



Introduction

Pain medicine continues to be a competitive fellowship program in the United States (US), likely due to the broad pool of applicants and the unique multidisciplinary nature of the specialty. Historically, medicine has largely been a male-dominated field, and although females continue to gain increasing representation in the healthcare profession, this gender imbalance remains prevalent across most medical specialties. This study aims to determine whether the difference in female-to-male representation in pain medicine fellowship programs is associated with a difference in research output to compensate. Furthermore, it seeks to explore whether research output in different racial backgrounds differs in a similar manner amongst the class of 2024 pain medicine fellows.

Methods

The pain medicine fellowship programs in the US were identified using the ASRA fellowship directory and the Association of Pain Program Directors directory. All pain fellows from the class of 2024 were identified from the respective program websites and social media platforms. Publication volume, encompassing first authorship or second authorship in pain publications, publications in specialty-related journals, and total publications, was recorded prior to the end of July in the application year for each fellow, utilizing PubMed and Google Scholar. Collectively, 331 fellows from the class of 2024 were sorted by gender and race for analysis, with Welch’s T-Test and ANOVA, respectively. IRB approval was not required as the study exclusively used publicly available data and involved no patient protected health information.

Figures

	Proportion of class	Total Publications (mean ± SD)	Anesthesia or Specialty Specific Journals	Pain Publications	First Author Pain Publications	Second Author Pain Publications
Female (n = 71)	21.45%	1.30 ± 2.52	0.20 ± 0.60	0.18 ± 0.59	0.03 ± 0.24	0.04 ± 0.20
Male (n = 260)	78.55%	1.42 ± 2.80	0.28 ± 0.83	0.22 ± 0.82	0.07 ± 0.44	0.07 ± 0.28
P-value (a = .005)		0.73	0.36	0.64	0.31	0.31
Asian (n = 109)	32.93%	1.25 ± 2.63	0.25 ± 0.65	0.22 ± 0.57	0.06 ± 0.28	0.06 ± 0.28
Black (n = 23)	6.94%	0.87 ± 1.10	0.30 ± 0.76	0.09 ± 0.29	0	0.09 ± 0.29
Hispanic (n = 12)	3.62%	2.50 ± 4.17	0.25 ± 0.87	0.58 ± 1.38	0.17 ± 0.58	0.08 ± 0.29
White (n = 153)	46.22%	1.45 ± 2.81	0.25 ± 0.86	0.21 ± 0.93	0.06 ± 0.50	0.06 ± 0.27
Other (n = 34)	10.27%	1.56 ± 2.97	0.35 ± 0.81	0.12 ± 0.41	0.09 ± 0.29	0
ANOVA p-value		0.58	0.97	0.43	0.83	0.70
ANOVA F-statistic		0.72	0.14	0.97	0.37	0.55

Table 1. Class of 2024 Pain Medicine Fellows Research Output

Summary

This study examined gender and racial disparities in publication output among pain medicine fellowship applicants in the U.S., focusing on the class of 2024. Despite the historically male-dominated field, the analysis of 331 fellows showed no significant difference in publication volume between male (78.55%) and female (21.45%) fellows across total publications, specialty-specific publications, or pain-related research. Similarly, no significant differences in research output were found when comparing fellows by race. The study concluded that underrepresented demographics, including females, did not exhibit compensatory increases in research output, suggesting other factors may contribute to disparities in fellowship representation. Further research is recommended to explore these variables and better support underrepresented groups in securing fellowship positions.

Results

Number of publications for 331 pain medicine fellows from the Class of 2024 were analyzed and compared by race and gender (Table 1). Among all pain medicine fellowship programs in the US, 260 (78.55%) fellows in the Class of 2024 were male, while 71 (21.45%) were female. There was no significant difference seen in the number of total publications (p = 0.73), specialty specific publications (p = 0.36), pain publications (p=0.64), first author pain publications (p = 0.31), or second author pain publications (p = 0.31) amongst male and female fellows. When comparing fellows by race, there was also no significant difference seen in the number of total publications (F = 0.72, p = 0.58), specialty specific publications (F = 0.14, p = 0.97), pain publications (F = 0.97, p = 0.43), first author pain publications (F = 0.37, p = 0.83), or second author pain publications (F = 0.55, p = 0.70).

Conclusion

In this study, we sought to investigate whether there would be any difference in publication output amongst the demographics that are underrepresented in the pain fellowship programs, i.e. applicants identified as female, black, hispanic, or other. Our results demonstrated that there was no significant difference in publication output amongst these demographics. Additionally, there was no compensatory increase in publications by female applicants to address the gender disparity. These findings suggest that there may be other variables contributing to disparities in representation. Additional studies should be conducted to further characterize these variables and help guide residents from underrepresented demographics to help secure a spot in a pain medicine fellowship.