Original Article

SOCIODEMOGRAPHIC MAPPING OF PLAYERS AND CLUBS IN THE BRAZILIAN CHAMPIONSHIP IN THE 2022 TO 2024 SEASONS

MAPEAMENTO SOCIODEMOGRÁFICO DE JOGADORAS E CLUBES DO CAMPEONATO BRASILEIRO NAS TEMPORADAS DE 2022 A 2024

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RESUMO

O estudo teve como objetivo realizar um mapeamento sociodemográfico descritivo para caracterizar o perfil de clubes e jogadoras do futebol de mulheres na elite nacional nas temporadas de 2022 a 2024. Foi realizada uma pesquisa exploratória de cunho documental. A amostra foi constituída por 23 clubes e 401 jogadoras em 2022, 351 em 2023 e 393 em 2024. Os dados foram coletados no site da CBF, páginas oficiais dos clubes e outras plataformas digitais. As variáveis dos clubes foram: cidade, estado, região e IDH; já para as jogadoras: cidade, estado, região, IDHM e população da cidade de nascimento. Os resultados evidenciam a predominância da região Sudeste, especialmente do estado e da cidade de São Paulo, tanto na quantidade de clubes quanto na naturalidade das atletas. Além disso, nas três temporadas, o número de clubes representantes da região Norte/Nordeste é muito inferior em relação ao Sudeste/Sul. Ademais, quase todos os estados dos clubes apresentaram IDH alto ou muito alto, assim como o IDHM de grande parte das cidades das jogadoras. Conclui-se que o Sudeste possui o maior número de clubes e jogadoras nascidas nesta região, ilustrando um grande desequilíbrio em relação às outras regiões do país.

Palavras-chave: Futebol. Fatores socioeconômicos. Desempenho atlético.

ABSTRACT

This study aimed to conduct descriptive sociodemographic mapping to characterize the profile of women's soccer clubs and players in the national elite level for the 2022-2024 seasons. Exploratory documentary research was conducted. The sample consisted of 23 clubs, with 401 players in 2022, 351 in 2023, and 393 in 2024. Data were collected from the CBF website, official club pages, and other digital platforms. The variables for the clubs were; city, state, region, and HDI, and for the female players were; city, state, region, MHDI, and population of the city of birth. The results highlight the predominance of the Southeast region, especially the state and city of São Paulo, both in the number of clubs and the athletes' birthplaces. Furthermore, in the three seasons, the number of clubs representing the North/Northeast region was lower compared to the South/Southeast. Finally, almost all the states where the clubs were located had high or very high HDI values, and most of the players' birth cities had high MHDI values. It follows that the Southeast has the largest number of clubs and the most players born in this region, illustrating a significant imbalance compared to other regions of the country.

Keywords: Soccer. Socioeconomic factors. Athletic performance.

Introduction

Football is the most popular sport in the world. Considering this statement and the issue of gender, it is essential that discussions about the development and advancement of women's football remain on the agenda. From a historical perspective, women's football, according to the Fédération Internationale de Football Association (FIFA), as cited by Vedove[1], originated in England in 1894, when Nettie Honeyball founded the first women's football club, the British Ladies Football Club. As Pessanha[2] states, women's football gained visibility during World War I with the emergence of several female teams in factories. However, in 1921, the Football Association (FA) banned women from playing, citing concerns related to "female corporeality" and the return of men after the war. In Brazil, the emergence of women's football dates back to the 1920s, initially as a form of performance in circuses[3], and one of the first recorded competitive matches took place in 1921 between the "Senhoritas Tremembenses" and the "Senhoritas Cantarinenses"[4]. This history reflects women's trajectory and protagonism, as emphasized by Perrot[14] who states: "in the theatre of memory, women are faint shadows," highlighting their limited visibility, and the same applies in football.

It is also essential to emphasize the period during which women's football was banned in Brazil (1941–1979) and the resilience women had to demonstrate, as described by Ribeiro[5]. Decree-Law No. 3,199/1941 represented a significant restrictive milestone for women's football, interrupting a growing trajectory of visibility, supported by prejudiced arguments and medical and moral narratives. The decree provoked opposition, delegitimizing women's participation in football[5]. The regulation of women's football only occurred in 1983, when the National Sports Council (CND) officially recognized the practice. From then on, the popularization of women's football increased considerably, albeit gradually, driven by the emergence of competitions and greater media attention. Following the regulation, competitions were authorized across different regions of the country, Goellner[7] .

According to the Jornal da Paraíba[8], the Brazilian Championship has a history that predates its official establishment. Under the Brazilian Football Confederation (CBF), the first *Taça Brasil de Clubes* was held in 1993, followed by the National Women's Championship in 1994. Between 2002 and 2005, no national-level competitions were held for women after the CBF withdrew from the organization. In 2006, LINAF organized the National League, and in 2007 the CBF created the *Copa do Brasil* for women's football. Finally, in 2013, the Brazilian Championship was established with 20 teams, and in 2017 it adopted its current format of 16 teams. It is noteworthy that in 2024 there was a record attendance at the Brazilian Championship final (Corinthians vs. São Paulo), with 44,529 spectators. In the following year's final (Corinthians vs. Cruzeiro), attendance reached 41,130 at Neo Química Arena, setting a revenue record (R$ 1,237,699.00) for a women's club football match in Brazil[9,10].

In addition to the establishment of national competitions, in 2016 CONMEBOL introduced a requirement mandating that first-division men's clubs must have a women's team, starting in 2019. This was fundamental for the development of the sport in Brazil[11], although further efforts are still needed to bring about more significant progress. To support the global development of women's football, the FIFA Strategy[12] was launched in 2018, aiming to increase participation, enhance the commercial value, and build sustainable foundations. In 2023, the Brazilian Federal Government introduced the National Strategy for Women's Football, aiming to "promote favourable conditions for professional development […], including the identification and advancement of new talent, with necessary investments for their development in sport" [11], aligned with the Sports Policy Factors Leading to International Sporting Success (SPLISS) framework. The strategy also aimed to strengthen Brazil's bid to host the 2027 FIFA Women's World Cup, which was confirmed in May 2024, with Brazil selected as the host country.

There is a gap in the literature regarding studies that map the national landscape of women's football, particularly concerning clubs, athletes, and key sociodemographic factors, such as the Human Development Index (HDI) – composed of income, education, and health indicators – the Municipal Human Development Index (MHDI), which uses the same indicators but is specific to each city, making it more suitable for municipal-level analysis[13], and population size. These sociodemographic variables are essential for understanding the context of women's football in Brazil, highlighting aspects that may generate inequalities in the sport. In this sense, the proposed mapping is relevant to present and discuss the diversity within women's football in Brazil, considering different regions of the country, with a focus on the main national competition, the Brazilian Championship Série A1 (2022–2024), contested by adult athletes. It is expected that this process will contribute to identifying the birthplace of elite players, understanding the reality of clubs in the top division, and examining their associated variables (state, city, and region of origin), as well as their relationship with sociodemographic factors (HDI, MHDI, and city population), thereby deepening the current knowledge and providing a basis for further discussion.

Therefore, the general objective of the current study was to conduct descriptive sociodemographic mapping to characterize the profile of players and clubs participating in the national elite level during the 2022 to 2024 seasons. It is believed that these findings can contribute to understanding the sport from social and geographical perspectives, enabling insights into the sociodemographic characteristics of women's football in Brazil, as well as identifying key changes, challenges, and barriers.

The following hypotheses were proposed to address the research problem: (i) the geographical distribution of clubs in the Brazilian Championship Série A1 is uneven, with the North and Northeast regions having fewer clubs, as also indicated by Accocella *et al.* [15], resulting in inequalities and imbalance across regions; (ii) the Human Development Index (HDI) and Municipal Human Development Index (MHDI) may be key factors influencing participation in sport, as they can affect engagement and the development of skills necessary for performance [16]; and (iii) larger cities may offer more resources and infrastructure for clubs and athletes.

Methods

Methodological approach, research context, and participants

The study used publicly available data, in accordance with Law No. 12,527 of November 18, 2011, and follows a quantitative, descriptive-exploratory approach of a documentary nature. The study involved players and clubs that participated in the Brazilian Championship Série A1 during the 2022 to 2024 seasons. Each season consisted of 16 teams. In the 2022 season, 533 players were identified; in 2023, 519 players; and in 2024, 537 players. After data collection, the total number of players was reduced based on the following exclusion criteria: (i) absence of information regarding place of birth in the consulted databases; (ii) inconsistencies in information related to the player's city and state of birth; and (iii) foreign players who participated in the Brazilian Championship Série A1 (first division) during the analyzed seasons. Thus, the final sample consisted of 401 players in 2022, 351 players in 2023, and 393 players in 2024. It should be noted that repeated participation of the same player across different seasons was considered.

Data collection procedures and instruments

Data was collected through access to the Brazilian Football Confederation (CBF) website (https://www.cbf.com.br) and retrieval of information on clubs and players for the selected seasons [17,18,19]. Subsequently, for players whose names were available but whose place of birth was not listed on the CBF website, additional searches were conducted on the ogol.com website (https://www.ogol.com.br/). When the required information on place of birth was still unavailable, official club websites were searched as a final source.

The variables considered in this study are related to both clubs and players. For clubs, the variables include: Club Name, City, State, Region, and HDI (state level). For players, the variables include: Player Name, City, State, and Region of Birth, MHDI (city level), and Population (city level). The MHDI and its classifications were verified directly on the Atlas Brasil website. Regarding population, the classification criteria followed the guidelines established by Política Nacional de Assistência Social - PNAS/2004 in Norma Operacional Nacional Básica [20]. Additionally, to collect variables related to sociodemographic characteristics—HDI (2021), MHDI (2010), and Population (2022)—the official website of the Brazilian Institute of Geography and Statistics (IBGE) was used [21].

Data analysis

The data were processed using SPSS software (Statistical Package for the Social

Sciences), version 25.0. To present the results, maps of the regions and states of the clubs and athletes were created using the Canva platform (http://canva.com). In addition, the data are also presented in tables developed using Excel and Word (Microsoft Office). Quantitative results are expressed as frequency (f), percentage (%), and cumulative percentage (Cum. %).

Results

Considering the elite level and seasons analyzed, there were a total of 23 clubs identified, located in 15 cities and 11 states of the country. Of these 23 clubs, 12 participated in all three editions of the Brazilian Championship first division included in the study, indicating that in each season (with 16 clubs), only four spots were taken by "new clubs." Furthermore, the study found that the cities with the highest concentration of clubs are São Paulo, Rio de Janeiro, and Belo Horizonte, with a total of three clubs each. Regarding the Human Development Index (HDI), Pará and Bahia have a medium HDI, 12 states have a high HDI, and 9 states have a very high HDI.

The 23 clubs in the seasons analysed come from 15 Brazilian cities, namely: Belo Horizonte (n = 3): América Saf (24), Atlético Mineiro Saf (22/23/24) and Cruzeiro (22/23/24); Rio de Janeiro (n = 3): Botafogo (24), Flamengo (22/23/24), and Fluminense (24); São Paulo (n = 3): Corinthians (22/23/24), Palmeiras (22/23/24), and São Paulo (22/23/24); Brasília (n = 2): Cresspom (22) and Real Brasília (22/23/24); Porto Alegre (n = 2): Grêmio (22/23/24) and Internacional (22/23/24); Ananindeua (n = 1): A. A. Esmac (22); Curitiba (n = 1): Athletico PR (23); Caçador (n = 1): Avaí Kindermann (22/23/24); Salvador (n = 1): Bahia (23); Fortaleza (n = 1): Ceará (23); Araraquara (n = 1): Ferroviária (22/23/24); Ariquemes (n = 1): Real Ariquemes (23); Bragança Paulista (n = 1): Red Bull Bragantino (22/24); Santos (n = 1): Santos (22/23/24) and São José dos Campos (n = 1): São José Ec (22).

Another important point identified in the study is the number of clubs per state across the 2022, 2023, and 2024 seasons, Being respectively: SP (7, 5, 6); MG (2, 2, 3); RJ (1, 1, 3); RS (2, 2, 2); DF (2, 1, 1); SC (1, 1, 1); PA (1, 0, 0); BA (0, 1, 0); CE (0, 1, 0), and RO (0, 1, 0), totalling 23 clubs. It is noteworthy that over the three years of competition, the state of São Paulo had the highest number of participating clubs, with seven in 2022, five in 2023, and six in 2024. The states of Rio de Janeiro and Minas Gerais reached three clubs in 2024. All other states had only one or two clubs in all seasons of the study.

Across the seasons analyzed, the 23 included clubs are concentrated in 11 states. The states of São Paulo/Southeast (HDI = 0.806) include the clubs Corinthians, Ferroviária, Palmeiras, Red Bull Bragantino, Santos, São José EC, and São Paulo. Rio de Janeiro/Southeast (HDI = 0.762): Botafogo, Flamengo, and Fluminense. Minas Gerais/Southeast (HDI = 0.774): América SAF, Atlético Mineiro SAF, and Cruzeiro. Rio Grande do Sul/South (HDI = 0.771): Grêmio and Internacional. Federal District/Midwest (HDI = 0.814): Cresspom and Real Brasília. Pará/North (HDI = 0.690): A. A. Esmac. Paraná/South (HDI = 0.769): Athletico PR. Santa Catarina/South (HDI = 0.792): Avaí Kindermann. Bahia/Northeast (HDI = 0.691): Bahia. Ceará/Northeast (HDI = 0.734): Ceará. Rondônia/North (HDI = 0.700): Real Ariquemes. The HDI values mentioned refer to the state level, based on 2021 data (IBGE).

Figure 1 presents the regions included in the study and the number of clubs per season (2022, 2023, and 2024).
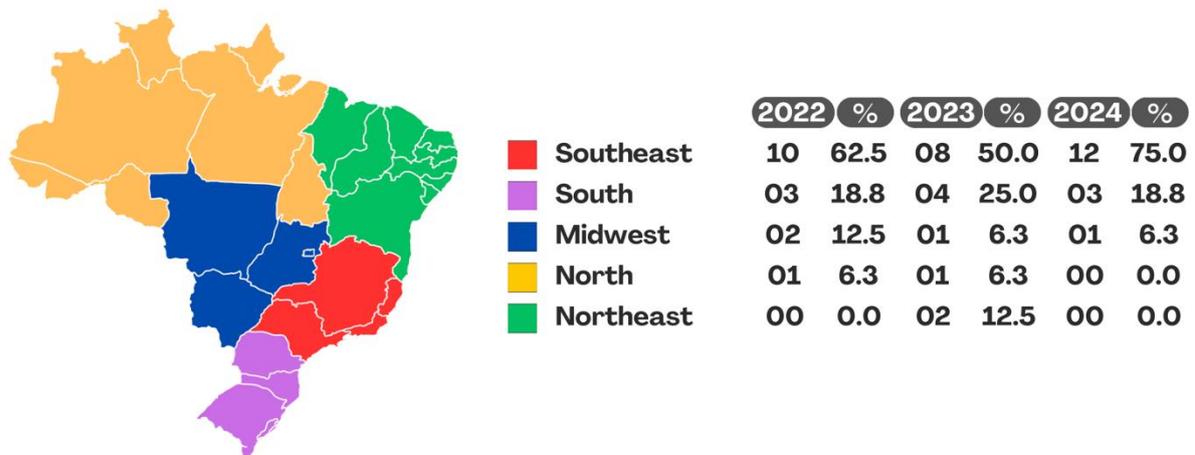
	2022	%	2023	%	2024	%
Southeast	10	62.5	08	50.0	12	75.0
South	03	18.8	04	25.0	03	18.8
Midwest	02	12.5	01	6.3	01	6.3
North	01	6.3	01	6.3	00	0.0
Northeast	00	0.0	02	12.5	00	0.0

Figure 1. Regions of the clubs that competed in the 2022, 2023, and 2024 editions of the Brazilian Championship A1.
Source: The authors

The figure shows that in 2024, the Brazilian Championship included representatives from only three regions of the country (Southeast, South, and Midwest), with twelve of the sixteen teams coming from the Southeast, highlighting the difficulty for clubs from other regions to reach the national elite. In 2022, only the Northeast region had no representatives. In 2023, all regions were represented, with the Northeast surpassing the Midwest and North regions, making it the most balanced year among those analyzed. The Southeast region had the highest number of representatives in all seasons, followed by the South, then the Midwest, and finally the North and Northeast.

Regarding the analysis of sociodemographic characteristics related to the athletes' places of birth, figure 2 shows the region of birth and the number of players from each region in each season.

	2022	%	2023	%	2024	%
Southeast	212	52.9	202	57.5	229	58.3
Northeast	71	17.7	59	16.8	65	16.5
South	68	17.0	62	17.7	60	15.3
North	28	7.0	12	3.4	17	4.3
Midwest	22	5.5	16	4.6	22	5.6

Figure 2. Region of birth of the athletes who competed in the 2022, 2023, and 2024 editions of the Brazilian Championship A1.
Source: The authors

Similarly, Figure 3 shows the state of birth of the players in the 2022 to 2024 seasons.
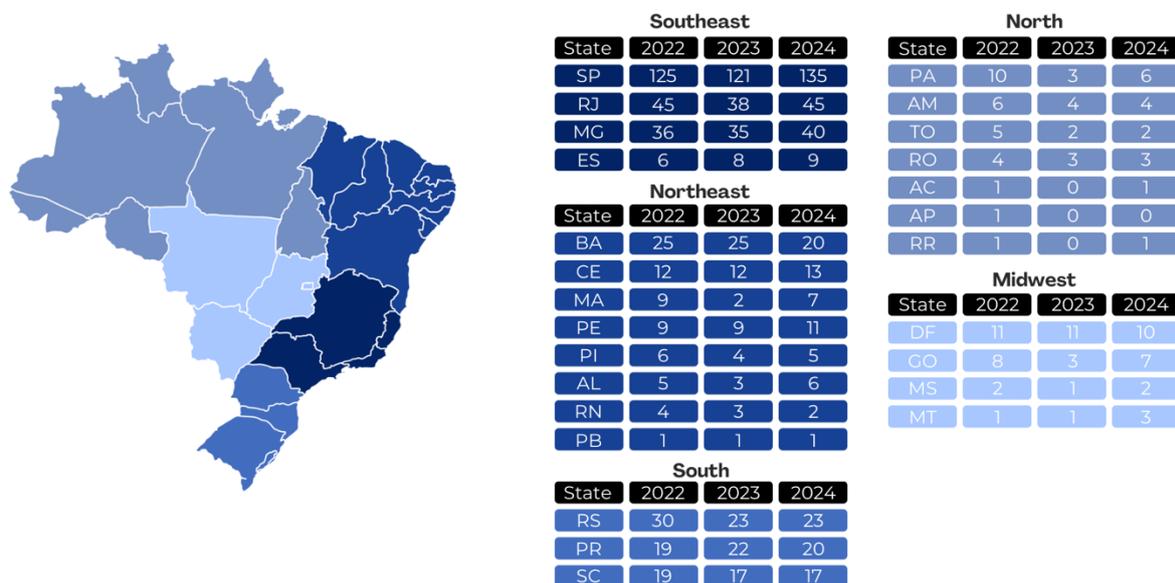

Southeast

State	2022	2023	2024
SP	125	121	135
RJ	45	38	45
MG	36	35	40
ES	6	8	9

Northeast

State	2022	2023	2024
BA	25	25	20
CE	12	12	13
MA	9	2	7
PE	9	9	11
PI	6	4	5
AL	5	3	6
RN	4	3	2
PB	1	1	1

South

State	2022	2023	2024
RS	30	23	23
PR	19	22	20
SC	19	17	17

North

State	2022	2023	2024
PA	10	3	6
AM	6	4	4
TO	5	2	2
RO	4	3	3
AC	1	0	1
AP	1	0	0
RR	1	0	1

Midwest

State	2022	2023	2024
DF	11	11	10
GO	8	3	7
MS	2	1	2
MT	1	1	3

Figure 3. State of birth of the athletes who competed in the 2022, 2023, and 2024 editions of the Brazilian Championship A1.
Source: Authors

Regarding the players' states of birth, the highest concentration was found in the Southeast and Northeast regions, followed by the South, Midwest, and North. The states with the largest number of players (in descending order) were São Paulo; Rio de Janeiro; Minas Gerais; Rio Grande do Sul; Bahia; Paraná; and Santa Catarina.

Table 1 presents the sociodemographic data related to the cities of birth of the players who competed in the 2022 edition of the Brazilian Championship A1.

Table 1. Cities of birth of the players who competed in the 2022 edition of the Brazilian Championship A1 (n = 21).

City (n = 21)*	f	%	Cum.%	MHDI	Population
São Paulo ©	47	11.7	11.7	0.805	11,451,999
Rio de Janeiro ©	29	7.2	19.0	0.799	6,211,223
Salvador ©	14	3.5	22.4	0.759	2,417,678
Belo Horizonte ©	13	3.2	25.7	0.810	2,315,560
Brasília ©	11	2.7	28.4	0.824	2,817,381
Fortaleza ©	9	2.2	30.7	0.754	2,428,708
Porto Alegre ©	8	2.0	32.7	0.805	1,332,845
Campinas	7	1.7	34.4	0.805	1,139,047
São José dos Campos	6	1.5	35.9	0.807	697,054
São Luís ©	6	1.5	37.4	0.768	1,037,775
Araraquara	5	1.2	38.7	0.815	242,228
Curitiba ©	5	1.2	39.9	0.823	1,773,718
Recife ©	5	1.2	41.1	0.772	1,488,920
Maceió ©	4	1.0	42.1	0.721	957,916
São Bernardo do Campo	4	1.0	43.1	0.805	810,729
Belém ©	3	0.7	43.9	0.746	1,303,403
Franca	3	0.7	44.6	0.780	352,536
Jundiaí	3	0.7	45.4	0.822	443,221
Manaus ©	3	0.7	46.1	0.737	2,063,689
Mogi das Cruzes	3	0.7	46.9	0.783	451,505
Osasco	3	0.7	47.6	0.776	728,615

Note: *Only cities with at least three athletes are presented in the table, representing more than 47% of the sample; a total of 214 cities were identified. f = frequency; % = percentage; C% = cumulative percentage; © = state capitals; MHDI = Municipal Human Development Index.
Source: The authors.

Considering the main cities—those with at least three athletes (n = 21)—thirteen are state capitals. Regarding the Municipal Human Development Index (MHDI), eleven cities have a high MHDI (0.700–0.799) and eleven have a very high MHDI (0.800–1.000). In terms of population size, seven municipalities are classified as large (population between 101,000 and 900,000 inhabitants), while fourteen are metropolitan areas (over 900,000 inhabitants).

Table 2 presents the data related to the cities of birth of the players who competed in the 2023 edition of the Brazilian Championship A1.

Table 2. Cities of birth of the players who competed in the 2023 edition of the Brazilian Championship A1 (n = 15).

City (n = 15)*	f	%	Cum.%	MHDI	Population
São Paulo ©	49	14.0	14.0	0.805	11,451,999
Rio de Janeiro ©	25	7.1	21.1	0.799	6,211,223
Belo Horizonte ©	13	3.7	24.8	0.810	2,315,560
Brasília ©	11	3.1	27.9	0.824	2,817,381
Fortaleza ©	11	3.1	31.1	0.754	2,428,708
Curitiba ©	10	2.8	33.9	0.823	1,773,718
Salvador ©	10	2.8	36.8	0.759	2,417,678
Campinas	6	1.7	38.5	0.805	1,139,047
Recife ©	6	1.7	40.2	0.772	1,488,920
São Bernardo do Campo	6	1.7	41.9	0.805	810,729
Porto Alegre ©	5	1.4	43.3	0.805	1,332,845
Jundiaí	4	1.1	44.4	0.822	443,221
Araraquara	3	0.9	45.3	0.815	242,228
Itu	3	0.9	46.2	0.773	168,240
Maceió ©	3	0.9	47.0	0.721	957,916

Note: *The table presents cities with at least three athletes, representing 47% of the sample; a total of 179 cities were identified. f = frequency; % = percentage; Cum. % = cumulative percentage; © = state capitals; MHDI = Municipal Human Development Index.
Source: The authors.

Considering the main cities—those with at least three athletes (n = 15)—ten are state capitals. Regarding the Municipal Human Development Index (MHDI), six cities have a high MHDI and nine have a very high MHDI. In terms of population size, four municipalities are classified as large, while eleven are metropolitan areas.

Finally, Table 3 presents the data related to the cities of birth of the players who competed in the 2024 edition of the Brazilian Championship A1.

Table 3. Main cities of birth of the players who competed in the 2024 edition of the Brazilian Championship A1 (n = 18).

City (n = 18)*	f	%	Cum.%	MHDI	Population
São Paulo ©	64	16.3	16.3	0.805	11,451,999
Rio de Janeiro ©	28	7.1	23.4	0.799	6,211,223
Belo Horizonte ©	16	4.1	27.5	0.810	2,315,560
Brasília ©	10	2.5	30.0	0.824	2,817,381
Fortaleza ©	10	2.5	32.6	0.754	2,428,708
Salvador ©	9	2.3	34.9	0.823	1,773,718
Recife ©	6	1.5	36.4	0.759	2,417,678
Jundiaí	4	1	37.4	0.805	1,139,047
Maceió ©	4	1	38.4	0.772	1,488,920
São Carlos	4	1	39.4	0.805	810,729
São José dos Campos	4	1	40.5	0.805	1,332,845
Campinas	3	0.8	41.2	0.822	443,221
Cuiabá ©	3	0.8	42.0	0.815	242,228
Mogi das Cruzes	3	0.8	42.7	0.773	168,240
Niterói	3	0.8	43.5	0.721	957,916
Porto Alegre ©	3	0.8	44.3	0.805	1,332,845
São Bernardo do Campo	3	0.8	45.0	0.805	810,729
Teresina ©	3	0.8	45.8	0.751	866,300

Note: *The table presents cities with at least three athletes, representing 45% of the sample; a total of 206 cities were identified. f = frequency; % = percentage; Cum. % = cumulative percentage; © = state capitals; MHDI = Municipal Human Development Index.
Source: The authors.

Considering the main cities—those with at least three athletes (n = 18)—eleven are state capitals. Regarding the Municipal Human Development Index (MHDI), eight cities have a high MHDI and ten have a very high MHDI. In terms of population size, eight municipalities are classified as large, while ten are metropolitan areas.

Table 4 presents results on the total sample in each of the three seasons and the relationship with MHDI, classified as; very low, low, medium, high, and very high, including the number of players in each category.

Table 4. Human Development Index of the cities of birth of the players who competed in the 2022, 2023, and 2024 editions of the Brazilian Championship Série A1.

	2022 (n = 401)		2023 (n = 351)		2024 (n = 393)	
MHDI	**f**	**%**	**f**	**%**	**f**	**%**
Very low	0	**0**	0	**0**	0	**0**
Low	13	**3.2**	8	**2.3**	14	**3.6**
Medium	53	**13.2**	41	**11.7**	44	**11.2**
High	214	**53.4**	177	**50.4**	206	**52.4**
Very High	121	**30.2**	125	**35.6**	129	**32.8**

Note: f = frequency; % = percentage; Very Low: 0.000–0.499; Low: 0.500–0.599; Medium: 0.600–0.699; High: 0.700–0.799; Very High: 0.800–1.000.; MHDI = Municipal Human Development Index.
Source: The authors.

High MHDI (52.1%) values predominated across the three seasons, followed by very high MHDI (32.7%), medium MHDI (12.1%), and low MHDI (3.1%) values. In the low MHDI category, all identified players are from the Northeast and North regions.

Discussion

The present study aimed to conduct descriptive sociodemographic mapping to characterize the profile of players and clubs in women's football, competing at the national elite level (Brazilian Championship Série A1), during the 2022 to 2024 seasons. The results indicate a total of 23 clubs, concentrated in 15 cities and 11 states across the country. Of these 23 clubs, 12 participated in all three editions of the *Brasileirão* included in the study, with only four spots occupied by new clubs during this period. The cities with the highest number of clubs (three each) are São Paulo, Rio de Janeiro, and Belo Horizonte. The promotion process to the elite division occurs as follows: the Brazilian Women's Championship Série A2 includes 16 clubs divided into two groups of eight and is structured in four phases. In the first phase, the top four teams from each group advance to the quarterfinals; subsequently, they compete for two spots (in each group) in the semifinals; finally, the teams compete for a place in the final. The four semi-finalist teams are promoted to the first division (A1) [22,23].

In the 2022 season, among the teams promoted from Série A2 (Atlético Mineiro SAF, Cresspom, A. A. Esmac, and Red Bull Bragantino), only Atlético Mineiro remained in the top division, while the other three were relegated. In the 2023 season, all teams that achieved promotion to the elite level (Athletico Paranaense, Bahia, Ceará, and Real Ariquemes) were relegated. In contrast, in the 2024 season, among the promoted clubs (América SAF, Botafogo, Fluminense, and Red Bull Bragantino), only Botafogo was relegated, while the other teams managed to remain in the elite division [24,25,26].

Another relevant finding is that, across the three seasons, the state of São Paulo had the highest number of club representatives, with seven in 2022, five in 2023, and six in 2024. The states of Rio de Janeiro and Minas Gerais achieved three clubs in 2024. Overall, the clubs participating in the three seasons are predominantly from the Southeast region, followed by the South, Midwest, and finally the North and Northeast. Specifically, the Southeast shows considerable disparity compared to the other regions. Of the 16 teams included per season, half (in 2023) or more than half (in 2022 and 2024) are from the Southeast. Teams from the

Northeast and North are those with the lowest participation in the Brazilian Championship Série A1. It was also observed that clubs from these regions tend to fluctuate between divisions, lacking stability in the competition, which may be explained by factors such as investment, infrastructure, and market visibility.

It is worth noting that in the 2023 season, the Northeast region had two clubs in the elite (Bahia and Ceará), surpassing the Midwest and North regions. In 2022, Bahia (a semi-finalist) invested in new signings, trial players, and retained athletes, and had the second-highest revenue for women's football in the Northeast that year (R$ 974,000) [27,28]. Ceará, champion of Série A2 in 2022, recorded a revenue of R$ 1,298,765 allocated to players, coordination, coaching staff, and supervision. However, despite this investment, in 2023 Ceará released its championship-winning squad and reduced its budget due to the relegation of the men's team, which negatively impacted the women's team that had just been promoted to the elite level[29]. Regarding the HDI of the states where the clubs are located, only Pará and Bahia present a medium HDI, while 12 states have a high HDI and 9 states a very high HDI.

Concerning the players' states of birth, the highest concentration is found in the Southeast and Northeast regions, followed by the South, Midwest, and North. The states with the largest number of players (in descending order) are São Paulo, Rio de Janeiro, Minas Gerais, Rio Grande do Sul, Bahia, Paraná, and Santa Catarina. Furthermore, the number of players born in the state of São Paulo is markedly higher than in other states, suggesting that the likelihood of reaching elite levels may be greater for those born there, given the concentration of strong and competitive clubs. This pattern is also reflected at the city level, with São Paulo consistently ranking first across all seasons.

Considering the MHDI and population size of the birth cities included in the study (with at least three athletes), these cities have high or very high MHDI values across all seasons and are classified as large or metropolitan areas. Overall, when analysing all players without a minimum threshold of three per city, high MHDI (52.1%) values predominate across the three seasons, followed by very high MHDI (32.7%), medium MHDI (12.1%), and low MHDI (3.1%) values. In the low MHDI category, all identified players are from the North and Northeast regions, which aligns with PNUD[30] reports indicating that these regions have the lowest HDI levels (North: 0.667; Northeast: 0.663), while the Southeast (0.766), Midwest (0.757), and South (0.754) rank highest. Additionally, although the number of players born in the Northeast is similar to that of the South, the Northeast has fewer participating clubs.

Driven by the FIFA Strategy, CONMEBOL, at the South American level, introduced the requirement that clubs participating in its competitions must have women's teams[11,12]. The study by Accocella *et al.*[15] contributes to understanding the sociodemographic changes resulting from this process, highlighting that the high concentration of men's clubs in the Southeast led to the creation of women's teams in the same region, thereby perpetuating the historical inequalities and imbalances. In this sense, CONMEBOL's requirement has contributed to the expansion of women's football in regions historically marked by stronger men's football development, although it has also created disadvantages for clubs and locations that had already supported the women's game from the outset of the national competition.

The current study aligns with the work of Teoldo *et al.*[31], which discusses the impact of birthplace on the identification and development of talented Brazilian players, showing that place of birth can shape long-term experiences and the likelihood of reaching elite levels in professional sport [31,32,33].

In terms of practical applications, this study provides valuable information for FIFA, CONMEBOL, the Brazilian Football Confederation (CBF), federations, and governmental bodies at the federal, state, and municipal levels. The findings offer deeper understanding of the reality of clubs, their structure, and organization, thereby supporting better conditions for

players' professional development, informing decision-making, and guiding public policies aimed at reducing inequalities.

As for limitations, the study faced challenges due to missing information about some players. Regarding birthplace, several players could not be included in the sample because this information was not available on the websites consulted. In some cases, these websites provided only partial squad information or focused exclusively on men's teams. Another limitation concerns MHDI data, which is essential for analysing municipalities more precisely but was last updated in 2010, representing a significant constraint for this research.

Despite these limitations, the study offers a broad range of data and perspectives, pointing to the need for further research in this area. Future studies could include qualitative approaches, such as collecting narratives from players competing in the Brazilian Championship Série A1, allowing for deeper exploration of issues related to professionalization and structural challenges, as well as sexism, prejudice, and racism.

Conclusion

The results of the current investigation showed that the Southeast region contains the highest number of clubs and birthplaces of female players in the Brazilian Championship Série A1 in 2022, 2023, and 2024, with the state of São Paulo standing out, demonstrating substantial disparity in comparison to the number of clubs in the Northeast and North relative to the Southeast and South. Regarding the HDI of the states where the clubs are located, Pará and Bahia presented a medium HDI, while 12 states showed a high HDI and 9 states a very high HDI. At the municipal level, it was found that players are predominantly born in cities with a high (52.1%) or very high (32.7%) MHDI. It is important to highlight that the North and Northeast regions presented the lowest HDI levels in relation to the states where the clubs are based. Additionally, a significant number of athletes were born in state capitals and in large or metropolitan cities.

Considering the social challenges faced by women, football is no exception. As highlighted in the United Nations report on gender inequality, referenced on the UN Women website in 2024, gender inequality remains a major barrier, as none of the indicators of SDG 5 (Gender Equality – Achieve gender equality and empower all women and girls) are being met, with projections suggesting parity may only be achieved by 2063.

Despite limitations related to missing information for some athletes, as well as outdated MHDI data, the study proved to be relevant, providing important data and discussions for women's football in Brazil. Studies such as this are essential to highlight the country's reality across its regions and states, pointing out inequalities and diversities, and potentially contributing to the present and future development of women's sport.

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