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Survey article

Factors influencing residents' interest in gynecologic oncology fellowship

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ABSTRACT

Objectives: To identify the role of mentorship and other factors associated with obstetrics and gynecology (OB/GYN) resident interest in pursuing a fellowship in gynecologic oncology.

Methods: A survey link was emailed to U.S. OB/GYN residency program coordinators to disperse to current residents. The 80-item survey asked about plans to pursue fellowship and influencing factors. Participants were stratified based on decision to pursue a fellowship in gynecologic oncology. Student's *t*-test and Mann-Whitney tests were applied.

Results: Among 236 surveyed residents, 32 (13.6%) were planning to pursue a fellowship in gynecologic oncology. There were no demographic differences favoring the choice of gynecologic oncology; however, trainees at academic programs were more likely to aspire to the subspecialty ($p = 0.01$). Residents interested in gynecologic oncology had marginally more mentors than others ($p = 0.06$), were more likely to have a gynecologic oncology mentor ($p < 0.01$), and were more likely to have cited mentorship as a reason for their career aspirations ($p = 0.01$). These residents were also less likely to report obvious burnout among faculty and fellows in their department ($p < 0.01$ and $p = 0.01$, respectively).

Conclusions: Strong mentor relationships and the display of job satisfaction and work-life balance influence OB/GYN residents' interest in gynecologic oncology fellowships. Programs should consider formal mentorship programs for residents, with priority on matching by subspecialty. The value of fellow and faculty efforts in mentorship should be recognized, and appropriate time should be protected for these relationships, along with efforts to support fellows and faculty at risk for burnout.

1. Introduction

Gynecologic oncology fellowships are arduous, but little has been published about factors that influence residents' interest in the subspecialty. Quality patient experiences and faculty encouragement lead residents to maternal fetal medicine fellowship (Lu et al., 2004). Iqbal and colleagues showed that successful applicants to fellowships recognized by the American Board of Obstetrics and Gynecology (ABOG) had better preparation and credentials, a letter of recommendation from a nationally recognized subspecialist, and mentoring leading to publication (Iqbal et al., 2014). Residents' expectations of workload, salary, and liability differences between subspecialists and generalists also influence fellowship decisions (Fang et al., 2009).

Trainees' perception of work-life balance and burnout may also deter interest away from certain subspecialties, especially gynecologic oncology, where burnout rates are high. In one survey, burnout was reported by 23% of respondents, while almost half screened positive for depression, 17% screened positive for alcohol abuse, and 12% screened positive for substance abuse (Vetter et al., 2018). Establishing work-life balance and avoiding burnout can be important factors in ameliorating this. Only 22% of gynecologic oncology fellows are satisfied with their work-life balance (Szender et al., 2016). The availability of mentoring and the role of mentors in having open discussions about burnout and modeling work-life balance while ameliorating these outcomes in residents' lives may influence obstetrics and gynecology (OB/GYN) residents' decisions to subspecialize in gynecologic oncology.

The purpose of this study was to identify factors associated with OB/GYN residents' interest in fellowship training in gynecologic oncology. In addition to demographic and program factors, we sought to explore the associations of interest in gynecologic oncology subspecialization with strong and supportive mentee-mentor relationships and the perception of burnout and/or work-life balance in subspecialty-specific faculty and mentors.

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2. Methods

Institutional review board approval was obtained for this cross-sectional study from the Washington University School of Medicine Institutional Review Board. A 77-item survey with 3 breakout questions was constructed, modeled after surveys in the surgery, radiology, ophthalmology and internal medicine literature (Incorvaia et al., 2005; Freilich et al., 2011; Arnold et al., 2009; Gedde et al., 2005; Bonura et al., 2016), and division faculty reviewed the resulting survey for content validation. The survey was organized by 4 main categories: intention to pursue fellowship in general, lifestyle and work preferences and priorities, information about mentor-mentee relationships, and experience specific to the gynecologic oncology rotation. General demographics were also collected about participants and their residency programs, which were used as predictor variables as well as potential confounders. The primary outcome was recognition of a mentoring relationship having an impact on resident intentions to pursue gynecologic oncology fellowship. Secondary outcomes were having a mentor specifically in the field of gynecologic oncology and the perception of job satisfaction and/or burnout in gynecologic oncology faculty and fellows. The survey was uploaded to the secure, web-based application Research Electronic Data Capture (REDCap) platform through Washington University (Harris et al., 2009).

Program Coordinators of all U.S. OB/GYN residency programs accredited by the Accreditation Council for Graduate Medical Education (ACGME) were approached by email, requesting dispersal to all currently active residents. Email addresses were verified by cross-referencing with Association of Professors of Gynecology and Obstetrics (APGO) directory and residency program websites. The email included an explanation of the goals of the research, a document of informed consent, and a link to the survey. Programs were contacted 3 times over a course of 6 weeks. Survey data were collected anonymously; however, participants were given the option to provide contact information after survey completion to be included in an incentive raffle. This information was not linked to survey responses.

Descriptive statistics were used to characterize sample attitudes and demographics. Student's *t*-test was used to compare residents who were interested in pursuing gynecologic oncology fellowship with those who were not. Ratings of the importance of various characteristics on a choice to pursue gynecologic oncology fellowship were compared using Mann-Whitney tests.

3. Results

Of 203 programs listed on the APGO website, representing 4458 US OB/GYN residents, email addresses were available for the program coordinators of 197 programs, either from the APGO directory or the direct website of the residency program. 26 of these email addresses were either incorrect or out of service, leaving presumed contact to 171 programs. Confirmation of study distribution to residents was obtained for 42 programs, representing presumed receipt by 1155 OB/GYN residents, of whom 236 (20%) completed the survey. A copy of the survey is included in supplementary materials.

Table 1 shows characteristics of all survey respondents. Of these, 55% planned to pursue fellowship, with a third planning to pursue a fellowship in gynecologic oncology. Most were female, less than 30 years of age, white, married or in a domestic partnership, and childless. No demographic characteristics distinguished gynecologic oncology fellowship candidates from candidates for other subspecialties, and we found no differences in medical degree, number of degrees, or training program characteristics between candidates for gynecologic oncology versus other subspecialties. Those expressing an interest in gynecologic oncology fellowship were more likely to be at academic university programs with larger class sizes.

Table 2 presents factors residents considered important when pursuing fellowship training. Residents pursuing gynecologic oncology were less likely than others to have had a personal motivating experience with the specialty and to want to retain obstetrics but more likely to want to make the biggest possible impact on patients' lives, to retain gynecologic surgery, and to seek stronger surgical training in programs with greater perceived intellectual challenge and more opportunities for basic and clinical research. Although burnout was perceived to be an issue, gynecologic oncology aspirants were less likely to perceive burnout among faculty and fellows in the field, and they placed less weight on weekend/call responsibilities, favorable work hours and vacation time, favorable work load and hours, and earning potential. They were less likely to weight geographic restrictions in career

Table 1
Characteristics of Respondents & Programs.

	All	Yes Gyn Onc (n = 32)	No Gyn Onc (n = 204)	p-value
Gender				0.40
Male	26	5 (15.6)	21 (10.6)	
Female	205	27 (84.4)	178 (89.4)	
Age (years)				0.14
25–30	156	24 (75.0)	132 (66.3)	
31–35	68	7 (21.9)	61 (30.7)	
> 35	7	1 (3.1)	6 (3.0)	
Latino				0.73
Yes	19	3 (9.4)	16 (8.1)	
No	211	29 (90.6)	182 (91.9)	
Race				0.63
Asian	36	3 (9.4)	33 (16.8)	
Black or African American	10	1 (3.1)	9 (4.6)	
American Indian/ Alaska Native or Native Hawaiian/ Other Pacific Islander	2	0 (0.0)	2 (1.0)	
White	169	25 (78.1)	144 (73.1)	
Other	12	3 (9.4)	9 (4.6)	
Marital Status				0.75
Single	83	14 (43.8)	69 (33.8)	
Married/ domestic partnership	131	16 (50.0)	115 (56.4)	
Divorced/separated	14	2 (6.3)	12 (5.8)	
Other	3	0 (0.0)	2 (1.0)	
Child responsibilities				
Has children	33	5 (15.6)	28 (14.2)	0.83
Has children born during residency	25	4 (80.0)	21 (77.8)	1.00
Felt supported by residency program	23	4 (100.0)	19 (90.5)	1.00
Time off after undergraduate school (yes)	112	16 (50.0)	96 (48.5)	0.87
Graduate degrees				0.08
MD	212	32 (100.0)	180 (90.9)	
DO	18	0 (0.0)	18 (9.1)	
PhD	7	0 (0.0)	7 (3.4)	0.60
Masters	35	4 (12.5)	31 (15.2)	1.00
Current year of residency				0.01
PGY1	62	13 (40.6)	49 (24.8)	
PGY2	63	13 (40.6)	50 (25.2)	
PGY3	58	3 (9.4)	55 (27.8)	
PGY4	47	3 (9.4)	44 (22.2)	
Type of program				0.01
University Academic	177	31 (96.9)	146 (73.4)	
University-affiliate	28	0 (0.0)	28 (14.1)	
Community hospital	26	1 (3.1)	25 (12.6)	
Geographic Area				0.83
Northeast	96	14 (43.8)	82 (41.2)	
South	36	4 (12.5)	32 (16.1)	
Midwest	83	13 (40.6)	70 (35.2)	
West	16	1 (3.1)	15 (7.5)	
# Residents per class				0.04
≤4	34	0 (0.0)	34 (17.1)	
5–7	81	12 (37.5)	69 (34.7)	
≥8	116	20 (62.5)	96 (48.2)	

Table 2
Median ranking of factors considered when deciding to pursue fellowship [*average of Likert-Scale points, where 3 is moderately important*].

	All	Yes Gyn Onc (n = 32)	No Gyn Onc (n = 204)	p-value
Area of strong personal interest (what you love doing)	228	5 (5, 5)	5 (5, 5)	0.16
Personal (self or family) experience relevant to the subspecialty	229	2 (1, 3)	3 (2, 4)	< 0.01
Patient-doctor relationship	229	5 (4, 5)	4 (4, 5)	0.07
Making the biggest impact in lives of patients	227	4 (4, 5)	4 (3, 4)	0.02
Don't want to give up obstetrics	229	1 (1, 2)	3 (2, 5)	< 0.01
Don't want to give up gynecologic surgery	229	5 (4, 5)	4 (3, 5)	< 0.01
A desire for stronger surgical training	229	5 (4, 5)	4 (3, 5)	< 0.01
Feeling generally unprepared for independent practice without additional training	229	2 (1, 4)	2 (1, 3)	0.15
Health and physical status of patients encountered in the subspecialty	227	3 (2, 4)	3 (2, 4)	0.41
Intellectual challenge	228	4 (4, 5)	4 (3, 4)	< 0.01
Opportunities for basic science research	229	2 (1, 3)	1 (1, 2)	0.04
Opportunities for clinical research	229	4 (3, 4)	3 (1, 4)	< 0.01
A desire to not ever do research again	229	1 (1, 2)	2 (1, 4)	< 0.01
Opportunities to teach/work with trainees	229	4 (3, 5)	4 (3, 4)	0.46
Relatable mentors within the field	228	4 (4, 5)	4 (3, 5)	0.52
Burnout among faculty within the field	229	3 (2, 4)	4 (3, 4)	< 0.01
Burnout among fellows within the field	227	3 (2, 4)	4 (3, 4)	0.01
Little or no evening/weekend call responsibilities	229	2 (1, 3)	3 (2, 4)	< 0.01
Favorable work hours and vacation time	229	2 (1, 3)	4 (3, 4)	< 0.01
Favorable daily work load on the job	229	3 (2, 3)	3 (2, 4)	< 0.01
Earning potential	228	3 (2, 4)	3 (2, 4)	0.03
Geographic limitations	229	2 (1, 3)	3 (2, 4)	< 0.01
Job security	228	3 (2, 4)	3 (2, 4)	0.21

Data are medians (IQR), p-value based on Mann Whitney U Test.

choices. We did not identify differences between those interested in gynecologic oncology fellowships and others in perceptions about the physician-patient relationship, feeling unprepared for independent practice, opportunities to work with trainees, identification of relatable mentors, or perceived job security.

Residents with an interest in gynecologic oncology fellowship were more likely than others to agree that gynecologic oncology attendings were very involved in residents' surgical and clinical education and in residents' personal and career success. They also were more likely to agree that they could easily find a gynecologic oncologist mentor and to believe that there were relatable attendings and fellows practicing gynecologic oncology. They were more likely to agree that gynecologic oncologists "seem to love their jobs," displayed good work-life balance, and could be encountered in social settings outside teaching hospitals.

Table 3 shows resident training experiences specific to their experiences with gynecologic oncology. Residents with an interest in gynecologic oncology were more likely than others to be in programs with more gynecologic oncologists and in programs with a gynecologic oncology fellowship, but time on gynecologic oncology rotations did not differ.

External influencers noted by residents gynecologic oncology aspirants and others are shown in Table 4. Those aspiring to gynecologic oncology were more likely than others to have been encouraged by faculty to pursue their field, but we found no differences in the frequency of faculty encouraging residents to pursue a different field or discouraging residents. Gynecologic oncology aspirants were more likely than others to have been discouraged from pursuing their career paths by family and friends.

Table 5 shows residents' experience of mentorship. Residents with intentions to pursue a gynecologic oncology fellowship had marginally more mentors than others, were more likely to have a gynecologic oncology mentor, and were more likely to have cited mentorship as a reason for pursuing fellowship.

Table 3
Gyn Onc Program Information.

	All	Yes Gyn Onc (n = 32)	No Gyn Onc (n = 204)	p-value
Number of Faculty in Gyn Onc Division				< 0.01
1–3	74	2 (6.3)	72 (36.4)	
4–6	103	16 (50.0)	87 (43.9)	
> =7	53	14 (43.8)	39 (19.7)	
Has a Gyn Onc Fellowship	111	24 (77.4)	87 (43.7)	< 0.01
Total number of weeks spent on Gyn Onc Residency Rotation each year *				
PGY1	221	7 (5, 9)	5 (0, 8)	0.01
PGY2	213	6 (5, 8)	6 (4, 8)	0.12
PGY3	221	7 (6, 10)	6 (5, 10)	0.70
PGY4	217	6 (4, 8)	6 (5, 8)	0.53

* Data are medians (IQR), p-value based on Mann Whitney U Test.

4. Discussion

Career decisions are complex and influences are multiple. The results of this survey show that interest in gynecologic oncology fellowship is especially complex. Gynecologic oncology fellowship aspirants tend to emerge from university academic programs with large numbers of gynecologic oncology faculty and established fellowships. Residents at programs without these characteristics may have self-selected during residency application to seek career paths other than gynecologic oncology. However, our results indicate that lack of role models and active mentors in gynecologic oncology may discourage some residents in smaller programs with less research focus from pursuing careers in gynecologic oncology. Cohen and colleagues found that the reported ability to easily identify a faculty mentor was associated with the research success of gynecologic oncology fellows (Cohen et al., 2012). Whether programs with less research focus can provide more active support or whether residents curious about gynecologic oncology careers might benefit from external elective gynecologic oncology rotations remains an area for further research. Of interest, Chi and colleagues found that almost a third of participants in a gynecologic oncology elective at Memorial Sloan-Kettering Cancer Center did not enter the fellowship match, suggesting that their experience with a rigorous academic program caused them to re-evaluate their fit for gynecologic oncology (Chi et al., 2001). In addition, the development of a formal mentoring program was evaluated by Quaas and associates, who found that OB/GYN residents placed greatest importance on the area of "career planning" in the program (Quaas et al., 2009). These residents found greatest satisfaction in this area over other areas of the mentoring program, and felt the most important factor in matching mentors with

Table 4
External influencers impacting residents considering gynecologic oncology fellowships and those pursuing other career choices.

	All	Yes Gyn Onc (n = 32)	No Gyn Onc (n = 204)	p-value
Have ever been ENCOURAGED into a career track by the following:				
Faculty encouraging you to pursue THEIR field	143	26 (81.3)	117 (57.4)	0.01
Faculty encouraging you to pursue a field DIFFERENT than their own	35	6 (18.8)	29 (14.2)	0.50
Friends/family encouraging you to pursue a specific field	65	10 (31.3)	55 (27.0)	0.61
No encouragement from anyone	68	4 (12.5)	64 (31.4)	0.03
Other	1	1 (3.1)	0 (0.0)	0.14
Have ever been DISCOURAGED from a career track by the following:				
Faculty discouraging from pursuing THEIR field	29	6 (18.8)	23 (11.3)	0.23
Faculty discouraging you from pursuing a field DIFFERENT than their own	38	6 (18.8)	32 (15.7)	0.66
Friends/family discouraging you from pursuing a specific field	33	10 (31.3)	23 (11.3)	< 0.01
No discouraging from anyone	150	15 (46.9)	135 (66.2)	0.03
Other	2	0 (0.0)	2 (1.0)	1.00

Table 5
Mentorship in pursuit of fellowship.

	All	Yes Gyn Onc (n = 32)	No Gyn Onc (n = 204)	p-value
Regardless of how many mentors you may have been assigned, how many true mentoring relationships would you say you have?				0.06
0	40	4 (12.5)	36 (18.1)	
1	68	7 (21.9)	61 (30.7)	
2	76	8 (25.0)	68 (34.2)	
3	32	9 (28.1)	23 (11.6)	
> =4	15	4 (12.5)	11 (5.5)	
Male/Female (for ANY mentor listed)				0.46
Male	53	10 (41.7)	43 (33.9)	
Female	98	14 (58.3)	84 (66.1)	
Is he/she in your chosen subspecialty (for ANY mentor listed)	130	25 (78.1)	105 (51.5)	< 0.01
Did this relationship form before or after you were sure of your decision? (for ANY mentor listed)				0.20
Before	94	10 (47.6)	84 (62.2)	
After	62	11 (52.4)	51 (37.8)	
Did this relationship contribute to your decision to pursue a fellowship? (for ANY mentor listed)	69	19 (79.2)	61 (48.8)	0.01

mentees was the specific specialty/subspecialty.

Vetter and colleagues have reported on the substantial impact of burnout on clinical productivity and early retirement among gynecologists (Vetter et al., 2019). Turner and associates have shown similar effects in gynecologic oncology, including a loss of over 1.5 million relative value units of work effort and nearly a thousand academic publications over a 15-year period (Turner et al., 2017). Our data shows that residents who are exposed to gynecologic oncology faculty and fellows with apparent job satisfaction are more likely to be interested in the field. Unfortunately, dissatisfaction of work-life balance is high in gynecologic oncology fellows, as shown by Szender and partners (Szender et al., 2016). In addition, Cass and colleagues, in a review for the Society of Gynecologic Oncology (SGO), noted that female physicians are at higher risk for burnout, and our survey shows how women are increasingly dominating the applicant pool for gynecologic oncology fellowships (Cass et al., 2016). Cass and colleagues recommended attention to general health through lifestyle interventions including diet, sleep, sunshine exposure, and exercise, and mentors for gynecologic oncology fellowship should both model these behaviors and encourage them in a culture that sometimes prioritizes self-sacrifice over resilience and the ability to set healthy boundaries. More critically, as the SGO review noted, mentors should model and encourage inquisitiveness and intellectual creativity as sustaining factors in creating meaning in work.

This study was subject to a number of limitations inherent to survey-based trials, including an inability to determine causal relationships, subjectivity of responses, recall bias, and selection bias from a limited response rate. Our study had a 20% overall response rate. The low response rate may be in part attributable to the route of contact, requiring distribution by residency coordinators, as well as the inability to confirm receipt by all 1155 presumed recipients. Twenty percent of OB/GYN resident graduates were accepted into ACGME accredited fellowships in 2012 (Rayburn, 2017). Given half of our respondents expressed interest in fellowship, our study is likely affected by a selection bias which would over-estimate factors related to pursuit of a Gyn Onc fellowship. An additional limitation of our study is the lack of long-term data, and thus the reliance on fellowship aspirations rather than true fellowship pursuance. Lastly, the concept of burnout is not discretely defined in this survey, left to the individualized interpretation of respondents, thus leading to subjectivity of responses. Though, objectively, burnout can be measured using the Maslach Burnout Inventory, this tool was validated to assess burnout in the responding individual (Dimou et al., 2016). To our knowledge, there is no validated tool to assess the perception of burnout in another individual. As burnout is commonly defined as a lack of enthusiasm for work, skepticism and distrust, and a low sense of personal accomplishment, it is presumed that the residents' responses reflect their perception of these behaviors in their faculty (Cass et al., 2016). Similarly, "mentorship" is also left to the interpretation of the respondent in our survey. This is, in part, because the mentee-mentor relationship is inherently a subjective entity, and, while sometimes formalized, is often an informal relationship informed by one's personal experiences.

Our results suggest steps that faculty in gynecologic oncology might take in cultivating gynecologic oncology aspirants among their trainees. Medical students interested in gynecologic oncology should be encouraged to match with larger programs with multiple gynecologic oncology faculty and active fellowship programs. Residents who demonstrate aptitude and interest should be identified and given opportunity for more meaningful work in gynecologic oncology, especially in research and advanced surgical practice. Given concerns raised in our survey about burnout, residents interested in gynecologic oncology fellowship should be actively counseled about strategies for coping with traumatic experiences, including patient deaths. Importantly highlighted here is the downstream effect of fellow and faculty burnout which must be recognized, respected, and actively responded to (or ideally, prevented) by programs. Junior residents should be identified and matched with mentors who should promote the development of personal relationships that will lead to impactful letters of recommendation. Mentoring may include counseling on strategies to accommodate friends and family who might otherwise discourage the workload gynecologic oncology fellows experience; this may include actively modeling work-life balance, meeting with residents outside the hospital so candidates can experience how gynecologic oncologists

balance work and home-life, and demonstrating passion for their work. The mentor's role in residents' interest in the field of gynecologic oncology is impactful; appropriate time and resources must be provided to foster these efforts.

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Declaration of competing interest

None.

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Author contributions

All authors have reviewed and approved the final article.

Marguerite Palisoul: Conceived and designed the analysis, collected the data, contributed data or analysis tools, wrote the paper.

Molly Greenwade: Contributed data or analysis tools, edited/contributed to the paper.

Leslie S. Massad: Edited/contributed to the paper.

Andrea Hagemann: Assisted in conception/design of the analysis, edited/contributed to the paper.

Matthew Powell: Edited/contributed to the paper.

David Mutch: Assisted in conception/design of the analysis, edited/contributed to the paper.

Candice Woolfolk: Performed data analysis.

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Appendix A. Supplementary material

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