Ophthalmology Education Leadership Attitudes Towards Gender-specific Mentorship

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Research Article

Keywords: Gender, Mentorship, Medical Education, Ophthalmology, Surgery

Posted Date: July 13th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-694840/v1>

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Abstract

Background:

Despite relatively equal gender representation among US medical students, a gender gap exists in female representation within academic medicine. Numerous studies have emphasized the influence of gender-specific mentors in medical students' career decisions, but this has not been explored fully in ophthalmology. Therefore, this study evaluated ophthalmology educators' attitudes towards gender-specific mentorship, to better understand how this relates to medical students' decision to enter the field and their career development.

Methods:

A 22-question survey was sent to AUPO Department Chairs, Residency Program Directors, and Medical Student Educators. Additionally, the gender breakdown of current AUPO members was determined through a review of the AUPO membership directory. The authors also compared the number of female students applying to ophthalmology residency with the number of female ophthalmology faculty using AUPO and AAMC workforce data. Student's t-tests and chi square were used for analysis.

Results:

75 members responded (23.7%), including 17 of 135 Chairs (12.6%), 34 of 114 PDs (29.8%), and 30 of 72 MSEs (41.7%). Of AUPO members, 85.2% of Chairs, 67.5% of Program Directors, and 43% of MSEs are male. Of respondents, 55.4% identified as female and 44.6% as male.

Male and female members had 47.9% and 47.6% female mentees, respectively, ($p=0.451$). However, 21.2% of male and 56.1% of female members agreed that a mentee of the same gender was important, ($p<0.01$). Furthermore, 13 of 40 female members (32.5%) reported having a significant female mentor themselves vs. 1 of 29 male members (3%), ($p<0.05$).

Conclusions:

Male and female AUPO members reported no difference in the ratio of female mentees. However, female members were more likely to feel gender-specific mentorship was important, suggesting room for further development of this resource. Expansion of gender-specific mentorship in ophthalmology can promote equity in training and help address the lack of female representation in academic leadership.

Background

Despite an increase in the number of women entering the medical field, there exists a disparity in the number of women in academic medicine.(1–3) More specifically, women comprise nearly 48% of all medical school graduates yet only represent 25% of all full time professors.(2) Furthermore, among cohorts of new assistant and associate professors beginning in 2008–2009, more men than women

advanced over seven years.(2) Traditional gender roles, discrimination in the medical environment, and research intensity of institutions have often been cited as barriers.(4–8) In addition to this disparity, women comprise just 18.9% of department chairs across the country.(2) Nonetheless, numerous studies have suggested that mentors and role models for women in academic medicine may help remedy this disparity.(1, 9, 10)

A mentor is defined as “a trusted counselor or guide” and can be influential in any career. For roles in which women are traditionally underrepresented, like academic medicine, mentorship can be critical in career outcomes.(11–14) For example, one study looking at the influence of female mentors on women in lower ranks (e.g. assistant or associate professors), found those who had “good mentors” noted more salary benefits, protected research time, emotional support and encouragement.(1) However, mentorship can also be influential earlier in a physician’s career, including while in medical school.(15) In a study focused on role models for medical students, researchers noted that “females report that the presence of a mentor had a significant impact on their final career choices, with 75% stating that mentorship played a significant role in their career selection.”(9, 16) Therefore, it is clear that mentorship can be beneficial throughout all stages of a woman’s career and can have a profound impact on her career trajectory.

What is perhaps even more striking is the need for mentorship for females seeking to enter a traditionally male-dominated specialties such as surgical fields.(17–19) Evidence suggests that female students, especially early in their training, need to have positive role models to emulate and prove that a surgical career is possible.(20, 21) For example, in a study conducted in the United Kingdom exploring female views of a surgical career, women who had decided on pursuing surgery had positive experiences as students and noted the importance of having a female role model.(22), ²⁴ A lack of female mentors could reduce the possibility of women entering such a surgical field. This, in turn, perpetuates a vicious cycle in which women are dissuaded from entering surgery and thus the number of potential females in leadership roles and female mentors is reduced for the next generation.

Within ophthalmology, the relationship between mentorship and recruitment of females to the field has not been explored. Compared to other specialties like orthopedics, ENT, thoracic surgery, and plastic surgery, the number of female ophthalmologists has increased due to the perception of a better lifestyle and greater flexibility.(23) For example, between 2016 and 2019, the number of female medical students participating in the San Francisco Match rose from 32–35% of all participants and matched female students rose from 36–38% of all of those matched.(24) Despite this trend, the representation of women ophthalmologists in academic leadership roles lags below the average for all clinical departments, especially at the Professor rank, compared to other medical specialties.(25)

With this disparity, the desire and need for mentorship and guidance is clear. For example, while looking at key selection criteria among medical students choosing a particular program for residency in ophthalmology, the three most important factors were resident-faculty relationships, clinical and surgical volume, and diversity in training. In the same study, researchers showed that female candidates ranked diversity of faculty and residents significantly more important than other factors.(26) Additionally, the

importance of gender equality in leadership has been shown for female candidates seeking jobs in academic institutions. In a survey conducted in 2010, Departments with female chairs had a higher proportion of female faculty (35% vs. 28%) though there was no difference based on the gender of residency program directors.(23) These findings indicate that gender diversity in mentorship and leadership influences both students' and faculty's career decisions.

While ophthalmology ranks third among surgical sub-specialties in female representation, 72% of US residency program directors and 90% of department chairs are male.(27–29) Recently, there has been an abundance of literature reporting gender disparities in ophthalmology with regard to surgical volume, compensation, and research productivity. A 2019 study demonstrated that female ophthalmology residents performed 36 to 80.2% fewer total procedures compared with their male counterparts between 2005 and 2017. While this study was limited to only 24 of 119 programs, these results have sparked further study into gender disparities in ophthalmology.(30–32) In fact, a 2020 study evaluating compensation among male and female ophthalmologists showed that female ophthalmologists earn significantly less than males in their first year of clinical practice, even after controlling for demographic, educational, and practice type variables.(33) Moreover, while female authorship in ophthalmology is improving, female authors represented only 32% of those publishing articles in ophthalmology between 2015 and 2019, with men publishing more articles per person over the same time period.(34) This same study suggested that authors are more likely to collaborate with individuals of the same gender, as female first authors in their study were more likely to have a female last author and vice versa.(34, 35) This association further emphasizes the need for female leaders to contribute to the recruitment, training, and advancement of female ophthalmologists.

Considering the importance of mentorship in furthering gender equity in medicine and leadership, the goal of this study is to explore the demographics of academic educational leaders in ophthalmology as well as their attitudes towards gender-specific mentorship, given this cohort is frequently involved in advising trainees. As meaningful mentorship may be a key strategy towards bridging the gender gap in female leadership within ophthalmology, understanding mentor attitudes will inform future needs to allow the field to move closer to this goal.(36) These findings may also contribute strategies for recruitment of a diverse pool of future ophthalmologists.

Methods

With permission from the Association of University Professors of Ophthalmology (AUPO), a review of the AUPO directory from 2019 was conducted to determine the gender breakdown of all Ophthalmology Department Chairs, Residency Program Directors (PDs), and Medical Student Educators (MSEs).(37) We also compared the number of applicants to ophthalmology residency between 2016 and 2019 to the total number of practicing female medical school ophthalmology faculty using the Gender and Ethnicity Data from the AUPO and SF Match as well as the AAMC physician workforce data.(24, 38) Results of these data were analyzed using Pearson's Rho and the associated R^2 value.

A 22-question anonymous web-based survey was sent to all Ophthalmology Department Chairs, Residency Program Directors (PDs), and Directors of Medical Student Education (MSEs) via the AUPO email listserv. Thirteen of the survey questions, including a mix of free response and Likert scale questions, inquired about attitudes towards mentorship and current mentorship experiences. Nine questions inquired about demographic information, including the participants' self-reported gender identities.

Respondent demographics were compared using summary statistics. Additionally, all Likert scale questions, survey questions involving numerical data such as students mentored per year, time spent dedicated to mentorship, as well as the various types of mentorship, and demographic information such as age and years in practice were analyzed using Student's T-tests. All other demographic information including race and subspecialty practice were compared using Chi Square Analysis as were survey questions involving categorical data, such as whether mentors had significant mentors and whether the number of female mentees has increased throughout their careers. All analyses were conducted in R Studio. This study was determined to be exempt by the Icahn School of Medicine at Mount Sinai IRB.

Results

Of 2019 AUPO members, 85.2% of Chairs, 67.5% of Program Directors, and 43% of MSEs are male. 75 members responded (23.7% of total), including 17 of 135 Chairs (12.6%), 34 of 114 PDs (29.8%), and 30 of 72 MSEs (41.7%). Of respondents, 54.7% identified as female and 45.3% as male (Fig. 1).

Respondents were evenly matched across sub-specialties, with the exceptions of oculoplastic surgery (20% of males vs. 7.3% of females) and comprehensive ophthalmologists (11.4% of males vs. 29.3% of females), though these differences were not significant (p-value?). Additionally, female respondents were in practice for 12.5 years vs. an average of 17.5 years for male-identifying respondents ($p = 0.104$), with average ages of 45 and 49.3, respectively ($p = 0.08$). Additionally, there were no significant differences in self-reported racial demographics of male and female participants (Table 1).

Table 1

AUPO survey respondent demographics, including sub-specialty, time in practice, age, and reported race. Note that p-values for sub-specialty and race are based on Chi Square testing whereas differences age and time and practice were evaluated using Student's T Tests. There were no statistical differences among survey respondents.

Topic	Men	Women	P-Value
Have Sub-Specialty	30 (88.2%)	29 (70.7%)	0.65
Cornea	5 (14.7%)	4 (12.2%)	0.51
Retina	3 (8.8%)	5 (12.2%)	0.64
Glaucoma	8 (23.5%)	8 (19.5%)	0.99
Pediatrics	5 (14.7%)	6 (14.6%)	0.67
Oculoplastics	6 (17.6%)	3 (7.3%)	0.17
Neurology	2 (5.9%)	1 (2.4%)	0.57
Other	1 (2.9%)	2 (4.9%)	0.18
Time in Practice (years)	12.5 (36.8%)	17.5 years	0.10
Age (years)	49.26	45	0.08
Reported Race	31 (91.2%)	41 (100%)	0.22
White	21 (61.8%)	23 (56.1%)	0.25
Asian or Asian Indian	6 (17.6%)	11 (26.8%)	0.34
Middle Eastern or Northern African	0 (0%)	2 (4.9%)	0.65
Black or African American	2 (5.9%)	2 (4.9%)	0.85
Hispanic, Latino, or Spanish	1 (2.9%)	1 (2.4%)	0.89
Other (Please specify)	1 (2.9%)	2 (4.9%)	0.67

Female members on average reported mentoring 5.27 students per year in ophthalmology vs. 4.26 students for males ($p = 0.164$). Additionally, male-identifying members indicated having approximately 47.9% female mentees vs. 47.6% for female-identifying members, ($p = 0.45$). However, 21.2% of male and 56.1% of female members agreed that a mentee of the same gender was important to them ($p < 0.01$). Interestingly, 50% of male members vs. only 29% of female members noted that the number of female students they have mentored has increased throughout their career ($p = 0.07$, Fig. 2). Finally, men and women on average reported contributing similar amounts of time to different forms of mentorship. More specifically, men and women reported dedicating 16% vs. 17% of their time to research projects ($p = 0.77$), 34% vs. 28% to career advising ($p = 0.23$), and 28% vs. 31% to clinical shadowing ($p = 0.49$), respectively.

Both men and women, on average, dedicated 3% ($p = 0.88$) of their time to “other mentorship,” which included leading student interest groups, helping connect students with other mentors, professional development (e.g. professionalism and communication skills, and helping prepare students for residency). Of all of the different types of mentorship, however, 68% of women and 68% of men agreed that the type of mentorship they enjoyed the most was career advising ($p = 0.95$).

When asked about their own mentorship experiences, men reported an average of 7.26 influential mentors in their career vs. 4.73 for women ($p = 0.12$). A mentor’s influence on the respondent’s decision to enter ophthalmology was similar between males and females, with a reported Likert Scale scores of 3.39 vs. 3.59 respectively ($p = 0.56$). Interestingly, 13 of 40 female members (32.5%) reported having a significant female mentor themselves compared to 1 of 29 male members (3%) ($p < 0.05$, Fig. 2). Finally, only 49% of survey respondents reported a formalized mentorship program for ophthalmology at their institution.

Notably, men and women both agreed that there was an equal representation of male and female mentors at their institution, with Likert scale scores of 3.79 and 3.85 ($p = 0.84$). Female and male mentors disagreed that they would prefer to mentor a medical student of the same gender in ophthalmology, with average Likert scale scores of 2 and 1.68, respectively ($p = 0.16$). However, females agreed that mentoring student of the same gender was important to them, with an average Likert scale score of 3.44 vs. 2.7 for male mentors ($p < 0.05$, Fig. 3).

Free response comments helped to enhance interpretation of the quantitative survey questions. While women believed gender-specific mentorship to be more important than men, both groups reported the same ratio of female mentees. A few commented that these relationships best occur organically which likely explains the even breakdown of mentees. One respondent wrote, “people tend to gravitate to mentors on their own. They set their own priorities re the importance of gender, race, ethnicity, interests,” and another remarked “best mentors are found not assigned.” Additionally, some respondents indicated they felt the best mentorship model included multiple mentors, with some suggesting that a mentor of the same gender was important within this group of mentors. For example, one respondent commented, “It is valuable for a female...to have a female mentor, but this may be separate from or complement a career mentor.” Another echoed this sentiment sharing, “the increase in female mentors in our specialty has been very important,” with another remarking that, “there were no female retina surgeons when I trained.” One cited a barrier to this form of mentorship stating, “there are few women in leadership positions in ophthalmology therefore it is difficult to have a female mentor.”

Finally, in a sub-analysis comparing the number of practicing female ophthalmology faculty and female applicants to ophthalmology residency between 2016 and 2019, both increased over the time period with an R^2 value of 0.32, though this was not significant (0.68). Female applicants increased from 32–35% of all in the San Francisco Match while female ophthalmology faculty increased from 35–41% over the same time period.

Discussion

These findings suggest that gender-specific mentorship for women is important within ophthalmology, given that female members cited same-gender mentees as more important than male mentors did. Furthermore, female-identifying AUPO members were more likely than male members to have had a female mentor themselves prior to their academic career. Still, the majority of female mentors and all except one male mentor reported that *their* most significant mentors were male. This could be due to a lack of females within certain specialties or in leadership roles.(39)

This discrepancy suggests a lack of female mentors in ophthalmology and a need to increase available female mentors. In fact, in 2014, only 23% of American Academy of Ophthalmology members were women with only 14% of retina subspecialists being female.(40, 41) Furthermore, the number of female faculty in ophthalmology has only increased from 24–34% in the past 15 years. However, this increase is mainly seen at the Assistant Professor rank with only a small increase at the Professor rank.(25) Though traditional barriers to equal gender representation in leadership include balancing careers with family life as well as feeling excluded from the dominant culture of surgery, what's notable is that women have been shown to be just as eager as men to attain leadership roles.(42) However, they cite a lack of effective mentors as one of the major reasons that this disparity exists.(43)

Encouragingly, female ophthalmology faculty and female medical students applying to ophthalmology both have increased from 2016–2019. While causation cannot be proved, increased female representation and female mentorship opportunities may have contributed to this trend. Our survey suggested an increase in mentorship of female medical students within ophthalmology. This increase was actually more pronounced among male AUPO members, with 50% noticing an increase in the number of their female mentees vs. 29% of female members during their career. This could be due to the fact that women have represented nearly 50% of all medical school matriculants since 2003 and the proportion of female surgeons is expected to increase in the next five years as more male surgeons retire. (44, 45) In other words, this increase for both male and female AUPO leaders could be due to the rising population of female medical students.

The smaller increase in female medical students mentored by females could be due to the fact that female ophthalmologists were already likely to mentor female medical students. Given that the female AUPO members in this survey were on average younger and thus in practice for less time, it's also possible that male members saw this 50% increase because they simply have had more time to witness change. Interestingly, among AUPO ophthalmology educators, the MSE group comprised a higher number of females. Considering their unique interaction with medical students, this may also be contributing to increased mentorship and recruitment of females to the field. However, as these females matriculate to residency the relative presence of female leaders, such as residency and fellowship program directors and chairs declines, and may hamper their ongoing career development.

Nevertheless, there are potential interventions that can encourage gender-specific mentorship within ophthalmology. For example, over half of AUPO members in this study noted that that there was no

formalized mentorship program in ophthalmology for medical students at their school and only one of those who did, noted a “Women in Medicine” mentorship program. Because formal mentorship programs in other surgical programs have been shown to result in greater satisfaction among medical students, one purposely geared towards gender-specific mentorship may be helpful.(1, 9) Additionally, other studies have suggested providing incentives for faculty mentorship.(1) With male and female respondents dedicating only 4.1% and 8.4% of their time each week mentoring students, respectively, financial and career incentives may boost these numbers. Finally, this study helps to substantiate the belief that institutions should create policies and procedures that reduce barriers for females in ophthalmology, especially in leadership.(4) This could help increase the limited number of female mentors available and potentially lead to recruitment of more female medical students.

While informative about current AUPO attitudes about leadership, this study has some limitations. First, the survey was web-based and written rather than via focus group, and therefore may not capture all possible attitudes towards mentorship. However, a combination of free response and Likert scale questions were employed in an effort to collect richer data. These response rate of 23.7% was also low, meaning that there is still a large portion of AUPO leaders whose opinions were not captured. However, demographics amongst male and female respondents were similar. There was also a higher response rate specifically among MSEs, of 41.7%, which is relevant as these individuals interact more frequently with medical students in an advising capacity. Selection bias is also possible, as perhaps those who did respond have an interest in gender-specific leadership. Additionally, though the survey was anonymous, respondents could have answered the survey in a “socially acceptable manner.” Still, the anonymous nature of the survey helped to mitigate this risk. Finally, this survey explored attitudes towards mentorship amongst, AUPO members, a select group of academic ophthalmologists who are frequently involved in mentorship activities. However, many more ophthalmologists both within academic medicine and private practice likely serve as mentors and therefore their perspectives were not captured in this study.

Conclusions

Despite these limitations, this is one of the first studies to explore gender-specific mentorship in ophthalmology. It found that gender-specific mentorship within ophthalmology among female AUPO Program Directors, Chairs, and Medical Student Educators exists, is valued, and may contribute to increased recruitment of female medical students. However, respondents acknowledged that multiple forms of mentorship exist including a multiple mentor model, with gender-specific mentorship being an important component to some. The findings of the survey therefore support the importance of increasing the availability of female ophthalmology mentors to potential female mentees who may benefit from this relationship. Perhaps the development and increased institutional support of more formal trainee mentorship programs may facilitate an increase in the pool of female ophthalmology mentors.(46, 47) Furthermore, mentorship programs for female faculty may also help to bridge the gap in female representation within academic leadership, which will in turn generate more potential female mentors for training ophthalmologists.(48, 49) An equally important resource to provide to all faculty mentors would be training on effective mentorship, as most respondents agreed mentorship was important to career

advancement, with one stating, “mentorship in an important aspect of medical education. Unmentored students are at a distinct disadvantage.”(50) More investigation is also required to understand institutional, national, and societal practices that currently provide obstacles for females in ophthalmology, to ultimately help reduce the gender gap and create more opportunities for women in ophthalmology.

Abbreviations

AUPO: Association of University Professors of Ophthalmology

PDs: Residency Program Directors

MSEs: Medical Student Educators

Declarations

Ethics Approval and consent to participate:

This project was deemed IRB exempt by the Mount Sinai Program for the Protection of Human Subjects (HS #: 20-00057)

Consent for Publication:

Not applicable

Availability of Data and Materials:

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing Interests:

The authors declare that they have no competing interests.

Funding:

None

Authors' Contributions:

NC conceptualized the study, contributed to survey development, and performed critical review of the data and manuscript. MP helped with study design, survey development, and data analysis. MD assisted with survey development and performed critical review of the manuscript. All authors contributed to the writing of the manuscript and approved the final manuscript.

Acknowledgements:

Thank you to Dr. Robert Fallar for his help with survey development.

Previous Presentations:

This study was presented as a poster at the Association of University Professors of Ophthalmology (AUPO) Educating the Educators Conference on February 4-6, 2021

References

1. Adler NE. Women mentors needed in academic medicine. *West J Med.* 1991;154(4):468-9.
2. Lautenberger D, Dandar V. The State of Women in Academic Medicine 2018-2019. American Association of Medical Colleges; 2020.
3. Thibault GE. Women in Academic Medicine. *Acad Med.* 2016;91(8):1045-6.
4. Yedidia MJ, Bickel J. Why aren't there more women leaders in academic medicine? the views of clinical department chairs. *Acad Med.* 2001;76(5):453-65.
5. Harrison RA, Gregg JL. A time for change: an exploration of attitudes toward part-time work in academia among women internists and their division chiefs. *Acad Med.* 2009;84(1):80-6.
6. Carapinha R, McCracken CM, Warner ET, Hill EV, Reede JY. Organizational Context and Female Faculty's Perception of the Climate for Women in Academic Medicine. *J Womens Health (Larchmt).* 2017;26(5):549-59.
7. Cochran A, Freischlag JA, Numann P. Women, surgery, and leadership: where we have been, where we are, where we are going. *JAMA Surg.* 2013;148(4):312-3.
8. Butkus R, Serchen J, Moyer DV, Bornstein SS, Hingle ST. Achieving Gender Equity in Physician Compensation and Career Advancement: A Position Paper of the American College of Physicians. *Ann Intern Med.* 2018;168(10):721-3.
9. Healy NA, Cantillon P, Malone C, Kerin MJ. Role models and mentors in surgery. *Am J Surg.* 2012;204(2):256-61.
10. Columbus AB, Lu PW, Hill SS, Fields AC, Davids JS, Melnitchouk N. Factors Associated With the Professional Success of Female Surgical Department Chairs: A Qualitative Study. *JAMA Surg.* 2020;155(11):1028-33.
11. Henry-Noel N, Bishop M, Gwede CK, Petkova E, Szumacher E. Mentorship in Medicine and Other Health Professions. *J Cancer Educ.* 2019;34(4):629-37.
12. Straus SE, Johnson MO, Marquez C, Feldman MD. Characteristics of successful and failed mentoring relationships: a qualitative study across two academic health centers. *Acad Med.* 2013;88(1):82-9.
13. Jackson VA, Palepu A, Szalacha L, Caswell C, Carr PL, Inui T. "Having the right chemistry": a qualitative study of mentoring in academic medicine. *Acad Med.* 2003;78(3):328-34.

14. Chang S, Guindani M, Morahan P, Magrane D, Newbill S, Helitzer D. Increasing Promotion of Women Faculty in Academic Medicine: Impact of National Career Development Programs. *J Womens Health (Larchmt)*. 2020;29(6):837-46.
15. Lareau S, Blumstein H, Hopson L, Keller BL, Haydel MJ, Cheaito MA, et al. Selecting a Medical School Advisor. *J Emerg Med*. 2019;56(5):e91-e3.
16. Schmidt LE, Cooper CA, Guo WA. Factors influencing US medical students' decision to pursue surgery. *J Surg Res*. 2016;203(1):64-74.
17. Corsini EM, Luc JGY, Antonoff MB. Women in thoracic surgery: social media and the value of mentorship. *J Thorac Dis*. 2021;13(1):464-72.
18. Trinh LN, O'Rorke E, Mulcahey MK. Factors Influencing Female Medical Students' Decision to Pursue Surgical Specialties: A Systematic Review. *J Surg Educ*. 2020.
19. Sorouri K, Khan S, Bowden S, Searle S, Carr L, Simpson JS. The Glaring Gender Bias in the Operating Room: A Qualitative Study of Factors Influencing Career Selection for First-Year Medical Students. *J Surg Educ*. 2021.
20. Kaderli R, Muff B, Stefenelli U, Businger A. Female surgeons' mentoring experiences and success in an academic career in Switzerland. *Swiss Med Wkly*. 2011;141:w13233.
21. Caniano DA, Sonnino RE, Paolo AM. Keys to career satisfaction: insights from a survey of women pediatric surgeons. *J Pediatr Surg*. 2004;39(6):984-90.
22. Williams C, Cantillon P. A surgical career? The views of junior women doctors. *Med Educ*. 2000;34(8):602-7.
23. Shah DN, Volpe NJ, Abbuhl SB, Pietrobon R, Shah A. Gender characteristics among academic ophthalmology leadership, faculty, and residents: results from a cross-sectional survey. *Ophthalmic Epidemiol*. 2010;17(1):1-6.
24. Ophthalmology AoUPo, Match S. Gender and Ethnicity Data; Ophthalmology Residency 2019. 2019.
25. Tuli SS. Status of Women in Academic Ophthalmology. *Journal of Academic Ophthalmology*. 2019;11(02):e59-e64.
26. Yousuf SJ, Kwagyan J, Jones LS. Applicants' choice of an ophthalmology residency program. *Ophthalmology*. 2013;120(2):423-7.
27. Masterfile AP. Active physicians by sex and specialty. American Association of Medical Colleges [Internet]. 2017.
28. Kloosterboer A, Yannuzzi NA, Gedde SJ, Sridhar J. Residency Program Directors of United States Ophthalmology Programs: A Descriptive Analysis. *Am J Ophthalmol*. 2020;209:71-6.
29. Dotan G, Qureshi HM, Gatton DD. Chairs of United States Academic Ophthalmology Departments: A Descriptive Analysis and Trends. *Am J Ophthalmol*. 2018;196:26-33.
30. Gong D, Winn BJ, Beal CJ, Blomquist PH, Chen RW, Culican SM, et al. Gender Differences in Case Volume Among Ophthalmology Residents. *JAMA Ophthalmol*. 2019;137(9):1015-20.

31. Feng PW, Ahluwalia A, Adelman RA, Chow JH. Gender Differences in Surgical Volume among Cataract Surgeons. *Ophthalmology*. 2020.
32. French DD, Margo CE, Campbell RR, Greenberg PB. Volume of Cataract Surgery and Surgeon Gender: The Florida Ambulatory Surgery Center Experience 2005 Through 2012. *J Med Pract Manage*. 2016;31(5):297-302.
33. Jia JS, Lazzaro A, Lidder AK, Elgin C, Alcantara-Castillo J, Gedde SJ, et al. Gender Compensation Gap for Ophthalmologists in the First Year of Clinical Practice. *Ophthalmology*. 2020.
34. Kalavar M, Watane A, Balaji N, Cavuoto KM, Vanner EA, Kuriyan A, et al. Authorship Gender Composition in the Ophthalmology Literature from 2015 to 2019. *Ophthalmology*. 2020.
35. Shah DN, Huang J, Ying GS, Pietrobon R, O'Brien JM. Trends in female representation in published ophthalmology literature, 2000-2009. *Digit J Ophthalmol*. 2013;19(4):50-5.
36. Xierali IM, Nivet MA, Wilson MR. Current and Future Status of Diversity in Ophthalmologist Workforce. *JAMA Ophthalmol*. 2016;134(9):1016-23.
37. AUPO Membership Directory San Francisco, California: Association of University Professors of Ophthalmology; 2019 [
38. Colleges AoAM. Diversity Facts and Figures. 2016-2019.
39. Shortell CK, Cook C. Importance of gender-specific role models in vascular surgery. *Vascular*. 2008;16(3):123-9.
40. Christiansen SM, Osher JM, Riemann CD. Association of Mentor-to-Program Contact and Applicant Rank Disclosure With Vitreoretinal Fellowship Applicant's Final Match Outcome in 2016 and 2017. *JAMA Ophthalmol*. 2018;136(6):642-7.
41. Barrocal M. A Woman's Touch to Improve Retina. 2016.
42. Freischlag JA. Women surgeons—still in a male-dominated world. *Yale J Biol Med*. 2008;81(4):203-4.
43. Zhuge Y, Kaufman J, Simeone DM, Chen H, Velazquez OC. Is there still a glass ceiling for women in academic surgery? *Ann Surg*. 2011;253(4):637-43.
44. Amoli MA, Flynn JM, Edmonds EW, Glotzbecker MP, Kelly DM, Sawyer JR. Gender Differences in Pediatric Orthopaedics: What Are the Implications for the Future Workforce? *Clin Orthop Relat Res*. 2016;474(9):1973-8.
45. Farkas AH, Bonifacino E, Turner R, Tilstra SA, Corbelli JA. Mentorship of Women in Academic Medicine: a Systematic Review. *J Gen Intern Med*. 2019;34(7):1322-9.
46. Kibbe MR, Pellegrini CA, Townsend CM, Jr., Helenowski IB, Patti MG. Characterization of Mentorship Programs in Departments of Surgery in the United States. *JAMA Surg*. 2016;151(10):900-6.
47. Passi V, Johnson S, Peile E, Wright S, Hafferty F, Johnson N. Doctor role modelling in medical education: BEME Guide No. 27. *Med Teach*. 2013;35(9):e1422-36.
48. Nowling TK, McClure E, Simpson A, Sheidow AJ, Shaw D, Feghali-Bostwick C. A Focused Career Development Program for Women Faculty at an Academic Medical Center. *J Womens Health (Larchmt)*. 2018;27(12):1474-81.

49. Helitzer DL, Newbill SL, Morahan PS, Magrane D, Cardinali G, Wu CC, et al. Perceptions of skill development of participants in three national career development programs for women faculty in academic medicine. Acad Med. 2014;89(6):896-903.

50. Choi AMK, Moon JE, Steinecke A, Prescott JE. Developing a Culture of Mentorship to Strengthen Academic Medical Centers. Acad Med. 2019;94(5):630-3.

Figures

Figure 1

AUPO Respondent Demographics. (Left) Number of respondents according to role. (Middle) Response rate based on role type. (Right) Percentage of male-identifying respondents and female-identifying respondents

Figure 2

General Mentorship Survey Responses Based on Gender. (Left, First): Percentage of leaders whose most influential mentor in their training was female. (Second) Time each week that each leader dedicates towards mentorship. (Third) Percentage of mentees that are female for leaders. (Right, Fourth) Percentage of Leaders who have seen an increase in the number of female mentees over their career

Figure 3

Average Survey Responses to Likert Scale Questions Based on Gender. 1 indicates strongly disagree whereas 5 indicates strongly agree with the statement.