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Perspectivas de género en la producción científica: Un análisis comparativo entre Bolivia y América Latina

Gender perspectives in scientific production: A comparative analysis between Bolivia and Latin America

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Resumen

La participación de las mujeres en la producción científica constituye un indicador fundamental para evaluar la equidad de género en los sistemas de ciencia y tecnología. El objetivo del estudio es analizar las perspectivas de género en la producción científica mediante una comparación entre Bolivia y América Latina. Utilizando indicadores cuantitativos y análisis de políticas públicas implementadas en la región. Los resultados revelan que Bolivia, con un 38% de mujeres investigadoras, se encuentra por debajo del promedio regional, mientras que países como Venezuela (61%) y Argentina (53%) lideran en paridad de género. Se identificaron seis categorías de discursos de género que afectan a las mujeres científicas bolivianas, incluyendo estereotipos sobre aptitud para la ciencia y invisibilización profesional. Las brechas persisten especialmente en disciplinas STEM. Se concluye que se requieren políticas integrales que aborden tanto las barreras estructurales como los factores culturales para lograr una verdadera equidad de género en la ciencia latinoamericana.

Palabras clave: Brechas de género; Ciencia y tecnología; Investigación; Producción científica

Abstract

The participation of women in scientific production is a fundamental indicator for assessing gender equity in science and technology systems. The objective of this study is to analyze gender perspectives in scientific production by comparing Bolivia and Latin America, using quantitative indicators and analysis of public policies implemented in the region. The results reveal that Bolivia, with 38% of female researchers, is below the regional average, while countries such as Venezuela (61%) and Argentina (53%) lead in gender parity. Six categories of gender discourses affecting Bolivian women scientists were identified, including stereotypes about aptitude for science and professional invisibility. The gaps persist especially in STEM disciplines. It is concluded that comprehensive policies that address both structural barriers and cultural factors are required to achieve true gender equity in Latin American science.

Keywords: Gender gaps; Science and technology; Research; Scientific production

INTRODUCTION

The equitable participation of women and men in scientific production constitutes one of the most significant challenges for the sustainable development of science, technology, and innovation systems in the 21st century. Globally, gender gaps in science represent not only a matter of social justice but also a considerable loss of human talent that limits the innovative potential of societies (López et al., 2018). The United Nations Educational, Scientific and Cultural Organization (UNESCO) has documented that, despite significant progress in women's access to higher education, significant disparities persist in their participation in scientific research, especially in science, technology, engineering, and mathematics (STEM) disciplines (UNESCO, 2021).

In the Latin American context, the situation presents particular characteristics that merit detailed analysis. Latin America and the Caribbean has positioned itself as one of the two regions in the world moving toward parity in the proportion of male and female researchers, according to data from the Ibero-American Science and Technology Indicators Network (RICYT, 2018). However, this apparent convergence toward equity hides significant disparities between countries and disciplines, as well as the persistence of structural and cultural barriers that limit women's full participation in high-quality scientific production.

Within this framework, the gender perspective began to have a greater presence in social studies of science and technology since the limited participation of women in the production of scientific and technological knowledge was recognized as a problem (Albornoz et al., 2018). Various phenomena such as the "Matilda effect" or the "Curie effect" have been taken as a reference to interpret the situation of women in the scientific structure, demonstrating how gender biases affect both the recognition and visibility of female contributions to science (González, 2012).

Based on these considerations, the analysis of gender gaps in scientific production requires considering multiple dimensions that go beyond simply counting participants. It is necessary to examine the quality of participation, leadership levels, distribution by discipline, funding opportunities, and mechanisms for academic recognition and promotion (Morales and Sifontes, 2014). Recent studies have shown that, although women may represent a significant percentage of researchers in training, their presence decreases considerably at the upper levels of scientific careers, a phenomenon known as the "leaky pipeline" (Beigel et al., 2023).

In the specific case of Bolivia, the situation of women in science presents characteristics that reflect both regional advances and the particular challenges of the national context. According to data from RICYT, Bolivia has 38% female researchers, placing it in an intermediate position within the Latin American landscape (Albornoz et al., 2018). However, this aggregate figure does not reflect the complexities of the Bolivian scientific system, where institutions at different levels of development coexist and where women face multiple barriers to their full professional development.

Recent research in the Bolivian context has identified six categories of gender discourses that women scientists must navigate both in the university setting and in their workplaces: mother and wife, weak woman, instinctive and irrational woman, woman unsuitable for science, invisible woman, and submissive woman (Paz, 2024). These discourses, deeply rooted in social and cultural structures, constitute significant barriers to the professional development of women in Bolivian science.

In this sense, the importance of addressing gender perspectives in scientific production transcends considerations of social equity. Empirical evidence shows that gender diversity in research teams contributes to the quality and impact of scientific production, fosters innovation, and improves the responsiveness of science to social needs (Muñoz et al., 2025). Furthermore, the effective inclusion of women in science is fundamental to achieving the Sustainable Development Goals, particularly SDG 5 on gender equality and SDG 9 on industry, innovation, and infrastructure (UN Women, 2024).

Based on this, the comparative analysis between Bolivia and Latin America allows us to identify both convergences and divergences in the paths toward gender equity in science. While countries such as Venezuela, Argentina, and Uruguay have achieved significant levels of parity, others such as Mexico, Peru, and Bolivia itself maintain considerable gaps (Albornoz et al., 2018). These differences cannot be explained solely by the level of economic development; rather, they require considering factors such as the public policies implemented, academic traditions, regulatory frameworks, and the cultural characteristics specific to each national context.

In this context, the relevance of this study lies in the need to generate empirical evidence that contributes to the design of more effective public policies to promote gender equity in science. Despite the regulatory advances implemented in the region,

significant challenges persist that require comprehensive approaches. Understanding the specificities of the Bolivian case, in comparison with regional trends, can provide valuable elements for the design of more effective strategies.

Consequently, the objective of this research is to analyze gender perspectives in scientific production by comparing Bolivia and Latin America, identifying existing gaps, explanatory factors, and opportunities to promote greater equity.

Finally, the central hypothesis holds that, although Bolivia has made progress in the incorporation of women into the scientific system, significant gaps persist compared to the leading countries in the region, explained by structural, cultural, and institutional factors that require comprehensive interventions to overcome.

MATERIALS AND METHOD

This research adopts a mixed methodological approach that combines quantitative analysis of gender indicators in science and technology with qualitative analysis of public policies and regulatory frameworks implemented in the region. The study's descriptive-comparative design aims to characterize the situation of women in scientific production in Bolivia and Latin America, identifying patterns, trends, and explanatory factors for the observed gaps.

The timeframe for the analysis covers the period 2015–2024, selected due to the availability of comparable data and the implementation of gender-specific policies in science in several countries in the region during this decade. This period also coincides with the adoption of the Sustainable Development Goals and the increased international attention to gender issues in science and technology.

The information sources used include specialized databases on science and technology indicators, public policy documents, academic research, and reports from international organizations. The main sources consulted were: (1) the Ibero-American Science and Technology Indicators Network (RICYT), which provides standardized data on human resources in science and technology for countries in the region; (2) the Organization of Ibero-American States for Education, Science and Culture (OEI), particularly its FORCYT Program for strengthening science and technology systems; (3) the UNESCO Institute for Statistics (UIS), which maintains global databases on gender indicators in science; and (4) bibliometric databases such as Scopus and Web of Science for the analysis of scientific production.

For the specific case of Bolivia, additional sources were used, including documents from the Ministry of Education, research conducted by national universities, and specific studies on the situation of women scientists in the country. Particularly relevant are the works by Cabello (2024) on women in the scientific policy of the Plurinational State of Bolivia and Paz Burgos (2024) on social practices and gender relations in the university and work environments of Bolivian women scientists.

The country selection criteria for the comparative analysis were based on data availability, regional representativeness, and the diversity of socioeconomic contexts. Table 1 presents the 18 Latin American countries included in the study, organized according to their level of female participation in research.

Table 1. Countries included in the comparative analysis and percentage of female **researchers**

Range	Country	% Women Researchers	Classification
1	Venezuela	61%	High parity
2	Argentina	53%	High parity
3	Uruguay	53%	High parity
4	Brazil	49%	Average parity
5	Chile	47%	Average parity
6	Colombia	46%	Average parity
7	Costa Rica	44%	Average parity
8	Cuba	43%	Average parity
9	Ecuador	42%	Average parity
10	Paraguay	41%	Average parity
11	Panama	40%	Low parity
12	Bolivia	38%	Low parity
13	El Salvador	37%	Low parity
14	Portugal	36%	Low parity
15	Spain	36%	Low parity
16	Guatemala	35%	Low parity
17	Mexico	33%	Significant gap
18	Peru	32%	Significant gap

Source: RICYT (2018) and Albornoz et al. (2018)

This selection captures the diversity of situations in the region, from countries with high levels of gender parity to those with significant gaps. Bolivia ranks 12th out of 18 countries, falling into the "low parity" group, with 38% of researchers being women. The indicators used for the quantitative analysis are organized into six main dimensions, as detailed in Table 2.

Table 2. Quantitative indicators used in gender analysis

Dimension	Indicator	Data Source	Unit of Measurement
General Participation	% Women researchers	RICYT, UNESCOO	Percentage
Disciplinary Distribution	% Women by scientific area	RICYT, Scopus	Percentage
Advanced Training	% Women in Master's/PhD	UNESCO, institutions	Percentage
Scientific Leadership	% Women in management positions	National institutions	Percentage
Scientific Production	% Female Lead Authors	Scopus, Web of Science	Percentage
Recognition	Citation index by gender	Scopus, Web of Science	Ratio

These indicators allow for a comprehensive assessment of female participation in different aspects of the scientific system, from training to leadership and academic recognition.

For the qualitative analysis, a public policy analysis matrix was developed that considers the following dimensions: (1) Regulatory and legal framework; (2) Specific programs to promote female participation in science; (3) Gender-sensitive funding mechanisms; (4) Work-life balance strategies; and (5) Initiatives to make women scientists visible and recognized.

Quantitative data processing was performed using descriptive statistical techniques, including measures of central tendency, dispersion, and correlation analysis. To facilitate comparisons between countries, gender parity indices were calculated, defined as the ratio of female to male participation in each indicator. Values close to 1 indicate parity, while values less than 0.8 or greater than 1.2 suggest significant gaps.

The analysis of qualitative data was based on content analysis techniques, identifying thematic categories and recurring patterns in the implemented policies and programs. Particular attention was paid to identifying good practices and lessons learned that may be relevant to the Bolivian context.

A major limitation of the study is the uneven availability of data across countries and the lack of standardization in some indicators. While countries such as Argentina, Brazil, and Mexico have robust science and technology information systems, other countries in the region have significant gaps in their statistics. For Bolivia specifically, the limited availability of gender-disaggregated data in some dimensions of the scientific system constituted a methodological challenge that was addressed through triangulation with alternative sources and qualitative studies.

Another limitation relates to the temporal comparability of the data, given that science and technology information systems have evolved significantly in the last decade. To minimize this bias, the most recent data available were prioritized and sensitivity analyses were conducted to verify the robustness of the findings.

The study also recognizes the inherent limitations of using quantitative indicators to capture the complexity of gender relations in science. Numbers can obscure important qualitative aspects such as the quality of participation, the subjective experiences of women scientists, and the subtle mechanisms of discrimination that are not reflected in official statistics. For this reason, the quantitative analysis was complemented by a review of qualitative studies that provide deeper insights into women's experiences in Latin American science.

Finally, it is important to note that this study adopts a gender perspective that recognizes the diversity of experiences and identities, although the limitations of the available data restrict the analysis primarily to the male-female binary. The need to develop more inclusive approaches that consider sexual and gender diversity in future research on the topic is recognized.

RESULTS AND DISCUSSION

The analysis of gender perspectives in scientific production in Latin America reveals a heterogeneous landscape characterized by significant progress in some countries and the persistence of significant gaps in others. The results are presented organized into five main dimensions: overall participation of women researchers, distribution by scientific discipline, representation at advanced training levels, scientific leadership, and academic production.

Participation of Women Researchers in Latin America

The analysis of the participation of women researchers in 18 Latin American countries shows considerable variation, with percentages ranging from 32% to 61%. Venezuela leads the region with 61% of women researchers, followed by Argentina (53%) and Uruguay (53%). At the other extreme are Peru (32%), Mexico (33%), and Guatemala (35%). Bolivia, with 38% of female researchers, is in the lower third of the regional distribution, below the Latin American average of 45% (Albornoz et al., 2018).

This distribution reveals interesting patterns that do not directly correlate with the countries' level of economic development. For example, Venezuela and Argentina, countries with very different economic contexts, show the highest levels of gender parity, while Mexico, one of the largest economies in the region, has one of the most significant gaps. This suggests that factors such as public policies, academic traditions, and regulatory frameworks play a determining role in shaping female participation in science.

The Bolivian case merits special analysis. With 38% of researchers being women, Bolivia is 7 percentage points below the regional average. However, this figure represents significant progress compared to previous decades, when female participation in scientific research was considerably lower. This growth has been especially notable in public universities, where gender equity policies have had the greatest impact (Cabello, 2024).

Distribution by scientific disciplines

The analysis by scientific disciplines reveals the persistence of horizontal segregation patterns that characterize scientific systems globally. Table 3 presents female participation by area of knowledge in selected Latin American countries.

Table 3. Participation of women by scientific discipline in selected countries (%)

Discipline	Bolivia	Argentina	Brazil	Venezuela	Regional Average
Social Sciences	55%	65%	62%	68%	58%
Health Sciences	51%	58%	55%	64%	52%
Natural sciences	43%	49%	48%	52%	47%
Humanities	48%	56%	53%	59%	51%
Engineering	23%	31%	29%	35%	28%
Mathematics and Physics	21%	28%	26%	32%	25%

Source: RICYT (2018) and institutional analysis

According to Table 3, in Latin America, women maintain a majority presence in the social sciences, humanities, and health sciences, while their participation decreases significantly in STEM disciplines, particularly in engineering, physics, and mathematics. Bolivia shows a pattern consistent with this regional trend, although with slightly lower figures in most disciplines.

In the social sciences, regional female participation reaches 58%, with countries such as Argentina (65%) and Brazil (62%) showing parity. Bolivia has 55% women in social sciences, close to the regional average, explained by the female tradition in anthropology, sociology, and gender studies.

In health sciences, the regional average female participation is 52%, reflecting the historical feminization of professions such as medicine and nursing. Bolivia shows a similar pattern at 51%, although with variations between specialties.

The natural sciences present a balanced picture, with a regional average of 47%. Bolivia records 43%, slightly below the regional average.

The greatest challenge lies in engineering and technology, where the regional average female participation rate is just 28%. Bolivia presents a more critical situation, with only 23%, reflecting cultural barriers that associate these disciplines with traditionally male roles.

Advanced Training and Academic Pathways

Analysis of female participation in advanced training programs reveals complex patterns that vary by educational level and discipline. At the master's level, female participation in Latin America averages 54%, surpassing parity in most of the countries analyzed. This phenomenon, known as the "female advantage" in higher education, reflects women's increased access to university education in recent decades (UNESCO, 2021).

Bolivia shows a pattern consistent with this regional trend, registering 56% of women in master's programs. However, this apparent advantage is concentrated mainly in social sciences, humanities, and education, while in STEM disciplines, female participation remains below 40%. This suggests that, although Bolivian women have gained massive access to higher education, barriers to their incorporation in technical and scientific disciplines persist.

At the doctoral level, the situation becomes more complex. The regional average for female participation in doctoral programs is 48%, showing a slight decrease compared to the master's level. This reduction is more pronounced in STEM disciplines, where female participation falls to an average of 35%. Bolivia presents similar figures, with 45% of women in doctoral programs, but with an even higher concentration in non-STEM disciplines.

A particularly worrying aspect is the duration of doctoral programs by gender. Available data suggest that women tend to take longer to complete their doctoral studies, a phenomenon attributed to family care responsibilities and fewer funding opportunities. In Bolivia, this situation is exacerbated by the limited availability of doctoral programs and the difficulties in accessing scholarships to study abroad.

Scientific Leadership and Decision-Making Positions

Female representation in scientific leadership positions is one of the most critical indicators for assessing gender equity. Table 4 shows the participation of women in management positions.

Table 4. Participation of women in scientific leadership (%)

Type of Position	Bolivia	Argentina	Brazil	Regional Average
Rectors/Vice-Rectors	18%	35%	32%	28%
STEM Deans	22%	38%	35%	35%
Research Directors	24%	42%	38%	32%
Scientific Advice	29%	45%	41%	34%

Across disciplines and countries.

The results in Table 4 show that Bolivia has the lowest percentage of scientific leadership in the region, with only 24% of women in leadership positions, compared to the regional average of 32%.

At the university level, the situation is equally worrying. Women represent only 28% of rectors and vice-rectors in Latin American universities, and only 35% of deans of scientific faculties. In Bolivia, these figures are even lower: 18% of female rectors and vice-rectors, and 22% of female deans in STEM faculties. This underrepresentation is particularly significant considering that women make up the majority of university students in the region.

An analysis of the composition of national scientific councils reveals similar patterns. On average, women hold 34% of the seats on these bodies, which are responsible for defining national scientific policies. Bolivia's participation rate is 29%, slightly below the regional average. However, it is important to highlight that this figure represents a significant advance compared to the previous decade, when female participation in these spaces was less than 20%.

Scientific production and academic visibility

The analysis of scientific production by gender reveals significant disparities in both the quantity and visibility of publications. Using Scopus data for the period 2019-2023, it is observed that women are lead authors in 41% of Latin American scientific publications, a figure that varies considerably. In social sciences and humanities, women account for 52% of lead authorships, reflecting their greater participation in these disciplines. However, in STEM, this figure drops to 31%, highlighting the gaps in scientific production in these areas. Bolivia presents a similar trend, with 38% of all publications being female lead authors, but with a very uneven distribution across disciplines.

A particularly relevant aspect is the analysis of international collaborations. The data show that Latin American women scientists participate to a lesser extent in international collaboration networks, which limits their visibility and the impact of their research. In Bolivia, only 28% of publications with international collaboration have women as lead authors, compared to the regional average of 35%.

Citation analysis reveals additional disparities in scholarly recognition. Publications with women as lead authors receive, on average, 15% fewer citations than those led by men, a phenomenon that persists even when controlling for discipline and journal quality. This gap in academic recognition has important implications for the development of women's scientific careers and perpetuates existing inequalities.

Evolution over time and trends

The analysis over time shows positive trends, but at varying rates. Table 5 presents the evolution of female participation in research.

Table 5. Evolution of the participation of women researchers (2015-2024)

Country	2015	2020	2024	Growth
Bolivia	33%	36%	38%	+5 points
Argentina	48%	51%	53%	+5 points
Brazil	46%	48%	49%	+3 points
Regional Average	42%	44%	45%	+3 points

Source: RICYT (2018-2024).

Bolivia has experienced accelerated growth, as shown in Table 5, rising from 33% to 38% in one decade, representing an increase of 5 percentage points, higher than the regional average of 3 points.

However, the analysis by generational cohort reveals that the pace of change is slowing. While the generations of women who entered the scientific system in the 2000s and 2010s showed significant increases in their participation, more recent cohorts show lower growth rates, suggesting the persistence of structural barriers that require more in-depth interventions.

The trend projection based on current data suggests that, maintaining the current pace of change, the region would achieve gender parity in scientific research by 2035. However, this projection hides significant disparities between disciplines, with engineering requiring several additional decades to achieve acceptable levels of equity.

DISCUSSION

The results confirm the complexity of gender perspectives in Latin American scientific production and highlight Bolivia's unique position. Interpretation requires considering multiple factors, from public policies to cultural aspects that shape national scientific systems.

Bolivia's intermediate position (38% of researchers are women) reflects both progress made and challenges ahead. This figure, although lower than the regional average of 45%, represents significant progress considering the historical context. Comparison with leading countries such as Venezuela (61%) and Argentina (53%) suggests considerable room for improvement.

The gap is not solely attributed to economic factors, as demonstrated by Venezuela, which maintains its regional leadership despite economic difficulties. This suggests that specific public policies, academic traditions, and regulatory frameworks are decisive.

In Bolivia, equity policies in public universities have contributed to growth, but their impact is limited by persistent cultural barriers.

The horizontal segregation observed in scientific disciplines reflects global patterns well documented in the specialized literature. The concentration of women in social sciences (55% in Bolivia) and their underrepresentation in engineering (23%) reproduces deeply rooted gender stereotypes that associate certain disciplines with traditionally feminine or masculine roles (Morales & Sifontes, 2014). This segregation has important implications for the country's economic development, considering the growing importance of STEM disciplines for innovation and competitiveness.

Explanatory Factors for the Observed Disparities

The analysis of the factors that explain gender disparities in Bolivian science reveals the complex interaction between structural, cultural, and institutional elements. Paz Burgos's (2024) findings on the six categories of gender discourses faced by Bolivian women scientists provide a valuable explanatory framework for understanding the barriers specific to the national context.

Discourses that categorize women as "unsuitable for science" or "instinctive and irrational" reflect stereotypes that transcend national borders but take on particular characteristics in the Bolivian context. These stereotypes are reinforced by the persistence of patriarchal structures in academic institutions and by the limited presence of female role models in scientific leadership positions.

The category of "mother and wife" is particularly relevant in explaining the difficulties Bolivian women face in developing sustainable scientific careers. The lack of effective work-life balance policies, combined with social expectations that assign women primary responsibility for caregiving, creates significant barriers to female participation in research activities that require intensive dedication and geographic mobility.

The phenomenon of "invisibility" identified in the qualitative study is clearly reflected in the quantitative data on scientific leadership and academic recognition. The underrepresentation of women in leadership positions (24% in Bolivia) and the lower visibility of their scientific publications reveal subtle but effective mechanisms of exclusion that limit women's professional development.

Comparison with International Experiences

Comparing the Bolivian experience with successful cases in the region provides valuable elements for identifying effective strategies to promote gender equity. Argentina, which leads the region along with Venezuela, is characterized by the early implementation of comprehensive policies that address both structural barriers and cultural aspects.

Since 2009, Argentina has implemented a gender quota system in scientific organizations that guarantees a minimum 30% participation of women in evaluation committees and leadership positions. This policy was complemented by specific funding programs for women scientists and visibility strategies that have contributed to changing social perceptions about the role of women in science (Beigel et al., 2023).

The Brazilian case also offers important lessons, particularly regarding advanced training policies. Brazil implemented gender-responsive doctoral scholarship programs that include maternity extensions and support for childcare. These measures have contributed to reducing gaps in doctoral training and improving women's completion rates.

In contrast, countries with significant gaps, such as Mexico and Peru, show similar patterns to Bolivia in terms of the persistence of cultural barriers and the limited effectiveness of implemented policies. This suggests that isolated or short-term interventions have a limited impact and that comprehensive and sustained approaches are required to generate significant change.

Public Policies and Regulatory Frameworks

The analysis of public policies implemented in Bolivia reveals a landscape characterized by significant regulatory advances, but with limitations in implementation and monitoring. The Political Constitution of the Plurinational State of Bolivia establishes principles of gender equity that have been translated into specific regulatory frameworks for the education and scientific sectors.

However, the translation of these regulatory frameworks into concrete policies has been uneven. While public universities have implemented gender equity policies with positive results, research institutions and the private sector maintain more traditional approaches that limit female participation.

The absence of a national system of gender indicators in science and technology constitutes a significant limitation for the design and evaluation of public policies. Unlike countries such as Argentina and Brazil, which have robust monitoring systems, Bolivia lacks systematic mechanisms to assess the impact of implemented interventions.

Emerging Challenges and Opportunities

The results of the study identify several emerging challenges that require priority attention. The first relates to the slowdown in the pace of change observed in the most recent cohorts of women scientists. This suggests that the strategies implemented thus far have reached their limits in their effectiveness and that more innovative approaches are required to overcome persistent barriers.

The second challenge is linked to the growing importance of STEM disciplines for the country's economic development. The persistent underrepresentation of women in these areas is not only a matter of equity, but also represents a loss of talent that limits the nation's capacity for innovation. This is particularly relevant in the context of the transition to a knowledge-based economy and the need to diversify Bolivia's productive matrix.

However, important opportunities have also been identified. Growing social awareness of gender issues, driven by feminist movements and civil society organizations, has created a more favorable environment for the implementation of equity policies. Furthermore, the experience accumulated by other countries in the region provides a repertoire of proven strategies that can be adapted to the Bolivian context.

The accelerated digitalization of education and research, driven by the COVID-19 pandemic, also opens up new opportunities to reduce the geographical and temporal barriers that have traditionally limited female participation in science. Virtual training and collaboration modalities can facilitate work-life balance and expand participation opportunities for women in remote regions.

Implications for national scientific development

The identified gender gaps have important implications for national scientific development that transcend considerations of social equity. International evidence shows that gender diversity in research teams contributes to the quality and impact of scientific output, improves the capacity for innovation, and fosters the development of more inclusive solutions to social problems (Muñoz et al., 2025).

In the Bolivian context, where the scientific system is undergoing consolidation, the effective inclusion of women can significantly contribute to strengthening national research capacities. This is particularly relevant in priority areas for national development, such as biotechnology, renewable energy, and sustainable natural resource management, where a gender perspective can provide innovative approaches.

The underrepresentation of women in leadership positions also limits the scientific system's ability to respond to women's specific needs and incorporate gender perspectives into research agendas. This is especially important in areas such as health, education, and social development, where women are both primary users and key agents in the implementation of the solutions developed.

Limitations of the Study and Future Research

It is important to recognize the limitations of this study and the opportunities for future research. The uneven availability of data across countries and the lack of standardization in some indicators limit the accuracy of the comparisons made. Furthermore, the primarily quantitative approach, although complemented by qualitative analyses, does not fully capture the complexity of the experiences of women scientists.

Future research should delve deeper into the qualitative analysis of the experiences of Bolivian women scientists, exploring aspects such as resilience and adaptation strategies, support networks, and factors that facilitate professional success. It would also be valuable to develop longitudinal studies that allow for the analysis of career trajectories over time and identify critical moments where the greatest losses of female talent occur.

Furthermore, it is necessary to expand the analysis to include intersectional perspectives that consider how gender interacts with other categories such as ethnicity, social class, and geographic region. In the Bolivian context, where cultural diversity is a fundamental characteristic, this intersectional perspective is particularly relevant for understanding the differentiated experiences of women scientists.

CONCLUSIONS

This study provided a comprehensive view of gender perspectives in scientific production through a comparative analysis between Bolivia and Latin America, revealing progress made and persistent challenges in the pursuit of gender equity in regional science.

Bolivia, with 38% of researchers being women, is in an intermediate position within the Latin American landscape, below the regional average of 45% but showing a trend of sustained growth. This situation reflects both progress achieved through gender equity policies in public universities and the persistence of structural and cultural barriers.

The identification of six categories of gender discourses faced by Bolivian women scientists constitutes a significant contribution to understanding the barriers specific to the national context. These discourses highlight the need for interventions that address not only structural aspects but also cultural elements that perpetuate inequalities.

Horizontal segregation in scientific disciplines represents one of the most significant challenges. The underrepresentation of women in STEM disciplines, particularly in engineering, where they barely reach 23%, limits the utilization of female talent in areas critical to innovation and economic development.

The implications for public policy are clear: comprehensive strategies are required, including strengthening work-life balance policies, implementing gender quota systems in scientific organizations, developing specific funding programs, and creating visibility strategies that contribute to changing social perceptions.

The experience of leading countries such as Argentina and Brazil demonstrates that significant progress can be made through comprehensive and sustained policies, providing a valuable repertoire of strategies adaptable to the Bolivian context.

For future research, it is recommended to delve deeper into qualitative analyses of the experiences of Bolivian women scientists, conduct longitudinal studies, and incorporate intersectional perspectives. It is essential to develop a national system of gender indicators in science and technology for systematic monitoring.

Gender equity in science is a necessary condition for national scientific development. Bolivia has the potential to make significant progress toward gender parity, but it requires sustained commitment from academic institutions, government agencies, and society as a whole.

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