

Factors Influencing Post-Graduate Career Decisions of Ophthalmology Residents

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Abstract

Background: To identify factors that influence ophthalmology residents' decisions to pursue fellowship training or to practice comprehensive ophthalmology after residency.

Methods: An anonymous survey was sent to ophthalmology residents in the U.S. from the graduating Class of 2018 and Class of 2019. The main outcome measure was the decision on whether to seek fellowship training or to practice comprehensive ophthalmology. Information on demographics, residency program characteristics and factors influencing career choices were collected.

Results: The overall response rate was 16.4% (153/931). Among the 153 respondents, 117 (76.5%) matched into subspecialty training. Residents pursuing fellowships had more first-author publications (4.4 vs. 1.2, $P < 0.001$), were more likely to plan to practice in an academic setting (47.0% vs. 8.3%, $P < 0.001$) and in an urban location (48.7% vs. 25.0%, $P < 0.001$). In a multivariable analysis, factors predictive of fellowship training included a desire to acquire special skills (OR=3.01; 95% CI, 1.34–6.77), working with new technology (OR=2.67; 95% CI, 1.14-6.24) and mentorship (OR=2.30; 95% CI, 1.02-5.17). Factors that predicted a career in comprehensive ophthalmology were being married (OR=0.11; 95% CI, 0.02-0.74), lifestyle considerations (OR=0.19; 95% CI, 0.07-0.56), educational debt (OR=0.31; 95% CI, 0.15-0.68) and a decreased interest in an academic career (OR=0.38; 95% CI, 0.17-0.86). Gender, prestige or perceived favorable job market were not significant factors.

Conclusions: The majority of U.S. ophthalmology residents responding to this survey matched into fellowships. Various factors including mentorship, lifestyle considerations, educational debt and interest in an academic career influenced the post-graduate career choices.

Background

The majority of graduating ophthalmology residents in the U.S. pursue subspecialty fellowship training. According to data from the Ophthalmology Fellowship Match, 81% of U.S. residents applied to subspecialty fellowship positions in 2017 (Figure 1) as opposed to 34% in 1996.¹ Shifts in health policy and rapid changes in healthcare delivery in the last 25 years have resulted in changes in the supply and demand for physicians in the healthcare workforce. While the Eye Care Workforce Study by RAND in 1995 identified an excess of eye care providers and predicted a surplus in subspecialist ophthalmologists in all subspecialty areas by the year 2010,² a 2011 study by Adelman et al. reported a consistently growing demand for subspecialist ophthalmologists.³ Indeed, more recent studies have noted current and future shortages in certain subspecialties such as glaucoma, pediatric ophthalmology and neuro-ophthalmology.^{4,5,6}

Healthcare human resources have been identified as the most critical constraint in achieving the well-being targets of the United Nations' Millennium Development Goals.⁷ Optimizing the physician workforce

is important for delivering high-quality health care.⁸ Aligning the ophthalmology workforce with health needs of the U.S. population requires not only an understanding of the supply and demand for ophthalmologists but also knowledge about factors influencing ophthalmology residents' decisions on professional career paths. A 2005 study by Gedde et al. found that male gender, a desire to acquire special skills, perceived prestige and job market opportunity were significant predictors for ophthalmology residents' decision to seek subspecialty training. On the other hand, lifestyle considerations such as work hours and preferred geographic locations were important in residents' decisions to practice comprehensive ophthalmology.¹ Since this study is almost 15 years old, more up-to-date information regarding the fellowship decision-making process is needed given the notable changes in ophthalmology in recent years.^{9 10 11 12} For example, with the greater regulatory burdens and costs of emerging new technology, young ophthalmologists might show a greater preference for joining integrated systems of care compared to small group practices, which can influence the decision on whether to pursue further training after residency. The purpose of the present study is to investigate factors that influence ophthalmology residents to enter fellowship training or a career in comprehensive ophthalmology. Considering the predictions of subspecialist shortages, such understanding has important implications for residency curriculum development and future workforce planning.

Methods

The study was deemed exempt by the Institutional Review Board of the Johns Hopkins University School of Medicine due to the anonymous nature of the survey and the minimal risks involved. Two consecutive classes of U.S. ophthalmology residents (Class of 2018 and Class of 2019) were invited to participate in an anonymous survey during their year of graduation. We included two years of U.S. graduating ophthalmology residents in our study to increase the sample size and the generalizability of our results. The completion of the survey served as consent for participation in this study. Survey links were sent to ophthalmology program directors who were members of the Association of University Professors of Ophthalmology (AUPO). The program directors were asked to forward the survey to their graduating third-year residents and to inform us when they had done so. For Class of 2018 residents, responses were collected between June 12, 2018, and July 12, 2018. For Class of 2019 residents, responses were collected between December 30, 2018 and Jan 30, 2019. Two reminders were sent out during each of the response collection periods. Both surveys were distributed after the fellowship match results were released.

The 22-question survey was adapted from the survey used by Gedde et al. The main outcome measure was whether a resident was matched to fellowships or entering comprehensive ophthalmology after residency. If a resident planned to pursue fellowship training, the survey asked which subspecialty he or she was matched into. The survey collected demographic and academic information (age, gender, ethnicity, marital status, number of children, level of education debt, academic degrees, Alpha Omega Alpha membership status, number of first-author papers), residency program characteristics (region of the program, number of residents per year, affiliated medical school, affiliated veteran affairs hospitals,

surgical cases performed, research requirement, international electives offered), career plans (timing of the decision to pursue or not to pursue fellowship training, planned practice location, preferred practice setting), and factors influencing the post-graduate career decision.¹ The importance of each factor in making the decision was rated on a five-point scale. Residents were asked to provide optional free-text responses regarding whether there were any other important factors in their decision-making process. Various characteristics were compared between residents pursuing subspecialty training and residents planning to practice comprehensive ophthalmology. Continuous variables such as age and number of children were compared using t tests. Ordinal variables such as level of educational debt and Likert scale responses were compared using Wilcoxon rank-sum tests. Categorical variables such as gender, race and practice setting were compared using Fisher exact or chi-squared tests. A multivariable logistic regression analysis was performed to assess the influence of measured factors in the decision to pursue fellowship training.

All data were analyzed using Stata version 14 (StataCorp LP, College Station, TX). A *P* value of 0.05 or less was considered statistically significant.

Results

Surveys were received from a total of 153 (16.4%) out of 931 residents: 112 (24.0%) out of 467 residents from Class of 2018 and 41 (8.8%) out of 464 from Class of 2019. Among the 153 respondents, 117 (76.5%) were entering subspecialty training in the coming year and 36 (23.5%) were going to practice comprehensive ophthalmology. Among the residents pursuing fellowship training, the three most popular subspecialty fields were cornea, external disease & refractive surgery (31 trainees, 26.5%), glaucoma (29 trainees, 24.8%), and retina (27 trainees, 23.1%) (Table 1).

Demographic information reported by respondents is shown in Table 2. Compared to residents pursuing fellowships, a higher percentage of residents entering comprehensive ophthalmology were married (83.3% vs. 59.8%, *P* = 0.010), had children (50.0% vs. 29.9%, *P* = 0.030), and had more than \$200,000 of educational debt (50.0% vs. 26.5%, *P* = 0.016). There were no statistically significant differences in terms of age, gender, and race between the two groups. In addition, there was no difference in the proportion of residents with children pursuing fellowship between female residents and male residents (66.7% vs. 69.7%, *P* = 0.824).

Characteristics of medical school education and residency training are presented in Table 3. Residents pursuing fellowship had more first-author publications than residents entering comprehensive ophthalmology (4.4 vs. 1.2, *P* < 0.001). Alpha Omega Alpha membership or number of graduate degrees held did not significantly influence residents' post-graduate career choice. Additionally, we did not find residency program characteristics such as average number of residents per year, region of the residency program or cases performed as primary surgeon correlated with the decision to seek fellowship training.

The decision to go into subspecialty fellowships was made earlier in the training than the decision to practice comprehensive ophthalmology (median time PGY2 vs. PGY3, $P = 0.001$). A total of 30 (25.6%) residents pursuing fellowship training made the decision before the start of their ophthalmology residency, while no resident entering comprehensive ophthalmology made the decision before the beginning of PGY2.

With regards to preferred future practice settings (Table 4), more residents entering fellowship favored an urban setting or were unsure about their intended practice setting (70.1% vs. 25.0%, $P < 0.001$) whereas residents planning to work as comprehensive ophthalmologists preferred a suburban setting compared to residents pursuing fellowships (47.2% vs. 28.2%, $P < 0.001$). In addition, the intended type of practice was significantly different between fellowship and comprehensive groups ($P < 0.001$). A university/academic setting was the most popular choice among residents seeking fellowship training, whereas small private practice was the most favored practice setting among residents entering comprehensive ophthalmology.

Residents rated the importance of each factor in influencing their decision to pursue or not to pursue fellowship training. The percentages of the responses are presented in Figure 2. Factors that were found to be rated significantly higher by residents seeking subspecialty training than residents entering comprehensive ophthalmology included mentors ($P = 0.005$), research experience ($P < 0.001$), types of patient problems ($P = 0.003$), types of surgeries ($P = 0.002$), working with new technology ($P = 0.002$), prestige ($P = 0.033$), academic career ($P = 0.048$) and desire to gain special skills ($P < 0.001$). In contrast, residents pursuing fellowships rated the following factors as significantly less important determinants in their career decision than residents going into comprehensive ophthalmology: preferred geographic area ($P = 0.003$), earning potential ($P = 0.019$) and working hours/lifestyle ($P < 0.001$).

In a multivariable regression analysis (Table 5), factors associated with higher odds of pursuing fellowship training included a desire to acquire special skills (odds ratio [OR], 3.01; 95% CI, 1.34–6.77), the ability to work with new technology (OR, 2.67; 95% CI, 1.14–6.24) and mentorship (OR, 2.30; 95% CI, 1.02–5.17). On the other hand, factors associated with lower odds of seeking fellowships were being married (OR, 0.11; 95% CI, 0.02–0.74), lifestyle considerations (OR, 0.19; 95% CI, 0.07–0.56), higher educational debt (OR, 0.31; 95% CI, 0.15–0.68), and a decreased interest in an academic career (OR, 0.38; 95% CI, 0.17–0.86).

Discussion

The proportions of ophthalmology residents pursuing fellowships have been increasing steadily, reaching 81% in 2017 (Figure 1). The rate of subspecialty training has important implications for residency curriculum development and physician workforce planning. This study updates our understanding of factors affecting ophthalmology residents' career choices to seek subspecialty fellowship training or to practice comprehensive ophthalmology. Our study found several factors that remained important in residents' decision-making since the 2005 study by Gedde et al, including a desire to acquire special skills and lifestyle considerations.¹ Retina, cornea and glaucoma continue to be the three most popular

fellowship choices. On the other hand, our study found a few important changes in resident decision-making regarding post-graduate career choices. In 2005, male gender, prestige and perceived more favorable job market were significant predictors of a resident pursuing fellowship training. The present study did not find such associations. Instead, we observed several previously insignificant factors to be correlated with post-graduate career choices of recent residents including marital status, educational debt and interest in academic career.

Fellowship programs focus on the attainment of clinical and research expertise over and above the competencies of residency. The goal of subspecialty training fits well with the desire of fellowship-seeking residents to acquire special skills and to work with new technology. Therefore, these two factors remain among the top factors influencing residents to pursue subspecialty training. The constant popularity of retina, cornea and glaucoma parallels the higher numbers of fellowship positions available in these fields. In 2017, 97 subspecialty training positions were offered for cornea (14.1% increase from 2012), 148 offered for retina (21.3% increase) and 81 offered for glaucoma (24.6% increase). In contrast, 65 positions were offered for pediatric and strabismus ophthalmology (8.3% increase from 2012), 28 position offered for ophthalmic plastic and reconstructive surgery (33.3% increase), 17 positions offered for uveitis (21.4% increase) and even fewer positions for ophthalmic pathology or neuro-ophthalmology.

Lifestyle has remained an important consideration for residents choosing comprehensive ophthalmology since 2005. Work hours/lifestyle and preferred geographic area were both regarded as more important by residents planning to practice comprehensive ophthalmology than by residents entering fellowships. In the free-text response, several residents mentioned family as an influential factor in their decision to practice comprehensive ophthalmology. Studies have found that lifestyle considerations influence post-residency career choices of a range of medical and surgical specialties, including internal medicine, obstetrics and gynecology, radiology and orthopedics.^{13 14 15 16} A study by Fang et al. found that lifestyle is among the top two factors influencing trainees' career choice after ob/gyn residency.¹³

One factor that we found to be insignificant in influencing the decision of residents to pursue fellowship was gender. In recent years, there has been a push to achieve gender equity in medicine through promoting transparency, routinely assessing compensation equity, minimizing unconscious gender bias, establishing policies regarding family and medical leave and engaging leadership.^{17 18 19} Although gender disparities are still noted in subspecialty training in some other fields of medicine,^{20 21 22} the present study did not find gender to significantly influence the decision to seek ophthalmology subspecialty training. Gender neutrality in motivations to pursue fellowship training was also observed in a recent study on general surgery residents in the U.S.²³ The study concluded that both genders have similar considerations when it comes to fellowship decisions.

Our results suggest that there has been a change in the perception of the job market by graduating residents. Fifteen years ago, residents entering fellowship training rated perceived a favorable job market as more important in their career decision than residents planning to practice comprehensive ophthalmology, whereas the present study found that residents entering comprehensive ophthalmology

regarded favorable job market as a more influential factor than residents seeking fellowships. One resident commented that he went on interviews for pediatric fellowship and comprehensive jobs at the same time, received good comprehensive ophthalmology job offers, and realized from fellowship interviews that “another year of training would potentially limit the range of my practice and marketability more than help it in the areas I was looking to practice”. Some residents entering comprehensive ophthalmology said good opportunities for comprehensive ophthalmology arose at the time of their graduation so they accepted the job offer.

A decreased interest in academic medicine is associated with lower odds of going into fellowship training. Some residents choosing comprehensive ophthalmology in our study pointed out in the comment section that burnout from the academic environment deterred them from entering subspecialty training. On the other hand, fellowships might be a good training opportunity for residents interested in future practice in academic institutions. Studies found that academic surgeons who have received fellowship training are less concerned about professional confidence, express greater career satisfaction,²⁴ have more grants proposal submissions, more grants funded, more publications and higher academic ranks than physician-faculty without fellowship training.²⁵ Mentorship is also found to increase the odds of residents pursuing subspecialty training. Studies in other specialties have also found mentorship to be influential in residents’ post-graduate career choices.^{26 27 28} In addition, a study by Rubeck et al. found that the importance of mentorship is rated higher by physicians who have chosen academic primary care medicine than by physicians who decide to work in nonacademic primary care settings.²⁹ Therefore, mentorship in residency is important for the future distribution of physician workforce.

Educational debt has become a more important factor associated with lower odds of seeking fellowships in our recent analysis. Medical school tuition and student debt levels continue to climb during the past two decades.^{30 31} The median educational debt for 2003 medical school graduates was between \$100,000 and \$135,000 depending on public or private medical school.³⁰ In 2018, the median educational debt of medical school graduates was reported to be \$195,000,³² a 44% to 95% increase from year 2003. In comparison, the consumer price index increased 40% from 2003 to 2018,^{33 34} meaning rise in medical trainee debt level has outpaced inflation. In our study, residents entering comprehensive ophthalmology rated earning potential as a more important determinant in their decision-making than their peers seeking fellowship training. One possible reason is that residents seeking fellowship training are more likely to go into academic medicine and the salary difference in academic versus private practice can reach more than \$100,000.³⁵ Indeed, studies have shown that higher educational debt is negatively correlated with a career in academic medicine.^{36 37}

One limitation of our study is the suboptimal response rate with the potential selection bias. Although we sent the survey to all residency program directors in the country, only a small percentage of them informed us that they had forwarded the survey to their residents. However, the response rate in our study is within the range of response rates of survey studies in the field of ophthalmology (10%-51%), albeit on

the lower end of the spectrum.^{1 38 39 40} In addition, the survey respondents in our study are a representative group of ophthalmology residents in the U.S. The demographics of our survey respondents are similar to the 2014 data from GME Track for all ophthalmology residents (female 49.0% vs. 44.3%, male 51.0% vs. 55.7%, $P = 0.266$; Non-Hispanic white 54.9% vs. 55.0%, Asian 33.3% vs. 31.8%, Hispanic 5.2% vs. 5.1%, African-American 1.9% vs. 2.4%, other 4.6% vs. 5.7%, $P = 0.968$).⁴¹ Seventy-seven percent of our respondents were pursuing subspecialty training. This number is comparable to the SF Match data (81%) in 2017. Moreover, the geographic distribution of the residency programs of our survey respondents is comparable to the data from Accreditation Council for Graduate Medical Education (ACGME) for all U.S. ophthalmology residents (northwest 32.0% vs. 30.9%, Midwest 28.1% vs. 24.8%, southeast 17.7% vs. 21.0%, west 17.0% vs. 13.4%, southwest 4.6% vs. 9.8%, $P = 0.198$). Despite the low response rate, our study results are reasonably generalizable to all U.S. ophthalmology residents.

There are several other limitations of our study. Our survey determined whether a resident enters fellowship or comprehensive ophthalmology based on the match results, which might not be the resident's original intention. The survey did not ask residents entering comprehensive ophthalmology if they had failed to match for fellowship. According to the SF Match data, 32% of graduating residents failed to match in Ophthalmic Plastic & Reconstructive Surgery fellowships in the 2017 match, and 10% of graduating residents failed to match in other ophthalmology fellowships in December 2018. However, some residents applied to more than one subspecialty fellowships, complicating the interpretation. Additionally, as the survey was distributed after the fellowship match, it is unknown if the match results affected what residents thought about the various factors influencing their career choices.

In conclusion, this study updates our understanding of the decision-making process of ophthalmology residents regarding their career plans. A desire to acquire special skills, working with new technology and mentorship are associated with the decision to enter subspecialty training, while a decreased interest in academic career, higher education debt, anticipated lifestyles and being married are considerations in the choice to practice comprehensive ophthalmology. Through multivariable analysis, our study found that gender, prestige, and perceived favorable job market were no longer significant factors in the choice to enter fellowship training. This study may provide useful information for the improvement of residency and fellowship education and for the planning of physician workforce to meet the vision care needs of the U.S. population.

Declarations

Ethical Approval and Consent to Participate: Johns Hopkins Institutional Review Board; resident's completion of survey was considered as consent to participate.

Consent for publication: Not applicable

Availability of data and material: Not applicable

Competing interests: None

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Authors' contributions: XC manuscript draft, data analysis and interpretation; SZ data collection, data analysis, manuscript draft; DS study design, critical revision of manuscript; MVB study design, data collection and critical revision; TJ study design, data collection, critical revision of manuscript; LG data collection, critical revision of manuscript; SR data analysis and interpretation, critical revision of manuscript; JP data collection, critical revision of manuscript; SJG data collection, critical revision of manuscript; ELS data collection, critical revision of manuscript; FW study design, data interpretation and critical revision of manuscript.

Tables

Table 1. Subspecialty choices among residents pursuing fellowships.

| | n (%) |
|---|-----------|
| Cornea, external disease & refractive surgery | 41 (26.5) |
| Glaucoma | 38 (24.8) |
| Retina | 35 (23.1) |
| Uveitides | 16 (10.3) |
| Neuro-ophthalmology | 9 (6.0) |
| Pediatric ophthalmology & strabismus | 5 (3.4) |
| Strabismus | 3 (1.7) |
| Anterior segment | 3 (1.7) |
| Global ophthalmology | 1 (0.9) |
| Ophthalmic informatics | 1 (0.9) |
| Ophthalmic oncology | 1 (0.9) |

Table 2. Demographic Information.

| | Total Group (n=153) | Fellowship (n=117) | Comprehensive (n=36) | P-value |
|----------------------------------|------------------------|-----------------------|-------------------------|---------|
| Age | | | | |
| Mean ± Stdev | 31.3 ± 2.5 | 31.0 ± 2.4 | 31.8 ± 2.9 | 0.956 |
| Gender, n (%) | | | | |
| Females | 75 (49.0) | 57 (48.7) | 18 (50.0) | |
| Males | 78 (51.0) | 60 (51.3) | 18 (50.0) | 0.893 |
| Ethnicity/Race, n (%) | | | | |
| Non-Hispanic white | 84 (54.9) | 60 (51.3) | 24 (66.7) | |
| Asian | 51 (33.3) | 44 (37.6) | 7 (19.4) | |
| Hispanic | 8 (5.2) | 6 (5.1) | 2 (5.6) | |
| African-American | 3 (1.9) | 1 (0.9) | 2 (5.6) | |
| Other/Prefer not to answer | 7 (4.6) | 6 (5.1) | 1 (27.8) | 0.118 |
| Marital Status, n (%) | | | | |
| Not married | 100 (65.4) | 47 (40.2) | 6 (16.7) | |
| Married | 53 (34.6) | 70 (59.8) | 30 (83.3) | 0.010* |
| Children, n (%) | | | | |
| Yes | 94 (63.9) | 35 (29.9) | 18 (50.0) | |
| No | 43 (35.4) | 77 (65.8) | 17 (47.2) | 0.030* |
| Range of educational debt, n (%) | | | | |
| None | | | | |
| ≤ \$100,000 | 51 (33.3) | 45 (38.5) | 6 (16.7) | |
| \$100,001 to ≤ \$200,000 | 22 (14.4) | 19 (16.2) | 3 (8.3) | |
| >\$200,000 | 31 (20.3) | 22 (18.8) | 9 (25.0) | |
| | 49 (32.0) | 31 (26.5) | 18 (50.0) | 0.016* |

* signifies statistically significant differences.

Table 3. Medical school education and residency training.

| | Total Group (n=153) | Fellowship (n=117) | Comprehensive (n=36) | P-value |
|--|------------------------|-----------------------|-------------------------|---------|
| Alpha Omega Status, n (%) | | | | |
| Yes | 44 (28.8) | 33 (28.2) | 11 (30.6) | |
| No | 109 (71.2) | 84 (71.8) | 25 (69.4) | 0.785 |
| >1 graduate-level degrees held, n (%) | | | | |
| Yes | | | | |
| No | 127 (83.0) | 20 (17.1) | 4 (11.1) | |
| | 26 (17.0) | 97 (82.9) | 32 (88.9) | 0.600 |
| Timing of decision to pursue/not to pursue fellowship, n (%) | | | | |
| Medical school | | | | |
| PGY1 | 23 (15.0) | 23 (19.7) | 0 (0) | |
| PGY2 | 7 (4.6) | 7 (6.0) | 0 (0) | |
| PGY3 | 42 (27.5) | 33 (28.2) | 9 (25.0) | |
| PGY4 | 62 (40.5) | 45 (38.5) | 17 (47.2) | |
| | 19 (12.4) | 9 (7.7) | 10 (27.8) | 0.001* |
| Region of residency program, n (%) | | | | |
| Northeast | | | | |
| Midwest | 49 (32.0) | 44 (37.6) | 5 (13.9) | |
| Southeast | 43 (28.1) | 29 (24.8) | 14 (38.9) | |
| West | 27 (17.7) | 19 (16.2) | 8 (22.2) | |
| Southwest | 26 (17.0) | 18 (15.4) | 8 (22.2) | |
| Other | 7 (4.6) | 6 (5.1) | 1 (2.8) | |
| | 1 (0.7) | 1 (0.9) | 0 (0) | 0.075 |
| Research requirement at residency, n (%) | | | | |
| Yes | | | | |
| No | 139 (90.9) | 104 (88.9) | 35 (97.2) | |
| Unsure | 10 (6.5) | 10 (8.5) | 0 (0) | |
| | 4 (2.6) | 3 (2.6) | 1 (2.8) | 0.193 |
| International elective offered, n (%) | | | | |
| Yes | | | | |
| No | 79 (51.6) | 62 (53.0) | 17 (47.2) | |

| | | | | |
|--|---------------|---------------|---------------|---------|
| Unsure | 72 (47.1) | 54 (46.2) | 18 (50.0) | |
| | 2 (1.3) | 1 (0.9) | 1 (2.8) | 0.594 |
| Associated VA, n (%) | | | | |
| Yes | 124 (81.0) | 91 (77.8) | 33 (91.7) | |
| No | 29 (19.0) | 26 (22.2) | 3 (8.3) | 0.063 |
| On-site affiliated med school, n (%) | | | | |
| Yes | | | | |
| No | 138 (90.2) | 106 (90.6) | 32 (88.9) | |
| | 15 (9.8) | 11 (9.4) | 4 (11.1) | 0.763 |
| Average resident/year | | | | |
| Mean ± Stdev | 4.7 ± 1.6 | 4.7 ± 1.5 | 4.5 ± 1.9 | |
| Range | 2 - 12 | 2 - 12 | 2 - 8 | 0.508 |
| Average research papers as first author | | | | |
| Mean ± Stdev | | | | |
| | 3.6 ± 4.4 | 4.4 ± 4.7 | 1.2 ± 1.6 | <0.001* |
| Cases performed as primary surgeon, Mean ± Stdev | | | | |
| Cataract | | | | |
| | 169.3 ± 70.9 | 171.9 ± 70.6 | 161.1 ± 72.1 | 0.445 |
| Cornea surgery | | | 7.8 ± 6.7 | 0.223 |
| Refractive | 9.6 ± 9.7 | 10.2 ± 10.4 | 7.6 ± 14.4 | 0.081 |
| Glaucoma filtering/shunting/MIGS | 5.0 ± 9.9 | 4.2 ± 7.9 | 11.8 ± 10.0 | 0.479 |
| Glaucoma lasers | 13.0 ± 10.8 | 13.3 ± 11.1 | 29.9 ± 28.2 | 0.620 |
| Retina (PPV or buckle) | 28.2 ± 21.8 | 27.7 ± 19.6 | 5.8 ± 11.3 | 0.477 |
| Retina (lasers or injections) | 7.1 ± 11.1 | 7.4 ± 11.0 | 200.0 ± 150.1 | 0.699 |
| Oculoplastics and orbit | 212.7 ± 213.6 | 216.6 ± 230.3 | 66.8 ± 50.8 | 0.661 |
| Globe trauma | | | | |
| | 71.2 ± 65.1 | 72.6 ± 69.1 | 10.6 ± 8.1 | 0.432 |
| Total | | | | |
| | 9.9 ± 6.5 | 9.6 ± 5.9 | 501.6 ± 217.2 | 0.563 |
| | 525.9 ± 275.1 | 533.4 ± 291.2 | | |

* signifies statistically significant differences.

Table 4. Preferred future practice setting.

| | Total Group (n=153) | Fellowship (n=117) | Comprehensive (n=36) | P-value |
|-------------------------------------|------------------------|-----------------------|-------------------------|---------|
| Intended setting of practice, n (%) | | | | |
| Urban | | | | |
| Suburban | 66 (43.1) | 57 (48.7) | 9 (25.0) | |
| Rural | 50 (32.7) | 33 (28.2) | 17 (47.2) | |
| Unsure | 12 (7.8) | 2 (1.7) | 10 (27.7) | |
| | 25 (16.3) | 25 (21.4) | 0 (0) | <0.001* |
| Kind of practice, n (%) | | | | |
| University/academic setting | 58 (37.9) | 55 (47.0) | 3 (8.3) | |
| Large/mid private practice | 39 (25.5) | 26 (22.2) | 13 (36.1) | |
| Small private practice | 39 (25.5) | 25 (21.4) | 14 (38.9) | |
| HMO | 7 (4.6) | 2 (1.7) | 5 (13.9) | |
| Community | 2 (1.3) | 2 (1.7) | 0 (0) | |
| VA | 1 (0.7) | 1 (0.9) | 0 (0) | |
| Other | 7 (4.6) | 6 (5.1) | 1 (2.8) | <0.001* |

* signifies statistically significant differences.

Table 5. Mean Likert scores for factors affecting decisions to pursue fellowship training or to practice comprehensive ophthalmology.

| | Total Group (n=153) | Fellowship (n=117) | Comprehensive (n=36) | P-value |
|--|------------------------|-----------------------|-------------------------|---------|
| Role models/mentors | 4.3 ± 1.0 | 4.5 ± 0.8 | 3.9 ± 1.2 | 0.001* |
| Residency rotations | 4.2 ± 1.0 | 4.3 ± 1.0 | 4.2 ± 1.1 | 0.601 |
| Research experience | 2.6 ± 1.5 | 2.8 ± 1.5 | 1.9 ± 1.2 | 0.001* |
| Types of patient problems | 4.3 ± 0.8 | 4.4 ± 0.7 | 4.0 ± 0.8 | 0.005* |
| Types of surgeries | 4.6 ± 0.8 | 4.7 ± 0.8 | 4.4 ± 0.7 | 0.039* |
| Working with new technology | 3.7 ± 1.2 | 3.8 ± 1.2 | 3.2 ± 1.2 | 0.004* |
| Favorable job market | 3.7 ± 1.2 | 3.6 ± 1.3 | 3.9 ± 1.0 | 0.229 |
| Preferred geographic area | 3.4 ± 1.4 | 3.2 ± 1.4 | 4.0 ± 1.1 | 0.022* |
| Earning potential | 3.2 ± 1.3 | 3.1 ± 1.3 | 3.6 ± 1.2 | 0.023* |
| Respect | 2.5 ± 1.3 | 2.6 ± 1.3 | 2.1 ± 1.1 | 0.025* |
| Working hours/lifestyle | 3.5 ± 1.3 | 3.3 ± 1.2 | 4.5 ± 0.8 | <0.001* |
| Academic career | 3.0 ± 1.5 | 3.1 ± 1.5 | 2.6 ± 1.3 | 0.045* |
| Peer interactions | 3.3 ± 1.2 | 3.4 ± 1.3 | 3.2 ± 1.1 | 0.323 |
| Desire to gain special skills | 4.1 ± 1.1 | 4.4 ± 0.8 | 3.1 ± 1.1 | <0.001* |
| Feeling inadequate to practice independently | 1.8 ± 1.2 | 1.8 ± 1.1 | 1.9 ± 1.3 | 0.480 |

* signifies statistically significant differences.

Table 6. Multivariate logistic regression analysis of factors affecting the decision to seek subspecialty training.

| | Odds Ratio | 95% Confidence Interval | P-Value |
|---------------------------------------|------------|-------------------------|---------|
| Acquisition of special skills | 3.08 | 1.38-6.89 | 0.006* |
| Working with new technology | 2.37 | 1.10-5.13 | 0.028* |
| Mentorship | 2.26 | 1.02-5.02 | 0.045* |
| Lifestyle considerations | 0.21 | 0.07-0.76 | 0.003* |
| Marital status (being married) | 0.12 | 0.02-0.76 | 0.025* |
| Presence of educational debt | 0.32 | 0.15-0.68 | 0.003* |
| Decreased interest in academic career | 0.40 | 0.18-0.88 | 0.023* |

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Figures

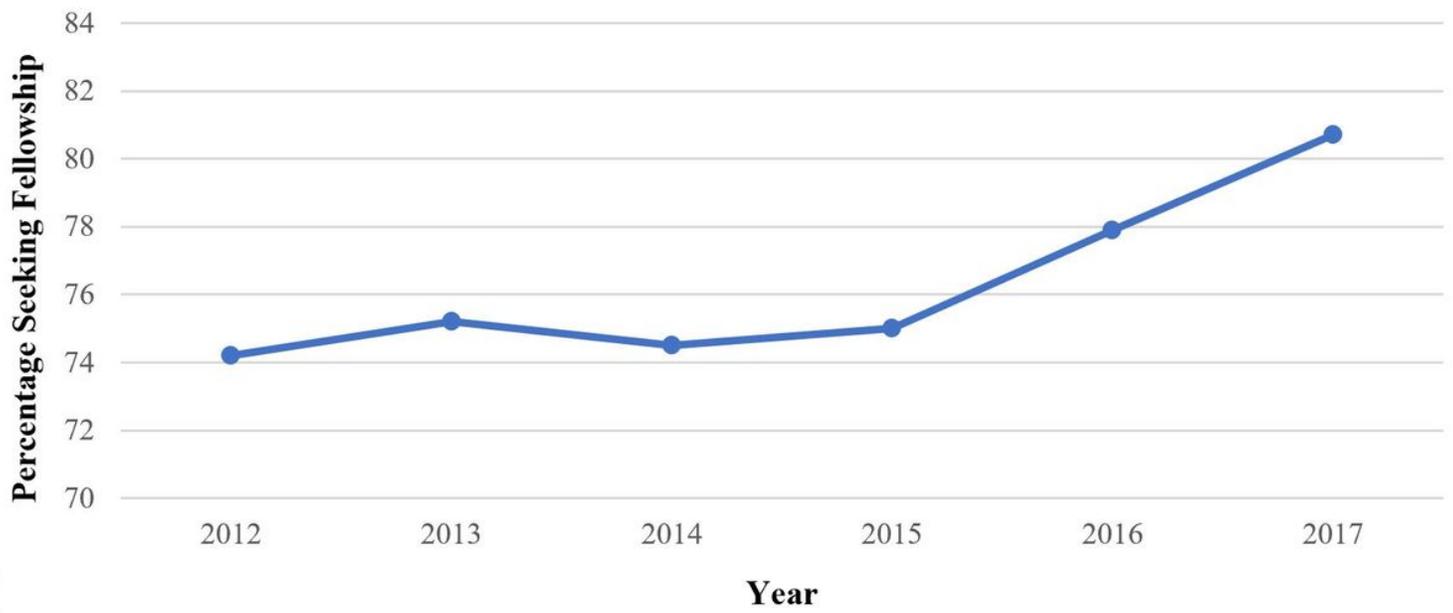


Figure 1

Percentages of graduating ophthalmology residents in the U.S. pursuing subspecialty training in 2012-2017. Data were obtained from SF Match.

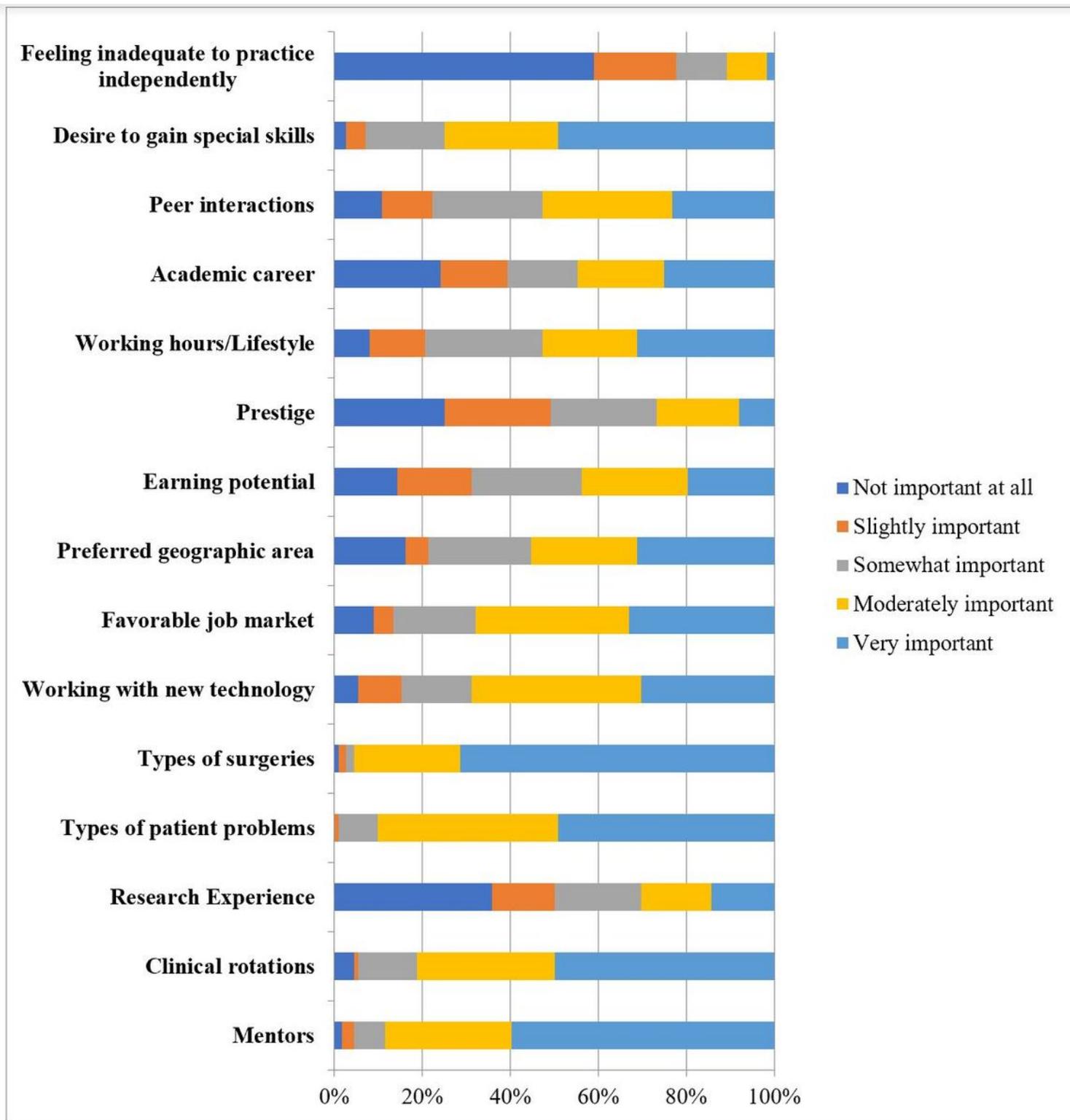


Figure 2

Percentages of Likert-scale responses for each of the factors influencing the post-graduate career choices of ophthalmology residents. * denotes statistically significant differences between residents pursuing fellowship training and residents entering comprehensive ophthalmology.