

Athletics is still a male-dominated sport: the underrepresentation of women as athletes, coaches, and referees in Brazil

El atletismo sigue siendo un deporte dominado por los hombres: la subrepresentación de las mujeres como atletas, entrenadoras y árbitros en Brasil

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Abstract. Gender inequality remains a pervasive issue in sports, attracting increasing attention in contemporary research. Despite this, scant scholarly focus has been directed towards the participation of women in athletics. This study sought to investigate the involvement of women as athletes, coaches, and referees across various age categories and events within the Brazilian Athletics Championship 2019. We assessed publicly available data from the championship, specifically the number of women in these roles. Data analysis involved descriptive statistics, Chi-Square test for association estimation, and one sample t-tests for mean frequency comparisons. The level of significance was set at $p < 0.05$. Our findings revealed no significant association between event type and age category, indicating a similar frequency of female athlete participation across different events and age groups. Notably, the average participation of women as athletes (42%) and coaches (19%) was statistically below the 50% threshold ($t = 4.595$, $p < 0.001$; $t = 25.00$, $p < 0.001$, respectively). Women represented 41% of the referees and did not show a significant difference to 50% ($t = 2.973$, $p = 0.058$). There was a significant association between gender and sport position with a higher participation of women as athletes and referees compared to coaches. In this study we show that, although there is a movement towards quantitative equality, women are still underrepresented as athletes, coaches, and referees in athletics, emphasizing the imperative for investment in sports policies, sports programs development geared towards fostering gender equality in athletics practices, and a qualitative comprehension of the challenges and barriers these professionals face.

Keywords: Gender; social justice; sport psychology; sport management; leadership

Resumen. La desigualdad de género sigue siendo un problema generalizado en los deportes y atrae cada vez más atención en la investigación contemporánea. A pesar de esto, la escasa atención académica se ha dirigido a la participación de las mujeres en el atletismo. El objetivo de este estudio es analizar la participación de mujeres como atletas, entrenadoras y árbitras en diferentes categorías de edad y eventos en el Campeonato Brasileño de Atletismo 2019. Evaluamos datos públicamente disponibles de dicho campeonato. El análisis de datos involucró estadísticas descriptivas, estimación de asociación utilizando la prueba de Chi-Cuadrado, y comparación de frecuencia media a través de la prueba t de una muestra. El nivel de significancia se estableció en $p < 0.05$. No hubo una asociación significativa entre el tipo de evento y la categoría de edad, indicando una frecuencia similar de participación de mujeres atletas en los diferentes eventos y grupos de edad. La participación promedio de mujeres como atletas (42%) y entrenadoras (19%) fue estadísticamente inferior al 50% ($t = 4.595$; $p < 0.001$; $t = 25.00$, $p < 0.001$, respectivamente). Las mujeres representaron el 41% de los árbitros y no mostraron una diferencia significativa con el 50% ($t = 2.973$, $p = 0.058$). Hubo una asociación significativa entre género y posición deportiva, con una mayor participación de mujeres como atletas y árbitras en comparación con entrenadoras. Concluimos que, aunque hay un movimiento hacia la igualdad cuantitativa, las mujeres siguen estando subrepresentadas como atletas, entrenadoras y árbitras en atletismo, lo que indica la necesidad de inversiones en políticas deportivas, desarrollo de programas deportivos considerando una práctica de atletismo equitativa en términos de género, y una comprensión cualitativa de los desafíos que enfrentan estas profesionales.

Palabras clave: género; justicia social; psicología del deporte; gestión deportiva; liderazgo

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Introduction

The participation of girls and women in sports has increased over time as a consequence of cultural changes and the struggles of women athletes, coaches and managers. In the past, sports were organized and practiced predominantly by men who strived to maintain their dominance. The modern Olympic Games (OG), for instance, were historically dominated by men, with women excluded from participation in its inaugural season in 1896 and facing several barriers to their participation in the first decades of the last century (Mitchell, 1977). Athletics, one of the most traditional sports in the OG, has been contested since the inception of the Olympic movement, initially exclusive to

men until 1928. The participation of women athletes became possible after French athlete Alice Milliat, a leading figure in the women's sports movement, challenged the existing system by advocating for the entry of women in the athletics program (Terret, 2010). Her activism, the feminist movement, and the retirement of Pierre de Coubertin from the board of the International Olympic Committee paved the way for women athletes' participation in athletics long before other sports (Mitchell, 1977). As one of the first sports practiced by women in the OG, athletics becomes an interesting case to be studied in relation to gender issues.

Despite its historical importance, the participation of women in athletics has remained largely understudied in the

literature. Alexander (1994) examined the newspaper coverage of athletics in World Athletic Championship and OG, revealing bias in the British print media. According to the author, women athletes were considered less newsworthy, and their sporting achievements were regarded as less important than those of men. The study highlighted ongoing challenges related to the recognition and visibility of women in sports a theme that persisted into the 1990s and continues to be observed in a study conducted in the current Spanish university context (Fernandez & Ospina-Betancurt, 2021). More recently, scholars have investigated the criteria used to define binary gender categories in athletics because of the prohibitions faced by some women with a higher level of testosterone in their body. For instance, Krech (2017) discussed the development and implementation of the international sporting regulations that discriminate against athletes based on sex or gender. She addressed the Indian sprinter Dutee Chand, who was disqualified from a competition because of her level of testosterone to reflect on the inequalities that still exist in sport. Similarly, Foddy and Savulescu (2011) analyzed the case of Caster Semenya after she won the women's 800m in the 2009 African Junior Championships and was tested for performance enhancing drugs and for being a man, raising questions about discriminatory practices against women athletes who do not conform to hegemonic feminine norms.

These studies, though limited in number, have fostered significant discussions on gender issues in athletics and on the barriers that persist for women participation as athletes in sport. However, research focusing on women coaches remains scarce. Scholars warn that women are still underrepresented as coaches (Guimarães et al., 2023; Wasend & LaVoi, 2019) and this gender imbalance is greater in elite sport compared to grassroots levels (Perondi et al., 2022; Borrucco et al., 2023; Pfister, 2010). A recent report on girls and women in sport showed that women represent only 19% of head coaches in NCAA Division I track and field (Boucher et al., 2021). While few studies have examined the experiences of coaches, particularly in athletics, a recent study underscored concerning findings. Recently, Hoeber and Dahlstrom (2021) explored the career development of Canadian women who coached high-performance athletics athletes. The authors showed that coaches are surviving in the sports system and facing problems such as lack of opportunity to coach full-time, lack of salary equity with male coaches, and lack of social recognition. Although the study explored a specific sport and country, these challenges are similar in other sports and sociocultural contexts.

The sociocultural context plays a pivotal role in shaping distinct career trajectories for male and female coaches. Brazil, for example, draws attention for officially recognizing and regulating the profession of sports coaching (Galatti et al., 2016), linking it to the higher education course of

Physical Education and with guidelines for professional performance determined by the Law 9.696/98 (Law 9696, September 1, 1998). On the other hand, in the same country, there is a delay in the insertion and permanence of women in leadership positions, such as coaches (Passero et al., 2020). Investigations into handball, soccer, and basketball show that women represent at most 24% of the elite coaches (Passero et al., 2019, 2020; Silva et al., 2021). According to the Brazilian Olympic Committee, the underrepresentation of women in coaching positions is also evident in adult and youth competitions. For instance, women accounted for only 16% of technical commissions in the Brazilian delegations at the 2021 Cali's Junior Pan American Games and 26% at the 2021 Tokyo Olympic Games (Brazil Olympic Committee, 2022).

The challenges in leadership in sport are also experienced in other positions, including referee. This is a position in which women seem to have greater entrance (Passero et al., 2020), but they still face constant discrimination. Among the most prevalent challenges, women referees are constantly questioned about their professional competence. Studies in team sports have shown that they put themselves under constant pressure to make the right decisions and not open space for discussion about the ability of women to referee (Forbes et al., 2015). Although these studies have provided important information about the challenges and negotiation strategies used by women referees, they were mostly carried out in team sports (Destrian et al., 2022; Hietala & Archibald, 2021; Tingle et al., 2014). It is also expected to find a higher participation of women as referees compared to other leadership positions in athletics, but their participation and challenges are still unknown.

Overall, women holding leadership positions in sports face similar challenges, such as a higher risk of mental health issues, the influence of hegemonic masculinity and institutionalized discrimination, and frequent questions about their professional competence (Burton, 2015; Forbes et al., 2015). The association between authority and masculinity is one of the explanations for the social challenges faced by women professionals (Norman, 2010). This scenario of underrepresentation and discrimination reinforces the importance of increasing women's representation in sports.

Although the discussion about the participation of women in various positions in sport is important and necessary, their current participation as athletes, coaches and referees in different event types and age groups in athletics remains largely unexplored. This type of study, although still exploratory and initial, has become more frequent over the last few years, providing a picture of the current gender inequality in sports and alerting sports organizations about the need of sport policies to improve women's participation in different positions in sports (Cardoso et al., 2022; Passero et al., 2019, 2020).

In this study we focus on the participation of women as

athletes, coaches, and referees in a Brazilian national athletics championship and there are some interesting reasons for choosing this specific country. Firstly, a law enforced from 1942 to 1983 in Brazil prohibited the participation of women in sports deemed “unsuitable” for their bodies. Although there is no explicit statement about athletics, women's sports in general faced a lack of support, investment, and visibility during this period (Giglio et al., 2018; Goellner, 2006). Second, even with little support, women were able to enter and maintain themselves in the athletics. Since 1948, Brazilian athletes have represented the country in women's competition in the OG (Oliveira & Costa, 2006). This situation changed in 2004 with a growing number of participants, and the largest delegation at the Rio edition in 2016, with a total of 28 women spread across the event types (Confederação Brasileira de Atletismo, n.d.). It is important to highlight the gold medal of the Brazilian athlete, Maurren Maggi, in long jump in 2008 which became a reference for girls to practice and pursue this career.

Moreover, although there are studies investigating specific aspects of women in athletics in Brazil, such as the relative age effect (Figueiredo et al., 2021) and the age-related performance (Brenzikofer et al., 2021), to our

knowledge, no prior study has delved into the participation of women as athletes, coaches, and referees. Therefore, the aim of this study was to analyze the participation of women as athletes, coaches and referees in different age categories and event types in The Brazilian Athletics Championship.

Material and Method

This descriptive study (Thomas et al., 2012) is based on a pragmatic philosophical approach, using quantitative data to describe women's athletics scenario in Brazil, considering the social, historic and political context of the data presented (Creswell, 2010).

Sample

The data was collected at the official website of the Brazilian Athletics Confederation (www.cbat.org.br). We collected the number of men and women that participated as athletes, coaches and referees in each event type and age category in the year of 2019, which was the most recent season at the moment of the study. All the event types analyzed in this study are shown in Table 1.

Table 1

Event types according to the different age groups category in the 2019 Brazilian Athletics Championship.

Event type	Under 16	Under 18	Under 20	Senior
Middle and long distance	1000m, 1000m steeplechase	800m, 1.500m, 3.000m, 2.000m steeplechase	800m, 1.500m, 3.000m, 3.000m steeplechase, 5.000m	800m, 1.500m, 3.000m steeplechase, 5.000m e 10.000m
Race walk	5km, 3km	10km, 5km	10km	20km
Sprints	75m, 250m	100m, 200m, 400m	100m, 200m, 400m	100m, 200m, 400m
Hurdles	100m (men), 80m (women), 300m	110m, 400m	110m, 400m	110m, 400m
Throws	Javelin, Discuss, Hammer, Shot Put	Javelin, Discuss, Hammer, Shot Put	Javelin, Discuss, Hammer, Shot Put	Javelin, Discuss, Hammer, Shot Put
Jumps	High, Long, Triple and Pole Vault	High, Long, Triple and Pole Vault	High, Long, Triple and Pole Vault	High, Long, Triple and Pole Vault
Combined events	Pentathlon	Heptathlon, Decathlon	Heptathlon, Decathlon	Heptathlon, Decathlon
Relays	4x75m	4x400m	4x100m, 4x400m	4x100m, 4x400m

Procedure

This study used publicly available data from 2019 The Brazilian Athletics Championship as a source of analysis. The Brazilian Athletics Confederation maintains a database on their website with statistics of the championships organized by them and in which Brazilian athletes participated. This data is publicly available. The website was accessed in March, 2020 and the results spreadsheets of the referred championship downloaded. Data presented on the number of women athletes, coaches, and referees participating were then visually and statistically analyzed.

Data analysis

The data was organized in an Excel spreadsheet and exported to GraphPad Prism for statistical analysis. To verify the difference in women's participation in different functions compared to men, the association between the number of women as coaches, athletes, and referees with the

different disciplines and age brackets was analyzed using the Chi-Square test, a statistical test employed for the analysis of categorical variables (Field, 2009). To compare the mean frequency of women in the different positions with the expected equality (50%) we performed the one sample t-test. The level of significance was set in $p < 0.05$.

Results

Table 2 shows the participation of women athletes according to the event type and age category. We did not find a significant association between disciplines and age category. Therefore, there is a similar frequency of women athletes' participation across the different events and age groups. The mean participation of women as athletes is 42% which is statistically inferior to 50% ($t\text{-value}=4.595$; $p\text{-value}<0.001$).

Table 2

Participation of women athletes according to the event type and age category in the 2019 Brazilian Athletics Championship (M age±DP)

Event type	Under 16	Under 18	Under 20	Senior	Chi-square
Middle and long distance	44% (13.46±0.77)	29% (15.30±0.78)	34% (16.98±1.12)	49% (25.47±6.75)	x ² =20.82 p=.470
Race walk	55% (13.31±0.79)	48% (15.33±0.78)	52% (16.64±1.15)	50% (27.06±10.07)	
Sprints	46% (13.45±0.76)	32% (15.12±0.86)	37% (16.91±1.08)	49% (23.36±4.32)	
Hurdles	46% (13.37±0.77)	40% (15.12±0.90)	35% (16.81±0.98)	49% (22.27±4.47)	
Throws	41% (13.50±0.66)	48% (15.26±0.83)	48% (16.67±1.28)	49% (22.65±4.69)	
Jumps	48% (13.69±0.89)	40% (15.19±0.93)	42% (16.78±1.14)	44% (22.30±5.25)	
Combined events	48% (13.67±0.66)	50% (15.59±0.91)	36% (16.90±0.88)	56% (22.93±5.01)	
Relays	50% (13.35±0.81)	50%*	30% (16.85±1.04)	32% (23.54±4.88)	

Notes: M = mean, SD = standard deviation. *Relays for Under 18 were mixed gender and therefore we did not provide mean age and DP

Table 3 and 4 show the participation of men and women as coaches and referees, respectively, in the Brazilian Athletics Championship. The mean participation of women as coaches is 19% which is statistically inferior to 50% (t-value=25.00, p-value<0.001). Women represent 41% of the referees and do not show a significant difference to 50% (t=2.973, p-value=0.0589). We find a similar participation of women across the different age groups.

Table 3

The participation of men and women as coaches in the 2019 Brazilian Athletics Championship

Age category	Men	Women	Chi-square
Senior	94 (81%)	22 (19%)	x ² =1.231 p=.745
Under 20	113 (84%)	21 (16%)	
Under 18	97 (82%)	21 (18%)	
Under 16	61 (78%)	17 (22%)	

Table 4

The participation of men and women as referees in the 2019 Brazilian Athletics Championship.

Age category	Men	Women	Chi-square
Senior	48 (56%)	38 (44%)	x ² =4.547 p=.208
Under 20	45 (53%)	40 (47%)	
Under 18	63 (67%)	31 (33%)	
Under 16	51 (60%)	34 (40%)	

Figure 1 shows the total participation of men and women as athletes, coaches, and referees. We found a significant association between gender and sport position in which there is a higher participation of women as athletes and referees compared to coaches.

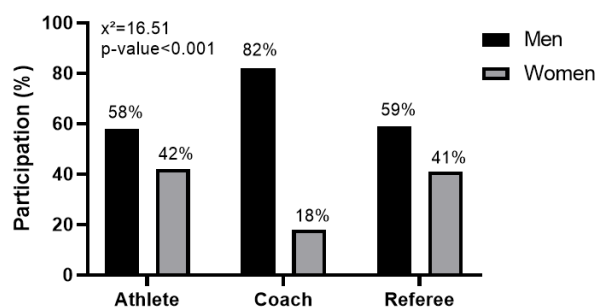


Figure 1. The participation of men and women as athletes, coaches and referees in the Brazilian Athletics Championship.

Discussion

This is the first study of our knowledge to investigate

the participation of women as athletes, coaches, and referees in athletics in Brazil. We found some important results regarding gender issues in sports. Firstly, women are still underrepresented as athletes, coaches and referees, and this gender disparity is higher for the coaching position in which they represented only 19% of the professionals. Secondly, there was no significant difference in women's participation as athletes among the different event types. Third, there was no significant difference in the participation of women as coaches and referees among the different age groups.

The Tokyo edition of the Olympic Games, in 2021, was the first in which the number of men and women was similar, 48% of the athletes were women (International Olympic Committee, 2021). Although the number of women has increased over the years, they are still underrepresented in athletics. We did not find differences in their participation among the event types, and the maintenance of the number of women athletes across the age groups indicates that they are receiving support to continue in the sport. The Brazilian scenario reveals an interesting case regarding the maintenance of women athletes in the elite pathway. It is worth noting that the women represent 47% of the athletes in the senior category and that the gender balance at this level in Brazil may reflect the public funding programs that reach both men and women, such as the "Bolsa Atletas", a government program that offers monthly remuneration to elite athletes. However, the mean participation of women as athletes is 42% indicating that there are still some actions to be proposed to improve their participation and to offer better environmental conditions. It is important to highlight that achieving numerical equality does not guarantee that the conditions for training and developing in sports are the same. Studies in other sports have also shown an increase in women athletes' participation but revealed that they still face discrimination, low investment, lack of resources and support (Galatti et al., 2021; Lima et al., 2023; McGowan & Downes, 2018; Pfister, 2010). Therefore, sports policies should also focus on the conditions to occupy this space.

An important finding was the lowest participation of women as coaches compared to the other positions. The participation rate found in this study is similar to other sports in Brazil such as football (Passero et al., 2020), basketball (Passero et al., 2019) and table tennis (Cardoso et al., 2022). However, these previous studies analyzed only women's sports and found a mean participation of 15% of

women coaches. To the best of our knowledge, there is no woman working as a head coach in the national competitions of men's football or basketball. If men's sports were included in these studies, the percentage of women as coaches would decrease. In the current investigation we analyzed the participation of women coaches in athletics events practiced by both genders. Thus, considering that we analyzed men's and women's sports together, this means that, although women are still underrepresented as coaches in athletics, they show a greater participation compared to other sports.

The underrepresentation of women coaches is also found in different countries around the world. For example, women accounted for 16% of head coaches in the Canadian university system during the 2016–2017 season (Norman et al., 2020). Specifically in athletics, women represent only 19% of head coaches in NCAA Division I track and field in the USA (Boucher et al., 2021). In this sense, Brazil finds itself in a situation similar to other countries in the world where there are opportunities to be a head coach in elite sport, but they are still low. This low representation is accompanied by a series of professional challenges such as lack of recognition and low incomes (Ferreira et al., 2013; Hoerber & Dahlstrom, 2021; Perondi et al., 2023). As suggested by previous studies, the culture of sports reinforces the gender power structure of the society and prevents women from occupying positions of leadership and visibility in sport.

Burton (2015) emphasizes the importance of considering gender as one of the structuring factors of the sporting environment, with processes based on a hegemonic understanding of masculinity (Alberdi et al., 2023). The socially constructed image of people who occupy leadership positions involves characteristics and behaviors commonly associated with the male figure and women are considered less capable for occupying such functions (Barreira, 2021; Perondi et al., 2022). Due to this negative view of women, they undergo an extensive qualification process and face several obstacles that are not usually present in men's pathway, discouraging their entry and permanence in sports. While acknowledging that this study, which considers women as an oppressed gender category in the sporting environment, contributes to the field by demonstrating that there are differences in representation, we recognize that we discuss gender from a binary perspective, and that this topic is much more complex than that. We decided to maintain this categorization because this is the way the Brazilian Athletics Confederation organized the championship results data, and we did not have access to the athletes. We acknowledge the need to deepen the understanding of the phenomenon by considering more diverse gender perspectives.

Our study showed an interesting result about the participation of women as coaches: their participation remains constant throughout the age groups. This means that even

increasing the age of the athletes and, consequently, the visibility of the sport, the entry and maintenance of the women coaches does not change. These results reveal a different scenario compared to other sports and contexts in which the higher the visibility of the athletes, the lower the participation of women in coaching positions (Acosta & Carpenter, 2014). In some contexts, this decrease in the number of women coaches as the level of performance increases has been explained by the metaphor known as the glass ceiling. This expression is used to represent invisible barriers that prevent women from progressing to higher positions. However, the results of our study show the possibility of advancement to higher visibility categories, even while remaining underrepresented. This result suggests the possibility of interpreting a coaching career in different ways beyond the glass ceiling.

This study also showed interesting findings regarding the participation of women as referees in athletics. We found a participation rate of 41%, which is similar to other sports, corroborating that women have greater entry into the referee position compared to other leadership positions. For instance, Passero et al. (2019, 2020) also showed that women participate more as referees than coaches in basketball and football compared to other leadership positions. However, this greater participation does not come without challenges. Scholars indicate that discrimination and marginalization persist with women refereeing and that they are frequently questioned about their competence based on gender stereotypes (Forbes et al., 2015; Tingle et al., 2014). We reinforce that this study did not investigate the barriers and challenges faced by women referees specifically in athletics and we indicate the need for further studies on this topic.

Although our study provided an overview of gender inequality in athletics, it is important to recognize its limitations. First, data collection was performed only on one season of the Brazilian championship. It would be interesting to analyze the longitudinal evolution or stagnation of women's participation over the years. Second, we analyzed gender inequality through a quantitative perspective, which limits our depth and knowledge about the barriers and constraints faced by women in sport. Third, the findings are limited to the Brazilian scenario, indicating the need for other studies in different contexts as well as in international competitions. Future research should further investigate broader contexts, like quantitative national data encompassing all championships, and qualitative data about the individual perceptions of the elite sports environment for athletes, coaches, and referees.

The findings of this study have various practical implications as they shed light on the gender inequalities prevalent in various roles within athletics. The results serve as a wake-up call for sports organizations and governing bodies to acknowledge their responsibility in creating and upholding

working environments that are conducive to women's participation (Barreira et al., 2022; Hoeber & Dahlstrom, 2021). This may involve implementing initiatives such as women-only programs, networking opportunities, and formal mentorship—sponsorship programs, which operate alongside other programs to support athletes, coaches and referees (Hoeber & Dahlstrom, 2021; Santos et al., 2023).

Conclusions

In this study, we examined the participation of women in athletics in Brazil as athletes, coaches, and referees. Our findings reveal that women continue to be underrepresented in these roles. Specifically, women comprise 42% of athletes, 41% of referees, and only 19% of coaches, highlighting a significant gender imbalance, particularly in coaching positions. Interestingly, we observed no significant variations in female participation across different event types and age groups, suggesting that their involvement remains consistent regardless of the level of sport visibility. However, sports managers should interpret these findings cautiously and not prematurely perceive the situation as egalitarian without first understanding the specific challenges that female professionals encounter in their daily roles.

Data availability

The data used in this study can be made available by reasonable request to the fourth author.

Declaration of conflicting interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

This is a descriptive study using publicly available data in which individuals are not identified. According to the National Health Council (Resolução No 674, de 06 de Maio de 2022, 2022) an ethical approval is not necessary for this study in Brazil.

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