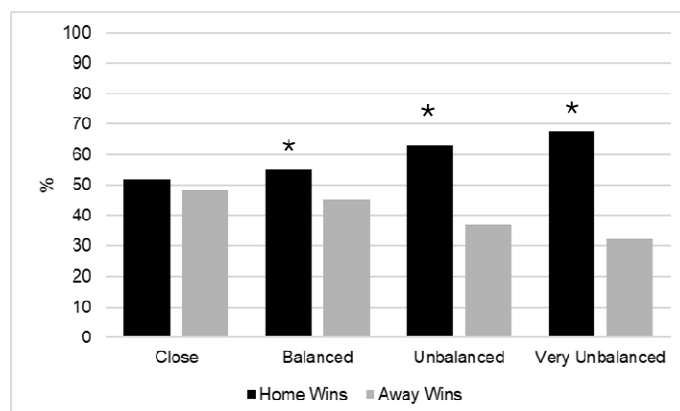


Fig 5. Comparison of home and away wins across score differential categories. * $p < 0.001$ compared to away wins

There was no HCA% in games decided by a score differential of fewer than two ball possessions. In these cases, home teams won only half of the games, and the odds of winning were not in favor of the home team (Table 2).

Table 2. Home court advantage percentage, home win percentage, and odds ratio of winning a home game in NBB matches, categorized by score differential

Match score differential	Games	HCA%	HW%	OR (CI 95%)	<i>p</i>
Close	1225 (28%)	51.8%	51.7%	1.1 (1.0–1.3)	0.075
Balanced	970 (22%)	54.7%	54.8%	1.5 (1.2–1.7)	<0.001
Unbalanced	994 (23%)	62.9%	62.9%	2.7 (2.3–3.3)	<0.001
Very unbalanced	1185 (27%)	67.7%	67.6%	4.4 (3.7–5.2)	<0.011

HCA%: home court advantage percentage; HW%: home wins percentage; OR: odds ratio

Regular vs. playoff phase analysis

The number of home and away wins did not differ significantly between the regular season and playoff phases ($\chi^2_{(1)} = 2.833$; $p = 0.092$). HCA% and HW% increased by less than 4% during the playoffs ($\phi = 0.25$; small ES for both), which was sufficient to increase the odds of a home win by 0.7 (Table 3).

Table 3. Home court advantage percentage, home win percentage, and odds ratio of winning a home game in NBB matches by competition phase

Competition phase	Games	HCA%	HW%	OR (CI 95%)	<i>p</i>
Regular	3765 (86%)	58.6%	58.7%	2.0 (1.8–2.2)	<0.001
Playoff	609 (14%)	62.2%	62.3%	2.7 (2.2–3.4)	<0.001

HCA%: home court advantage; HW%: home wins percentage; OR: odds ratio

Discussion

This study aimed to verify the existence of HCA and determine its magnitude during the 2008/09 to 2023/24 NBB seasons. Our findings show that a) playing at home increases the odds of winning, although this advantage has decreased recently; b) there is a negative correlation between overall season performance level and HCA%; c) in highly unbalanced games, the odds of a home win are three times greater than in close matches; and d) the percentage of playoff home wins is less than 4% higher than that of regular season home wins. In general, teams playing at their home venues were more successful, winning 6 out of every 10 total games and 6 out of every 10 home games. This success is supported by the larger margin of points in home wins compared to away wins, albeit with a small effect size. Although we did not control for crowd attendance or behavior, strong evidence shows that playing in front of home fans can increase effort (Leota et al., 2022) and

performance (Leota et al., 2022; McHill & Chinoy, 2020). Therefore, the influence of the crowd on HCA cannot be ruled out.

Although Brazil has vast, continent-sized territorial dimensions, travel distances for games are relatively short. The longest distance between cities hosting NBB games is approximately 4,000 km; however, all of these cities have airports either within or near them. Consequently, travel time rarely exceeds 2–3 h, always in the same time zone, eliminating concerns about jet lag (Glinski & Chandy, 2022; Özdalyan et al., 2024). Additionally, none of the host cities are located at high altitudes, which prevents altitude-related performance impairments for visiting teams (Salgado et al., 2025). Therefore, travel fatigue should not be considered a considerable challenge for visiting teams. Moreover, unlike the NBA, the NBB schedule does not include back-to-back games or extended road trips (e.g., 5 or 6 consecutive away games) (Wang et al., 2023). This ensures that NBB teams always have at least one day off to recover after a game, which appears sufficient to prevent any decline in performance (Esteves et al., 2021; Steenland & Deddens, 1997).

However, this represents only the overall trend because the season-by-season analysis revealed that HCA fluctuates rather than remains constant. In the first four seasons, home teams had winning odds 3–4 times higher than away teams. Despite this, there was a continuous decline in home win odds over five consecutive seasons, and in half of the subsequent seasons, these odds decreased below 2.0. Although home teams still won more than 50% of games during this period (except for the 2019/20 season), indicating the presence of HCA (Courneya & Carron, 1992), the reduced magnitude of this advantage points to a trend toward more balanced competition.

Ribeiro et al. (2016) also identified a trend of a declining HCA in the NBA, with early seasons exhibiting a strong HCA that began to decline from 1965 onward. From the spectators' perspective, a lower HCA is often beneficial because increased uncertainty about the outcome makes attending games or watching broadcasts more engaging (Humphreys, 2002). This uncertainty regarding which team will win is recognized as a crucial factor contributing to the entertainment value and appeal of sports (Knobloch-Westernwick et al., 2009).

The style of play considerably influences the HCA (Harris & Roebber, 2019), as does the impact of HCA on a team's success during the season (Durmuş & Güllü, 2022). However, an easy schedule can mislead both players and fans about the true extent of HCA, potentially changing the style of play by encouraging a more aggressive defensive approach (Watkins, 2013). In college basketball, home teams tend to exhibit better decision-making in both offense and defense, along with higher shooting efficiency (Cabarkapa et al., 2023). Conversely, in professional basketball, while home teams may achieve higher scoring rates (Ribeiro et al., 2016), they often demonstrate poorer shot selection and free throw performance (Sansone et al., 2024).

Basketball has increasingly shifted toward a long-distance shooting-first offensive strategy. Over the past decade, there has been a considerable increase in the number of 3-point attempts across major leagues such as the NBA (Zajac et al., 2023), EuroLeague (Foteinakis & Pavlidou, 2024), and NBB (Canuto et al., 2022). Specifically, from the 2008/09 to the 2020/21 NBB seasons, this increase in 3-point shooting was accompanied by a decrease in 2-point and free-throw attempts (Canuto et al., 2022). According to Harris and Roebber (2019), home teams tend to secure more wins by making more 2-point and free-throw shots. This shift in shooting preference toward long-distance attempts may partially explain the observed decline in the HCA.

Allen and Jones (2014) stated that home teams tended to win approximately 60% of their games but noted that no sport consistently showed a team as more dominant when playing away. One notable exception occurred in the 2019 Baseball World Series, where both teams won all their games as the visiting team in a best-of-seven series (DiGangi, 2019). In our results, the overall HW% was 60%; however, in eight seasons, fewer than half of the teams reached this mark. The 2019/20 season stood out, with two-thirds of the teams failing to win at least 60% of their home games (data not shown).

Our results partially align with Pojskić et al. (2011), who found that HCA was more pronounced in lower-quality basketball competitions and less influential at higher levels. An overall analysis supports this claim because we observed an inverse association between HCA% and season performance, measured by win percentage. However, the strength of this association fluctuated considerably across seasons, with a substantial decline over the past eight years—during which correlations were weak, negligible, and statistically non-significant. These findings challenge the assumption that lower-performing teams consistently benefit more from HCA.

Still, when teams were stratified by their seasonal winning capacity, contenders and high-level performance teams exhibited lower HCA% than less prolific teams. This finding supports the results reported by Pojskić et al. (2011), Pérez-Chao et al. (2024a), and Pérez-Chao et al. (2024c). Conversely, our results contrast with López-García et al. (2024), who reported higher HCA% and HW% in contenders compared to teams with lower season performance. These conflicting results require careful consideration because the first three studies focused on different European leagues, while López-García et al. (2024) analyzed NBA data. Notably, substantial differences between FIBA and NBA basketball must be recognized when interpreting these results.

The NBA's business extends beyond just sports events because the League markets itself primarily as an entertainment provider. To maintain this appeal, it is essential to have closely contested, competitive games with unpredictable outcomes during both the season and individual matches (Rascher & Solmes, 2007). To promote fair competition and prevent wealthier teams from dominating by acquiring all top players, the NBA enforces a

salary cap (Akabas, 2024). This system likely reduces the competitive gap between top and bottom-ranked teams in the NBA compared to FIBA leagues and competitions, where lower-ability or lower-budget teams tend to rely more heavily on HCA to achieve success (Pérez-Chao et al., 2024b).

Our results showed that 10% of NBB teams had more away wins than home wins. Although this clearly indicates the absence of HCA in these cases, there is no evidence supporting the "home choke hypothesis" proposed by Baumeister and Steinhilber (1984). Their research, along with subsequent studies (Jones, 2014; Schlenker et al., 1995; Tauer et al., 2009), focused only on playoff and elimination games, not regular season performance. Schlenker et al. (1995) highlighted that the home choke phenomenon typically applies to teams that perform like underdogs during the regular season. In our dataset, only five of the 24 teams analyzed finished the regular season among the top four, indicating that the majority should not be classified as underdogs.

On the other hand, 15 teams finished in the bottom five positions, with several experiencing early playoff eliminations and others failing to qualify for the playoffs at all (data not presented). This highlights a valuable distinction between genuinely poor home performance and exceptional away dominance. Notably, among the five high-ranked teams, two exhibited dominance both at home and, even more remarkably, as visiting teams—a highly unusual scenario, considering they represent only 2% of the sample.

Because basketball does not allow draws, games can end with either a narrow or a large scoring margin, regardless of the teams' conditioning, tactics, or technical level. Initially, we applied k-means clustering to classify point differentials into four game types, which resulted in group ranges of 1–11, 12–31, 32–51, and 52–62 points. However, these ranges lacked practical basketball relevance. Therefore, we adopted quartile-based stratification because, in basketball terms, it provided more meaningful distinctions (Canuto & Almeida, 2022); for instance, a four-possession-point difference does not constitute a close game, just as a 30-point margin clearly reflects an unbalanced contest.

Our findings indicate that the more closely contested a match is, the smaller the home team's advantage becomes. Two key results stand out: close games and very unbalanced games, which represent distinctly different scenarios. In blowout games, the odds of a home win were four times higher than those of an away win. It is important to emphasize that in basketball, the winner is not necessarily the team with the better overall record but the one that performs best in that particular game, regardless of physical, conditioning, tactical, or technical factors. Sometimes, strong teams underperform and are decisively outplayed, allowing a confident away team to upset expectations of a home victory. This increased confidence can be influenced by the opponent's nonverbal behavior, especially during unexpected struggles in clutch moments (Furley & Schweizer, 2014; Martin, 2023).

Even though Gómez et al. (2015) found that home teams doubled their chances of winning in close games, our results indicate that the outcome can go either way. In such cases, the decisive factor tends to be an increase in technical efficiency (Giovannini et al., 2021; Gomez et al., 2016; Gómez et al., 2015) or the selection of optimal offensive tactical strategies (Christmann et al., 2018).

López-García et al. (2024) emphasize that HCA can be essential for success in the playoffs. Our findings show a slightly more pronounced HCA during playoffs compared to regular-season games, though the difference is minimal. This contrasts with EuroLeague Basketball data, where home winning percentages declined from 66% in the regular season to 58% in playoff games (Pojskić et al., 2011). Additionally, Gomes et al. (2017) reported a small but statistically significant decrease in game performance indicators from the regular season to playoffs, which may contribute to reducing the HCA as noted by Pojskić et al. (2011).

The decrease in HCA is also evident in the NBA playoff series. Tauer et al. (2009) found that home teams tended to underperform in the following game when they needed only one more win to close the series. In the high-stakes "win or go home" games during the Conference Finals and NBA Finals, HCA declines from 66% to 63% (Graham et al., 2022). Despite this decrease, home teams remain more successful than visiting teams over a span of more than 50 years (Tauer et al., 2009). In such decisive games, both individual player performance and team playing style tend to change.

During the playoff phase, basketball coaches tend to reduce player rotation and increase starters' playing time (Palmer et al., 2022) because these players typically exhibit stronger offensive and defensive capabilities (Sun et al., 2023). However, individual performance varies between the first and last playoff games, with players improving or declining in different performance indicators, leading teams to rely more heavily on specific individuals for success. Furthermore, the style of play also changes, with an increase in passing, greater reliance on outside plays, and increased defensive effort (Mateus et al., 2018).

The increased importance of the playoffs increases game intensity (Ferioli et al., 2021; Morgulev et al., 2022), and defensive performance becomes more critical for progression in the post-season (Teramoto & Cross, 2010). As defensive pressure intensifies (Sansone et al., 2024), home crowds further motivate players to exert greater effort in rebounding (Leota et al., 2022)—a key game statistic that distinguishes winning from losing teams (Almeida et al., 2022; S. C. Canuto & Almeida, 2022). An aggressive defender may attempt to block the shot, prompting quicker ball releases and higher release points (Li et al., 2024; Okazaki et al., 2015), or influence how teams approach basket attacks (Gorman & Maloney, 2016). These biomechanical adjustments can reduce jump shot efficiency (Kambič et al., 2022) and increase opportunities for defensive rebounds. Additionally, increased defensive pressure may change preferred hand usage in offensive maneuvers (Giovannini et al., 2020),

pushing players out of their comfort zones and leading to greater variability in movement and offensive play selection (Gorman & Maloney, 2016). Combined with crowd noise, these in-game efforts can influence referees' decisions, thereby contributing to the HCA (Myers, 2014).

It is important to note that this study focused on analyzing numerical data, not individual players (Canuto & Almeida, 2022). We did not review the games themselves; therefore, our only indicator of HCA was the number of wins (Smith, 2005). Future research should incorporate additional factors that may confound results and affect data interpretation. Basketball is a high-intensity sport that requires considerable physical effort (Stojanović et al., 2018) and involves frequent contact (Wellm et al., 2024), resulting in a high injury rate among athletes (Liu et al., 2025). Furthermore, midseason changes in coaching staff or player rosters can influence team dynamics and performance (Gómez-Haro & Salmerón-Gómez, 2016; Martinez & Caudill, 2013). However, no studies have yet examined how these factors may affect HCA.

Conclusion

In conclusion, our findings confirm the existence of HCA in the NBB over 16 seasons, although its strength has gradually declined over time. This advantage is not consistent across all situations; it is significantly stronger in games involving lower-ranked teams, especially in unbalanced and highly unbalanced matchups. Moreover, while the overall difference is small, HCA tends to be slightly more pronounced during playoff games than in the regular season. These findings underscore the complex nature of HCA in Brazilian professional basketball, indicating that team performance level and game context are critical factors influencing its effect.

Conflicts of interest The authors report no competing interests to declare.

References

- Akabas, L. (2024, July 5, 2024). *How do NBA contracts and the salary cap work?* Retrieved February 16, 2025 from <https://www.sportico.com/feature/nba-salaries-explained-salary-cap-1234786618/>
- Allen, M. S., & Jones, M. V. (2014). The “home advantage” in athletic competitions. *Curr Dir Psychol Sci*, 23(1), 48-53. <https://doi.org/10.1177/0963721413513267>.
- Almeida, M. B., Canuto, S. C., Lima, G. S., & Oliveira, W. G. (2022). Performance analysis in elite basketball differentiating game outcome and gender. *Eur J Hum Mov*, 49, 105-117. <https://doi.org/10.21134/eurjhm.2022.49.7>
- Alonso, E., Lorenzo, A., Ribas, C., & Gómez, M. Á. (2022). Impact of COVID-19 Pandemic on HOME Advantage in Different European Professional Basketball Leagues. *Percept Mot Skills*, 129(2), 328-342. <https://doi.org/10.1177/00315125211072483>
- Baumeister, R. F., & Steinhilber, A. (1984). Paradoxical effects of supportive audiences on performance under pressure: the home field disadvantage in sports championships. *J Pers Soc Psychol*, 47(1), 85-93.
- Cabarkapa, D., Deane, M. A., Ciccone, A. B., Jones, G. T., Cabarkapa, D. V., & Fry, A. C. (2023). The home-court advantage in NCAA Division-I men's basketball. *J Hum Sport Exerc*, 18(2), 420-427. <https://doi.org/10.14198/jhse.2023.182.13>
- Canuto, S. C., & Almeida, M. B. (2022). Determinants of basketball match outcome based on game-related statistics: a systematic review and meta-analysis. *Eur J Hum Mov*, 48, 4-20. <https://doi.org/10.21134/eurjhm.2022.48.2>
- Canuto, S. C. M., Santos, L. L. R., & B., A. M. (2022). Análise longitudinal do desempenho do basquetebol brasileiro em 13 temporadas do Novo Basquete Brasil. *Scientia Plena*, 18(4). <https://doi.org/10.14808/sci.plena.2022.042801>
- Carter, K. E. (2017). Relative home-court advantage: the impact of travel on team production when one team is closer than its opponent to a neutral game site. *Manag Decis Econ*, 38(1), 76-91. <https://doi.org/10.1002/mde.2742>
- Carvalho, E., Leicht, A., Nakamura, F., Okuno, N., & Okazaki, V. (2017). Team statistical determinants of victory in Brazilian basketball. *MOJ Sports Med*, 1(4), 00018. <https://doi.org/10.15406/mojm.2017.01.00018>
- Christmann, J., Akamphuber, M., Müllenbach, A. L., & Güllich, A. (2018). Crunch time in the NBA: the effectiveness of different play types in the endgame of close matches in professional basketball. *Int J Sports Sci Coach*, 13(6), 1090-1099. <https://doi.org/10.1177/1747954118772485>
- Cohen, J. (1988). *Statistical power analysis for behavioral sciences*. Lawrence Erlbaum Associates.
- Courneya, K. S., & Carron, A. V. (1992). The home advantage in sport competitions: a literature review. *J Sport Exerc Psychol*, 14(1), 13-27. <https://doi.org/10.1123/jsep.14.1.13>
- DiGangi, D. (2019, November 12th, 2019). *This is the first-ever World Series where neither team won a home game*. ABC News. Retrieved January 28th, 2025 from <https://wjla.com/sports/washington-nationals/this-is-the-first-ever-world-series-where-neither-team-won-a-home-game>
- Durmuş, T., & Güllü, M. (2022). Comparison of the home-court performances of successful and unsuccessful teams at Euroleague before and after Covid-19 pandemic. *Perform Anal Sport Exerc*, 1(1), 31-40.

- Esteves, P. T., Mikolajec, K., Schelling, X., & Sampaio, J. (2021). Basketball performance is affected by the schedule congestion: NBA back-to-backs under the microscope. *Eur J Sport Sci*, 21(1), 26-35. <https://doi.org/10.1080/17461391.2020.1736179>
- Ferioli, D., Scanlan, A. T., Conte, D., Tibiletti, E., & Rampinini, E. (2021). The business end of the season: a comparison between playoff and regular-season workloads in professional basketball players. *Int J Sports Physiol Perform*, 16(5), 655-665. <https://doi.org/10.1123/ijsp.2020-0405>
- Foteinakis, P. F., & Pavlidou, S. P. (2024). Evolution of three-point field goals shooting trends in EuroLeague basketball. *Trends Sport Sci*, 31(4).
- Furley, P., & Schweizer, G. (2014). "I'm Pretty Sure That We Will Win!": The Influence of Score-Related Nonverbal Behavioral Changes on the Confidence in Winning a Basketball Game. *J Sport Exerc Psychol*, 36(3), 315-319. <https://doi.org/10.1123/jsep.2013-0199>
- Giovanini, B., Conte, D., Ferreira-Junior, A., & Nascimento, V. B. (2021). Assessing the key game-related statistics in Brazilian professional basketball according to season phase and final score difference. *Int J Perform Anal Sport*, 21(2), 295-305. <https://doi.org/10.1080/24748668.2021.1881358>
- García, J., Ibáñez, S. J., De Santos, R. M., Leite, N., & Sampaio, J. (2013). Identifying basketball performance indicators in regular season and playoff games. *Journal of Human Kinetics*, 36(1), 161-168.
- Giovanini, B., Marcori, A. J., Monteiro, P. H. M., & Okazaki, V. H. A. (2020). Does game pressure affect hand selection of NBA basketball players? *Psychol Sport Exercise*, 51, 101785. <https://doi.org/https://doi.org/10.1016/j.psychsport.2020.101785>
- Glinski, J., & Chandy, D. (2022). Impact of jet lag on free throw shooting in the National Basketball Association. *Chronobiol Int*, 39(7), 1001-1005. <https://doi.org/10.1080/07420528.2022.2057321>
- Gomes, J. H., Mendes, R. R., Almeida, M. B., Zanetti, M. C., Leite, G. S., & Ferreira Jr, A. J. (2017). Relationship between physical fitness and game related statistics in elite professional basketball players: Regular season vs. playoffs. *Motriz: J Phys Ed*, 23(2), e101626. <https://doi.org/10.1590/S1980-6574201700020004>
- Gómez-Haro, S., & Salmerón-Gómez, R. (2016). Recovering performance in the short term after coach succession in Spanish basketball organisations. *Coaching: Int J Theor Res Pract*, 9(1), 24-37. <https://doi.org/10.1080/17521882.2015.1119169>
- Gomez, M. A., Gasperi, L., & Lupo, C. (2016). Performance analysis of game dynamics during the 4th game quarter of NBA close games. *Int J Perform Anal Sport*, 16(1), 249-263. <https://doi.org/10.1080/24748668.2016.1186884>
- Gómez, M. A., Lorenzo, A., Jiménez, S., Navarro, R. M., & Sampaio, J. (2015). Examining choking in basketball: effects of game outcome and situational variables during last 5 minutes and overtimes. *Percept Mot Skills*, 120(1), 111-124. <https://doi.org/10.2466/25.29.PMS.120v11x0>
- Gómez, M. A., Jiménez, S., Sánchez, P. A., & Leo, F. M. (2009). Análisis de la ventaja de jugar en casa en diferentes ligas de baloncesto femenino. *Revista Kronos*, 8(15).
- Gómez, M. A., & Pollard, R. (2011). Reduced home advantage for basketball teams from capital cities in Europe. *Eur J Sport Sci*, 11(2), 143-148. <https://doi.org/10.1080/17461391.2010.499970>
- Gorman, A. D., & Maloney, M. A. (2016). Representative design: does the addition of a defender change the execution of a basketball shot? *Psychol Sport Exerc*, 27, 112-119.
- Graham, J. D., Zhang, B., Brown, D. M. Y., & Cairney, J. (2022). The home advantage in the National Basketball Association Conference Finals and Finals series from 1979 to 2019: a mediation analysis of offensive and defensive skills. *J Sport Exerc Psychol*, 44(1), 52-61. <https://doi.org/10.1123/jsep.2020-0314>
- Harris, A. R., & Roebber, P. J. (2019). NBA team home advantage: Identifying key factors using an artificial neural network. *PLoS One*, 14(7), e0220630. <https://doi.org/10.1371/journal.pone.0220630>
- Humphreys, B. R. (2002). Alternative measures of competitive balance in sports leagues. *J Sports Econ*, 3(2), 133-148. <https://doi.org/10.1177/152700250200300203>
- Jones, M. B. (2014). The home disadvantage in championship competitions: team sports. *Psychol Sport Exerc*, 15(4), 392-398. <https://doi.org/10.1016/j.psychsport.2014.04.002>
- Kambič, T., Stepišnik Krašovec, F., Erčulj, F., & Štirn, I. (2022). Biomechanical adjustments of the basketball jump shot performed over differently high opponents. *J Hum Kinet*, 83, 23-28. <https://doi.org/10.2478/hukin-2022-0049>
- Knobloch-Westernwick, S., David, P., Eastin, M. S., Tamborini, R., & Greenwood, D. (2009). Sports spectators' suspense: affect and uncertainty in sports entertainment. *J Comm*, 59(4), 750-767. <https://doi.org/10.1111/j.1460-2466.2009.01456.x>
- Leota, J., Hoffman, D., Mascaro, L., Czeisler, M. E., Nash, K., Drummond, S. P. A., Anderson, C., Rajaratnam, S. M. W., & Facer-Childs, E. R. (2022). Home is where the hustle is: the influence of crowds on effort and home advantage in the National Basketball Association. *J Sports Sci*, 40(20), 2343-2352. <https://doi.org/10.1080/02640414.2022.2154933>
- Li, F., Dukarić, V., Očić, M., Li, Z., & Knjaz, D. (2024). Influence of fatigue and defensive pressure on three-point jump-shot kinematics in basketball. *Appl Sci*, 14(20), 9582. <https://doi.org/10.3390/app14209582>

- Liu, Y., Huang, H., Yang, Y., & Huang, Y. (2025). Global prevalence and pattern of injuries in basketball players: a systematic review. *J Sports Med Phys Fitness*, 65(3), 428-437. <https://doi.org/10.23736/s0022-4707.24.15916-6>
- López-García, A., Alonso-Pérez-Chao, E., Navarro Barragán, R. M., & Jiménez-Sáiz, S. L. (2024). Home-Court advantage and home win percentage in the NBA: an in-depth investigation by conference and team ability. *Appl Sci*, 14(21), 9989. <https://doi.org/10.3390/app14219989>
- Lorenzo, A., Gómez, M. Á., Ortega, E., Ibáñez, S. J., & Sampaio, J. (2010). Game related statistics which discriminate between winning and losing under-16 male basketball games. *Journal of Sports Science & Medicine*, 9(4), 664
- Loughead, T. M., Carron, A. V., Bray, S. R., & Kim, A. J. (2003). Facility familiarity and the home advantage in professional sports. *Int J Sport Exerc Psychol.*, 1(3), 264-274.
- Madarambe, H. (2017). Game-related statistics which discriminate between winning and losing teams in Asian and European men's basketball championships. *Asian Journal of Sports Medicine*, 8(2), e42727.
- Madrigal, R., & James, J. (1999). Team quality and the home advantage. *J Sport Behav*, 22(3), 381-398.
- Martin, B. (2023, April 18th, 2023). *Stats breakdown: finalists for Kia Clutch Player of the Year: comparing the finalists for the Kia NBA Clutch Player of the Year with interactive stats visuals*. Retrieved February 18, 2025 from <https://www.nba.com/news/stats-breakdown-coming-through-in-the-clutch>
- Martinez, J. A., & Caudill, S. B. (2013). Does midseason change of coach improve team performance? Evidence from the NBA. *J Sport Manag*, 27(2), 108-113. <https://doi.org/10.1123/jsm.27.2.108>
- Mateus, N., Gonçalves, B., Abade, E., Leite, N., Gomez, M. A., & Sampaio, J. (2018). Exploring game performance in NBA playoffs. *Kinesiology*, 50(1), 89-96.
- McHill, A. W., & Chinoy, E. D. (2020). Utilizing the National Basketball Association's COVID-19 restart "bubble" to uncover the impact of travel and circadian disruption on athletic performance. *Sci Rep*, 10(1), 21827. <https://doi.org/10.1038/s41598-020-78901-2>
- Meneses, L. R., Gois Jr, L. E. M., & Almeida, M. B. (2016). Análise do desempenho do basquetebol brasileiro ao longo de três temporadas do Novo Basquete Brasil. *Rev Bras Ciên Esporte*, 38(1), 93-100. <https://doi.org/10.1016/j.rbce.2015.12.002>
- Mochales Cuesta, I., Jiménez-Sáiz, S. L., Kelly, A. L., & Bustamante-Sánchez, Á. (2024). The influence of home-court advantage in elite basketball: a systematic review. *J Funct Morphol Kinesiol*, 9(4), 192. <https://doi.org/10.3390/jfmk9040192>
- Morgulev, E., Azar, O. H., Lidor, R., Sabag, E., & Bar-Eli, M. (2018). Searching for judgment biases among elite basketball referees [Original Research]. *Front Psychol*, 9. <https://doi.org/10.3389/fpsyg.2018.02637>
- Morgulev, E., Raphaeli, M., & Goldschmied, N. (2022). Fighting with their back to the wall: An analysis of one-sided elimination games in National Basketball Association (NBA) playoffs. *J Sports Sci*, 40(21), 2437-2443. <https://doi.org/10.1080/02640414.2022.2162243>
- Myers, T. D. (2014). Achieving external validity in home advantage research: generalizing crowd noise effects. *Front Psychol*, 5, 532. <https://doi.org/10.3389/fpsyg.2014.00532>
- Nevill, A. M., & Holder, R. L. (1999). Home advantage in sport: an overview of studies on the advantage of playing at home. *Sports Med*, 28(4), 221-236. <https://doi.org/10.2165/00007256-199928040-00001>
- Okazaki, V. H., Rodacki, A. L., & Satern, M. N. (2015). A review on the basketball jump shot. *Sports Biomech*, 14(2), 190-205. <https://doi.org/10.1080/14763141.2015.1052541>
- Özdalyan, F., Çene, E., Gümüş, H., & Açıkgöz, O. (2024). Investigation of the effect of circadian rhythm on the performances of NBA teams. *Chronobiology International*, 41(5), 599-608. <https://doi.org/10.1080/07420528.2024.2325641>
- Palmer, J. A., Bini, R., Wundersitz, D., & Kingsley, M. (2022). Training and match demands differ between the regular season and finals in semi-professional basketball. *Front Sports Act Living*, 4, 970455. <https://doi.org/10.3389/fspor.2022.970455>
- Pérez-Chao, E. A., Nieto-Acevedo, R., Scanlan, A. T., Lopez-García, A., Lorenzo, A., & Gómez, M. Á. (2024a). Is there no place like home? home-court advantage and home win percentage vary according to team sex and ability in Spanish basketball. *Int J Perform Anal Sport*, 24(5), 510-517. <https://doi.org/10.1080/24748668.2024.2325842>
- Pérez-Chao, E. A., Nieto-Acevedo, R., Scanlan, A. T., Martin-Castellanos, A., Lorenzo, A., & Gómez, M. (2024b). Home-court advantage is greater for teams competing at higher playing levels: an exploratory analysis of Spanish male basketball leagues. *Percept Mot Skills*, 131(5), 1708-1719. <https://doi.org/10.1177/00315125241262124>
- Pérez-Chao, E. A., Portes, R., Ribas, C., Lorenzo, A., Leicht, A. S., & Gómez, M. Á. (2024c). Impact of spectators, league and team ability on home advantage in professional European basketball. *Percept Mot Skills*, 131(1), 177-191. <https://doi.org/10.1177/00315125231215710>
- Pojškić, H., Šeparović, V., & Užičanin, E. (2011). Modelling home advantage in basketball at different levels of competition. *Acta Kinesiol*, 5(1), 25-30.

- Pollard, R. (2002). Evidence of a reduced home advantage when a team moves to a new stadium. *J Sports Sci*, 20(12), 969-973. <https://doi.org/10.1080/026404102321011724>
- Pollard, R., & Pollard, G. (2005). Long-term trends in home advantage in professional team sports in North America and England (1876-2003). *J Sports Sci*, 23(4), 337-350. <https://doi.org/10.1080/02640410400021559>
- Prochnow, R. A., Reale, V. M. C., Santos, Y. Y. S., Monezi, L. A., & Mercadante, L. A. (2017). Análise dos indicadores técnicos que discriminam equipes vencedoras e perdedoras no Novo Basquete Brasil. *Sport TK*, 6 (suppl)(1), 207-212.
- Rascher, D. A., & Solmes, J. (2007). Do fans want close contests? A test of the uncertainty of outcome hypothesis in the National Basketball Association. *SSRN Electron J*, 2, 130-141.
- Ribeiro, H. V., Mukherjee, S., & Zeng, X. H. (2016). The advantage of playing home in NBA: microscopic, team-specific and evolving features. *PLoS One*, 11(3), e0152440. <https://doi.org/10.1371/journal.pone.0152440>
- Ribeiro Junior, D. B., Werneck, F. Z., Oliveira, H. Z., Panza, P. S., Ibáñez, S. J., & Vianna, J. M. (2021). From talent identification to Novo Basquete Brasil (NBB): multifactorial analysis of the career progression in youth Brazilian elite basketball. *Front Psychol*, 12, 617563. <https://doi.org/10.3389/fpsyg.2021.617563>
- Salgado, R. M., Ryan, B. J., Seeley, A. D., & Charkoudian, N. (2025). Improving endurance exercise performance at high altitude: traditional and nontraditional approaches. *Exerc Sport Sci Rev*, 53(1), 10-22. <https://doi.org/10.1249/jes.0000000000000347>
- Sansone, P., Gasperi, L., Conte, D., Scanlan, A. T., Sampaio, J., & Gómez-Ruano, M. Á. (2024). Game schedule, travel demands and contextual factors influence key game-related statistics among the top European male basketball teams. *J Sports Sci*, 42(18), 1759-1766. <https://doi.org/10.1080/02640414.2024.2409557>
- Schlenker, B. R., Phillips, S. T., Boniecki, K. A., & Schlenker, D. R. (1995). Where is the home choke? *J Pers Soc Psychol*, 68(4), 649-652.
- Schober, P., Mascha, E. J., & Vetter, T. R. (2021). Statistics from A (Agreement) to Z (z Score): a guide to interpreting common measures of association, agreement, diagnostic accuracy, effect size, heterogeneity, and reliability in medical research. *Anesth Analg*, 133(6), 1633-1641. <https://doi.org/10.1213/ANE.0000000000005773>
- Smith, D. R. (2005). Disconnects between popular discourse and home advantage research: what can fans and media tell us about the home advantage phenomenon? *J Sports Sci*, 23(4), 351-364. <https://doi.org/10.1080/02640410400021633>
- Steenland, K., & Deddens, J. A. (1997). Effect of travel and rest on performance of professional basketball players. *Sleep*, 20(5), 366-369.
- Stojanović, E., Stojiljković, N., Scanlan, A. T., Dalbo, V. J., Berkemans, D. M., & Milanović, Z. (2018). The activity demands and physiological responses encountered during basketball match-play: a systematic review. *Sports Med*, 48, 111-135. <https://doi.org/10.1007/s40279-017-0794-z>
- Sun, W., Chee, C., Kok, L., Lim, F., & Samsudin, S. (2023). Differentiating attack-defense performance for starting and bench players during the Tokyo Olympics men's basketball competition. *PLoS One*, 18(12), e0296012. <https://doi.org/10.1371/journal.pone.0296012>
- Tauer, J. M., Guenther, C. L., & Rozek, C. (2009). Is there a home choke in decisive playoff basketball games? *J Appl Sport Psychol*, 21(2), 148-162. <https://doi.org/10.1080/10413200902795331>
- Teramoto, M., & Cross, C. L. (2010). Relative importance of performance factors in winning NBA games in regular season versus playoffs. *J Quant Anal Sports*, 6(3). <https://doi.org/10.2202/1559-0410.1260>
- Tomczak, M., & Tomczak, E. (2014). The need to report effect size estimates revisited: an overview of some recommended measures of effect size. *Trends Sport Sci*, 1(21), 19-25.
- Wang, X., Zhang, S., Gasperi, L., Robertson, S., & Ruano, M. A. G. (2023). Rest or rust? Complex influence of schedule congestion on the home advantage in the National Basketball Association. *Chaos Soliton Fract*, 174, 113698. <https://doi.org/10.1016/j.chaos.2023.113698>
- Watkins, P. (2013). Revisiting the home court advantage in college basketball. *Int J Sport Soc*, 3(1), 33-42. <https://doi.org/10.18848/2152-7857/CGP/v03i01/53892>
- Wellm, D., Jäger, J., & Zentgraf, K. (2024). Dismissing the idea that basketball is a “contactless” sport: quantifying contacts during professional gameplay [Original Research]. *Front Sports Act Living*, 6. <https://doi.org/10.3389/fspor.2024.1419088>
- Zajac, T., Mikołajec, K., Chmura, P., Konefal, M., Krzysztofik, M., & Makar, P. (2023). Long-term trends in shooting performance in the NBA: an analysis of two- and three-point shooting across 40 consecutive seasons. *Int J Environ Res Public Health*, 20(3), 1924. <https://doi.org/10.3390/ijerph20031924>
- Ziani, C. M. D. C., Cavallini, L. R., Galatti, L. R., & Mazzei, L. C. (2019). Dez anos de novo basquete brasil: uma análise descritiva sobre suas equipes participantes eo equilíbrio competitivo da liga. *E-balonmano. com: Revista de Ciencias del Deporte*, 15(2), 159-166.