




Perceived Barriers to Increasing Diversity within Oculofacial Plastic Surgery

Johsias A. Maru, BA¹  Nicole D. Carvajal, MS¹ Alejandra G. de Alba Campomanes, MD, MPH²
Neeti Parikh, MD² Davin C. Ashraf, MD² Robert C. Kersten, MD² Bryan J. Winn, MD^{2,3}
M. Reza Vagefi, MD² Seanna R. Grob, MD, MS²

¹School of Medicine, University of California, San Francisco, San Francisco, California

²Department of Ophthalmology, University of California, San Francisco, San Francisco, California

³Ophthalmology Section, Surgical Service, San Francisco Veterans Affairs Health Care System, San Francisco, California

Address for correspondence Seanna R. Grob, MD, MS, Wayne and Gladys Valley Center for Vision, Department of Ophthalmology, University of California, San Francisco, 490 Illinois St., San Francisco, CA 94158 (e-mail: seanna.grob@ucsf.edu).

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Abstract

Purpose Physician diversity is limited in ophthalmology and oculofacial plastic surgery. Determination of barriers within the application process for oculofacial plastic surgery may help target efforts to improve the recruitment of underrepresented groups. This study aimed to illuminate perceived barriers to increasing diversity in oculofacial plastic surgery trainees, according to the American Society of Ophthalmic Plastic and Reconstructive Surgery (ASOPRS) fellows and fellowship program directors (FPDs).

Methods During the month of February 2021, we sent surveys out to 54 current oculofacial plastic surgery fellows and 56 FPDs at 56 oculofacial plastic surgery programs recognized by the ASOPRS nationwide using a 15-question Qualtrics survey.

Results Sixty-three individuals (57%) responded to the survey: 34 fellows (63%) and 29 FPDs (52%). Eighty-eight percent of fellows and 68% of FPDs identified as non-underrepresented in medicine (UiM). Forty-four percent of fellows and 25% of FPDs identified as men. FPDs most commonly noted, “Not enough minorities applying to our program” and “The objective data (Ophthalmic Knowledge Assessment Program score, United States Medical Licensing Examination Step scores, clinical honors, Alpha Omega Alpha status, letter of recommendation) for minority applicants often do not meet the threshold required to offer an interview or to be ranked to match” as barriers. Among fellows, the lowest-rated considerations when applying to oculofacial plastic surgery were “Racially/ethnically diverse faculty” and “Perceptions of minority candidates by fellowship programs,” whereas “Likelihood of matching in program of choice” was ranked highest in considerations. Fellows identifying as men indicated greater concern for “Financial factors related to fellowship (e.g., loans, salary, cost of living, or cost of interviewing)” compared to fellows identifying as women who noted greater concern for “Program or preceptor acceptance of starting or having a family during fellowship.”

Keywords

- ▶ oculofacial plastic surgery
- ▶ oculoplastics
- ▶ underrepresented
- ▶ UiM
- ▶ underrepresented in medicine
- ▶ barriers
- ▶ fellowship
- ▶ minority

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Conclusion Responses from FPDs suggest that efforts focused on recruiting and supporting diverse students to medicine and ophthalmology, mentoring applicants interested in oculofacial plastic surgery, and restructuring the application process to decrease bias, may improve diversity within the subspecialty. The lack of UiM representation in this study, 6% fellows and 7.4% FPDs identified as UiM, shows both the stark underrepresentation and the need for further research into this topic.

Over the past several decades, the increasing diversification of the United States population has been documented across different communities.¹ Representation of individuals from groups historically underrepresented in medicine (UiM)—Black/African Americans, Hispanic/Latinx, Pacific Islanders, and Native Americans, Alaskans, and Hawaiians—has declined across multiple medical specialties when shifts in population composition are taken into account.^{2,3} In 2021, approximately 25% of medical school matriculants identified as UiM (1.1% American Indian or Alaska Native, 9.7% Black or African American, 11.8% Hispanic, Latino or of Spanish origin, 0.4% Native Hawaiian or Other Pacific Islander).⁴ Within ophthalmology, UiM are even further underrepresented, with roughly 6% of practicing ophthalmologists, 5.7% of ophthalmology faculty, and 7.7% of ophthalmology residents self-identifying as UiM, compared with the 30.7% that contribute to the U.S. population.³ This trend percolates through the various ophthalmologic subspecialties as well, including retina and oculofacial plastic surgery, with only 4.2 and 9.4% of practicing specialists self-identifying as UiM, respectively.^{5,6}

This lack of representation can diminish access to adequate health care and drive health disparities.⁷ Prior literature has shown that UiM physicians are more likely than their non-UiM counterparts to work in predominantly UiM communities, which are also more likely to experience physician shortages and the aforementioned disparities.^{8,9} Moreover, a body of literature exists that has demonstrated a positive association between race-concordance and important aspects of the physician-patient interaction, including cultural competence, communication, and patient satisfaction.^{10–12}

In addition to racial and ethnic disparities, sex and gender disparities also exist in many surgical subspecialties. In ophthalmology, there has been some progress toward the representation of women over recent years.¹³ Medical school enrollment of women was 52.7% in 2021. In 2018, 40% of ophthalmology residents identified as women and in 2019 there were about 27% women ophthalmologists.^{13,14} Within the population of oculofacial plastic surgeons, there has been about 45.8% of fellows that were female since 2008 according to the American Society of Ophthalmic Plastic and Reconstructive Surgery's (ASOPRS) general membership.¹³ However, only 22% of full professors in ophthalmology identified as women in 2019 and there is a known lack of women in ophthalmology leadership roles.¹³ The lack of representation in leadership roles and academic positions impacts patient care as prior research has noted gender to influence patient counseling services, communication styles, and patient satisfaction.⁵

In 2020, transgender and gender nonbinary (TGNB) people accounted for about 0.8% of medical school matriculants.¹⁵ Representation of TGNB people in surgery and surgical subspecialties is lacking. General surgery and surgical subspecialties have been perceived as least accepting of sex and gender minority students when compared to other specialties contributing to significant barriers experienced by TGNB people.¹⁶

Therefore, the authors surveyed ASOPRS oculofacial plastic fellowship program directors (FPDs) and fellows to identify barriers to increasing diversity within oculofacial plastic surgery.

Methods

During the month of February 2021, a 15-question Qualtrics survey (Qualtrics; Provo, UT) was electronically distributed to all oculofacial plastic FPDs and current fellows at 56 oculofacial plastic surgery programs recognized by the ASOPRS. Fellows were asked to rate 16 barriers on a 5-point Likert scale—1 (not at all concerned), 2 (slightly concerned), 3 (somewhat concerned), 4 (moderately concerned), and 5 (extremely concerned)—about how concerned they were about each barrier when deciding to pursue a fellowship in oculofacial plastic surgery. FPDs were asked to select all perceived barriers they believed precluded them from recruiting diverse trainees into their fellowship programs. Moreover, both fellows and FPDs were given the option to write in any barriers they deemed important but were not listed. The FPD survey portion was adapted from McDonald et al¹⁷ due to the similar goals and precedent set as one of the only studies of its kind. In addition to perceived barriers, demographic data were also collected from all respondents; this included geographic region, gender identity, race/ethnicity, and household income during childhood. We did not collect which program each participant was part of to protect anonymity. During the study period, three reminders were sent out to all participants, and all data was captured, anonymized, and stored within Qualtrics. SAS (SAS Institute; Cary, NC) was used for data management and statistical analysis, with an alpha level of $p < 0.05$ used as the cutoff for statistical significance. All research activities for this study were deemed exempt from ethical review by the institutional review board at the University of California, San Francisco, CA. Data collection was Health Insurance Portability and Accountability Act compliant, adhering to the tenets of the Declaration of Helsinki.

Results

A total of 63 individuals (57%) responded to the survey. Of those, 34 (63%) were current fellows and 29 (52%) were current FPDs. In terms of gender distributions, 44% of fellows identified as men, while 56% identified as women; no respondents selected nonbinary or “please list if not specified” gender choices. Eighty-six percent of FPDs identified as men, whereas 3% identified as women and 11% preferred not to answer. Of those who disclosed their racial/ethnic identity, 6% of fellows and 7.4% of FPDs identified as UiM (► **Table 1**). The geographic spread of respondents was fairly even across the four major regions of the U.S. Lastly, of those

Table 1 Survey participant demographics

Gender, n (%)	Fellows (n = 34)	Program directors (n = 29)
Man	15 (44)	25 (86)
Woman	19 (56)	1 (3)
Prefer not to answer	0	3 (11)
Race/Ethnicity, n (%)		
White/Caucasian	21 (62)	18 (62)
Black/African American	0	2 (7)
Asian/Asian American	9 (26)	5 (17)
Latinx/Hispanic	2 (6)	0
Middle Eastern and/or North African	1 (3)	0
American Indian or Alaskan Native	0	0
Native Hawaiian or Other Pacific Islander	0	0
Multiple races	0	2 (7)
Prefer not to answer	1 (3)	2 (7)
Other	0	0
Region, n (%)		
Midwest	9 (26)	10 (35)
Northeast	4 (12)	4 (14)
South	11 (32)	8 (28)
West	10 (29)	7 (24)
Average childhood household income, n (%)		
> \$100,000	19 (56)	8 (28)
\$80,000–\$100,000	1 (3)	1 (3)
\$60,000–\$80,000	5 (15)	0
\$30,000–\$60,000	5 (15)	5 (17)
\$15,000–\$30,000	1 (3)	2 (7)
< \$15,000	1 (3)	4 (14)
Prefer not to answer	2 (6)	9 (31)

Note: Survey participant demographics of the American Society of Ophthalmic Plastic and Reconstructive Surgery fellowship program directors and fellows partaking in the appraisal of potential barriers to increasing underrepresented in medicine representation.

who disclosed their average childhood household income, the 56% of fellows and 40% of FPDs came from homes with an income greater than \$100,000.

Fellows reported the most concern about likelihood of matching when applying to oculofacial plastic surgery; namely “Likelihood of matching in the program of choice,” “Likelihood of matching” overall, as well as the “Likelihood of matching in location of choice.” Conversely, the trainees who responded were least concerned about the following topics when considering their application to oculofacial plastic surgery fellowships—“Racially/ethnically diverse faculty” followed by “Perceptions of minority candidates by fellowship programs” (► **Table 2**).

Differences between UiM and non-UiM fellow responses were assessed. Compared to non-UiM fellows, UiM fellows reported greater concern for the elements comprising fellowship applications, including, “Competitiveness of Ophthalmic Knowledge Assessment Program (OKAP) score,” “Required number of research projects/publications,” and “Required number of Honors/Awards/Distinctions” when applying to oculofacial plastic surgery fellowship programs (► **Table 3**).

Table 2 Average fellow response

Question	Average rating (n = 34)
Likelihood of matching in program of choice	4.24
Likelihood of matching	3.82
Likelihood of matching in location of choice	3.62
Job availability after fellowship	3.47
Perceived exclusivity of the field	3.41
Financial factors related to fellowship (e.g., loans, salary, cost of living, or cost of interviewing)	2.91
Required number of research projects/publications	2.76
Early application	2.71
Competitiveness of OKAPs score	2.53
Required number of Honors/Awards/Distinctions	2.47
Gender diverse faculty	2.21
Length of training (i.e., additional one/two years of training)	2.12
Program or preceptor acceptance of starting or having a family during fellowship	2.03
Accessibility to mentors at home residency program	1.94
Racially/ethnically diverse faculty	1.71
Perceptions of minority candidates by fellowship programs	1.65

Abbreviation: OKAP, Ophthalmic Knowledge Assessment Program. Note: Overall average of fellow ratings per listed barrier faced when applying to oculofacial plastic surgery fellowship programs, on a scale from 1 (not at all concerned) to 5 (extremely concerned).

Table 3 Average fellow response by UiM status

Question	UiM (n = 2)	Non-UiM (n = 32)	p-Value
Competitiveness of OKAPs score	4.5	2.5	0.12
Required number of research projects/publications	4.0	2.6	0.40
Required number of Honors/Awards/Distinctions	3.5	2.4	0.22
Job availability after fellowship	4.5	3.4	0.22
Financial factors related to fellowship (e.g., loans, salary, cost of living, or cost of interviewing)	4.0	2.9	0.46
Length of training (i.e., additional one/two years of training)	3.0	2.0	0.70
Accessibility to mentors at home residency program	2.5	1.9	0.76
Likelihood of matching in location of choice	4.0	3.7	0.80
Program or preceptor acceptance of starting or having a family during fellowship	2.0	2.0	0.98
Perceptions of minority candidates by fellowship programs	1.5	1.6	0.82
Early application	2.5	2.7	0.93
Racially/ethnically diverse faculty	1.5	1.7	0.78
Likelihood of matching in program of choice	4.0	4.3	0.84
Likelihood of matching	3.5	3.9	0.59
Perceived exclusivity of the field	2.5	3.5	0.26
Gender diverse faculty	1.0	2.3	0.01

Abbreviations: OKAP, Ophthalmic Knowledge Assessment Program; UiM, underrepresented in medicine.

Note: Average fellow ratings of 16 barriers faced when applying to oculofacial plastic surgery fellowship programs, on a scale from 1 (not at all concerned) to 5 (extremely concerned), based on self-identified UiM status.

Significance of boldfaced values $p < 0.05$.

Gender-based differences between fellow responses were also assessed. Among this sample, fellows identifying as men indicated greater concern for “Financial factors related to fellowship (e.g., loans, salary, cost of living, or cost of interviewing)” at the time of application to oculofacial plastic surgery compared to fellows identifying as women ($p = 0.06$). Women fellows, however, noted greater concern for “Program or preceptor acceptance of starting or having a family during fellowship” ($p = 0.07$) (► **Table 4**). These findings did not reach statistical significance.

Three factors were most commonly identified as potential barriers among FPDs. These factors were, in order from most to least commonly cited, “Not enough minorities applying to our program,” “Other perceived barrier(s) not listed above,” and “The objective data (OKAP exam score, United States Medical Licensing Examination [USMLE] Step scores, clinical honors, Alpha Omega Alpha status, letter of recommendation [LOR]) for minority applicants often do not meet the threshold required to offer an interview or to be ranked to match” (► **Table 5**). Respondents that selected “Other perceived barrier(s) not listed above” were provided space to elaborate on their selection. Submitted responses fell into three thematic categories. The first emphasized a lack of UiM resident mentorship in the field of oculofacial plastic surgery, while the second posited a potential geographic barrier in which UiM candidates are heavily recruited by coastal programs, leaving few options for programs in the Midwest. The third and final category suggested that these FPDs

perceived no unique barriers to oculofacial plastic surgery faced by UiM applicants; these programs also did not rank applicants based on characteristics of identity (e.g., gender, race, sexual orientation).

Discussion

The purpose of this study was to investigate the perceived barriers to increasing diversity within the field of oculofacial plastic surgery from the viewpoints of ASOPRS fellows and FPDs. According to the surveyed FPDs, the main perceived barriers to increasing diversity in the oculofacial plastic surgery workforce are a lack of UiM applicants and the objective metrics of UiM not meeting required threshold levels (e.g., OKAP scores).

The lack of applicants into the field of ophthalmology poses a significant problem in the recruitment pipeline. As medical school exposure to ophthalmology declines, fewer students have applied to ophthalmology in recent years than in the past.^{18,19} Developing methods to recruit underrepresented people into medical school and then ophthalmology is key, followed by mentorship and support for those interested in oculofacial plastic surgery. Residency programs outside of ophthalmology have shown success in recruiting UiM residents by establishing and maintaining institutional financial support to develop and sustain respectful partnerships with communities and schools. These partnerships include pipeline programs for all education levels, programs

Table 4 Average fellow response by gender

Question	Average man rating (n = 15)	Average woman rating (n = 19)	p-Value
Likelihood of matching	4.00	3.68	0.42
Likelihood of matching in program of choice	4.00	4.42	0.13
Likelihood of matching in location of choice	3.67	3.58	0.83
Perceived exclusivity of the field	3.60	3.26	0.45
Financial factors related to fellowship (e.g., loans, salary, cost of living, or cost of interviewing)	3.40	2.53	0.06
Job availability after fellowship	3.07	3.79	0.13
Competitiveness of OKAPs score	2.67	2.42	0.54
Required number of research projects/publications	2.67	2.84	0.69
Early application	2.53	2.84	0.50
Required number of Honors/Awards/Distinctions	2.47	2.47	0.99
Length of training (i.e., additional one/two years of training)	2.33	1.95	0.42
Gender diverse faculty	1.87	2.47	0.13
Accessibility to mentors at home residency program	1.73	2.11	0.42
Program or preceptor acceptance of starting or having a family during fellowship	1.60	2.37	0.07
Perceptions of minority candidates by fellowship programs	1.60	1.68	0.78
Racially/ethnically diverse faculty	1.60	1.79	0.53

Abbreviation: OKAP, Ophthalmic Knowledge Assessment Program.

Note: Average fellow ratings of 16 barriers faced when applying to oculofacial plastic surgery fellowship programs, on a scale from 1 (not at all concerned) to 5 (extremely concerned), based on self-identified gender.

that actively engage student advisors, and intentionally investing in the community through means of employment.^{20–23} Some FPDs noted in their survey the lack of UiM mentorship in the field of oculofacial plastic surgery. Previous findings show that representation and visibility of diversity among residents and faculty members including having a UiM mentor have been helpful for trainees to garnish a stronger interest in academic careers as well as disrupt stereotypes.²⁴ This is particularly important in the field of oculofacial plastic surgery as fellows can work with a

single preceptor and no co-fellow peers in the span of the 2-year training program. Encouraging our ophthalmology faculty to mentor UiM medical students and ophthalmology residents interested in oculoplastic surgery, or other specialties, so they are highly competitive is important. Continued mentorship in fellowship and beyond to develop a successful career after fellowship is also essential.

Fortunately, pathway programs such as the Minority Ophthalmology Mentoring program and Rabb Venable are already making strides in UiM representation to ophthalmology. These

Table 5 Barriers selected by fellowship PDs

Barrier	Number of responses (%)
Not enough minorities applying to our program	24 (56)
Other perceived barrier(s) not listed above	6 (14)
The objective data (OKAPs score, USMLE Step scores, clinical honors, AOA status, LOR) for minority applicants often do not meet the threshold required to offer an interview or to be ranked to match	5 (12)
None are applicable	4 (9)
We consistently rank minority applicants high but can never seem to match them	3 (7)
We do not have enough minority faculty	1 (2)

Abbreviations: AOA, Alpha Omega Alpha; FPD, fellowship program director; LOR, letter of recommendation; OKAP, Ophthalmic Knowledge Assessment Program; PD, program director; UiM, underrepresented in medicine; USMLE, United States Medical Licensing Examination.

Note: Selected perceived barriers to the recruitment of UiM-identifying candidates to oculofacial plastic surgery faced by FPDs.

programs expose interested UiM medical students to the field of ophthalmology, pair students with a mentor, and provide resources to achieve success on standardized exams (i.e., USMLE Step 1) and throughout the residency application process. Similar programs in other specialties, such as the Perry Initiative and Nth Dimensions, designed to increase representation in the highly competitive specialty of orthopedic surgery for women and UiM, respectively, have found tremendous success boasting a 96% match rate for participants.²⁵

The FPDs' other reported perception, that UiM trainees often do not meet required thresholds for objective metrics, suggests the need for structural changes in the fellowship application process. While UiM individuals have been found to have lower test scores compared to their non-UiM counterparts, this more reflects generations of structural and interpersonal racism and bias than individual underachievement.²⁶⁻²⁸ To take steps to combat racism on the interpersonal level, unconscious bias training can be useful.²⁶ This training may also be supportive in exploring beliefs motivating the comments around "no unique barriers faced by UiM applicants and consideration of gender, race/ethnicity into the application process." This outdated, biased, and ineffective "color blind" philosophy directly impedes intentional actions to increase representation by UiM and gender minority physicians. Additionally, admission committees have been shown to demonstrate pro-white bias; thus, recruitment of more UiM physicians, who are less likely to demonstrate pro-white bias, into these committees, may also increase representation.^{26,29}

National organizations have taken great steps toward encouraging holistic review, with the USMLE changing the Step 1 exam to pass/fail and the American Academy of Ophthalmology releasing a position statement that OKAP scores should not be used for decision-making in fellowship application.²⁷ In addition to the use of test scores, the use of LORs has been shown to be of high importance in fellowship selection within the field of ophthalmic plastic and reconstructive surgery; however, implicit bias found within LORs can present an additional barrier to applicants not meeting the required threshold.²⁹⁻³³ Suggestions for addressing this barrier include the use of freely available artificial intelligence tools when writing letters as well as the use of a standard LOR as currently used in the field of emergency medicine, orthopaedic surgery, and otolaryngology.^{29,34} The holistic review of an application has been shown to be beneficial to both individuals and programs and the use of a task force can help streamline the process of holistic review for graduate medical education programs.³⁵⁻³⁷

Interestingly, when comparing responses from men and women fellows, women fellows were more concerned about starting a family and the perceptions of program leadership surrounding this, whereas men fellows were more concerned about the financial aspect of fellowship (e.g., salary, loans, etc.). These findings mirror those identified in other specialties. Cochran et al found that woman surgeons were far more likely than their man counterparts to agree that having children would be a career impediment and less

optimistic that they could overcome child-rearing-related career barriers represented by their desire to have children.³⁸ Prior studies have shown the additional work done by physician mothers per day in comparison to fathers and the impact that can have on work-life balance and burn-out.^{39,40} Structural changes in programs such as increased control in scheduling, practice efficiency improvements, gender-specific mentorship, and home-life directed interventions (i.e., onsite or readily accessible high-quality backup childcare) can help promote gender parity.³⁹⁻⁴²

In assessing the current state of diversity within oculofacial plastic surgery, it is also important to note progress relative to other medical specialties. Studies have observed that 7.2% of practicing dermatologists, 5.8% of practicing vascular surgeons, and 6.8% of practicing orthopaedic surgeons identify as UiM, compared to 9.4% in oculofacial plastic surgery.^{5,43-45} Furthermore, the UiM composition of the U.S. medical student body sits roughly around 15%.⁴⁶ Though also quite far below national representation, these numbers are encouraging in that they suggest oculofacial plastic surgery has forward movement and that perhaps the deficiency in the "pipeline" lies further upstream of the medical student level. However, it is not intended to elicit complacency as overall UiM representation, especially when compared with the demographics of the patients we serve, is still lacking.

Our study has several limitations. First, this is a survey-based study with a response rate of only 57% of current ASOPRS fellows and FPDs which could result in sampling bias; despite geographic diversity, perhaps the perspectives of individuals already dedicated to increasing UiM representation within oculofacial plastic surgery were overestimated. Additionally, while the survey instrument has been used by authors from another medical specialty, the survey has not been formally validated. A third notable limitation of this study was the limited UiM fellow and FPD representation in the response pool. The majority of those that responded identified as either White or Asian; only two ASOPRS fellows and two FPDs self-identified as UiM. This lack of UiM representation in the survey likely affects the survey responses. For example, although the current fellowship pool did not rate "Racially/ethnically diverse faculty" and "Perceptions of minority candidates by fellowship programs" highly, these metrics may be important for the recruitment of UiMs and may be ranked differently if the make-up of fellows had greater UiM representation. This clearly poses a significant obstacle when trying to better understand the barriers faced by this group. However, this also perfectly illustrates the lack of representation among current ASOPRS fellows and FPDs. Collecting responses from ophthalmology residents and medical students interested in ophthalmology—though the percentage of UiMs is also restricted in this population—may help to elucidate some of the upstream barriers dissuading UiMs from pursuing oculofacial plastic surgery fellowship training. Additionally, our study did not have representation from TGNB people in those that responded to the survey. Future studies focused on understanding barriers faced by TGNB people specifically are imperative to further increasing diversity in the field of oculofacial plastic surgery.

To the authors' knowledge, this is the first study examining barriers to the field of oculofacial plastic surgery for UIM and woman trainees. Given this, future studies should replicate with a larger, more diverse cohort, and potentially explore the perspectives of UIM and woman medical students and ophthalmology residents. These findings highlight the need for bolstered efforts focused on the recruitment of UIMs and woman to ophthalmology and oculofacial plastic surgery, as well as supporting holistic review of residency and fellowship applicants. By taking intentional, evidence-based steps, FPDs and division chiefs may improve UIM and woman representation within the discipline of oculofacial plastic surgery.

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Conflict of Interest

None declared.

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