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Original Article

From youth teams to senior squad: analyzing the developmental pathway and migration patterns of Brazilian basketball players

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Abstract
Introduction: This study aimed to analyze the initiation, development, and migration processes that shape the sports pathways of athletes in Brazil's main women's and men's basketball leagues (LBF and NBB). Using questionnaires and focusing on athletes' development from U-12 to U-22 competitive categories, we analyzed the basketball pathways of 148 athletes (79 men and 69 women), highlighting factors that influenced their development between 12 and 22 years of age. The initial contact with basketball primarily occurred in schools, and subsequent development varied by genders: men migrated to clubs, while women relied on social projects and public institutions. Migration to cities with a higher Municipal Human Development Index (MHDI) was found to be crucial, as these locations offer better infrastructure and opportunities. More populous cities are the main sites for athlete development. Population density (PD) also played a relevant role: athletes from cities with higher PD tended to start competing earlier, especially in the U-12 and U-13 categories. Despite a greater representation in youth national teams (63.8% for LBF and 46.8% for NBB), there is no strong correlation between success in these youth categories and selection for adult national teams (26.1% for LBF and 22.8% for NBB), indicating that initial performance does not guarantee continuous success. Thus, the need for investments in sports infrastructure and public policies is suggested to reduce access disparities, especially between genders. Furthermore, the concentration of resources in cities with higher MHDI and PD reinforces the importance of a more equitable distribution of sports opportunities across different regions.
Keywords: **Talent identification; Gender disparities; Human development index; Population density; Sports pedagogy; Elite performance**

Introduction

The scientific community has diligently strived to better understand the development of elite athletes (Ribeiro Junior et al., 2021). This endeavor encompasses the investigation of individual predictors, such as anthropometric, physiological, and biomechanical factors (Han et al., 2023), in addition to influential factors from coaches, family, and friends (McCann et al., 2022), and economic and sociodemographic aspects (Lounassalo et al., 2025). However, most existing models of talent development have been conceived in high-income countries with relatively homogeneous access to sporting infrastructure, leaving a critical gap in understanding how athletes develop in countries marked by deep regional inequalities—such as Brazil.

To illustrate the development of basketball athletes in Brazil, it is crucial to acknowledge the role of the sporting environment (Henriksen & Stambulova, 2023), considering territorial dimensions and social inequality, which influence access to sports practice, alongside gender issues (Amaral et al., 2021; Barreira, 2021; Brazilian Olympic Committee, 2022). The geographical context can determine training and competition opportunities, while economic and social barriers can impact athletic development from its initial stages. Thus, it becomes essential to investigate how these variables influence the success of Brazilian basketball athletes, as when addressed collectively, these aspects can be fundamental for the development of initiatives aimed at providing the necessary conditions for achieving high performance.

The Brazilian scenario presents unique characteristics that make this analysis crucial. Brazil, a country of continental dimensions divided into five macro-regions (North, Northeast, Central-West, Southeast, and South) with profound developmental asymmetries, recently returned to the top ten in the International Basketball Federation (FIBA) world rankings for both men and women. However, this elite-level success contrasts with a geographically concentrated developmental base. Previous research has already indicated a strong centralization of opportunities in the Southeast region, the wealthiest and most populous part of the country (Faria et al., 2021). Investigating patterns of sports migration is, therefore, imperative to comprehend how athletes' pathways are

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facilitated—or limited—across the territory, offering a diagnosis for the sustainable development of the sport in a nation marked by regional inequalities.

This discussion aligns with approaches that investigate the influence of the environment on talent development, such as the "Birthplace Effect" (Thuany et al., 2023). Such studies demonstrate how socioeconomic and demographic variables, including the Municipal Human Development Index (MHDI), population size, and demographic density, shape initial opportunities in sports (Caetano et al., 2020; Leonardi et al., 2021). Nevertheless, these approaches frequently treat migration as a methodological limitation rather than a central factor in an athletic career (Painter & Price, 2021). In other words, while the birthplace effect has been well documented in several sports and countries, the dynamic process of moving between locations—and how these moves interact with developmental stages, age, and performance outcomes—remains underexplored, especially in non-European, non-North American contexts.

In Brazil, studies on sports talent have predominantly focused on soccer (Ribeiro Junior et al., 2021), leaving basketball comparatively under-researched. Furthermore, existing Brazilian studies often describe migration as a peripheral variable or control factor, without systematically analyzing the trajectories, ages, directions, and consequences of geographic mobility. This gap is particularly problematic because, in a continental country like Brazil, migration is not an exception but a structural necessity for thousands of young athletes.

In practice, the necessity for athletes to relocate in search of better training and competition conditions is an undeniable reality in Brazil; yet, its impact on athletic formation remains largely unexplored. Failing to thoroughly analyze mobility overlooks one of the central mechanisms athletes employ to overcome geographical and structural barriers. Without this analysis, policymakers, coaches, and sports administrators risk designing talent development programs based on incomplete or misleading assumptions—for instance, assuming that talent is evenly distributed across the territory, or that initial detection in underserved regions is sufficient without subsequent support for relocation.

By mapping the typical migration pathways, ages of first move, and destination hubs, the present study offers actionable opportunities: (1) informing the creation of regional development poles to reduce the need for premature migration; (2) guiding federations and clubs to implement support systems (housing, education, psychosocial assistance) for migrating young athletes; (3) providing evidence for public policies that allocate resources to historically underrepresented regions; and (4) contributing to more equitable selection processes for national youth teams. Ultimately, understanding migration as an integral part of athletic development—rather than as noise—provides a framework for understanding athlete development pathways in Brazil from grassroots to elite levels.

In light of these considerations, this study aims to analyze the initiation, development, and migration processes forming the athletic pathways of athletes from the Liga de Basquete Feminina (LBF) and Novo Basquete Brasil (NBB) to identify potential trends and unique aspects. The analysis considers environmental variables such as the MHDI, population, and population density of the involved localities, as well as fundamental temporal aspects, including the age of sports initiation, the transition period to regular competitions, and decisive moments of geographical mobility. Factors related to permanence in the sport and relevant milestones, such as call-ups to national youth and senior teams, are also considered.

By systematically articulating geographical, temporal, and sporting factors during the critical formation period (from 12 to 22 years of age), the study seeks to contribute to both the theoretical advancement of sports development models and the formulation of public policies more appropriate to Brazilian reality. To the best of our knowledge, this is the first work to thoroughly examine the sports migration of basketball athletes in Brazil.

Material & methods

Participants and Ethics

The study included 148 athletes from the main men's (NBB) and women's (LBF) basketball leagues in Brazil, comprising 79 men from the NBB and 69 women from the LBF. Data collection occurred during the 2021/2022 (NBB) and 2022 (LBF) seasons. Response rates were 30.86% (NBB) and 47.26% (LBF). Inclusion criteria were active NBB/LBF athletes with Brazilian nationality. The study was approved by the Research Ethics Committee of the Federal University of São Paulo (No. 0400/2021, CAAE 45521721.2.0000.5505), with formal informed consent (ICF) obtained from all participants.

Procedures and Instruments

Participants were contacted via email, social media, and direct messages with an invitation detailing the study objectives and ensuring anonymity. The accompanying questionnaire asked them to detail their athletic history year by year, covering the age categories from Under-12 to Under-22, which represent the core youth development phases in Brazil. A pilot study involving three participants verified the clarity of the questions and response time, leading to adjustments in the final questionnaire. Data were collected through a retrospective online questionnaire (Côté et al., 2005) administered via Google Forms, comprising 19 questions on career initiation, influences, development location, and sports outcomes. The questionnaire's structure was based on a four-dimensional analytical matrix, grounded in theoretical frameworks (Marques et al., 2022). Secondary data

on call-ups to national teams (CBB, FIBA) and socioeconomic information (MHDI, population density, total population) from the 2010 Census (IBGE) were also utilized.

Data Analysis

Data analysis aimed to identify geographical centers of athlete development by age group (U-12 to U-22). Frequencies and percentages of cities were calculated by category and gender to identify training hubs. Socioeconomic and mobility indicators were considered for reported cities, including data from foreign countries where applicable. Logistic regression was employed to associate independent variables (development location, age of migration, social influences) with sports outcomes (national team participation, achievements). Results were expressed with significance set at $p < 0.05$. Descriptive analyses (frequency, mean, standard deviation) were initially performed. Spearman's correlation (ρ) assessed relationships between quantitative variables, indicating the direction and intensity of the association.

Results

The presentation of the results was structured into two central categories that emerged from the data analysis: Career Initiation and Development; and the Migration Process of basketball athletes. This approach allows for an in-depth understanding of athletes' pathways, from their first contacts with the sport to the consolidation of their careers in different sports centers.

Regarding Career Initiation and Development, the analysis primarily aimed to identify the average age of the investigated groups, the age at which they began playing basketball, and the moment of their debut in competitions, as presented in Table I.

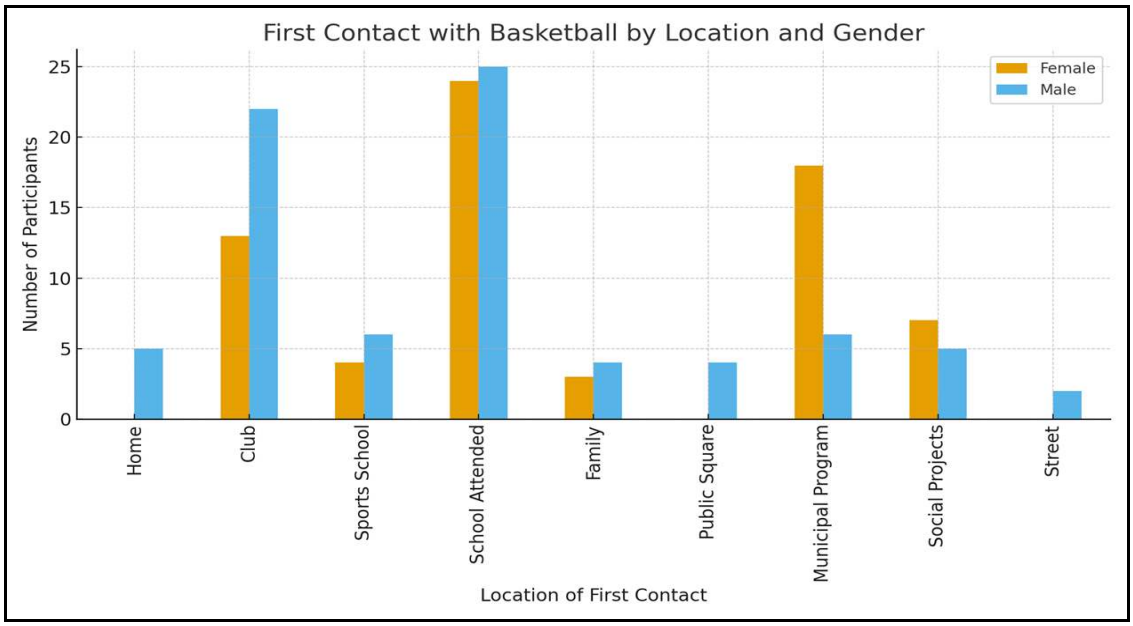
Table I. Age at the time of research, Age of training initiation, and Age of competition initiation. Mean and respective standard deviations.

	Gender		
	Female	**Male**	**Total**
	n= 69	n= 79	n= 148
Age (years)	25,88 (6,16)	25,91 (6,24)	25,90 (6,18)
Age of training initiation (years)	10,29 (3,06)	10,47 (2,91)	10,39 (2,97)
Age of competition initiation (years)	11,61 (1,98)	12,00 (2,35)	11,82 (2,19)

Source: author's own

Beyond the temporal aspects, the study investigated the primary environments for early training. Figure I illustrates these initial contexts, highlighting the pivotal roles of clubs, schools, and social projects as the foundational entry points into the Brazilian basketball ecosystem.

FIGURE I



Source: author's own

Athlete success in terms of call-ups to national teams, both youth and adult categories, was also measured, as shown in Table II. The data reveal: for females, 63.8% of the athletes in the sample were called up to youth national teams, and 26.10% reached the senior national team. For males, 46.8% of athletes received call-ups to youth national teams, and 22.80% to the adult team.

Table II. Selected for the National Team (Absolute Total and Percentage)

Gender					
Female	**Total n**	**%**	Male	**Total n**	**%**
Youth/Junior	44	63,80%	Youth/Junior	37	46,80%
Adult	18	26,10%	Adult	18	22,80%

Source: author's own

After characterizing the athletes' career initiation—detailing initial practice locations, age of entry into competitions, and the subsequent funneling to youth and senior national teams—the contexts enabling this journey were analyzed, which justified the investigation of the migration process. To this end, the main geographical destinations of athletes were mapped, analyzing variables such as population density and MHDI to characterize the ecosystems that foster development and success in basketball.

The investigation into the athlete migration process, as presented in Table III, indicates that basketball development in Brazil is a phenomenon predominantly located in large urban centers. The analysis of population density reveals that the vast majority of athletes, of both genders, operate in cities with a "Very High" demographic density. This category alone accounts for 79.2% of female records and 73.3% of male records. This trend is reflected in the main identified training hubs. For women, cities such as Osasco (10.06%) and Santo André (9.17%) in Greater São Paulo, in addition to Rio de Janeiro (9.32%), are among the primary destinations. For men, the centrality is even more explicit, with the city of São Paulo (SP) (28.19%) dominating as the main pole of attraction.

Table III. Most Frequent Cities[1] (Absolute total and percentage) and Population Density

Gender					
Female	**Absolute total**	**%**	**Male**	**Absolute total**	**%**
Osasco (SP)	68	10,06%	São Paulo (SP)	212	28,19%
Americana (SP)	64	9,47%	Franca (SP)	49	6,52%
Rio de Janeiro (RJ)	63	9,32%	Bauru (SP)	40	5,32%
Santo André (SP)	62	9,17%	Limeira (SP)	37	4,92%
Very Low	5			4	
Low	29			45	
Moderate	31			25	
High	75			130	
Very High	534			551	

Source: author's own

A Spearman correlation analysis was conducted to investigate the association between the age of competition debut and the population density of the cities where athletes in each category competed. The results, presented in Table IV, indicate the existence of statistically significant correlations ($p < 0.05$) in specific stages of training.

For males, a negative and significant correlation was observed in the under-12 ($\rho = -0.646$), under-13 ($\rho = -0.474$), under-14 ($\rho = -0.369$), and under-15 ($\rho = -0.238$) categories. In the under-16 category, the relationship was reversed, becoming positive and significant ($\rho = 0.254$). From the under-17 category onwards, no significant correlations were found.

[1] The acronyms (SP) and (RJ) refer to the states of São Paulo and Rio de Janeiro, respectively, both located in the Southeast region of Brazil, the country 's most economically developed area. Cities such as Osasco and Santo André are part of 'Greater São Paulo,' the metropolitan area of the city of São Paulo.

For females, negative and significant correlations were identified only in the initial under-12 (ρ = -0.389) and under-13 (ρ = -0.312) categories. In the other categories, from under-14 to under-22, there was no statistically significant association between the variables.

Table IV. Correlation between category and population density for Female and Male

	Female	**Male**
Competitive age	Spearman's rho (p-value)	Spearman's rho (p-value)
den_12	**-0.389 (< .001)**	**-0.646 (< .001)**
den_13	**-0.312 (0.009)**	**-0.474 (< .001)**
den_14	-0.04 (0.976)	**-0.369 (< .001)**
den_15	-0.052 (0.669)	**-0.238 (0.035)**
den_16	0.050 (0.681)	**0.254 (0.024)**
den_17	0.095 (0.436)	-0.089 (0.436)
den_18	-0.078 (0.522)	-0.056 (0.621)
den_19	-0.122 (0.317)	0.165 (0.146)
den_20	0.038 (0.759)	0.153 (0.178)
den_21	-0.012 (0.921)	0.115 (0.312)
den_22	-0.092 (0.452)	-0.042 (0.714)

Source: author's own

Figure II illustrates the evolution of the average MHDI of the cities where athletes played, segmented by gender and contrasted with the cutoff point for high/very high MHDI (purple line). The analysis reveals a clear tendency for migration to municipalities with greater socioeconomic development as athletes advance in their careers.

In the initial categories (U-12 to U-15), both men and women tend to develop in cities with MHDI below this threshold, indicating early development in centers with lower indices. From the U-16 category, the male pathways consistently surpasses the cutoff point, remaining in cities with high or very high MHDI until the U-22 category. For women, this transition to more developed municipalities occurs slightly later, from the U-17 category, but also sustains until the end of the formative period.

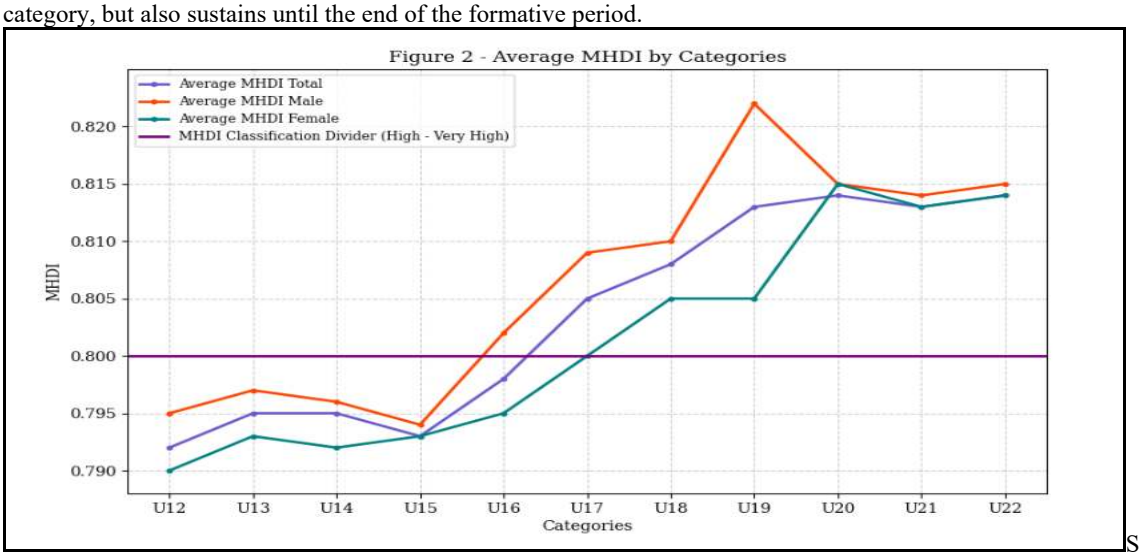


Figure II source: author's own

The analysis of the relationship between athletes' pathways and the characteristics of the municipalities where they developed their careers reveals distinct dynamics between genders, as shown in Figure III. The average total population (men and women) of the cities fluctuates between 2 and 4 million inhabitants across the

categories. For male athletes, there is a tendency to migrate to cities with a larger average population, starting from approximately 3 million in the U-12 category and reaching a peak of almost 6 million in the U-19 category. It is also noted that from the U-18 category onwards, a more marked process of athlete internationalization begins. In contrast, the female pathways shows a general tendency to move to cities with a smaller average population, starting near 2 million and receding to about 1 million in the U-22 category; here, internationalization is observed from the U-20 category.

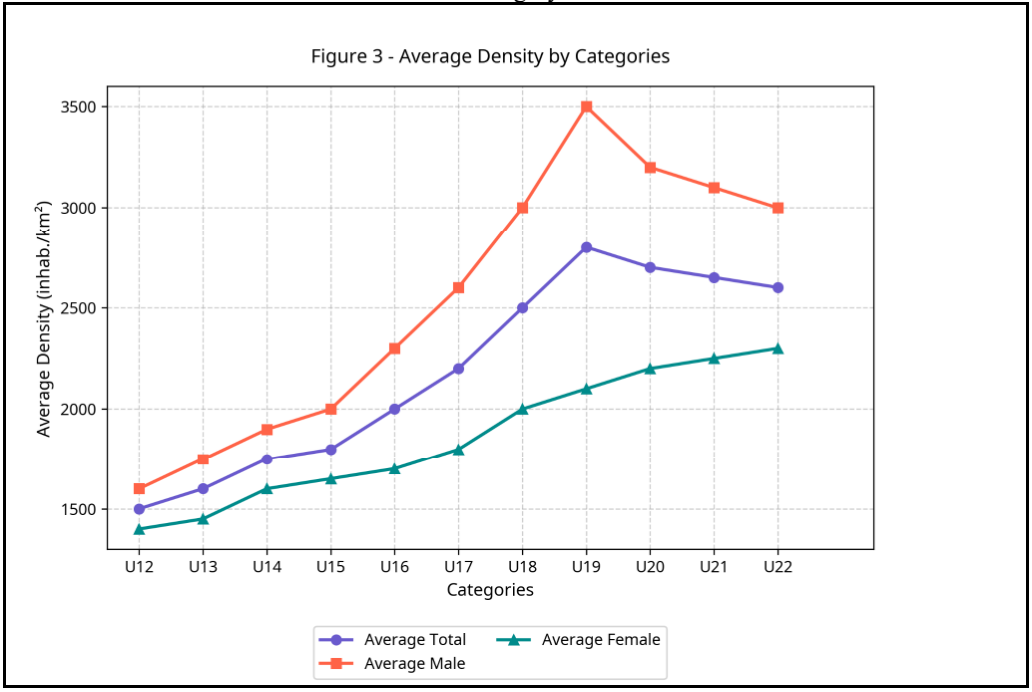


Figure III Source: author's own

In Table V, data were analyzed for the three main cities where athletes developed their careers in each age group, from U-12 to U-22. For each category and gender, frequencies and percentages for each city were calculated, allowing for the identification of the main centers of athlete development at each stage of formation.

Table V. Most Frequent Cities[2]

Male						
Category	1st City	%	2nd City	%	3rd City	%
Sub 12	São Paulo - SP	17.86%	Limeira - SP	8.93%	Franca - SP	5.36%
Sub 13	São Paulo - SP	16.42%	Limeira - SP	7.46%	Franca - SP	7.46%
Sub 14	São Paulo - SP	19.72%	Limeira - SP	7.04%	Franca - SP	7.04%
Sub 15	São Paulo - SP	26.32%	Franca - SP	7.89%	Limeira - SP	6.58%
Sub 16	São Paulo - SP	29.33%	Franca - SP	8.00%	Limeira - SP	5.33%
Sub 17	São Paulo - SP	32.47%	Franca - SP	9.09%	Bauru - SP	7.79%
Sub 18	São Paulo - SP	35.53%	Franca - SP	9.21%	USA	6.58%
Sub 19	São Paulo - SP	36.11%	USA	11.11%	Bauru - SP	5.56%
Sub 20	São Paulo -	31.34%	USA	8.96%	Rio Claro -	5.97%

[2]São Paulo, Limeira, Franca, Bauru, Rio Claro, Santo André, Osasco, Americana, São José dos Campos, Guarulhos, and Rio de Janeiro are part of the Southeast region. Blumenau is part of the South region and Recife is part of the Northeast region of Brazil.

	SP				SP	
Sub 21	São Paulo - SP	24.59%	USA	9.84%	Spain	6.56%
Sub 22	São Paulo - SP	40.38%	Bauru - SP	9.62%	USA	7.69%
Female						
Category	1st City	%	2nd City	%	3rd City	%
Sub 12	Rio de Janeiro - RJ	10.71%	Santo André - SP	8.93%	São Paulo - SP	8.93%
Sub 13	Santo André - SP	11.11%	Osasco - SP	11.11%	Rio de Janeiro - RJ	9.52%
Sub 14	Osasco - SP	13.24%	Santo André - SP	13.24%	Rio de Janeiro - RJ	11.76%
Sub 15	Osasco - SP	17.65%	Santo André - SP	11.76%	Rio de Janeiro - RJ	11.76%
Sub 16	Osasco - SP	16.42%	Americana - SP	13.43%	Rio de Janeiro - RJ	11.94%
Sub 17	Osasco - SP	13.64%	Americana - SP	13.64%	Santo André - SP	10.61%
Sub 18	Osasco - SP	13.85%	Americana - SP	10.77%	Santo André - SP	9.23%
Sub 19	Osasco - SP	10.17%	Santo André - SP	10.17%	Americana - SP	10.17%
Sub 20	Americana - SP	10.71%	Guarulhos - SP	10.71%	USA	10.71%
Sub 21	Americana - SP	9.26%	USA	9.26%	São José dos Campos - SP	7.41%
Sub 22	Recife - PE	7.69%	USA	7.69%	Blumenau - SC	7.69%

Source: author's own

Discussion

This discussion interprets the developmental pathways of basketball athletes through two axes: early career development, contrasting the findings with the literature on sports training. The second axis positions the migration process as a strategic step, debating its role as a response to structural inequalities in sports in Brazil.

There is a clear distinction in training environments between genders: while the first contact with basketball occurs at school, which highlights its role as an entry point, the continuity of male practice occurs predominantly in clubs, and female practice in social projects. The role of the school as the main gateway to basketball, for both boys and girls, corroborates its importance as a universal space for contact with the physical culture of movement. However, as recommended by the Ministry of Education (2018), the goal of school physical education is not high performance, which explains the need for transition to other environments.

Gender disparities become evident in this transition. While male pathways toward clubs reflect a more structured and traditional competitive route, female development, often linked to social projects and public institutions, suggests an alternative pathway associated with lower institutional investment (Galatti et al., 2021; Leonardi et al., 2021; Lima et al., 2022; Santos & Mendes, 2020). One of the key findings concerns differences between youth and adult national team participation There is a clear reduction from youth (63.8% for women and 46.8% for men) to adult levels (26.1% and 22.8%, respectively), a pattern consistent with talent development literature (Dell'Antonio et al., 2025; Güllich et al., 2023). In the women's case, the higher proportion of athletes with national team experience may indicate a smaller high performance pool. However, early participation does not guarantee long-term success, as junior and senior performance predictors differ (Barth et al., 2022; Güllich et al., 2023). This reinforces the understanding that athlete development is a non-linear process, influenced by factors that transcend initial performance.

Furthermore, statistical analysis reveals that there is no strong correlation between being selected for the youth team and being selected for the adult team, except in the men's under-18 category; specifically, those selected for the under-18 national team are 9.5 times more likely to report participation in the adult team as well. This may indicate a critical developmental stage or greater alignment with elite demands.

Overall, these findings reinforce that youth success is not a reliable predictor of elite performance, aligning with previous studies (García-Rubio et al., 2022) that suggest that performance in youth categories may not, in itself, guarantee continued development. Therefore, this study reinforces findings that initial success in

youth categories is not a decisive factor or reliable predictor of reaching the highest level (Barth et al., 2022; Güllich et al., 2023).

The complexity of athlete development is accentuated by the structure of the youth competitive calendar in Brazil. Irregular and concentrated competitions limit consistent exposure, which is essential for skill development (Leonardi et al., 2021). Thus, athlete development depends not only on individual factors but also on systemic conditions and opportunities.

In this context, migration emerges as a key transition. Typically occurring between ages 14 and 18, it reflects the search for better development environments (Marques et al., 2022; Maciel et al., 2024). This study goes further by demonstrating that this migration is not random, but rather directed toward cities with higher MHDI. Although municipalities with lower MHDI offer initial opportunities linked to educational sports, career progression requires relocation. The transition to cities with high/very high MHDI—from under-16 for men and under-17 for women—suggests a search for better development conditions (Hancock et al., 2018). This movement corroborates the thesis that investment in competitive sports tends to be concentrated in municipalities with greater capital accumulation and infrastructure (Micaliski et al., 2024).

The analysis of population distribution in cities is characterized by dense populations, which differs from the evidence pointed out by studies conducted in the northern hemisphere (Güllich et al., 2022) which indicate a possible advantage of smaller cities in the development of athletes. Such differences reinforce the need for studies that consider the specificities of each country and context, avoiding generalizations based on very different population and structural realities.

The notable overrepresentation of athletes in densely populated cities, one of the central findings of this study, establishes a complex dialogue with the international literature. Our results contrast with studies such as that of Hancock et al. (2018), which found that high-density Portuguese cities were less likely to produce elite athletes. This contextual “paradox” suggests that the role of population density is not universal. In the Brazilian context, the tendency to concentrate in large centers seems to be a broader characteristic, as pointed out by the study by Caetano et al. (2020) on artistic gymnastics, which also revealed that female athletes tend to originate from cities with higher population density than men.

The analysis goes further by revealing a significant negative correlation between population density and the age of competitive debut, particularly in the initial youth categories (under-12 to under-16 for males; under-12 and under-13 for females). This result suggests that athletes in denser urban centers tend to start their competitive careers earlier. This phenomenon can be attributed to the higher concentration of teams and a more competitive sports culture in these locations, factors that, while they may accelerate development, also increase the risk of early specialization.

Opportunities for development are closely linked to infrastructure availability, which is concentrated in economically developed regions(Faria et al., 2021; Galatti et al., 2021; Leonardi et al., 2021; Uhle et al., 2022). The analysis reveals a significant concentration of athlete development in the state of São Paulo, for both men and women, reflecting possible inequalities in the distribution of resources and sports opportunities across the country.

The development of women's basketball has a more decentralized structure compared to men's basketball, possibly reflecting differences in incentive policies and competition structure. Thus, the data suggest that migration to specific centers is a crucial factor in the development of elite athletes, especially for men, who tend to concentrate in São Paulo.

Some limitations should be considered in this study, such as the difficulty in data collection, limited participation, and the cross-sectional design, reinforcing the need for longitudinal research in sport.

Conclusions

This study concludes that the pathways to high performance in Brazilian basketball constitute a complex and unequal process, deeply shaped by socio-spatial determinants, systemic asymmetries between genders, and specific geographical-structural factors. The evidence suggests that athlete development in Brazil does not follow a linear or decentralized trajectory; rather, it is defined by a mandatory strategic migration toward specific "opportunity hubs" concentrated in a few urban centers, primarily in the Southeast region. This geographical centralization creates a "talent funnel" that is as much a reflection of socioeconomic privilege as it is of athletic potential, reinforcing a model of sports development that favors athletes from regions with superior infrastructure.

A fundamental contribution of this research is the characterization of what can be defined as the "Brazilian Paradox" in sports talent development. Unlike international models where sports excellence is often distributed across various regional centers, elite basketball in Brazil is intrinsically linked to migration to cities with high Municipal Human Development Index and high Population Density. While this phenomenon facilitates an earlier competitive start—particularly in the U-12 and U-13 categories—it simultaneously raises significant concerns regarding early specialization and the systemic exclusion of potential talents located outside these privileged urban centers. The study empirically demonstrates that the urban sports environment—

characterized by facility density, competitive saturation, and professional coaching availability—is the primary determinant of the athletic pathway, often outweighing individual talent in the formative stages.

Furthermore, the investigation demonstrated a critical structural disparity in sports support between genders. While male careers are predominantly channeled through the club system, providing a clearer professional path, female athletes rely heavily on social projects and public institutions. This reliance on less stable structures explains the higher attrition rates and the distinct migration patterns observed, indicating a gendered institutional gap that hinders the development of female talent. Another striking finding that challenges current management practices is the lack of a strong correlation between success in youth national teams and selection for senior squads. This "non-linearity" of the talent funnel aligns with contemporary sports pedagogy literature that warns against the overvaluation of early performance, suggesting that current selection processes may be biased toward early-maturing athletes or those from more developed regions, rather than long-term developmental ceilings.

Based on these findings, this study offers several proven and applicable solutions to lead to an evolution in the field through new approaches and efficient practices:

1.Decentralization of High-Performance Ecosystems: National and state federations (CBB, LBF, and NBB) must transition from a reactive migration-based model to a proactive regional development strategy. We recommend the implementation of "Regional Excellence Centers" in the North, Northeast, and Midwest. These centers must be equipped with standardized infrastructure and high-level coaching to replicate the competitive density of the Southeast, thereby reducing the mandatory need for early migration and its associated psychosocial and financial burdens.

2.Institutional Integration for Women's Basketball: Given that female athletes rely more on social projects, we propose a "Formal Integration Protocol" between these projects and professional clubs. This would ensure that female talent in social programs has a clear, supported transition to the professional level, with access to the same specialized sports medicine and pedagogical support as the male club system.

3.Reform of Talent Identification and Selection Protocols: To address the high turnover in national teams (where 63.8% of youth athletes do not reach the senior level), scouts and coaches should adopt multi-dimensional assessment tools. These should include Relative Age Effect (RAE) corrections and biological maturity markers, shifting the focus from immediate competitive results to long-term developmental potential. This change would optimize the allocation of financial and human resources within the national team system. Additionally, more regional leagues, including for junior athletes, would be created, increasing the career development opportunities.

4.Urban Sports Policy and Planning: Municipal governments must integrate sports infrastructure into urban planning, using PD and MHDI data as indicators for resource allocation. High-density areas require vertical, multi-use sports facilities, while lower-density regions need mobile coaching units and regional competition circuits to maintain engagement and prevent the "geographical exclusion" of talent.

In summary, the evolution of Brazilian basketball depends on a paradigm shift: from a model of "survival of the most geographically privileged" to a "systemic and equitable talent management" model. Future research, particularly of a longitudinal nature, is essential to monitor the long-term impact of these socio-spatial factors and to refine inclusive training models that maximize the national talent pool across all regions.

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