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Exploring Home-court Advantage and Home Win Percentage Rates in American Basketball Leagues: A Gender-Centric Examination of WNBA and NBA Teams

Explorando la Ventaja de Jugar en Casa y los Porcentajes de Victorias como Local en las Ligas de Baloncesto Estadounidenses: Un Análisis Centrado en el Género de Equipos de la WNBA y la NBA

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Abstract

The National Basketball Association (NBA) and the Women's National Basketball Association (WNBA) are the premier professional basketball leagues in the United States of America. Home-court advantage (HA) and home win percentage (HW) are crucial factors that influence game outcomes. This study aimed to compare the extent of HA and HW between male and female teams in these leagues. Data were collected across 23 seasons from both leagues. For each team and season, HA (%) was determined as (total home wins / total wins) * 100, and HW (%) was determined as (total home wins / total home games) * 100. HA and HW were compared between sexes using the Mann-Whitney test. The analyses revealed no significant differences in HA ($p = 0.731$) and HW ($p = 0.890$) between male and female teams. These findings underscore the importance of further investigation to elucidate the mechanisms underlying these results, which may inform the development of evidence-based strategies to optimize HA and HW across both leagues.

Keywords: game location; women; sex; gender; performance; USA.

Resumen

La Asociación Nacional de Baloncesto (NBA) y la Asociación Nacional de Baloncesto Femenino (WNBA) son las principales ligas profesionales de baloncesto en los Estados Unidos. La ventaja de jugar en casa (HA) y el porcentaje de victorias como local (HW) se han identificado como factores críticos que influyen en los resultados de los partidos. Este estudio tuvo como objetivo comparar la magnitud del HA y del HW entre equipos masculinos y femeninos en estas ligas. Se recopilaron datos de 23 temporadas en ambas ligas. Para cada equipo y temporada, el HA (%) se calculó como (victorias en casa totales / victorias totales) * 100, y el HW (%) como (victorias en casa totales / partidos jugados en casa totales) * 100. El HA y HW se compararon entre géneros utilizando la prueba de Mann-Whitney. Los análisis no revelaron diferencias significativas en el HA ($p = 0.731$) ni en el HW ($p = 0.890$) entre los equipos masculinos y femeninos. Estos hallazgos subrayan la importancia de investigar más a fondo los mecanismos subyacentes a estos resultados, lo que podría contribuir al desarrollo de estrategias basadas en evidencia para optimizar el HA y el HW en ambas ligas.

Palabras clave: ubicación del partido; mujeres; sexo; género; rendimiento; EE.UU.

Introduction

The home-court advantage (HA) refers to the phenomenon in which teams playing on their home court experience an advantage over visiting teams (Pollard & Gomez, 2014; Pollard & Gómez, 2015). The concept of HA was first defined by Koppet (1972), who analyzed multiple competitions to establish a statistical link between match location and competitive outcome. Since then, numerous studies have confirmed the presence of HA across different sports (Bermejo & Gómez Ruano, 2012; Pollard & Gomez, 2014; Pollard & Pollard, 2005). In basketball, HA is widely recognized by fans, players and coaches as a significant determinant of success in competitive games, offering a measurable benefit to the home team (Alonso et al., 2022; Inan, 2020; Smith, 2005). Research suggests that basketball exhibits one of the strongest HA effects among team sports (Pollard et al., 2017). Furthermore, some studies indicate that HA has fluctuated over time due to factors such as changes in game rules, improvement in travel logistics or advancements in player conditioning (Pollard & Gomez, 2014).

This advantage is extensively documented in basketball leagues (Alonso Pérez-Chao et al., 2024; Alonso-Pérez-Chao et al., 2024; Morgado & Barreira, 2023; Pollard & Gomez, 2014; Pollard & Gómez, 2015) and is typically quantified as the percentage of games won at home relative to the total number of games won during a season (Gómez Ruano & Pollard, 2013). In addition to HA, the home win percentage (HW) serves as a complementary metric, indicating a team's performance solely in home games (Alonso Pérez-Chao et al., 2023; Alonso-Pérez-Chao et al., 2024). While HA accounts for the overall advantage of playing at home by comparing home and away results, HW isolates home performance as a stand-alone metric, allowing researchers to assess a team's effectiveness in its own venue without considering its away performance (Alonso Pérez-Chao et al., 2024; Gómez Ruano & Pollard, 2013).

Research attributes HA and HW to factors such as reduced travel demands, familiarity with the home court, and support from local fans (Alonso Pérez-Chao et al., 2023; Goumas, 2014; Nichols, 2014; Pollard & Gómez, 2015). Several studies have examined multiple factors influencing team success, including controllable factors, such as team quality, crowd support, and recovery from travel (Alonso et al., 2022; Alonso Pérez-Chao et al., 2023; Huyghe et al., 2018; Pollard & Gómez Ruano, 2007), as well as uncontrollable factors, such as league region and referee bias (Bourdas et al., 2022; Carter, 2015; Gómez & Pollard, 2011; Gómez Ruano & Pollard, 2013; Wunderlich Fabian et al., 2021).

The COVID-19 pandemic provided a unique opportunity to analyse HA in the absence of spectators. Studies have shown that the presence of fans was associated with higher HA and HW, reinforcing the importance of crowd influence as a key determinant of HA. (Alonso et al., 2022; Lu et al., 2022). In contrast, some leagues exhibited minimal reduction in HA, suggesting that other elements, such as tactical approaches, player conditioning or travel fatigue, may also play a significant role in the game outcome (Alonso-Pérez-Chao et al., 2024).

While previous research has explored the impact of team gender on HA and HW, few studies have directly compared male and female teams (Alonso Pérez-Chao et al., 2024; Krommidas et al., 2019; Pollard et al., 2017). Exploring gender differences in HA and HW across basketball leagues could contribute to a more inclusive and equitable sporting environment by informing strategies to enhance performance and equality for all teams. If significant gender differences are identified, further research could examine the reason behind these differences, enabling the development of tailored strategies for male and female leagues. Conversely, if no gender differences are observed, a unified approach could be adopted to enhance the HA across both genders.

Previous studies on HA and HW reported that male teams in professional basketball leagues had a higher HA compared to female teams (60.1% vs 55.6%) (Pollard et al., 2017), while HW was nearly identical for both genders in the A1 Greek Basketball League during the 2014-2015 season (61.5% for males and 61.4 for females) (Krommidas et al., 2019). These findings are based on data from competitions held 8–12 years ago. More recent analyses of the top Spanish basketball leagues over 12 seasons (2010–2023) indicate that male teams continue to exhibit higher HA and HW than female teams, with significant differences reported (p < 0.013) (Alonso Pérez-Chao et al., 2024).

Despite recent research in the top Spanish basketball leagues (Alonso Pérez-Chao et al., 2024), most studies rely on data collected many years ago. Given the inconsistent findings across sexes, there is a clear need for more contemporary and comprehensive evidence to compare HA and HW between male and female players competing at similar levels. Therefore, this study aimed to compare the extent of HA and HW by team sex in the United States of America (USA) leagues: the National Basketball Association (NBA) and the Women National Basketball Association (WNBA). Based on the study referenced above (Alonso Pérez-Chao et al., 2024), we hypothesized that NBA teams would exhibit higher HA and HW compared to WNBA teams.

Methods

Sample

Data were collected from the NBA and WNBA. The dataset included 23 regular seasons for each league [from the 2000 to 2023 (WNBA) and from 1999-2000 to 2022-2023 season (NBA)] excluding games played in the pre-season, playoffs, and without crowds due to pandemic-related restrictions. In this regard, all data from the 2020–2021 season (NBA) and 2020 season (WNBA) were excluded given restrictions in place prohibited crowds from attending games. In turn, the dataset was split male (685 samples) and female (298 samples) teams.

Procedures

Data were extracted from an open-access website (www.flashscore.com, accessed on 15 October 2023). The variables collected included the year of the season and competition (male vs. female), as well as the number of homes wins, away wins, total wins, total games played, and total games played at home for each team in each season. These data were inputted into customized Microsoft Excel (version 16.0, Microsoft Corporation, Redmond, WA) spreadsheets for further analysis. Within these spreadsheets, calculations were carried out to determine HA and HW for each team across each season. Specifically, HA (%) was calculated as: [(total home wins / total wins) * 100] (Alonso et al., 2022; Pollard & Gómez Ruano, 2015), while HW (%) was calculated as [(total home wins / total home games) * 100] (Gómez & Pollard, 2011). For example, the HA for a team that won 10 games at home and 10 games at away venues would be equal to [(10 / 20) * 100 = 50%] (Alonso et al., 2022; Pollard & Gómez Ruano, 2015).

Statistical analysis

Given data were not normally distributed as shown via Shapiro-Wilk tests, HA and HW are presented as medians and interquartile ranges (IQR) according to team sex across all seasons combined. Furthermore, comparisons in HA and HW between team sexes were conducted using Mann-Whitney tests. The level of significance for all statistical tests was set at p <0.05. Descriptive analyses and inferential tests were conducted using the open statistical software package JASP (Version 0.18) [Computer software].

Results

Figure 1 shows the comparisons between team sex. Table 1 shows the median and IQR for HA and HW according to team sex. Analyses revealed no significant differences for HA ($p = 0.731$) and HW ($p = 0.890$) between male and female teams.
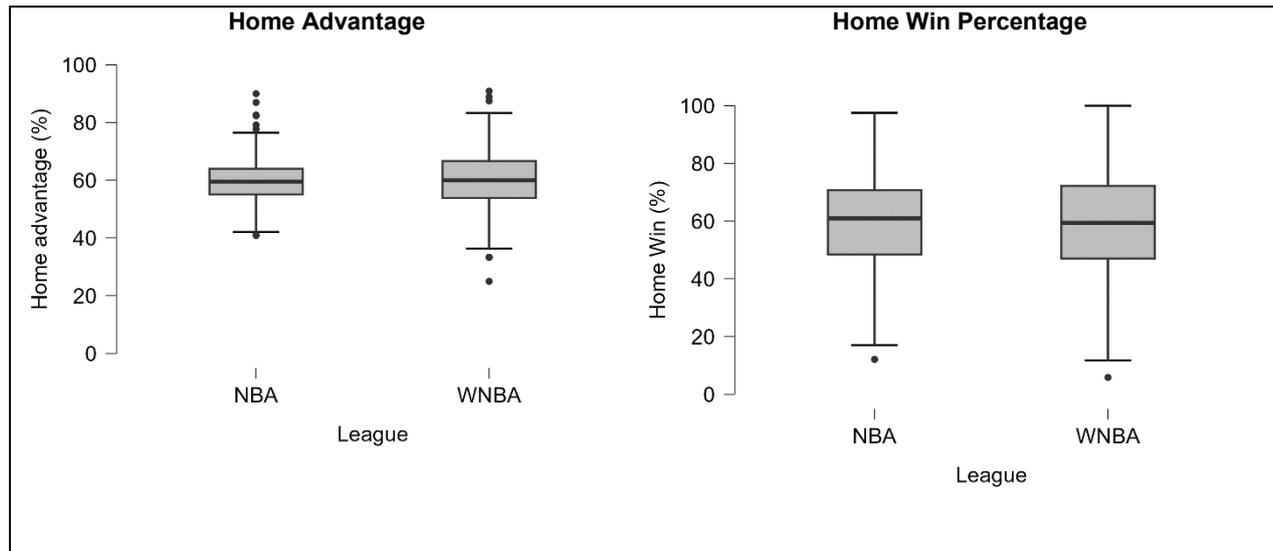
Figure 1. Comparisons in home-court advantage (HA) and home win percentage (HW) between WNBA (female) and NBA (male) teams

Table 1. Descriptive analysis of home-court advantage (HA) and home win percentage (HW) according to sex

Variables	Sex	Median	IQR	CV%
Home-court advantage (%)	Female (WNBA)	60.0	12.82	16.4 %
	Male (NBA)	59.52	8.90	11.0 %
Home Win Percentage (%)	Female (WNBA)	59.41	25.16	32.2 %
	Male (NBA)	60.98	22.25	28.0 %

Abbreviations: IQR = interquartile range, CV = coefficient of variation

Discussion

The purpose of this study was to quantify and compare the HA and HW between male and female teams competing in top USA basketball leagues. The key findings from the data include: (1) no significant differences in HA ($p = 0.731$) and HW ($p = 0.890$) between male and female teams. Previous research has demonstrated that in the A1 Greek Basketball League, HW for male and female teams was almost identical (61.5% for males and 61.4 for females) (Krommidas et al., 2019). Consistent with this body of research, our findings reveal a similar trend, with HW percentages of 60.9% for males and 59.4% for females.

This similarity in HW between male and female teams across different leagues suggests that, despite potential differences in physicality, strategy, and game dynamics, both sexes tend to perform comparably in their home environments (Krommidas et al., 2019). These findings imply that the key advantages of playing at home—such as court familiarity, local fan support, and reduced travel-related fatigue—are equally beneficial to both male and female teams (Carter, 2015; Pollard et al., 2017). The observed parity in home performance between genders indicates that the external factors influencing HA and HW are consistent across genders. These external factors include key aspects that have been widely studied, such as crowd support, which has been shown to provide psychological and motivational benefits to home teams while potentially influencing referee decisions in their favor (Alonso Pérez-Chao et al., 2024; García Rubio et al., 2015; Inan, 2020; Ponzo & Scoppa, 2018). Studies analyzing games played without spectators during the COVID-19 pandemic revealed a reduction in HA, reinforcing the notion that fan presence plays a crucial role in home performance (Alonso et al., 2022; Bourdas et al., 2022).

Another critical factor is travel logistics, which can create fatigue and disrupt circadian rhythms for visiting teams, particularly in leagues with extensive travel requirements (Huyghe et al., 2018; Steenland & Deddens, 1997). Research has demonstrated that increased travel distance and reduced rest time negatively impact player and team performance, leading to a disadvantage for away teams (Carter, 2015; Nichols, 2014). This effect is especially pronounced in North American leagues, where long-distance travel and time zone changes increase player fatigue (Huyghe et al., 2018; Steenland & Deddens, 1997).

Lastly, referee bias has been identified as a contributing factor to HA, with studies suggesting that officials may subconsciously favor home teams in crucial moments of the game (Ponzo & Scoppa, 2018; Wunderlich Fabian et al., 2021). Factors such as crowd noise and environmental familiarity can influence referees' decisions (Ponzo & Scoppa, 2018; Sutter & Kocher, 2004; Wunderlich Fabian et al., 2021).

Despite the influence of these external factors, the observed parity in HA and HW between genders suggests that their influence is relatively balanced across men's and women's competitions. This finding may point to a level of equity in the competitive conditions provided within these leagues (Carter, 2015; Krommidas et al., 2019; Pollard et al., 2017).

In contrast to our findings, previous studies have reported that male teams generally exhibit a higher HA compared to female teams (60.1% vs 55.6%) (Pollard et al., 2017). Additionally, a recent study analyzing the top Spanish basketball leagues found that male teams had significantly higher HA and HW than female teams (Alonso Pérez-Chao et al., 2024). The discrepancies between these studies and our results could be attributed to a variety of factors, including differences in coaching strategies, playing styles, league levels, and player motivation.

Additionally, disparities in game attendance, arena size and media exposure between male and female leagues may contribute to differences in HA, as previous research has shown that larger audiences and increased media coverage amplify HA effects (García Rubio et al., 2015; Leota et al., 2021; van Bommel et al., 2021). These factors may help explain why male leagues, which generally receive greater financial and media investment, exhibit a stronger HA than female leagues in some contexts, such as the Spanish basketball leagues, where Alonso Pérez-Chao et al. (2024) observed that male teams had greater HA and HW than female teams. However, this contrasts with our results, which show no significant differences in HA (p = 0.731) and HW (p = 0.890) between male and female teams in the USA leagues analyzed.

Moreover, it is well-documented that in cosmopolitan cities, where populations are more transient and diverse, the sense of belonging and community identity may be weaker. This weaker sense of connection can diminish HA, as fans in such cities may exhibit less allegiance to their local teams, resulting in less enthusiastic support during home games (Gómez & Pollard, 2011; Gómez Ruano & Pollard, 2013). In contrast, teams based in smaller or more culturally cohesive cities often benefit from a more unified and passionate fan base, which can enhance their HA (Gómez & Pollard, 2011; Gómez Ruano & Pollard, 2013). This pattern is particularly relevant in the NBA and WNBA, where teams located in major metropolitan areas may experience a weaker HA due to a highly diverse population and competition from multiple sports franchises. Conversely, franchises in smaller markets tend to cultivate a more dedicated fan base, which may reinforce HA effects over time (Gómez & Pollard, 2011).

While the literature does not explicitly mention specific examples within the NBA or WNBA, teams such as the Utah Jazz (Salt Lake City) and the Oklahoma City Thunder, located in smaller markets characterized by lower population density, fewer major professional sports teams, and strong local identity, may align with this theoretical framework. These franchises operate in metropolitan areas with significantly smaller populations compared to major markets like New York or Los Angeles, and they are the only NBA teams in their respective states, which contributes to a deeply engaged fan base. This strong local support could amplify HA effects. However, further empirical research would be needed to establish a direct causal link between cultural cohesion and HA in these specific cases.

As highlighted in previous research, both HA and HW are positively impacted by higher levels of public attendance at games (Alonso et al., 2022; Alonso Pérez-Chao et al., 2023). This relationship between fan attendance and HA has been reinforced by recent studies analyzing the effects of matches played without spectators during the COVID-19 pandemic,

which demonstrated a significant decline in HA in multiple European basketball leagues (Alonso et al., 2022; Bourdas et al., 2022). The absence of spectators not only reduced HA but also altered team performance metrics, suggesting that fan engagement plays a crucial role in creating a favorable home environment (Bourdas et al., 2022). To maintain or enhance these trends, it is imperative to develop and implement effective marketing strategies aimed at increasing supporter turnout in stadiums. Additionally, campaigns designed to foster a strong bond and identity between teams and their local fan base should be prioritized. Establishing a recognizable team identity can transform stadiums into formidable environments for visiting teams, effectively creating "fortresses" for home teams (Alonso-Pérez-Chao et al., 2024; García Rubio et al., 2015).

Another factor influencing HA is travel-related fatigue, which has been identified as a determinant of home performance (Carter, 2015; Steenland & Deddens, 1997). Studies in professional leagues have shown that congested schedules negatively impact visiting team performance, reinforcing the competitive edge of home teams (Huyghe et al., 2018; Nichols, 2014).

Given the substantial impact of HA and HW on team performance, these findings open the door to innovative basketball strategies. By analyzing and planning optimal approaches to home and away games, teams can enhance their performance in both the short and long term, ultimately improving their standings in league competitions.

Despite the strengths of this study, when interpreting our results, it is important to consider certain limitations. First, the results of our study are limited to 23 regular seasons of USA leagues and should not be generalized to other basketball leagues, including semi-professional or amateur levels or leagues in other countries. Additionally, some key variables could not be measured due to insufficient data in public records and logistical constraints. These variables include factors such as travel requirements, crowd hostility, stadium capacity and occupancy, as well as tactical adjustments made by teams when playing at home or away. Those contextual factors may have influenced HA and HW (Carter, 2015; Leota et al., 2021; Staufenbiel et al., 2015; Steenland & Deddens, 1997) and should be considered in future studies to better understand their impact.

Future studies should investigate the psychological impact of crowd dynamics on home-court advantage (HA) in both male and female teams, exploring how fan behavior, noise levels, and crowd density influence player performance and team outcomes. Evidence suggests that crowd support can significantly enhance player motivation and reduce stress levels, thus reinforcing HA (Leota et al., 2021).

Conclusions

In the American Basketball leagues (NBA and WNBA), no significant differences in HA or HW were observed between male and female teams. These findings highlight the need for further research to identify the factors contributing these results, which could inform the development of unified strategies to enhance HA and HW across both leagues.

Practical applications

The results of this study, which revealed no significant differences in Home Advantage (HA) or Home Win Percentage (HW) between NBA and WNBA teams, provide valuable insights for optimizing performance in both leagues. Given that no significant differences were found between male and female teams, this suggests that optimizing external factors, rather than gender-related variables, is key to maximizing HA and HW. Therefore, training methodologies should be equally applied across both leagues, ensuring that teams leverage home conditions effectively.

Coaches and team managers should prioritize strategies to enhance HA and HW such as focusing on factors like familiarity with the court and the influence of local support. In particular, technical and tactical preparation should incorporate home-specific training sessions to better adapt to court dimensions, lighting, and arena conditions. In these home-specific training sessions, coaches can focus on practicing free throws, which have been identified as a key determinant of game outcomes, especially when playing at home and in close matches

Additionally, teams could implement targeted initiatives to further strengthen HA and HW. Organizing fan engagement events, such as meet-and-greet sessions or open practices, may enhance crowd involvement and reinforce the psychological impact of home support. Likewise, scheduling intensive training sessions at the home venue can help players adapt to environmental factors and optimize their spatial awareness during games. Furthermore, leveraging psychological preparation techniques, including visualization exercises and mental conditioning, can be instrumental in maximizing the benefits of playing in a familiar environment.

As previously described, both phenomena are positively impacted by higher levels of public attendance at games. To sustain and amplify this trend, marketing strategies aimed at increasing the affluence of supporters in stadiums should be developed and implemented. This could include community engagement initiatives, targeted social media campaigns to engage fans, and initiatives that foster a strong sense of team identity, ultimately contributing to a more intimidating atmosphere for visiting teams.

By leveraging these approaches, teams can maximize their home-court advantage and improve overall performance.

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