



Survey article

Gynecologic oncology fellowship leadership trends by gender

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ABSTRACT

Our objective was to examine the educational, research, and leadership trends among gynecologic oncology (GYO) fellowship program directors (PD) and how these vary by gender.

PDs were identified using the Society of Gynecologic Oncology Fellowship Directory. Surveys were sent to PDs' emails to obtain information about demographics, education, and research background. Publicly available data and institutional biographies were used to supplement primary survey data for incomplete responses or survey non-responders. Scopus was used to determine the h-index and number of publications and citations for each PD. Parametric data were compared using unpaired two-tailed t-tests. Chi-square and Fisher's exact tests were performed for categorical data. The significance level was $p < 0.05$.

Approximately one-half of PDs were female (50.8%). Female PDs had a younger mean age than male PDs (46.4 years vs 51.9 years, $p = 0.0014$). The average overall h-index was 22 (SD = 14.5) and the average number of publications was 71.2 (SD = 63.3). The average h-index was higher in male PDs than females (27.8 vs 16.3, $p = 0.0012$), as were the number of publications (97.3 vs 45.8, $p = 0.0008$).

Differences exist among GYO PDs by gender. While research productivity may be reflective of age, gender-based equity in research time should be further explored.

1. Introduction

There are 63 Gynecologic Oncology (GYO) fellowship programs in the United States. These training programs provide advanced surgical and medical education on the management of gynecologic malignancies ([Internet], 2022). Within each fellowship program, a program director (PD) oversees curricular content and fellow education, thereby playing an important role in the development of future GYO specialists.

Leadership trends within other surgical subspecialties, including breast surgery, cardiothoracic surgery, gastrointestinal surgery, hand surgery, spine surgery, and transplant surgery, have been published (Schachner et al., 2022; Singh et al., 2021; Wolbrom et al., 2021; Madhan et al., 2022; Donnally et al., 2020; Choubey et al., 2022). With the exception of breast surgical oncology, a specialty in which the majority of fellows are women, these studies reported that fellowship PDs are overwhelmingly male (Schachner et al., 2022; Singh et al., 2021; Wolbrom et al., 2021; Madhan et al., 2022; Donnally et al., 2020;

Choubey et al., 2022). To date, there are no studies that have analyzed trends in leadership in obstetrics and gynecology (OB/GYN). We hypothesized that there would be unique trends in fellowship leadership within the field of GYO, an OB/GYN surgical subspecialty whose distribution of physicians is representatively more women than men (Hong et al., 2022). This study aims to understand the demographic and leadership profile of current GYO PDs, providing potential insight into opportunities for improved gender equity among GYO fellowship leaders. Elucidation of the qualifications possessed by PDs may equip GYO trainees interested in academic leadership with a roadmap for future scholarly endeavors.

2. Methods

The study was approved by the Institutional Review Board at the University of Miami (IRB #20220020). A Qualtrics survey was developed by the study team for dissemination to GYO PDs. Survey questions

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emphasized PDs' demographic background, professional training, and involvement in various professional organizations (Schachner et al., 2022; Singh et al., 2021; Wolbrom et al., 2021; Madhan et al., 2022; Donnally et al., 2020; Choubey et al., 2022). Demographic information included age, gender, race, ethnicity, and sexual orientation. Professional training information included medical school, residency, and fellowship institution; years of graduation; year hired by their current institution; year appointed PD at their current institution; and prior PD positions at other institutions, if applicable. Professional involvement information included membership and leadership within various OB/GYN societies and reviewer status for academic journals.

The Society of Gynecologic Oncology (SGO) Fellowship Directory was used to compile a list of GYO fellowship programs and their associated PDs. Co-directors and associate program directors were not included in the study. Each PD was verified via university or hospital fellowship websites. An email invitation with a description of the study and a link to the Qualtrics survey was sent to GYO PDs in July 2022. Reminder emails were sent four and eight weeks later. Survey participation was voluntary, and informed consent was obtained via Qualtrics before survey initiation.

To supplement primary survey data for incomplete responses or survey non-responders, publicly available data and institutional biographies were used. Information regarding medical school, residency, fellowship institution(s), and years of graduation was obtained through curriculum vitae (CV), institutional biographies, and Doximity (Doximity.com, Doximity Inc., San Francisco, CA). The website Healthgrades (Healthgrades Operating Company Inc, Denver, CO) was used to acquire or confirm the age and gender of PDs. Research productivity and impact were determined by collecting each PDs' publication number, citation number, and h-index via the Scopus database (Elsevier B.V., Waltham, MA, USA) (Hirsch, 2005). All collected data were reviewed and cross-referenced.

All data were recorded in Qualtrics and analyzed using Excel 365 (Microsoft Inc, Redmond, WA). Correlation coefficient values were categorized by < 0.3, 0.3–0.5, 0.5–0.7, 0.7–0.9, and > 0.90 are indicative of negligible, low, moderate, high, and very high positive correlation, respectively. Unpaired t-tests were run for all parametric data comparisons. Chi-square and Fisher's exact test were performed for categorical data. The significance level was $p < 0.05$.

3. Results

Sixty-three PDs were invited to participate, with primary survey data obtained for 29 PDs (response rate of 46.0%) and secondary, publicly available data obtained for all 63 PDs. Table 1 demonstrates the

Table 1
Demographics of GYO PDs.

	Males	Females
Gender and Age (n = 63)		
Number of PDs - no. (%)	31 (49.2%)	32 (50.8%)
Mean Age - no. ± SD	51.9 ± 7.1	46.4 ± 5.2
Race (n = 29)		
White - n (%)	9 (69.2%)	12 (75%)
Black or African American - n (%)	0 (0%)	1 (6.3%)
Asian - n (%)	3 (23.1%)	2 (12.5%)
Other - n (%)	1 (7.7%)	0 (0%)
Identify as more than one race - n (%)	0 (0%)	1 (6.3%)
Ethnicity (n = 29)		
Non-Hispanic - n (%)	11 (84.6%)	15 (93.8%)
Hispanic - n (%)	1 (7.7%)	1 (6.3%)
Did not disclose - n (%)	1 (7.7%)	0 (0%)
Sexual Orientation (n = 29)		
Heterosexual - n (%)	10 (76.9%)	16 (100%)
Homosexual - n (%)	2 (15.4%)	0 (0%)
Did not disclose - n (%)	1 (7.7%)	0 (%)

Presented in this graphic are the gender distribution, age, and sexual orientation by gender identity.

demographic breakdown of PDs based on gender, with approximately half of the current PDs being female (50.8%, n = 32). On average, female PDs were significantly younger than male PDs (46.4 years vs. 51.9 years, $p = 0.0014$). The majority of responding male (69.2%, n = 9) and female PDs (75%, n = 12) identified as White. Regarding ethnicity, 84.6% (n = 11) of male PDs and 93.8% (n = 15) of female PDs identified as non-Hispanic. 100% (n = 16) of the female PDs surveyed identified as heterosexual, while 76.9% (n = 10) of male PDs identified as heterosexual, 15.4% (n = 2) identified as homosexual, and 7.7% (n = 1) chose not to disclose their sexual orientation. None of the PDs identified as non-binary or gender nonconforming.

Table 2 displays the education and employment histories of PDs. On average, male PDs were 45.9 years old (SD = 6.5, n = 18) at the time of their PD appointment, while female PDs were 42.9 years old (SD = 4.7, n = 15). The mean time between fellowship graduation and PD appointment was 9.4 years (SD = 4.9, n = 13) for female PDs and 10.9 years (SD = 5.1, n = 18) for male PDs. Male PDs on average held their current position for 4.2 years (SD = 3.1, n = 18), while females held their position for approximately 2.7 years (SD = 2.3, n = 15). 29% (n = 9) of male PDs and 9.4% (n = 3) of female PDs were employed at the same institution where they completed their residency program. Additionally, 28.1% (n = 9) of female PDs trained in the institution where they completed both their residency and fellowship training, while only 15.6% (n = 5) of male PDs did the same.

Table 3 displays the research productivity and professional organization involvements of GYO PDs. Male PDs had significantly more publications than female PDs (97.3 vs 45.8, $p = 0.0008$) and a significantly higher average h-index (27.8 vs 16.3, $p = 0.0012$). About 92.3% of responding male PDs (n = 12) and 75% (n = 12) of responding female PDs reported being journal editors or reviewers. All responding male PDs (100%, n = 13) were members of SGO, and the majority (84.6%, n = 11) were members of both the American College of Obstetricians and Gynecologists (ACOG) and the American Board of Obstetrics and Gynecology (ABOG). Similarly, 93.7% of responding female PDs (n = 15) were members of SGO, and the majority (81.2%, n = 13) were members

Table 2
Education and Employment Progression of GYO PDs.

	Males	Females
Education Progression (n = 63)		
Mean calendar year of residency graduation - no. ± SD	2001 ± 6.3 (n = 30)	2006 ± 5 (n = 32)
Mean duration from residency graduation to earning position of PD - no. ± SD	14.5 ± 5.0 (n = 18)	13.1 ± 4.9 (n = 15)
Mean calendar year of fellowship graduation - no. ± SD	2005 ± 6.4 (n = 30)	2009 ± 5.0 (n = 31)
Mean duration from fellowship graduation to earning position of PD - no. ± SD	10.9 ± 5.1 (n = 18)	9.4 ± 4.9 (n = 13)
Employment Progression (n = 63)		
Mean time from year of hire to year promoted to PD - no. ± SD	5 ± 4.4 (n = 18)	5.5 ± 3.9 (n = 15)
Mean duration of employment at current institution - no. ± SD	9.7 ± 5.9 (n = 21)	9.8 ± 4.8 (n = 22)
Mean duration that PD has held position as PD - no. ± SD	4.2 ± 3.1 (n = 18)	2.7 ± 2.3 (n = 15)
Mean age of appointment to PD - no. ± SD	45.9 ± 6.5 (n = 18)	42.9 ± 4.7 (n = 15)
Institutional Loyalty (n = 63)		
PDs currently working at same institution as residency training - n (%)	9 (29.0%)	3 (9.4%)
PDs currently working at same institution as fellowship training - n (%)	9 (29.0%)	2 (6.3%)
PDs who trained at same institution for residency and fellowship - n (%)	5 (15.6%)	9 (28.1%)

This table summarizes the statistical findings for education, employment, and institutional loyalty. Educational and employment progression shows the average and standard deviation associated with each factor presented. Institutional loyalty shows the number of PDs who reported working at the same institution where they completed residency and/or fellowship.

Table 3
Academic Productivity and Involvements of GYO PDs.

	Males	Females	P-Value
Research Output (n = 63)			
Mean Scopus h-Index - no. \pm SD	27.8 \pm 15.4	16.3 \pm 11.1	0.0012
Mean Number of Publications - no. \pm SD	97.3 \pm 74.9	45.8 \pm 35.0	0.0008
Mean Number of Citations - no. \pm SD	3716 \pm 4433.2	1627.5 \pm 2819.7	0.0288
Research Involvement (n = 29)			
Journal Reviewers or Editors - n (%)	12 (92.3%)	12 (75%)	0.3432
Professional Organization Involvement (n = 29)			
Holds professional organization leadership position - n (%)	8 (61.5%)	10 (62.5%)	0.9577
Mean number of professional organization leadership positions - no. \pm SD	2.3 \pm 2.1	1.5 \pm 0.7	0.1810

Research output is displayed as Scopus h-index and the number of publications. Leadership and editorial positions were self-reported by respondents to the survey.

of ACOG and ABOG. Less than one-half of responding male (46.1%, n = 6) and female (43.7%, n = 7) PDs reported being members of the Association of Professors of Gynecology and Obstetrics (APGO).

4. Discussion

Our study provides an overview of the demographic and academic profile of current GYO PDs. In 2020, 70% of GYO fellows were females (Hong et al., 2022). In contrast, this study determined that as of 2022, 50.8% of GYO PDs were females. This discrepancy may indicate a lag between the growing number of females entering the field of GYO and those who currently hold leadership positions (Richter et al., 2021). However, this study found that the average age of female GYO PDs was 46.4 years old, whereas male PDs were slightly older with an average age of 51.9 years. It is possible that the age discrepancy between male and female PDs could be attributed to female PDs being newer to the position and having had less time to accumulate years of experience in the role. Furthermore, the mean time in the PD position for females was 2.7 years compared to 4.2 years for males, and the mean calendar year for fellowship graduation was 2001 for males and 2006 for females. This suggests that female GYOs may be receiving a greater number of recent GYO PD appointments. The stratified data from Table 2 reveal that female PDs required an extra 6 months to be promoted and had been in the position for less time, which may further contribute to the age discrepancy between male and female PDs. Nevertheless, future studies should assess whether as time progresses, the gender distribution of GYO PDs more closely resembles that of trainees in the field. If it fails to do so, efforts should be made to determine how best to support females aspiring to become GYO PDs. To our knowledge, there have been no studies aimed at doing so.

In our study, there was a significant difference in the research productivity among male and female PDs. Male GYO PDs had on average 97.3 publications and female PDs had an average of 45.8 publications. One potential explanation for this discrepancy could be the historical gender disparities in academic medicine, where women have faced obstacles such as implicit biases, lack of mentorship opportunities, and unequal access to research resources, which can affect their ability to generate academic publications (Larivière et al., 2013). The difference in average age between female and male GYO PDs may also account for the higher h-index and publication count among male PDs as compared to their female colleagues, simply as a function of years of academic productivity. For instance, a survey at Mayo Clinic in 2007 found that in the first 27 years of practice, female physicians had a mean of 1.9 fewer publications annually than their male colleagues; however, after 27

years of practice, women had a mean of 1.6 more publications annually than their male colleagues (Reed et al., 2011). Further research is needed to identify whether current female GYO PDs attribute gender differences as a cause for variance in academic productivity, as compared to their male colleagues. If so, there may be an opportunity to address these differences and thereby assist aspiring female GYO PDs during the early years of their career.

Although there does not seem to be any single approach to becoming a GYO PD, one must consider the influence of institutional loyalty. Among the sampled PDs, a significantly higher proportion of male PDs reported serving as PD at the institution where they completed either their residency or fellowship, compared to female PDs. Specifically, 29% (n = 9) of responding male PDs were currently serving as PDs in the institution where they completed their residency, while 9.4% (n = 3) of responding female PDs were in the same situation. Similarly, 29% (n = 9) of responding male PDs were serving as PDs at the institution where they completed their fellowship, while only 6.3% (n = 2) of responding female PDs were doing the same. While certainly not a requirement, increased time at an institution seems to improve the likelihood of becoming a PD there. This may be due to factors such as having a larger or more influential network within the institution or the benefit that familiarity with an institution may provide in successfully fulfilling the role of PD (Van Horne et al.). Some studies have commented on the impact of institutional loyalty on the appointment of PDs across other medical specialties such as cardiothoracic imaging and orthopedic surgery (Cummings et al., 2023; Zippi et al., 2022). In both of these fields, almost 60% of PDs held positions at institutions where they pursued medical education or training (Cummings et al., 2023; Zippi et al., 2022). This is a higher proportion than our finding for GYO PDs, which may indicate that institutional loyalty plays a more significant role in the appointment of PDs in other fields compared to GYO.

This study highlights gender discrepancies in the representation of PDs in GYO, but it is important to acknowledge its limitations. The 46% response rate raises concerns about the representativeness of our respondents in relation to the entire population of PDs. Furthermore, it is essential to be cautious about potential biases that may exist within the survey results. Additionally, our survey did not ask about PD administrative time and the support systems that their institutions have in place for them such as resource allocation and availability of necessary tools and personnel. By not including questions regarding administrative time and support, our survey failed to capture an important component of PDs' time allocation.

While the reasons for this gender disparity are not clear from this data alone, it is crucial to address this issue to promote gender equity in academic medicine. Future research and interventions should focus on identifying the underlying factors that contribute to this gender imbalance. By addressing these factors and implementing evidence-based interventions, we can create an environment that enables female PDs to thrive and contribute to the advancement of GYO.

CRedit authorship contribution statement

Nicolle Rodriguez Yanes: Conceptualization, Visualization, Writing – original draft. **Valerie Vilarino:** Conceptualization, Writing – original draft. **Gabriella F. Rodriguez:** Conceptualization, Visualization, Writing – original draft. **Omar J. Rosete:** Conceptualization, Writing – review & editing. **Zachary Zippi:** Conceptualization, Formal analysis, Methodology, Writing – review & editing. **Benjamin Schachner:** Conceptualization, Writing – review & editing. **Matthew P. Schlumbrecht:** Supervision, Conceptualization, Methodology, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence

the work reported in this paper.

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