



Women's Performance in Conferences and Their Publications: A Critical Analysis

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Abstract

Introduction Gender inequality occurs in all spheres of society, which is no different in the medical field. Abstract presentations in congress are the vanguard of scientific knowledge, an integral part of topic discussion, and, ideally, culminate in the publication of these works as complete manuscripts.

Objective The objective of this study is to evaluate the role played by women in the presentation of scientific works at the Brazilian Society of Coloproctology congress and in the works published from these presentations.

Methods The bibliometric evaluation of the presented abstracts in the editions from 2015 to 2018 of the Brazilian Congress of Coloproctology was used, along with the works later published from these presentations. Gender identification data was extracted from the authors of the abstracts through their names and research for conference on the Lattes and Google Scholar platforms. The collected data was on the number of female participants and their order of authorship of abstracts and publications, evaluating possible changes when publication occurs.

Results A total of 1,336 abstracts were analyzed, with 91.6% of female authors. When publication occurs, women's presence dropped to 75.2% and suffered a change of order in the position of authorship to one of lesser relevance in 38.1%.

Conclusion Women's participation occurs in most abstracts. However, this proportion undergoes unfavorable changes when these works are published, either by changing the order of authorship, when women leave main positions and become coauthors, or are removed from the complete manuscript's publication.

Keywords

- ▶ descriptors
- ▶ women
- ▶ colorectal
- ▶ manuscripts
- ▶ gender

Introduction

Gender inequality is prevalent in many social spheres, including the medical field. Female leadership is limited even in specialties where women predominate, such as pediatrics, obstetrics, and gynecology, where there is still a higher male influence in management and leadership positions,

such as full professors, department heads, and coordinators.^{1,2} Women in surgical specialties may face implicit biases that can subtly create an environment of exclusion, discouraging them from pursuing academic positions.³ For example, in the United States, in 2019, there were 520 female surgery professors, compared with 3,512 male professors.⁴ Oncologic and cardiothoracic surgery areas also exhibit the

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same imbalance, which will also be observed in the present study within Coloproctology.^{1,4}

This unequal pattern is also described in scientific publications, both in Brazil and in international studies.⁵ Scientific publication serves as a marker of productivity and academic quality, enabling professional growth. An American study reviewing 560 manuscripts found that women accounted for only 24.8% of first authors and 16.3% of last authors of articles, both positions being prominent in authorship.⁶

The objective of this study is to assess the scientific role played by women the Coloproctology surgical specialty in scientific works presented at the Brazilian Congress of Coloproctology, compared with works published after these presentations. Despite women now constituting more than half of medical school graduates, gender inequality remains significant when it comes to leadership roles, especially in surgical specialties.

Methods

This is a descriptive study that conducts a review of scientific abstracts presented at national Coloproctology congresses from 2015 to 2018 and published in their proceedings. Using a bibliometric approach, two different examiners utilized a standardized form to collect data, which was then tabulated using the Excel 2019 (Microsoft Corp. Redmond, WA, USA). The study also evaluated works that were published in peer-reviewed journals, identified through a standardized search in the databases MEDLINE (PubMed), SciELO, and Google Scholar (Google LLC., Mountain View, CA, USA).^{7,8}

Data on author identification in the abstracts were extracted through searching their names and were verified through searches on the Lattes platform and Google Scholar. Through this research, the number of women authors and their classification were determined, followed by a comparison of whether this number was maintained or not when the work was published. The position of their names as first or last authors and other analyses derived from this data were also specified. By doing so, the information was compiled and used to produce the analyses described in this study (► Fig. 1).

After data gathering, a statistical analysis of the results was conducted, including quantitative and qualitative descriptive analysis of the collected data, confidence intervals, comparative analysis of variables, multivariate logistic regression test, data comparison, equality of two proportions, chi-square test, bivariate analysis, and a *p*-value of 0.05 was considered significant.

Due to the use of secondary data from the annals of the Brazilian Congress of Coloproctology and published articles, there was no need for evaluation and approval by an ethics committee for this article.

Results

Over the course of 4 years, from 2015 to 2018, a total of 1,336 abstracts presented at the Brazilian Congress of Coloproctol-

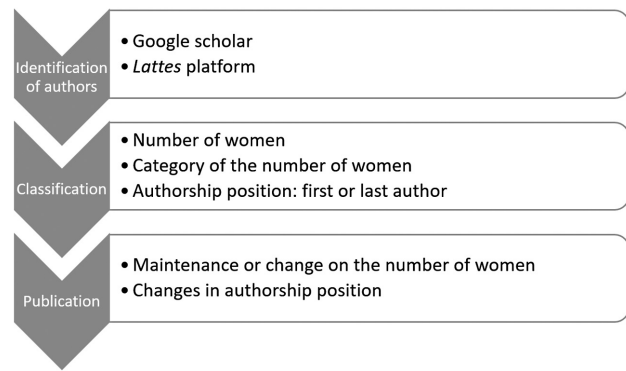


Fig. 1 Methodology of data collection with research.

ogy were analyzed. Among these, 1,169 (64.6%) were in the poster category, and the remaining 35.4% were in the oral category. It is important to note that works from the video presentation category were excluded from the sample. There was heterogeneity in the number of abstracts presented over the years, including variations in the presentation format, with the poster category having the highest number of entries.

Considering the analysis of all works presented, women were involved in 91.6% of the abstracts. The average number of authors per work is 6.7, and the average number of female authors is 2.5, with a growing trend of female authorship over the years. Nevertheless, women occupied the positions of first and last authors, regardless of the presentation category (poster/oral), in 51.9 and 26.9% of the congress abstracts, respectively (► Table 1).

When analyzing the abstracts that were published as full articles, there is a global decline to 75.2% in the presence of women upon publication, with a statistically significant difference between the two groups (► Table 2).

When comparing the abstract presented at the congress with the article subsequently published based on it, a change in the order/position of authors was observed in 85.1% of cases. In the case of female authors, there was a change in the order for those who held prominent positions, meaning they were no longer listed as first or last authors, or were excluded from the work, in 38.1% of cases. There is also a significant decrease in the number of women when the research is published, as shown in ► Table 3.

In ► Table 4, we can observe the prevalence ratio of 0.37 (0.24–0.57) for the presence of women as authors or coauthors. This ratio indicates that the presence of women is a negative factor for the abstract presented at the congress to become a publication.

Discussion

The disharmony in the division of domestic activities, with the expectation for women to fulfill roles as mothers and wives, along with the challenges in their professional lives, can also hinder their involvement in scientific activities. Even today, roles that are equally performed by men and women are unequally valued by society, including in the medical and scientific fields. This is due

Table 1 Qualitative factors of congresses

Variables		2015		2016		2017		2018		Total		p-value
		N	%	N	%	N	%	N	%	N	%	
Presence of women	Yes	267	87	315	95.5	315	89.2	327	94.5	1,224	91.6	<0.001
Number of authors	1	56	21	70	22.2	53	16.8	58	17.7	237	19.4	0.253
	2–3	135	50.6	157	49.8	172	54.6	178	54.4	642	52.5	
	4–5	63	23.6	71	22.5	83	26.3	82	25.1	299	24.4	
	≥6	13	4.9	17	5.4	7	2.2	9	2.8	46	3.8	
First female author	Yes	143	53.6	152	48.3	157	49.8	190	58.1	642	52.5	0.359
Last female author	Yes	64	24	87	27.6	106	33.7	103	31.5	360	29.4	0.071

Note: Chi-square test had been applied.

Table 2 List of published and unpublished abstracts with qualitative factors

Variables		Unpublished		Published		Total		p-value
		N	%	N	%	N	%	
Presence of women	Yes	1,140	92.6	79	75.2	1,224	91.6	<0.001
Classes of number of authors	Zero	91	7.4	21	20	112	8.4	<0.001
	1	216	17.5	21	20	237	17.7	
	2–3	591	48	51	48.6	642	48.1	
	4–5	290	23.6	9	8.6	299	22.4	
	≥6	43	3.5	3	2.9	46	3.4	

Note: Chi-Square test had been applied. Source: Prepared by the author (2023).

Table 3 Changes in publications

Published		N	%	p-value
Author changes	Increased	40	33.1	0.589
	Decreased	44	36.4	
	Remained	37	30.6	
Changes of authors (change of order)	Yes	103	85.1	<0.001
Change of female authors	Increased	27	25.7	<0.001
	Decreased	24	22.9	
	Remained	54	51.4	
Change of female authors (changed order)	Yes	40	38.1	<0.001

Note: The test of equality of two proportions was applied.

Table 4 Comparison of qualitative factors related to the abstracts

Variables	Published	Unpublished	Prevalence	p-value	Prevalence ratio
Presence of women	84	1,140	6.86	<0.001	0.37 (0.24–0.57)
First female author	45	597	7.01	0.47	0.87 (0.59–1.27)
Last female author	21	339	5.83	0.146	0.71 (0.45–1.13)

Note: The test of equality of two proportions was applied.

to the existence of a patriarchal society that deprived women of access to universities and science until the mid-19th century.² Elizabeth Blackwell was the first woman in the world to graduate as a medical doctor, in 1838, and in

Brazil, it was only in 1879 that a decree allowed women to attend colleges and obtain academic degrees. Finally, Rita Lobato became the country’s first female medical doctor in 1887.⁹

The latest Brazilian Medical Demographic Census, conducted in 2020, revealed that women represent 32% of specialists in Coloproctology.¹⁰ Despite this, a study that evaluated four major annual surgery conferences (The Eastern Association for the Surgery of Trauma, Society of American Gastrointestinal and Endoscopic Surgeons, Academic Surgical Conference, and the American Society of Breast Surgeons) observed that out of 1,388 participants, only 28% of the speakers were women.⁵ Another American study in Coloproctology pointed out that since the founding of the American Society of Colon and Rectal Surgeons (ASCRS) in 1899, the presidency has only been held by women twice.³

In this study, the presence of women in abstracts presented at the Coloproctology Congress from 2015 to 2018 ranged from 87 to 94.5%, with an average of 91.6% over the entire period. A study conducted during the Academic Surgical Congress⁴ showed an increase in the number of early-career female first authors in the last 40 years. However, other studies reinforce that women are still a minority in authoring original research articles and as members of journals' editorial boards.^{11–16} The field of Vascular Surgery has the highest female academic production.¹⁷

The first author position in a scientific article is typically occupied by the person who made the most significant contribution to the research, essentially whoever is considered the project's lead author. On the other hand, in congress presentations, the first author position is often associated with the presenter rather than the principal author.^{2,18,19} In our research, we observed a certain balance between men and women: in 2015, of the presented abstracts, 53.6% had women as the first author. In the following years, the statistics remained similar: 48.3 (2016), 49.8 (2017), and 58.1% (2018). However, the total number of works with 6 or more female authors during the period was only 3.8%, indicating that despite the inclusion of these women, male authors are still predominant.

When the presented abstracts are published, our study demonstrated that the presence of women as authors decreases from 91.6 to 75.2%. The total number of women in published works also decreased. Moreover, there was a decline in the distribution of the categories of the number of female authors (2–3 and 4–5) among the published works.

Furthermore, positions of relevance (first or last author) also undergo changes, with 38.1% of the abstracts that were published showing alterations in the order of the first and last female authors to a less prominent position or exclusion. The reason behind this change in order is intriguing, as it may occur due to various factors, such as loss of interest by the authors, modification of the criteria, assignment of the first name to someone who will solely present the work, changes in the involvement of these women throughout the research and article construction, or even a structural change influenced by male dominance, as scientific publication brings more prestige and results than an abstract presented at conferences. Addressing these issues is crucial to promote gender equality and ensure fair recognition for female researchers' contributions in the scientific community.

Some studies show that despite women being roughly equal in numbers to men, when analyzed as last authors, there is still

inequality.² Other analyses describe women as the minority in authorship when it comes to original research articles,¹¹ or topics related to surgical techniques.⁵

In the surgical field, studies show there is still low representation of women in mentoring and leading scientific research, which is evident in the finding of a smaller proportion of women as last authors. A study evaluated an American congress (Academic Surgical Congress) and concluded that for every female author of abstracts, there are approximately three male last authors, a significant difference, especially in the fields of oncologic and cardiothoracic surgery.⁴ In our study, the rate of works with women as last authors was low, varying from 24 to 33.7%.

Another interesting finding in the multivariate analysis was that the presence of women is associated with non-publication, Prevalence ratio (PR): 0.37 (0.24–0.57), meaning there is a lower chance of publication when women are involved in the work.

Although in increasing numbers, women must be credited and encouraged to lead institutions, conduct research, guide articles and studies, speak about scientific and social subjects, and, above all, influence other women to do the same. It is known that the medical and surgical environment, as well as the daily life of institutions, are important factors in bringing women to the goals discussed here. Furthermore, even today, there is much disrespect, disbelief, and contempt for women's productions.

In short, as a historical and recent issue, the presence and role of women in science must be constantly evaluated, discussed, and respected until there is equality in all areas of society, from small spheres to positions of power. To achieve this, it is necessary to provide them with more visibility, attention, and opportunities.

Limitations

We assess that this is a groundbreaking work in the field of Brazilian Coloproctology, but some limitations need to be highlighted: we evaluated the proportional contribution of women through abstracts presented at congresses and manuscripts published based on these presentations. However, the quality of the abstracts that included female authors was not under analysis.

The order of authors can vary for various reasons in conference abstracts and scientific articles, and often the selection criterion for the first author might be the simple fact that they were the presenter at the event. Additionally, no investigation was performed on women whose authorship order was changed or who were excluded from publications later on. Future studies could address the gaps mentioned above, considering that this work was limited to the analysis of quantitative data.

It is also possible that research has been published as full manuscripts during the years analyzed and had greater participation of women without necessarily being presented at the evaluated Coloproctology congresses. Therefore, it is essential to encourage further audit studies to control and better assess what has been presented at conferences and/or

by whom (male and female authors). Part of this work could even be initiated by the medical societies themselves with the aim of improving the scientific content of their events.

Conclusion

The data found in this research demonstrate that women's participation occurs in the vast majority of works presented in the form of abstracts at the Brazilian Coloproctology congress. However, this proportion undergoes unfavorable changes when these abstracts are published, either through changes in authorship order, where women shift from principal positions to coauthors, or even when they are not included in the publication of the full manuscript. Additionally, based on the statistical analysis conducted, it was concluded that the presence of women as first or last authors is a factor associated with nonpublication, exerting a negative influence in this regard.

Author Contributions

Conceptualization: HSJ, GBG
 Data curation: HSJ, GBG, LRM, LIS, and NGL
 Formal analysis: HSJ, JLBdeA, and ETM
 Funding acquisition: HSJ, JLBdeA, and ETM
 Investigation: HSJ, GBG
 Methodology: HSJ, GBG
 Project administration: HSJ, GBG
 Visualization: HSJ, GBG, JLBdeA, and ETM
 Writing—original draft: HSJ and GBG
 Writing—review & editing: HSJ, JLBdeA, and ETM
 All authors read and approved the final manuscript.

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Conflict of Interests

The authors have no conflict of interests to declare.

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