Original Research

OPEN ACCESS

Determinants of Career Advancement Among Medical Doctors in Italy: The Gender Gap

Citation: Mazzalai, E., Turatto, F., Furia, G., Heidar Alizadeh, A., Sapienza, M., Tarsitano, M. G., Patrizi, C., Capelli, G., Rome OMCeO Group, Damiani, G., & De Vito, C. (2026). Determinants of Career Advancement Among Medical Doctors in Italy: The Gender Gap. *Interdisciplinary Journal of Nursing and Health,* 5(3): 201-211. https://doi.org/10.82051/ijnh-2025-333

Disciplines: Health Workforce, Gender Studies, Medical Education

Received: February 25, 2026

Revised: June 8, 2026

Just accepted: July 22, 2026

Published: September 23, 2026

Correspondence: Elena Mazzalai - Department of Public Health and Infectious Disease, Sapienza University of Rome, Rome, Italy; Mail: elena.mazzalai@uniroma1.it

Copyright: © The Author(s) 2026. This article is distributed under the terms of the Creative Commons Attribution 4.0 International (CC BY 4.0).

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Conflict of Interest: The author(s) declare(s) no conflict of interest.

Funding: This research received no external funding.

Elena Mazzalai[1,2], Federica Turatto[1,3], Giuseppe Furia[1,4], Aurora Heidar Alizadeh[4,5], Martina Sapienza[4,6], Maria Grazia Tarsitano[4,7], Cristina Patrizi[4,8], Giovanni Capelli[4,9], Rome OMCeO Group, Gianfranco Damiani[4,5,10], Corrado De Vito[1]

[1] Department of Public Health and Infectious Disease, Sapienza University of Rome, Rome, Italy
[2] Local Health District 3, ASL Rome 1, Rome, Italy
[3] Department of Clinical and Biological Sciences, University of Turin, Turin, Italy
[4] Physicians and Dental Surgeons Board of the Province of Rome, Rome, Italy
[5] Department of Health Sciences and Public Health, Università Cattolica del Sacro Cuore, Rome, Italy
[6] Health Management, National Institute for Infectious Diseases "Lazzaro Spallanzani" IRCCS, Rome, Italy
[7] Department of Human Sciences and Promotion of the Quality of Life, San Raffaele Roma Open University, Rome, Italy
[8] Local Health District 5, ASL Rome 2, Rome, Italy
[9] National Center for Disease Prevention and Health Promotion, Istituto Superiore di Sanità, Rome, Italy
[10] Department of Woman and Child Health and Public Health, Fondazione Policlinico Universitario "A. Gemelli" IRCCS, Rome, Italy

Abstract

Introduction. Despite increasing numbers of women in medicine, they remain underrepresented in senior roles. Gender biases, lack of mentorship, work-family imbalance, and limited opportunities for advancement are among the factors that could hinder women's career progression in the field. The study aims to investigate factors associated with the gender gap in career advancement in the medical field in Italy. **Methods.** A cross-sectional study was conducted through a survey among the members of the Professional Order of the Physicians and Dental Surgeons of the Province of Rome from October 2023 to February 2024, focusing on career advancement, work-family balance, workload control, and harassment. Four different career paths were identified: Academic researchers and professors (ARP), Employees (EM), Self-employed medical doctors (SE), and Physicians practicing

in agreement with the NHS (PPAN). Descriptive analyses and multivariate logistic regression were run to assess factors influencing career progress and workplace experiences across various medical careers.

Results. A survey of 260 physicians found significant differences in career advancement: males, older physicians, and PPAN had higher odds of career advancement. Logistic regression showed that age, gender, and career type were associated with career advancement, with gender having a borderline significant interaction with having children. Work-family balance, exhaustion, and control over work had no significant impact on advancement. Harassment was reported more by women (36.4%) than men (17.2%), particularly in the EM subgroup, and greater control over work was significantly linked to lower harassment odds.

Discussion. A lower publishing rate among female academic hospital physicians and the impact of parenthood could be the reasons behind gender disparities in career progression between male and female medical doctors. Despite all other factors, being a woman is one of the most significant characteristics in shaping career progression.

Keywords: Gender Gap, Medical Doctors, Career Advancement, Inequalities, Barriers

Introduction

The issue of gender gap in our society and in the work environment is gaining space in academic and public debate.

In Europe and North America, the number of female physicians and women in medical research has increased considerably (Johannesen & Hagen, 2012; Buddeberg-Fischer et al., 2003), yet they are still underrepresented at senior levels, as well as in the editorial boards of major medical journals, and face barriers to academic career progression. (Fridner et al., 2015; Penny et al., 2014; Amrein et al., 2011).

In Italy, the percentage of women filling medical manager roles within the National Healthcare Service (NHS) went from 38.4% in 2010 to 48.1% in 2019, which rises to 64.0% considering personnel aged 35-44. However, both at the hospital and territorial level, 34.7% of women work in low-middle management and 17.2% are top managers (Ministero della Salute, 2021; OECD, 2020). Previous studies have confirmed the difficulty for women in Italy to reach leading positions in various medical fields, recognizing among the main determinant factors the presence of discriminatory practices, the lack of support and female networks, social expectations and gender roles hampering work-family balance (Larese Filon et al., 2019). The health academic field is no exception: women represent 32.7% of the academic staff, but the proportion of women is inversely proportional to the degree of career advancement (46.2% of researchers, 33.5% of associate professors and 19.1% of full professors are female) (MIUR; De Angelis & Grüning, 2020).

Previous studies have identified, among the possible reasons for the underrepresentation of women at senior levels in the medical field the clinical workload, the difficulty of having a mentor, a lower possibility of publishing their scientific works (House et al., 2021; Blood et al., 2012; Pololi et al., 2012) because of greater challenges in securing financial research support, and a lower representation of women in the editorial field and in scientific journals' boards (Lundine et al., 2018; Mayer et a., 2008; Valian, 1998). In the early defining stages of their careers, women are also less likely than men to hold full-time positions, possibly due to domestic tethers (Hitti et al., 2022), the presence of minor children at home and the feeling of

exhaustion due to the workload, factors that seem to penalize women more than men. (Fridner et al., 2015)

In the Italian context, the definition of career progression in the medical field is not homogeneous across different career paths, as it varies considerably between professional settings, depending on the characteristics of the organisation (i.e. Local Healthcare Units, Universities, Hospitals, ...) and the kind of employment contract. For career paths with hierarchical progression, such as academia and physicians practicing within the NHS, career advancement coincides with attaining the highest positions within the organization. In contrast, for career paths without upward mobility, the advancement may instead be measured by other factors, such as salary increases for General Practitioners or the number of working hours for Specialist Physicians.

Evidence on determinants of gender inequalities in career progression is essential to ensure adequate representation of women at the highest levels of the medical field. It is therefore necessary to broaden the investigation in different contexts to verify the presence of specific and contextual factors that influence women's career in the medical field. This study aims to investigate factors related to career advancement in the medical field in Italy with a focus on gender disparities.

Methods

Survey development and distribution

This cross-sectional study was carried out among medical doctor members of the Professional Order of the Physicians and Dental Surgeons of the Province of Rome (Ordine dei Medici Chirurghi e Odontoiatri di Roma OMCeO Roma), consisting of 41,553 people as of December 2024 (OMCeO Roma, 2024).

The survey was first published online on October 17, 2023 on the OMCeO-Roma website. Subsequently, the link to the anonymous questionnaire and a short introductory presentation of the study was sent via email as part of the weekly newsletter of the Order to all members. Two reminders were sent and the questionnaire remained available until February 29, 2024. Due to the low response rate, further ad hoc reminders were sent to increase participation throughout March 2024. Given the survey dissemination procedure, the study relies on a non-probabilistic self-selected sample.

The questionnaire was developed based on the one from Fridner et al., 2015, translated into Italian, and adjusted for the different target populations. The translated questionnaire had previously been used by a research group at the University of Padua, originally involved in the HOUPE study, a longitudinal research program on work-related health, organizational culture, career paths, and working conditions in university hospitals in Sweden, Norway, Iceland, and Italy. It was structured into two main sections: the first section investigated sociodemographic characteristics such as marital status, number of children, and basic information about the type of medical career, and was the same for all participants; the second section was articulated in four different branches, reflecting the different medical careers, and investigated specific characteristics of each job, working position, workload and control over work, work-family balance, work environment and harassment, and physical and mental health and wellbeing.

The different medical careers were labeled as Academic researchers and professors (ARP), Employees (EM), Self-employed medical doctors (SEMD), and Physicians practicing in agreement with the NHS (PPAN), this last category including General Practitioners (GP), General Paediatrician, and Specialist Physicians.

The working position for ARP was identified either as full or assistant professor, whereas for EM it was classified as head physician, permanent medical officer or fixed-term medical officer. SEMD and PPAN are characterized by no differentiation in working position, and therefore, no information related to working position was retrieved.

Control over work and exhaustion were assessed through the items considered by Fridner et al., 2015 of the "Nordic Questionnaire for Psychological and Social Factors at Work" (QPS Nordic) and "Mini Oldenburg Burnout Inventory" (MOLBI), respectively. Each item was obtained on a Likert scale and a summary measure was calculated as the mean response score per person.

The work-family balance score was dichotomised as "Poor" or "Good" according to

the Likert scale score to the question "My work prevents me from taking care of my family activities as much as I would like". Answers "partially agree" and "completely agree" were categorised as "Poor", whereas "partially disagree" and "completely disagree" were categorised as "Good".

ARP and EM were also asked about control over workload and work management within their organisations.

Variables

The main outcome was "career advancement", a dichotomous variable which was identified differently for each professional category. For the ARP, positive career advancement was identified as being a professor, for EM as being the head of a department of the local healthcare unit, for SEMD as earning more than 5000€ per month, whereas for PPAN the cut-off for the definition of career advancement was considered to have at least 1500 patients, which is the maximum allowed number of patients for a single GP or General Paediatrician, or having a 38 hours per week work shift for Specialist Physicians, which is the maximum amount of working hours set by law for this kind of contracts, meaning that they reached the peak of their activity.

A secondary outcome was having experienced harassment on the job in the last six months. The definition of harassment was an offensive behavior that "[...] has to occur repeatedly over a period of time, and the person confronted has to experience difficulties defending himself/herself".

The qualitative variables, such as sex, marital and parental status, and career advancement were dichotomized, whereas age, control over work and exhaustion were analyzed as continuous variables.

Statistical Analyses

A descriptive analysis was conducted to identify the sociodemographic characteristics of the sample, as well as work-family balance, control at work, and exhaustion. Percentages were estimated for categorical variables, whereas mean and standard deviation or median and interquartile ranges were calculated for continuous variables. Univariate analysis between dependent and independent variables was run through $\chi 2$ or Fisher's exact test. Two multivariate logistic regression models were built including all the variables with a statistically significant association with p-value <0.25 and those of epidemiological interest. The first multivariable logistic regression model was conducted to understand the influence of the independent variables of age, gender, marital status, presence of children, type of medical career and work-family balance on the primary outcome, i.e. career advancement. The interaction between sex and having children was also added to the model.

The second multivariable logistic regression model focused on the influence of the independent variables of working position, age, sex, level of exhaustion, and control over work on the secondary outcome, which was experiencing episodes of harassment at the workplace.

A p-value <0.05 was considered significant for all analyses. The odds ratio (OR) and 95% confidence interval (95% CI) were calculated for each independent variable. The statistical analyses were done through STATA 18 (Stata Corporation, College Station, TX, USA).

Ethical approval

Ethical approval for this study was obtained from the Ethics Committee for Transdisciplinary Research of Sapienza University of Rome (determination 49/2023) on 17/03/2023.

Results

A total of 260 physicians responded to the survey. The majority of them (41%) were EM, followed by ARP (24%), PPAN (18%) and SEMD (13%) The characteristics of the respondents are reported in Table 1.

In the univariate analysis (Table 2), statistically significant differences in career advancement were observed according to gender, age, and type of medical career (for the definition of career advancement for different medical careers, see the Methods section). Male doctors reported career advancements significantly more frequently than females (33.3% vs. 15.9%, p=0.002). Likewise, older physicians were more

Table 1. Characteristics of the sample.

Characteristics		Total, n (%)	ARP, n (%)	EM, n (%)	PPAN, n (%)	SEMD, n (%)	Other, n (%)
Number of respondents		260	63 (24.2)	106 (40.8)	47 (18.1)	34 (13.1)	10 (3.9)
Sex	Female	182 (70.0)	34 (54.0)	83 (78.3)	34 (72.3)	24 (70.6)	7 (70.0)
	Male	78 (30.0)	29 (46.0)	23 (21.7)	13 (27.7)	10 (29.4)	3 (30.0)
Age group	Median (Q1-Q3)	49 (39.5-62)	53 (30-77)	44.5 (26-71)	60 (25-71)	54 (30-75)	42 (27-71)
Civil status	In a relationship	215 (82.7)	55 (87.3)	85 (80.2)	41 (87.2)	26 (76.5)	8 (80.0)
	Not in a relationship	45 (17.3)	8 (12.7)	21 (19.8)	6 (12.8)	8 (23.5)	2 (20.0)
Children	Yes	165 (63.5)	46 (73.0)	59 (55.7)	36 (76.6)	19 (55.9)	5 (50.0)
	No	95 (36.5)	17 (27.0)	47 (44.3)	11 (23.4)	15 (44.1)	5 (50.0)
Career advancement	Yes	55 (21.1)	10 (15.9)	14 (13.2)	22 (46.8)	9 (26.5)	0 (0.0)
	No	205 (78.9)	53 (84.1)	92 (86.8)	25 (53.2)	25 (73.5)	10 (100.0)
Work-family balance	Poor	45 (17.3)	11 (17.5)	14 (13.2)	8 (17.0)	10 (29.4)	2 (20.0)
	Good	215 (83.0)	52 (82.5)	92 (86.8)	39 (83.0)	24 (70.6)	8 (80.0)
Control at work	Median (Q1-Q3)	2.67 (2-3.3)	3 (2.2-3.5)	2.5 (1.7-3.2)	NA*	NA*	2.67(2.3-3.2)
Exhaustion	Mean (SD)	2.79 (0.32)	2.73 (0.38)	2.80 (0.31)	2.83 (0.30)	2.81 (0.27)	2.74 (0.28)

Legend. NA: not attributable. ARP: Academic researchers and professors; EM: Employees; PPAN: Physicians practicing in agreement with the National Healthcare Service; SEMD: Self-employed medical doctors.

likely at a higher career level, with a median age of 62 years old (Q1-Q3=53-68) among those reporting career advancement vs. 46 years old (Q1-Q3=38-59) of those who did not (p<0.001). PPAN were significantly more represented among the career advancement group (46.8%) compared to all other categories of medical career (SEMD 26.5%, ARPs 15.9 %, EM 13.2 %, p<0.001). Differences in work-family balance, control over work and exhaustion were not statistically significant among the two groups.

The logistic regression model, which included age, gender, marital status, children, type of medical career and work family balance, showed that older age, being male, and being employed as PPAN were associated with career advancement (Table 3). When considering the possible interaction between gender and having children, though gender was not a statistically significant predictor, the interaction term was borderline significant (Table 4).

When adding control over work to the model (which restricted the sample only to ARP and EM), the interaction term remained a statistically significant predictor of career advancement (OR 0.05, p=0.048) (Table 5).

We analyzed the association of experiencing harassment in the workplace with gender. The association was statistically significant with 36.42% of women reporting harassment in the workplace compared to 17.24% of men (p=0.001). This relationship was observed also in the EM subgroup (48.19% of women and 17.39% of males reported being harassed, p=0.008), where we investigated the role of potential predictors of harassment as well, such as working position,

Table 2. Results from the univariate analysis.

		Career advancement		
Characteristics		No (%) n=205	Yes (%) n=55	p-value
Sex	Female	153 (84.1)	29 (15.9)	0.002
	Male	52 (66.7)	26 (33.3)	
Age group	Median (Q1-Q3)	46 (38-59)	62 (53-68)	0.000
Civil status	In a relationship	169 (78.6)	46 (21.4)	0.835
	Not in a relationship	36 (80.0)	9 (20.0)	
Children	Yes	127 (77.0)	38(23.0)	0.272
	No	78 (82.1)	17 (17.9)	
Type of medical career	ARP	53 (84.1)	10 (15.9)	0.000
	EM	92 (86.8)	14 (13.2)	
	PPAN	25 (53.2)	22(46.8)	
	SEMD	25 (73.5)	9 (26.5)	
	Other	10 (100.0)	0 (0.0)	
Work-family balance	Poor	32 (71.1)	13 (28.9)	0.162
	Good	173 (80.5)	42 (19.5)	
Control at work	Median (Q1-Q3)	2.67 (1.83-3.33)	3 (2.33-3.58)	0.090
Exhaustion	Mean (SD)	2.79 (0.32)	2.78 (0.29)	0.848

Legend. ARP: Academic researchers and professors; EM: Employees; PPAN: Physicians practicing in agreement with the National Healthcare Service; SEMD: Self-employed medical doctors.

Table 3. Result from the multiple logistic regression analysis (without interaction term).

	Odds ratio	SE	95% CI	p-value
Age	1.08	0.02	1.05-1.12	<0.001
Gender (ref. Male)	0.36	0.14	0.17-0.76	0.007
Marital status (ref. not married)	1.30	0.61	0.51-3.28	0.584
Children (ref. no children)	0.51	0.22	0.23-1.17	0.113
Type of medical career (ref. ARP)				
SEMD	1.82	1.11	0.56-5.99	0.322
PPAN	6.44	3.29	2.37-17.52	<0.001
EM	1.51	0.75	0.57-4.02	0.411
Work-family balance (ref. low)	1.03	0.47	0.42-2.50	0.947

Legend. ARP: Academic researchers and professors; EM: Employees; PPAN: Physicians practicing in agreement with the National Healthcare Service; SEMD: Self-employed medical doctors.

Table 4. Results from the multiple logistic regression analysis for career advancement.

	Odds ratio	SE	95% CI	p-value
Age	1.08	0.02	1.05-1.12	<0.001
Gender (ref. Male)	1.13	0.81	0.27-4.68	0.871
Marital status (ref. not married)	1.31	0.63	0.51-3.37	0.566
Children (ref. no children)	1.63	1.21	0.38-6.96	0.508
Interaction term Children-gender	0.18	0.16	0.03-1.00	0.050
Type of medical career (ref. ARP)				
SEMD	1.88	1.16	0.56-6.28	0.307
PPAN	7.27	3.84	2.57-20.47	<0.001
EM	1.63	0.84	0.59-4.48	0.342
Work-family balance (ref. low)	1.03	0.47	0.42-2.54	0.936

Legend. ARP: Academic researchers and professors; EM: Employees; PPAN: Physicians practicing in agreement with the National Healthcare Service; SEMD: Self-employed medical doctors.

control over work and exhaustion, using a multiple logistic regression model (Table 6). The analysis showed that the only statistically significant predictor of experiencing harassment at the workplace was control over work, with higher levels of control associated with lower odds of experiencing harassment.

Table 5. Result from the multiple logistic regression analysis with interaction term and control over work (restricted to ARP and EM).

	Odds ratio	SE	95% CI	p-value
Age	1.18	0.04	1.10-1.27	<0.001
Gender (ref. Male)	2.19	2.77	0.18-26.28	0.538
Marital status (ref. not married)	0.98	0.65	0.27-3.61	0.977
Children (ref. no children)	5.61	7.43	0.42-75.23	0.193
Interaction term Children-gender	0.05	0.07	0.00-0.97	0.048
Type of medical career (ref. ARP)				
EM	3.89	2.72	0.98-15.34	0.053
Work-family balance (ref. low)	1.13	0.81	0.28-4.57	0.864
Control over work	1.45	0.52	0.72-2.95	0.299

Legend. ARP: Academic researchers and professors; EM: Employees.

Table 6. Result from the multiple logistic regression analysis for harassment in the workplace.

	Odds ratio	SE	95% CI	p-value
Gender (ref. Male)	3.27	2.20	0.88-12.21	0.078
Age	1.02	0.02	0.98-1.07	0.322
Working position (ref. Head physician)				
Permanent Medical Officer	1.07	0.77	0.27-4.35	0.920
Fixed-term Medical Officer	2.41	2.24	0.39-14.92	0.346
Control over work	0.42	0.12	0.24-0.74	0.002
Exhaustion	0.98	0.74	0.22-4.37	0.987

Discussion and conclusions

This research attempts to depict the characteristics of career advancement in a sample of medical doctors in four different career paths in Italy. Our findings suggest that, being older, being male and working as a PPAN is associated with higher odds of career advancement. Academic work appears to be associated with lower career advancement odds than all other career paths. Having children appeared to have a differential impact on male and female physicians, while work-family balance did not seem to be significantly associated with career advancement when adjusting by the other factors.

In our sample, being a male was significantly associated with higher odds of career advancement, which aligns with the literature on the subject. Although there is evidence that gender disparities also exist in non-academic medical career paths (Weil et al., 1996; De Rosa et al., 2024; Bosco et al., 2020), the majority of the literature on the subject has focused on academic career opportunities for medical doctors (Bennett et al., 2019; Collazo et al., 2024; Lee et al., 2023; Hunter et al., 2021; Sharma et al., 2025; Khatib et al., 2024; De Paola, 2024). Publishing rate is an essential element that can generate disparities between the genders (Kaufman & Chevan, 2011) among academic hospital physicians (Løvseth et al., 2014). According to a global analysis, women contribute to approximately 30% of scientific publications. (Larivière et al., 2013) Even in Italy, the scientific production of women is lower than that of their male colleagues. A similar gender publication gap is evident when considering publications with a woman as the first author (Abramo et al., 2009; Jagsi et al., 2006). A multicenter study compared the volume of publications of male and female medical personnel in Norway, Sweden, and Italy. In all three samples, men published more than women. This phenomenon was more emphasized when considering publications as first or last authors. (Løvseth et al., 2014) Similarly, an analysis of the Italian scientific production regarding COVID-19 throughout the first months of the health emergency revealed a low prevalence of studies with a female first or last author (Mazzalai et al., 2022). Possible reasons for this include gender-based discrimination and structural barriers such as limited access to established networks, lower access to quality mentorship and difficulty in gaining funds for research. Moreover, studies suggest balancing work and family responsibilities could play a role in this pattern

(Larese Filon et al., 2019; House et al., 2021; Hitti et al., 2022; Rosa et al., 2024; Bosco et al., 2020).

In fact, having children or being married did not seem to influence career advancement in our multiple regression analyses, although the interaction between gender and having children turned out to be statistically significant. This seems to point to the differential impact that being a parent has on male and female physicians. This is well acknowledged, and the literature showed how parenthood impacts more heavily on women's rather than men's career, widening the pay gap between sexes, and its substantial persistence over the lifecycle (Angelov et al., 2016; Goldin et al., 2024).

Working in the academic field was independently associated with lower odds of career advancement in the multiple regression models compared to other career paths, although these differences were not always statistically significant. In particular, being PPAN was associated with higher odds of career advancement. This could be partly attributed to the way in which career advancement was measured for PPAN, with a high proportion of medical doctors in this field having reached the maximum number of patients or hours of contract. Indeed, in Italy the average number of GPs per 1000 inhabitants is 0.69, meaning that each doctor has on average more than 1449 patients. In the Lazio Region, where the analysis was conducted, the rate is slightly higher (0.71 GP/1000 inhabitants), but still the share of patients is very close to the maximum number allowed. The situation is similar for General Pediatricians (ISTAT, 2025).

When excluding the influence of gender, work-family balance did not appear to have a significant impact. Even though evidence on the topic is scarce and often unclear, these results do not seem to align with recent evidence highlighting how a better work-life balance and job satisfaction positively influence career advancement, at least for managers (Lyness & Judiesch, 2008). Another study showed how work-life balance was positively associated with career opportunities, even though women reported lower scores for both work-life balance and career opportunities (Pace & Sciotto, 2022). However, based on our results, the disadvantage that women experience is not only related to a heavier burden of domestic duties and difficulties in balancing work with family life, but rather to other factors that would deserve further investigation.

Control over work did not seem to play a significant role in career advancement either, nor did it play a significant role in the univariate analyses in the whole sample or in the multiple logistic regression for ARP and EM. By contrast, the study by Fridner et al., 2015 showed that control over work was an important predictor of publishing rate (in turn associated with career advancement) in medical doctors with a PhD and that men experienced higher control than women.

Our analyses suggest that experiencing harassment in the workplace could be associated with gender, with women experiencing harassment more frequently than their male colleagues. When analyzing a wider range of possible determinants in the employed subgroup, control over work seemed to be the only significant predictor of experiencing harassment. This seems to point to the fact that physicians experiencing lower levels of control over their work are more subject to harassment. In this subsample, the relationship between control over work and working position is u-shaped, with lower mean levels of control being reported in the permanent medical officers. The small sample size could partly explain the lack of statistical significance of gender in the multiple regression analysis.

The study has some limitations which should be acknowledged. The response rate from the study sample was low, around 0.63%, and the sample size small. Therefore, the effect of certain factors could not be estimated precisely. Moreover, the sample size has limited the possibility to analyze in further detail the determinants of career advancement for each career path, such as, for example, specific working positions or medical fields (surgical, diagnostic, etc.). The sampling strategy may have been affected by selection bias, as participation was self-selected due to the survey dissemination methods. Consequently, individuals with a stronger interest in the topic, and potentially those more affected by gender disparities, may have been more likely to take part in the survey.

Finally, career advancement was dichotomized for all career paths, according to the progression in job roles for ARP and EM, reaching the maximum number of patients or hours for PPAN, and reaching a salary threshold for SEMD. This allowed us to compare different career paths,

although inevitably overlooking peculiarities in each path.

To our knowledge, this is the first study analyzing the factors influencing career advancement in medical doctors in the Italian context with a gender perspective. It provides an overview of the current situation for different career paths in the medical field and identifies critical areas for improving current working conditions in the medical field. Even though the access of women to the medical field has increased and reached that of men, inequalities persist when looking at senior positions. Moreover, women are more likely to experience harassment in the workplace. Even though the understanding of the underlying factors remains limited, gender appears to be the strongest determinant of power imbalance.

This research could serve as a starting point for further investigations in this area. Further studies are needed to provide evidence on the reasons behind the role of gender in hampering the career progression of women. Future research should include a focus on career-specific analyses to better understand each work environment's specific characteristics.

Acknowledgments

The authors sincerely express their gratitude to the Rome OMCeO Group members: Antonio Magi, Stefano De Lillo & Guido Coen Tirelli.

© The Author(s) 2026. This article is published by iEditore and distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0).

References

- Abramo, G., D'Angelo, C. A., & Caprasecca, A. (2009). Gender differences in research productivity: A bibliometric analysis of the Italian academic system. *Scientometrics*, 79(3), 517–539. https://doi.org/10.1007/s11192-007-2046-8
- Amrein, K., Langmann, A., Fahrleitner-Pammer, A., Pieber, T. R., & Zollner-Schwetz, I. (2011). Women underrepresented on editorial boards of 60 major medical journals. *Gender Medicine*, 8(6), 378–387. https://doi.org/10.1016/j.genm.2011.10.007
- Angelov, N., Johansson, P., & Lindahl, E. (2016). Parenthood and the gender gap in pay. *Journal of Labor Economics*, 34(3), 545–579.
- Bennett, C. L., Raja, A. S., Kapoor, N., Kass, D., Blumenthal, D. M., Gross, N., & Mills, A. M. (2019). Gender differences in faculty rank among academic emergency physicians in the United States. *Academic Emergency Medicine*, 26(3), 281–285. https://doi.org/10.1111/acem.13685
- Blood, E. A., Ullrich, N. J., Hirshfeld-Becker, D. R., Seely, E. W., Connelly, M. T., Warfield, C. A., & Emans, S. J. (2012). Academic women faculty: Are they finding the mentoring they need? *Journal of Women's Health*, 21(11), 1201–1208. https://doi.org/10.1089/jwh.2012.3529
- Bosco, L., Lorello, G. R., Flexman, A. M., & Hastie, M. J. (2020). Women in anaesthesia: A scoping review. *British Journal of Anaesthesia*, 124(3), e134–e147. https://doi.org/10.1016/j.bja.2019.12.021
- Buddeberg-Fischer, B., Leemann, R., & Klaghofer, R. (2003). Sociodemographic and career characteristics in female and male faculty members of Swiss medical schools. *Swiss Medical Weekly*. https://smw.ch/index.php/smw/article/view/270
- Collazo, A., Yu, X., Jan, Q., Xie, C. Z., & Campbell, K. M. (2024). Trends among women in academic medicine faculty ranks. *Journal of Women's Health*, 33(6), 723–728. https://doi.org/10.1089/jwh.2023.0886
- De Angelis, G., & Grüning, B. (2020). Gender inequality in precarious academic work: Female adjunct professors in Italy. *Frontiers in Sociology*, 4, Article 87. https://doi.org/10.3389/fsoc.2019.00087
- De Paola, L. (2024). Gender gap in academic medicine: A narrative review and the Italian forensic context. *Clinica Terapeutica*, 175(Suppl. 1, No. 4), 92–96. https://doi.org/10.7417/CT.2024.5093
- De Rosa, S., Schaller, S. J., Galarza, L., Ferrer, R., McNicholas, B. A., Bell, M., Helms, J., Azoulay, E., & Vieillard-Baron, A. (2024). Barriers to female leadership in intensive care medicine: Insights from an ESICM NEXT & Diversity Monitoring Group survey. *Annals of Intensive Care*, 14(1), Article 126. https://doi.org/10.1186/s13613-024-01358-3
- Fridner, A., Norell, A., Åkesson, G., Gustafsson Sendén, M., Tevik Løvseth, L., & Schenck-Gustafsson, K. (2015). Possible reasons why female physicians publish fewer scientific articles than male physicians: A cross-sectional study. *BMC Medical Education*, 15, Article 67. https://doi.org/10.1186/s12909-015-0347-9
- Goldin, C., Kerr, S. P., & Olivetti, C. (2024). The parental pay gap over the life cycle: Children, jobs, and labor supply. *Journal of Economic Dynamics and Control*, 169, Article 104963. https://doi.org/10.1016/j.jedc.2024.104963
- Hitti, E., Hadid, D., Khoury, S. J., Tamim, H., Makki, M., & Karam, C. M. (2022). Domestic tethers: Gender differences in career paths and domestic responsibilities of top research medical school graduates. *PLOS ONE*, 17(4), Article e0267288. https://doi.org/10.1371/journal.pone.0267288
- House, A., Dracup, N., Burkinshaw, P., Ward, V., & Bryant, L. D. (2021). Mentoring as an intervention to promote gender equality in academic medicine: A systematic review. *BMJ Open*, 11(1), Article e040355. https://doi.org/10.1136/bmjopen-2020-040355
- Hunter, J., Crofts, H., Keehn, A., Schlagintweit, S., Luc, J. G. Y., & Lefaivre, K. A. (2021). Gender imbalance amongst promotion and leadership in academic surgical programs in Canada: A cross-sectional investigation. *PLOS ONE*, 16(8), Article e0256742. https://doi.org/10.1371/journal.pone.0256742
- Istat. (2025). *Personale sanitario [Data set]*. http://dati.istat.it/Index.aspx?QueryId=31546
- Jagsi, R., Guancial, E. A., Worobey, C. C., Henault, L. E., Chang, Y., Starr, R., Tarbell, N. J., & Hylek, E. M. (2006). The "gender gap" in authorship of academic medical literature: A 35-year perspective. *New England Journal of Medicine*, 355(3), 281–287. https://doi.org/10.1056/NEJMsa053910
- Johannessen, K. A., & Hagen, T. P. (2012). Variations in labor supply between female and male hospital physicians: Results from a modern welfare state. *Health Policy*, 107(1), 74–82. https://doi.org/10.1016/j.healthpol.2012.05.009
- Kaufman, R. R., & Chevan, J. (2011). The gender gap in peer-reviewed publications by physical therapy faculty members: A productivity puzzle. *Physical Therapy*, 91(1), 122–131. https://doi.org/10.2522/ptj.20100106
- Khatib, A., Ahmed, R., Niaz, S., Chatha, A., Hakim, I., Amornteerasawas, O., Qureshi, S., Dong, C., Shuja Raza, S., Tiwana, M., Ahmed, F., & Khosa, F. (2024). Sticky floor, broken ladder, and glass ceiling in internal medicine academic ranking, leadership, and research productivity. *Journal of General Internal Medicine*, 40(2), 354–360. https://doi.org/10.1007/s11606-024-08998-y

- Larese Filon, F., Paniz, E., & Prodi, A. (2019). The gender gap in Italian academic medicine from 2005 to 2015: Still a glass ceiling. *La Medicina del Lavoro,* 110(1), 29–36. https://doi.org/10.23749/mdl.v110i1.7617
- Larivière, V., Ni, C., Gingras, Y., Cronin, B., & Sugimoto, C. R. (2013). Bibliometrics: Global gender disparities in science. *Nature*, 504(7479), 211–213. https://doi.org/10.1038/504211a
- Lee, M. O., Flores, B., Fassiotto, M., & Hobgood, C. (2023). Career advancement among women physicians in nine academic medicine specialties. *Journal of Women's Health,* 32(10), 1073–1079. https://doi.org/10.1089/jwh.2022.0464
- Løvseth, L. T., Güzey, I. C., Fridner, A., Minucci, D., & Linaker, O. M. (2014). Age and gender differences in authorship among university hospital physicians in Sweden, Norway and Italy (The HOUPE study). *British Journal of Medicine and Medical Research,* 4(27), 4582–4590.
- Lundine, J., Bourgeault, I. L., Clark, J., Heidari, S., & Balabanova, D. (2018). The gendered system of academic publishing. *The Lancet,* 391(10132), 1754–1756. https://doi.org/10.1016/S0140-6736(18)30950-4
- Lyness, K. S., & Judiesch, M. K. (2008). Can a manager have a life and a career? International and multisource perspectives on work–life balance and career advancement potential. *Journal of Applied Psychology,* 93(4), 789–805. https://doi.org/10.1037/0021-9010.93.4.789
- Mayer, A. P., Files, J. A., Ko, M. G., & Blair, J. E. (2008). Academic advancement of women in medicine: Do socialized gender differences have a role in mentoring? *Mayo Clinic Proceedings*, 83(2), 204–207. https://doi.org/10.4065/83.2.204
- Mazzalai, E., Turatto, F., & De Vito, C. (2022). Gender gap in scientific publications on COVID-19 in Italy during the first wave of the pandemic: An observational study. *Frontiers in Public Health*, 10, Article 818594. https://doi.org/10.3389/fpubh.2022.818594
- Ministero della Salute. (2021). *Personale del Sistema sanitario italiano. Anno 2019 [Report]*. https://www.salute.gov.it/imgs/C_17_pubblicazioni_3164_allegato.pdf
- Ministero dell'Istruzione e della Ricerca. (n.d.). *Cerca Università*. Retrieved June 19, 2026, from https://cercauniversita.mur.gov.it/
- OECD. (2020). *OECD statistics*. https://stats.oecd.org/
- Ordine Provinciale di Roma dei Medici Chirurghi e degli Odontoiatri. (2024). *Avviso di convocazione assemblee elettorali.* https://www.ordinemediciroma.it/download/allegati/304/24226838171O__OConvocazione_ALBOMEDICICHIRURGHI.pdf
- Pace, F., & Sciotto, G. (2022). Gender differences in the relationship between work–life balance, career opportunities and general health perception. *Sustainability*, 14(1), Article 357. https://doi.org/10.3390/su14010357
- Penny, M., Jeffries, R., Grant, J., & Davies, S. C. (2014). Women and academic medicine: A review of the evidence on female representation. *Journal of the Royal Society of Medicine*, 107(7), 259–263. https://doi.org/10.1177/0141076814528893
- Pololi, L., & Knight, S. (2005). Mentoring faculty in academic medicine: A new paradigm? *Journal of General Internal Medicine*, 20(9), 866–870. https://doi.org/10.1111/j.1525-1497.2005.05007.x
- Sharma, S., Malik, A., Matschek, J., Zaki-Metias, K. M., Gandhi, R., Yong-Hing, C. J., & Khosa, F. (2025). Assessing and improving women representation in radiology leadership positions. *Current Problems in Diagnostic Radiology*, 54(1), 4–10. https://doi.org/10.1067/j.cpradiol.2024.10.021
- Valian, V. (1998). *Why so slow? The advancement of women*. MIT Press.
- Weil, P. A., & Kimball, P. A. (1996). Gender and compensation in health care management. *Health Care Management Review,* 21(3), 19–33.