

Gender Gap in academic medicine: a narrative review and the Italian forensic context

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Abstract

Background. Gender gap is a neologism that identifies the disparity between social and professional conditions experienced by females compared to males. The disparity increases as one ascends the academic hierarchy. In recent years, the debate has expanded, and more options have been planned for the elimination of the current gender gap.

Methods. This research was conducted by examining the landscape of the gender gap, particularly in the academic forensic medicine field. Our analysis involved reviewing papers published between 2006 and 2024, identified through electronic database searches (PubMed). The search terms used were: “gender gap” AND “academic” AND “medicine” AND “leadership.” In total, we analyzed 85 papers. Additionally, we examined data from forensic medicine residency programs.

Conclusions. The representation of women in medicine is well-known. Despite the increasing number of women in leadership positions in medicine, they still lag significantly behind men. These data highlight a situation that could be seen as grounds for an accusation of “academic abuse”. In the Italian forensic residency programs, less than 20% are led by women, and among these, not all hold the rank of full professor.

Although a certain rebalancing is already underway, the gap is still significant. There are already regulations obliging local authorities to promote gender equality in councils, companies, and institutions under their jurisdiction. It would be desirable to consider minimum quotas for female participation in university competitions. This would be a first step toward eliminating the gender gap in academic and forensic medical fields. *Clin Ter 2024; 175 Suppl. 1(4):92-96 doi: 10.7417/CT.2024.5093*

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Introduction

Gender gap is a neologism that identifies the disparity between social and professional conditions experienced by females compared to males. It is a condition of inequality that women face compared to men in every country. This disparity extends to numerous, if not all, areas of social and

professional life. The disparity increases as one ascends the academic hierarchy and represents a loss of professionals for academic medical institutions. Historically, the gender gap has manifested across all areas of life, relegating women to the domestic sphere. The inequality was evident from school age, with differences in education between women and men, extending to social and political realms. It was a social emergency that remained silent for centuries. The prejudices underlying these differences date back centuries, rooted in the belief that women were suited only for family life and the care of children, husbands, and fathers, and were therefore not considered to possess the characteristics of leaders. In contrast, men have always been seen as strong and capable of leading the masses, inherently suited to roles of power. Over the centuries, this has constructed a male leadership stereotype that has inexorably marked the history of the world and the female gender. The struggles for women’s social rights have been numerous and have only in the last century led to real opportunities, including educational ones. In Italy, the Casati Law of 1859 began to speak of the cultural unification of the country, sought through an attempt at mass education that finally included women. However, access to education for females was limited to the initial levels, and only much later were women admitted to higher levels of education. Indeed, the first Italian woman to graduate in Medicine and Surgery was Ernestina Paper, who graduated in medicine in Florence in 1877 (1), following Elizabeth Blackwell, who graduated in 1849 in the USA, the first woman in the world to graduate in medicine and surgery (2). Another case to remember is that of Maria Salomea Skłodowska, better known as Marie Curie, who was the first woman to be awarded the Nobel Prize. She received the Nobel Prize in Physics, together with her husband Pierre Curie, for their studies on radiation. In 1911, she received another Nobel Prize in Chemistry for discovering radium and polonium, the latter named in honor of her homeland. It is noteworthy that this scientist was one of only five Nobel laureates to have received two prizes and the only one to have won the Prize in two different scientific fields.

In the early decades of the 1900s, things gradually improved, and women, increasingly educated and aware,

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managed to secure more appropriate job positions, although their salaries were significantly lower than those of men for the same work and qualifications. Despite the increasing education of women, society was not entirely prepared for this revolution. For instance, when the United States entered World War I in 1917, female doctors who applied for commissioned service in the army were rejected solely because of their sex, even though this could have caused a significant resource deficit at that historical moment (3). By the end of the 20th century, the number of women enrolled in medical and surgery faculties had steadily increased, and in recent decades the gender gap has significantly narrowed, leading to an increase in female representation in both medical faculties and STEM (Science, Technology, Engineering, and Mathematics) fields. Despite this recent reduction in gender disparity for access to higher levels of education, women face a new challenge represented by inequality in academic medical fields, which strongly affects their university careers. Gender biases related to medical professionals negatively impact career advancement in the medical sciences. The disparity increases as one ascends the academic hierarchy and represents a loss of professionals for academic medical institutions (4). Since 2006, society has become globally aware of the gender gap, and for the first time, the World Economic Forum introduced the Global Gender Gap Index (GGGI) (5). The use of this index allows for the comparison of gender inequality in different countries (approximately 146) by evaluating four different points: the degree of education, economic opportunities, access to and use of healthcare, and political leadership. In recent years, the debate has expanded, and in Italy, targeted interventions funded with PNRR funds, over 20% of the total (38.5 billion euros), are planned for the elimination of the current gender gap.

Materials and Methods

This research was conducted by examining the landscape of the gender gap, particularly in the academic medicine and forensic medicine field. Our analysis involved reviewing papers published between 2006 and 2024, identified through electronic database searches (PubMed). The search terms used were: “gender gap” AND “academic” AND “medicine” AND “leadership”.

We chose 2006 as the lower temporal limit for our research because, although there were several studies on the topic prior to that date, it was only in 2006 that the gender gap was universally recognized (5). The recognition of the problem allowed us to establish a starting point from which to study the phenomenon in its most salient aspects, while still acknowledging the historical events that led to this point. We found 126 documents, and after eliminating irrelevant topics and duplicates, we analyzed 85 papers. Following a general analysis of the issue, we also decided to examine Italian data from forensic medicine residency programs in 2023 to evaluate the presence of women in the academic hierarchy. The pathway of our research is summarized in Figure 1.

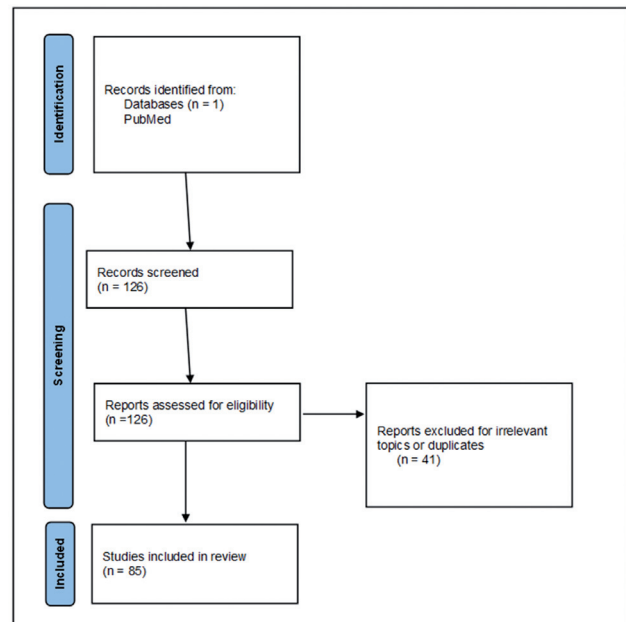


Fig. 1. Prisma chart

Results

Our study highlighted a concept that others before us have already analyzed: we observed that the cultural legacy of a society that has always considered the female gender differently, and as a subordinate if compared to the male gender, has manifested in various ways within social and professional domains, extending into the academic field across all regions. It became evident that gender-related biases against medical professionals negatively impact career advancements in the scientific field, independent of other factors. This disparity among professionals due to gender has been highlighted by several studies, which noted that medical scientific societies are more inclined to assign recognition to male scientists than to female scientists (6). This correlation has also been highlighted by the American Association of Medical Society Executives (AAMSE) (7), and it is undeniable that belonging to groups or professional associations can provide opportunities for inclusion, networking, growth, and research, which are thus denied to female professionals. Other studies have also shown that women are invited as speakers at major scientific events less frequently than their male colleagues (4). The lesser presence of female professionals and scientists at these events naturally results in a lower visibility within the academic community of the scientific achievements reached by female researchers (8); consequently, this leads to a lower likelihood of competing for and attaining academic leadership positions. In recent years, some studies, driven by the growing awareness of the academic gender gap, have also evaluated the presence of female physicians among the authors of published scientific articles. In these cases, as well, women were found to be underrepresented both among the first and the last authors (9).

By analyzing the GGGI data, we noted that among the 146 countries evaluated with the 2023 GGGI (5), the top three positions were occupied by Nordic countries - Iceland, Norway, and Finland - which have managed to close the gender gap with very high percentages, exceeding 86%. Italy was ranked 79th with a GGGI of 0.7. Despite these encouraging data regarding the gender gap, we noted a correlation with other startling data. At this point, we must introduce the so-called Nordic paradox (10). In Nordic countries, which better respect gender equality, there is simultaneously a higher incidence of domestic abuse against women. This data is disheartening; women are still mistreated, whether at home or in the workplace. To stress the concept, we could say that in cases where they are not victims of physical abuse (11-14), they are victims of “academic abuse.” In fact, the representation of women in medicine is well-known; in Italy in 2023, 70% of medical school enrollees were women.

As in many European Countries (15), in Italy, despite the increasing number of women in leadership positions in medicine, they still lag significantly behind men, constituting only 25% of full professors, 18% of department chairs and deans, and 20% of hospital leaders. Additionally, they earn much less than men even with comparable qualifications.

This situation seems to be prevalent across all countries (16) and in all clinical or surgical medical specialties (17). Narrowing the research to the Italian forensic medical field, we analyzed data from the MIUR (18) and sought to analyze data on the directors of forensic medicine residency programs (19) to highlight the potential presence of a gender gap in the forensic academic field. We observed that out of all the Italian residency programs, less than 20% are led by women, and among these, not all hold the rank of full professor (Table 1).

Discussion

Our study clearly shows that female medical professionals are underrepresented in leadership roles in the academic field. Among full professors, directors of residency programs, and even the rectors of the most important universities internationally and particularly within Italy, female representation is significantly low. The highest hierarchical roles are held by men, which is not explained by the number of female presences in medical academia, where women actually outnumber men. The numbers depict a scientific

Table 1. Italian forensic medicine residency programs (Pink: female Blu: male)

RESIDENCY PROGRAMS - 2023	FULL PROFESSOR/ ASSOCIATE
Forensic medicine in BARI	Full Professor
Forensic medicine in BOLOGNA	Full Professor
Forensic medicine in BRESCIA	Full Professor
Forensic medicine in CAGLIARI	Full Professor
Forensic medicine in CAMPANIA -"L. Vanvitelli"	Full Professor
Forensic medicine in CATANIA	Full Professor
Forensic medicine in CATANZARO	Associate
Forensic medicine in ROMA - Cattolica del Sacro Cuore	Full Professor
Forensic medicine in FIRENZE	Full Professor
Forensic medicine in FOGGIA	Full Professor
Forensic medicine in GENOVA	Full Professor
Forensic medicine in INSUBRIA	Associate
Forensic medicine in MESSINA	Full Professor
Forensic medicine in MILANO	Full Professor
Forensic medicine in MODENA-REGGIO EMILIA	Full Professor
Forensic medicine in NAPOLI "Federico II"	Full Professor
Forensic medicine in PADOVA	Associate
Forensic medicine in PALERMO	Full Professor
Forensic medicine in PAVIA	Associate
Forensic medicine in PISA	Full Professor
Forensic medicine in Ancona – Univ. Pol. MARCHE	Full Professor
Forensic medicine in ROMA "Tor Vergata"	Full Professor
Forensic medicine in ROMA La Sapienza	Associate
Forensic medicine in SIENA	Full Professor
Forensic medicine in TRIESTE	Full Professor
Forensic medicine in VERONA	Full Professor

bottleneck that filters leaders based on gender and selects males. Although our study did not consider causal events, the lower presence of female medical professionals cannot merely be the result of a lack of adequately qualified women. In light of the data, a change of course appears mandatory. We, as a scientific community, can and must do better.

Let us remember that higher hierarchical roles have an impact on scientific progress and also on subsequent political choices; therefore, this cannot be the result of predetermined inequality. According to the authors, inequality should be eradicated, but this does not imply that there should be any form of gratuitous recognition for the female scientific community. However, until the scientific community, even in its highest hierarchical roles at the academic level, has representatives chosen without gender biases, perhaps it would be desirable to consider minimum quotas for female participation in university competitions. There are already regulations obliging local authorities to promote gender equality in councils, companies, and institutions under their jurisdiction. Similarly, in academia, it should be ensured that each gender is represented by at least one-third, both in the elections of school or department directors (like political elections) and in introducing double gender preference for candidates. This would be a first step toward eliminating the gender gap in academic and forensic medical fields.

Finally, it is worth mentioning the role of artificial intelligence (AI), which in recent decades has been inexorably reshaping the role of physicians with significant implications not only in social but also in academic contexts (20). AI could indeed be utilized by female physicians who, over the decades, have been excluded from accessing the latest scientific innovations that were more readily available to those in higher hierarchical positions. Today, with the widespread availability of AI-utilizing programs, it could become a valuable tool in the scientific field, enabling female scientists to reach heights previously inaccessible to them. This, coupled with appropriate social measures, appears to be another opportunity to improve the current inequitable situation, eliminating all forms of inequality and restriction, which are psychologically as relevant as other factors (21), and thereby enhancing the awareness and scientific value of every researcher regardless of gender, ultimately leading to benefits for the well-being of all.

Conclusions

The urgency of the situation has been widely recognized, and in recent years, metaphorically speaking, it has undergone a thorough forensic examination; the tools to address it are available, and society and academia have a duty to implement them. The authors wish to emphasize that any intervention aimed at the possible and desirable solution to the gender gap, it should be clear, must not create a non-meritocratic model. Meritocracy must be the foundation of any effort to improve the gap. Our paper aims to underscore the necessity of accelerating an already ongoing process that can reduce inequalities while maintaining, or even better, raising the level of competencies in academia. Greater academic competition between genders would not only be desirable and socially just, but it could also enhance and

diversify expertise. For example, candidates in a competition would face more competitors, fostering a greater drive and sense of determination. Finally, like any epochal change, the elimination of the gender gap in academic settings, including the Italian forensic context, requires everyone to do their part. And perhaps more than in other areas, academics, as scientists, should embody the new torchbearers carrying the flame of science and gender equity.

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