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# Mentorship Experiences Are Not All the Same: A Survey Study of Oncology Trainees and Early-Career Faculty

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## ABSTRACT

**PURPOSE** Physician workforce diversity can be a driver of institutional excellence, improving innovation and reducing health disparities. However, the current diversity of the hematology/oncology (HO) workforce does not reflect that of the US population.

**METHODS** We conducted a cross-sectional online survey of current trainees and faculty within 5 years of completing terminal training in oncology specialties.

**RESULTS** Of the 306 respondents, 64 (21%) were under-represented in medicine (URiM) and 161 (53%) identified as male. URiM participants were less likely to have a primary mentor (66%) than non-URiM participants (80%; $P = .015$). Among those who had a primary mentor, URiMs met less frequently (once every 3-6 months or less) with their mentor (19% *v* 7% non-URiM; $P = .003$). Furthermore, URiMs were more likely to report having mentors outside their own institution (47% *v* 40% non-URiM; $P = .002$) and making compromises to gain access to mentorship (36% *v* 23% non-URiM; $P \leq 0.001$). URiMs were also less likely to apply for grants (34% *v* 42% non-URiM; $P = .035$) and awards (28% *v* 43% non-URiM; $P = .019$). In multivariable models, URiM individuals were more likely to make compromises to gain access to mentors (odds ratio [OR], 1.96; 95% CI, 1.01 to 3.82) and this remained significant for females (OR, 2.17; 95% CI, 1.26 to 3.75).

**CONCLUSION** URiM individuals may be less likely to have effective mentorship and apply for awards and grant support. Understanding the challenges of URiM trainees can help shape training environments in academic medicine to ensure that they are grounded in diversity, inclusion, and retention.

ACCOMPANYING CONTENT

Appendix

Data Supplement

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## INTRODUCTION

The importance of workforce diversity has been increasingly recognized in academic medicine; however, the number of physicians from racial and ethnic minority groups underrepresented in medicine (URiM) remains low.[1] Although individuals belonging to URiM groups make up one third of the US population, only 9% of independently practicing physicians identify as URiM.[2] This trend is similar at the trainee level with only 6% of hematology/oncology (HO) trainees self-identifying as Hispanic/Latino(a), 3.8% as Black or African American, 0.1% as American Indian/Alaskan Native, and only one Native Hawaiian/Pacific Islander trainee as of 2019.[2] It is also increasingly evident that certain Southeast Asian subgroups (ie, Hmong, Filipino, Vietnamese, Cambodian, and Laotian) are URiM.[3] Because the Asian group is aggregated in many reporting, data are lacking regarding how many individuals of these backgrounds comprise oncology trainees and early-career faculty.[4]

According to a 2018 Graduate Medical Education census, the diversity among internal medicine (IM) subspecialty fellows does not reflect the diversity of the US population.[5] In particular, HO fellowships have consistently ranked last of all IM subspecialties in racial/ethnic diversity.[5,6] Lack of mentorship and role models are barriers to careers in medicine disproportionally experienced by URiM individuals across the training pipeline, from high school to early career.[7-10]

The influence that mentorship has on academic productivity, advancement, and career satisfaction has been well documented. Specifically, in HO, Masselink et al[11] have demonstrated that increased opportunities for exposure to hematology patients, research opportunities, and mentorship throughout HO training could help increase the pipeline for potential hematologists. Similarly, mentorship has been identified as a reason to pursue training and careers in radiation oncology and gynecologic oncology.[12,13] Unfortunately,

## CONTEXT

**Key Objective**

What are mentorship experiences of trainees and early-career faculty in oncology subspecialties and do these experiences defer for individuals from backgrounds under-represented in medicine (URiM)?

**Knowledge Generated**

Participants from backgrounds URiM were less likely to have a primary mentor and more likely to have mentors outside their own institution and/or make compromises to gain access to mentorship when compared with participants who were not from backgrounds URiM. They were also less likely to have an advisor, a coach, or a sponsor and less likely to apply for grants and awards compared with non-URiM participants.

**Relevance**

Understanding the challenges of URiM trainees can help shape training environments in academic medicine to ensure that they are grounded in diversity, inclusion, and retention.

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women and URiM trainees and faculty face many barriers to career advancement in academia, with lack of mentorship and sponsorship being key challenges.[14-16] For example, over half of women trainees in radiation oncology report that lack of mentorship affected their career ambitions and academic productivity.[17] However, little is known about the role of mentoring on career choices of URiM trainees and early-career faculty in oncology subspecialties. Considering this paucity of data, we examined differences in mentorship experiences of URiM and non-URiM trainees and early-career faculty in adult HO, radiation oncology, and gynecology oncology with regards to securing mentorship during training and explored ways in which such experiences affected their overall career choices.

## METHODS

We conducted a cross-sectional survey study to characterize the mentorship experiences of current trainees and early-career faculty in oncology subspecialties. The target population was trainees and early-career faculty in medical HO, radiation oncology, and gynecologic oncology. Early-career faculty was defined as practicing physicians within 5 years of their terminal training. In the survey, an advisor was defined as someone who gives you guidance regarding your career/goals. A coach was defined as someone who encourages you, helps you establish career goals, and work with you to help you accomplish those goals. A sponsor was defined as someone to vouch for you to get onto projects and into roles that you may not have had access to on your own. This study was not conducted for a confirmatory purpose but a hypothesis-generating purpose. Thus, the study sample size was not on the basis of a power calculation to detect a prespecified difference in survey response between URiM and non-URiM participants.

The survey was open for 30 days from April 1, 2021, to April 30, 2021. There were 55 questions including multiple-choice, Likert scale, and open-ended questions to assess the trainees' and early-career faculty's demographics, mentorship experiences, experiences with discrimination and/or microaggressions, and future career plans.

The nonexternally validated survey was designed by the study team using the SurveyMonkey platform for the purposes of this research (SurveyMonkey, San Mateo, CA). Before administration, a pilot survey was sent to members from the Florez Lab to review the content, flow, and presence of leading questions. A multimodal approach using snowball sampling (type of convenience sampling) was used to recruit study participants. A link to the online questionnaire (Data Supplement, online only) was sent via institutional e-mail address to HO, radiation oncology, and gynecologic oncology program directors and administrators for distribution (n = 165). In addition, social media channels (Facebook and Twitter) were used for recruitment and to reach the target population, although links to the survey were not made public on social media. URiMs were specifically encouraged in our social media messaging to participate in the study. Upon completion of the questionnaire, participants received a gift card of $20 in US dollars. The survey questions used for the analysis of this manuscript are included in the appendix.

Quantitative analysis was performed on the participants' demographics and experiences with mentorship. Fisher's exact tests were used to explore the bivariate association between each of the participants' characteristics/experiences and URiM status (URiM *v* non-URiM). URiM status was defined as self-identifying as Hispanic ethnicity or the following racial groups: Native American/Pacific Islander Black, Southeast Asian, or multiracial—with URiM ethnicity or aforementioned racial groups. In the bivariate association analysis, missing data were included as the not reported category for the primary analyses, considering missing values are not necessarily noninformative. As a sensitivity analysis,

we performed the complete case analyses under the assumption that missing values are not informative. Multivariable logistic regression analyses were performed to assess the association of participants' characteristics with the primary outcome of having a primary mentor and secondary outcomes of difficulty of finding a mentor and making compromises to gain mentorship. The participants with missing values in the outcome of interest or any predictor variables were omitted from the analysis. The degree of association was summarized by the odds ratio (OR) and its 95% CI. A two-sided $P < .05$ was considered statistically significant. Study data were deidentified and analyzed using R version 4.0.3 (R Foundation for Statistical Computing, Vienna, Austria). All study procedures were approved by the University Wisconsin, Madison Institutional Review Board.

## RESULTS

A total of 321 individuals initiated the online survey (Data Supplement), of whom 306 (95%) completed it during the study period. The respondents comprised individuals with specialty training in adult combined HO (n = 179; 58.5%), radiation oncology (n = 61; 20%), medical oncology (n = 54; 18%), adult hematology (n = 11; 4%), and gynecology oncology (n = 1; <1%). The majority, 278 (91%), were trainees and 28 (9%) were early-career faculty within 5 years of the completion of terminal training. Of the 306 respondents, 64 (21%) were URiM. Five participants whose URiM status was unknown were removed from the analysis cohort comparing mentorship experiences among URiM and non-URiM participants (primary outcome). The demographic and clinical characteristics of the 301 study participants are reported in Table 1. Overall, URiM individuals were more likely to be born outside of the United States compared with their non-URiM counterparts (50% *v* 28%; $P = .001$). Forty six percent (n = 139) of respondents identified as women; however, when the data were stratified by URiM status, there was a larger proportion of women in the URiM group (n = 32, 50%) versus the non-URiM group (n = 107, 45%; $P = .035$).

### Mentorship Experiences

Most study participants reported having a primary mentor (n = 231; 77%) and an advisor (n = 153; 51%), but few individuals had a coach (n = 55; 18%) or sponsor (n = 74; 25%). Overall, there were no statistically significant differences in the attributes of mentors that were important to the study participants. The most important characteristics of a mentor selected by the entire cohort was the availability of the mentor, followed by personality match, track record of mentorship, mentor's accomplishments and seniority, and finally, sharing a similar background with the mentor.

In general, trainees and early-career faculty from URiM backgrounds were less likely to have a primary mentor (66%) compared with non-URiM participants (80%; $P = .015$; Fig 1). Among the 231 (42 URiM and 189 non-URiM) individuals who reported having a primary mentor, URiM individuals were less likely to report having received mentorship on a primary research project (74% *v* 91% non-URiM; $P = .008$), poster presentation (31% *v* 55% non-URiM; $P = .006$), coauthorship of book chapters (0% *v* 16% non-URiM; $P = .002$), writing grants (17% *v* 33% non-URiM; $P = .041$), or clinical skills (45% *v* 63% non-URiM; $P = .038$; Table 2). URiM participants were also more likely to meet less frequently (once every 3-6 months or less) with their mentor compared with non-URiMs (19% *v* 7%; $P = .003$; Table 3).

URiM individuals were less likely to rate their ability to find a mentor as easy/very easy compared with non-URiM participants (22% *v* 47% non-URiM; $P \leq 0.001$). They were also significantly more likely to report making compromises, such as working on projects outside of their disease focus or career goals, to access mentorship (36% *v* 23% non-URiM; $P < .001$). More URiM individuals also reported having mentors outside of their own institution (47% *v* 40% non-URiM; $P = .002$; Table 3).

Initially, most participants (71%) reported not knowing the difference between a mentor, advisor, coach, and sponsor before completing this questionnaire. However, on the basis of the standard definitions provided in the questionnaire, URiM participants were less likely to report having an advisor (38% *v* 54% non-URiM; $P = .017$), a coach (13% *v* 20% non-URiM; $P = .054$), or a sponsor (19% *v* 26% non-URiM; $P = .046$; Fig 1).

In multivariable models controlling for sex, country of birth, and household income, individuals born outside of the United States had lower odds of having a primary mentor (OR, 0.41; 95% CI, 0.23 to 0.75) compared with individuals born in the United States and reported having a difficult/very difficult time finding mentors (OR, 2.13; 95% CI, 1.12 to 4.06). Furthermore, URiM individuals (OR, 1.96; 95% CI, 1.01 to 3.82) and females (OR, 2.17; 95% CI, 1.26 to 3.75) were more likely to make compromises to gain access to mentors compared with their male and non-URiM counterparts (Table 4).

### Experiences Applying for Grants and Awards

When evaluating grantsmanship and award applications, a similar pattern was observed, in that URiM participants were less likely to apply for grants (34% *v* 42% non-URiM; $P = .035$) and awards (28% *v* 43%; $P = .019$). Among those who applied to grants, there were no statistically significant differences in the types of grant applications (ie, T32, young investigator award, F31, and National Institutes of Health [NIH] K-awards) submitted between URiM versus non-URiM applicants (Table 3). Although it did not reach statistical significance, a higher proportion of individuals with a primary mentor submitted grant applications, compared with those without a primary mentor (44% *v* 30%; $P = .068$; Appendix Table A1, online only).

Similarly, of 119 individuals (18 URiM and 101 non-URiM) who applied for awards (ie, merit, travel, and institutional awards),

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**TABLE 1.** Characteristics of Participants

| Variable | URiM (n = 64), No. (%) | Non-URiM (n = 237), No. (%) | *P* |
|---|---|---|---|
| Ethnicity | | | |
| Hispanic | 39 (60.9) | 0 | NA[a] |
| Non-Hispanic | 25 (39.1) | 237 (100) | |
| Race | | | |
| White | 20 (31.2) | 126 (53.2) | NA[a] |
| Black/African American | 20 (31.2) | 0 | |
| Middle Eastern | 0 | 11 (4.6) | |
| East Asian | 0 | 31 (13.1) | |
| South Asian | 1 (1.6) | 63 (26.6) | |
| South East Asian | 7 (10.9) | 0 | |
| Multiracial | 11 (17.2) | 1 (0.4) | |
| Other/not reported | 5 (7.8) | 5 (2.1) | |
| Age, years | | | |
| <25 | 2 (3.1) | 0 | .021 |
| 25-29 | 3 (4.7) | 34 (14.3) | |
| 30-34 | 40 (62.5) | 144 (60.8) | |
| 35-39 | 15 (23.4) | 52 (21.9) | |
| ≥40 | 3 (4.7) | 6 (2.5) | |
| Not reported | 1 (1.6) | 1 (0.4) | |
| Sex | | | |
| Male | 30 (46.9) | 130 (54.9) | .035[b] |
| Female | 32 (50.0) | 107 (45.1) | |
| Other/not reported | 2 (3.1) | 0 | |
| Practice location | | | |
| Academic/university-based | 57 (89.1) | 223 (94.1) | .034[b] |
| Community-based | 1 (1.6) | 7 (3.0) | |
| Community-based/university-affiliated | 4 (6.2) | 2 (0.8) | |
| Government | 0 | 3 (1.3) | |
| Industry | 0 | 1 (0.4) | |
| Not reported | 2 (3.1) | 1 (0.4) | |
| Annual No. of trainees | | | |
| ≤3 | 17 (26.6) | 58 (24.5) | .427 |
| 4-7 | 25 (39.1) | 102 (43.0) | |
| 8-11 | 15 (23.4) | 38 (16.0) | |
| ≥12 | 7 (10.9) | 39 (16.5) | |
| Training specialty/current practice | | | |
| Adult hematology | 5 (7.8) | 6 (2.5) | .217 |
| Adult hematology/oncology | 39 (60.9) | 138 (58.2) | |
| Adult medical oncology | 11 (17.2) | 40 (16.9) | |
| Gynecology oncology | 0 | 1 (0.4) | |
| Radiation oncology | 9 (14.1) | 52 (21.9) | |
| PGY level | | | |
| PGY 2 | 0 | 19 (8.0) | .148 |
| PGY 3 | 4 (6.2) | 16 (6.8) | |
| PGY 4 | 15 (23.4) | 45 (19.0) | |
| PGY 5 | 17 (26.6) | 77 (32.5) | |
| PGY 6 | 17 (26.6) | 47 (19.8) | |
| PGY 7 | 5 (7.8) | 12 (5.1) | |
| Not applicable | 6 (9.4) | 21 (8.9) | |

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**TABLE 1.** Characteristics of Participants (continued)

| Variable | URiM (n = 64), No. (%) | Non-URiM (n = 237), No. (%) | *P* |
|---|---|---|---|
| Years out of fellowship | | | |
| 1 | 7 (10.9) | 11 (4.6) | .022 |
| 2 | 1 (1.6) | 8 (3.4) | |
| 3 | 4 (6.2) | 3 (1.3) | |
| 4 | 2 (3.1) | 3 (1.3) | |
| Not applicable | 50 (78.1) | 212 (89.5) | |
| Country of birth | | | |
| United States | 30 (46.9) | 169 (71.3) | .001 |
| Non-US | 32 (50.0) | 66 (27.8) | |
| Not reported | 2 (3.1) | 2 (0.8) | |
| Medical school | | | |
| United States | 39 (60.9) | 183 (77.2) | .011 |
| Non-US | 25 (39.1) | 54 (22.8) | |
| First-generation college graduate | | | |
| Yes | 14 (21.9) | 31 (13.1) | .112 |
| No | 50 (78.1) | 206 (86.9) | |
| Parent's highest level of education | | | |
| High school or less | 11 (17.2) | 15 (6.3) | .032 |
| Some college | 4 (6.2) | 19 (8.0) | |
| Four-year college | 13 (20.3) | 50 (21.1) | |
| Masters | 8 (12.5) | 54 (22.8) | |
| Doctoral | 25 (39.1) | 96 (40.5) | |
| Not reported | 3 (4.7) | 3 (1.3) | |
| Household income | | | |
| Low | 15 (23.4) | 22 (9.3) | .003 |
| Middle | 32 (50.0) | 141 (59.5) | |
| High | 14 (21.9) | 72 (30.4) | |
| Not reported | 3 (4.7) | 2 (0.8) | |
| Place of upbringing | | | |
| Inner city | 8 (12.5) | 15 (6.3) | .004 |
| Urban | 25 (39.1) | 48 (20.3) | |
| Rural | 4 (6.2) | 32 (13.5) | |
| Suburb | 26 (40.6) | 138 (58.2) | |
| Other/not reported | 1 (1.6) | 4 (1.7) | |
| Current research project | | | |
| Basic science | 7 (10.9) | 8 (3.4) | .073 |
| Clinical | 39 (60.9) | 160 (67.5) | |
| Outcomes/social science | 6 (9.4) | 20 (8.4) | |
| Translational | 5 (7.8) | 33 (13.9) | |
| Multiple | 0 | 3 (1.3) | |
| Other/not reported | 7 (10.9) | 13 (5.5) | |

Abbreviations: NA, not available; PGY, post graduate year; URiM, under-represented in medicine.
[a]We did not perform statistical tests for ethnicity and race because the URiM status was determined on the basis of these variables.
[b]We did not observe a statistically significant *P* value (<0.05) for these variables when excluding missing values from the analysis.

URiM individuals were less likely to apply for merit awards (28% *v* 61% non-URiM; $P = .010$; Table 3). We observed that those with a primary mentor were more likely to apply for awards, compared with individuals without a primary mentor (45% *v* 25%; $P = .005$; Appendix Table A1).

## Career Plans and Perceived Support

Overall, those who had a primary mentor endorsed feeling that their careers goals were supported, compared with those without a primary mentor (82% *v* 57%; $P \leq 0.001$; Appendix



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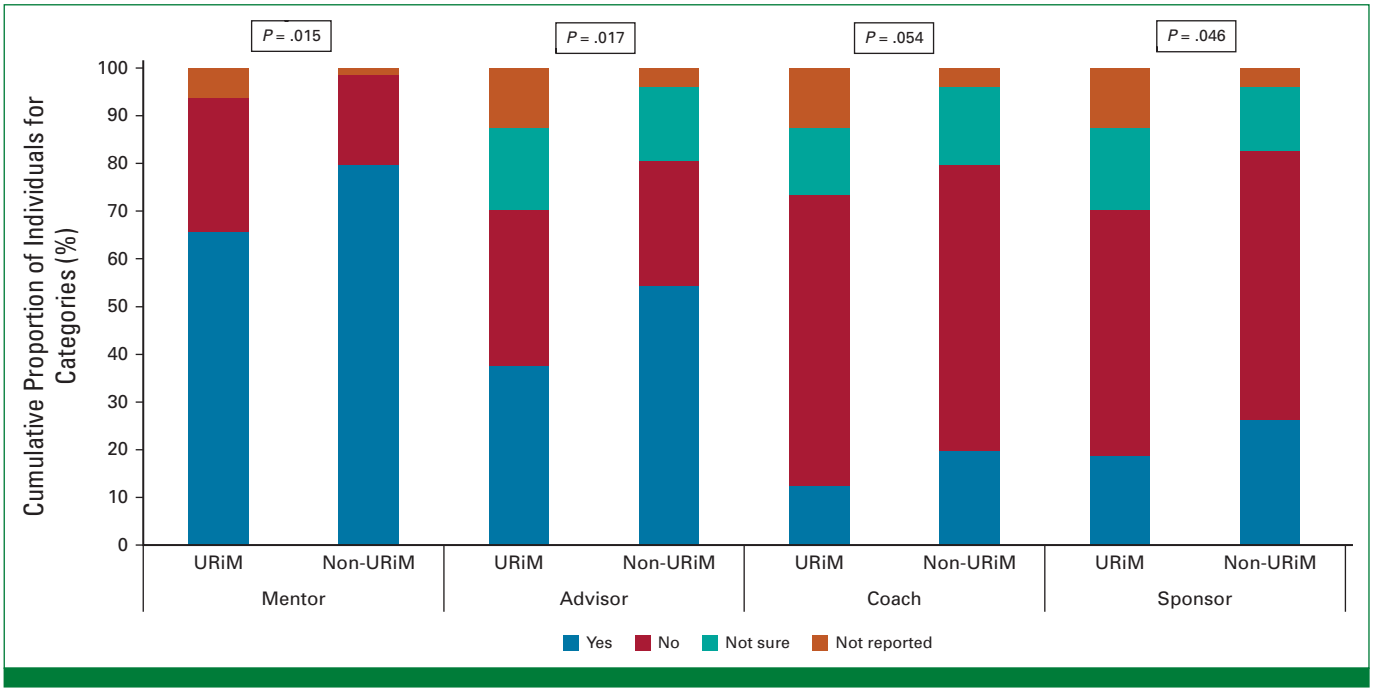


**FIG 1.** Comparison of access to mentors, advisors, coaches, and sponsors among URiM versus non-URiM participants. URiM, under-represented in medicine.

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Table A1). Most participants, 226 (75%), felt that their career goals were supported at their institution and there was no statistically significant difference between URiM and non-URiM participants (67% *v* 77%; $P = .182$). However, a lesser proportion of URiM participants reported feeling supported by their mentors (67% *v* 83%; $P = .035$; Table 3).

Most participants (56%) planned to pursue a career in academia. The proportion of individuals who reported changing their career plans by the end of training was small (25% of URiM and 37% of non-URiM). Granular analyses regarding the career changes were limited by the small sample size. Among the total study participants, 25% reported changing their career plans from academic medicine to other fields including community practice, government, and/or industry. The proportion of participants who reported changing their career plans from community practice to academic medicine in non-URiM was numerically higher than those in URiM (46% *v* 25%; $P = .106$; Table 3).

## DISCUSSION

Improving the diversity of our physician workforce can be a mechanism to spark innovation in medicine and reduce

**TABLE 2.** Type of Mentorship Provided for Individuals Who Had Mentors (n = 231)

| Type | URiM (n = 42), No. (%) | Non-URiM (n = 189), No. (%) | *P* |
|---|---|---|---|
| Primary research | 31 (73.8) | 171 (90.5) | .008 |
| Quality improvement project | 4 (9.5) | 24 (12.7) | .794 |
| Poster presentation | 13 (31.0) | 104 (55.0) | .006 |
| Oral presentation | 7 (16.7) | 53 (28.0) | .173 |
| Coauthoring a paper | 22 (52.4) | 119 (63.0) | .223 |
| Coauthoring a book chapter | 0 | 31 (16.4) | .002 |
| Writing a grant | 7 (16.7) | 63 (33.3) | .041 |
| First job search | 9 (21.4) | 51 (27.0) | .561 |
| Salary negotiation on first job | 2 (4.8) | 24 (12.7) | .182 |
| Provided clinical mentorship | 19 (45.2) | 119 (63.0) | .038 |
| Provided career mentorship | 19 (45.2) | 115 (60.8) | .083 |
| Leadership position search | 4 (9.5) | 37 (19.6) | .179 |

Abbreviation: URiM, under-represented in medicine.

**TABLE 3.** Participants' Experience in Mentorship, Grant/Award Applications, and Career Support/Goal

| Variable | URiM (n = 64), No. (%) | Non-URiM (n = 237), No. (%) | *P* |
|---|---|---|---|
| Experience in mentorship | | | |
| Having a primary mentor | | | |
| Yes | 42 (65.6) | 189 (79.7) | .015[g] |
| No | 18 (28.1) | 45 (19.0) | |
| Not reported | 4 (6.2) | 3 (1.3) | |
| Having a mentor outside | | | |
| Yes | 30 (46.9) | 95 (40.1) | .002 |
| No | 26 (40.6) | 136 (57.4) | |
| Not reported | 8 (12.5) | 6 (2.5) | |
| Ease of finding a mentor | | | |
| Very easy/easy | 14 (21.9) | 111 (46.8) | <.001 |
| Moderate/difficult/very difficult | 42 (65.6) | 119 (50.2) | |
| Not reported | 8 (12.5) | 7 (3.0) | |
| Frequency of meeting with their primary mentor | | | |
| Meet once every 3 months or more frequent | 31 (73.8)[a] | 173 (91.5)[a] | .003 |
| Meet once every 3-6 months or less frequent | 8 (19.0)[a] | 13 (6.9)[a] | |
| Not reported | 3 (7.1)[a] | 3 (1.6)[a] | |
| Compromises to gain access to their mentors | | | |
| Yes | 23 (35.9) | 54 (22.8) | <.001 |
| No | 33 (51.6) | 177 (74.7) | |
| Not reported | 8 (12.5) | 6 (2.5) | |
| Experience in grant/award applications | | | |
| Applied for any grant | | | |
| Yes | 22 (34.4) | 99 (41.8) | .035 |
| No | 34 (53.1) | 129 (54.4) | |
| Not reported | 8 (12.5) | 9 (3.8) | |
| Type of grant: T32 | | | |
| Yes | 5 (22.7)[b] | 26 (26.3)[b] | 1 |
| Type of grant: F31 | | | |
| Yes | 1 (4.5)[b] | 12 (12.1)[b] | .459 |
| Type of grant: YIA | | | |
| Yes | 11 (50.0)[b] | 50 (50.5)[b] | 1 |
| Type of grant: NIH K-type career development | | | |
| Yes | 1 (4.5)[b] | 2 (2.0)[b] | .455 |
| Applied for any award | | | |
| Yes | 18 (28.1) | 101 (42.6) | .019 |
| No | 38 (59.4) | 125 (52.7) | |
| Not reported | 8 (12.5) | 11 (4.6) | |
| Type of award: merit | | | |
| Yes | 5 (27.8)[c] | 62 (61.4)[c] | .010 |
| Type of award: travel award | | | |
| Yes | 10 (55.6)[c] | 39 (38.6)[c] | .201 |
| Type of award: institutional | | | |
| Yes | 6 (33)[c] | 28 (27.7)[c] | .777 |
| Experience in career support/goal | | | |
| Having career goal support by their institution | | | |
| Yes | 43 (67.2) | 183 (77.2) | .182 |
| No | 12 (18.8) | 36 (15.2) | |
| Not reported | 9 (14.1) | 18 (7.6) | |

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**TABLE 3.** Participants' Experience in Mentorship, Grant/Award Applications, and Career Support/Goal (continued)

| Variable | URiM (n = 64), No. (%) | Non-URiM (n = 237), No. (%) | *P* |
|---|---|---|---|
| Having career goal support by their mentors | | | |
| Yes | 29 (67.4)[d] | 151 (82.5)[d] | .035 |
| Changing their career plans by the end of training | | | |
| Yes | 16 (25.0) | 87 (36.7) | .112 |
| No | 39 (60.9) | 131 (55.3) | |
| Not reported | 9 (14.1) | 19 (8.0) | |
| Type of the career plan change because of their mentorship experience | | | |
| Community practice to academic medicine | 4 (25.0)[e] | 40 (46.0)[e] | .106 |
| Other listed types[f] | 7 (43.8)[e] | 37 (42.5)[e] | |
| Others/not reported | 5 (31.2)[e] | 10 (11.5)[e] | |

Abbreviations: NIH, National Institutes of Health; URiM, under-represented in medicine; YIA, young investigator award.
[a]The denominator is the number of participants who reported having a primary mentor (n = 42 for URiM and n = 189 for non-URiM groups).
[b]The denominator is the number of participants who reported having experience in applying for any grant (n = 22 for URiM and n = 99 for non-URiM groups).
[c]Denominator is the number of participants who reported having experience in applying for any award (n = 18 for URiM and n = 101 for non-URiM groups).
[d]The denominator is the number of participants who reported having a career goal support by their institution (n = 43 for URiM and n = 183 for non-URiM groups).
[e]The denominator is the number of participants who reported changing their career plan by the end of training because of their mentorship experience (n = 16 for URiM and n = 87 for non-URiM groups).
[f]Other listed types include academic medicine to government/industry, government to academic medicine/community practice, and industry to academic medicine.
[g]We did not observe a statistically significant *P* value (<0.05) for this variable when excluding missing values from the analysis.

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health disparities. The importance of workforce diversity in general has been well established.[18] For example, the problem-solving skills of diverse teams have been shown to outperform those of homogeneous ones, and academic papers coauthored by ethnically diverse contributors have been shown to have a greater impact on the scientific community.[19,20] The lack of diversity within institutions can often be a symptom of systemic discrimination and injustice, which also need to be recognized and addressed. As the US population becomes more diverse, it is increasingly important to ensure that the workforce of oncology subspecialties reflects that diversity.[6] Although prior studies have also demonstrated that mentorship in hematology, for instance, is positively associated with trainees pursuing careers in this specialty,[11] there is currently a paucity of data regarding if this is the case for groups historically excluded from oncology subspecialties.

To our knowledge, this is the first study to describe the challenges around access to mentorship and sponsorship experienced by URiM trainees and early-career faculty in oncology subspecialties. Overall, our study demonstrated that many trainees and early-career faculty from all backgrounds do not have mentors, advisors, coaches, and/or sponsors. This was especially apparent for individuals from backgrounds URiM, with less URiM participants in the study population

**TABLE 4.** Multivariable Logistic Regression Analysis of Participants' Characteristics Associated With the Primary and Secondary Outcomes

| | Outcome | | |
|---|---|---|---|
| | Having a Primary Mentor[a] | Difficulty of Finding a Mentor[b] | Making Compromises to Gain Mentorship[c] |
| Variable | OR (95% CI) | OR (95% CI) | OR (95% CI) |
| URiM status (ref: non-URiM) | 0.72 (0.36 to 1.43) | 1.29 (0.61 to 2.73) | 1.96 (1.01 to 3.82) |
| Female sex (ref: male) | 0.89 (0.50 to 1.58) | 1.78 (0.96 to 3.31) | 2.17 (1.26 to 3.75) |
| Non–US-born (ref: US-born) | 0.41 (0.23 to 0.75) | 2.13 (1.12 to 4.06) | 1.37 (0.76 to 2.46) |
| Middle household income (ref: low) | 0.87 (0.35 to 2.13) | 1.38 (0.51 to 3.72) | 1.25 (0.52 to 2.98) |
| High household income (ref: low) | 0.78 (0.29 to 2.10) | 1.40 (0.47 to 4.13) | 1.47 (0.58 to 3.77) |

Abbreviations: OR, odds ratio; URiM, under-represented in medicine.
[a]A total of 288 participants were included in the analysis.
[b]A total of 281 participants were included in the analysis. Respondents who rated finding mentors as very difficult or difficult were considered as having difficulty of finding mentors.
[c]A total of 282 participants were included in the analysis.

reporting adequate mentorship during their oncology training compared with non-URiM individuals. Furthermore, URiM participants had higher odds of making compromises to gain mentorship, and this was especially significant for women. This can potentially exacerbate existing challenges and lead to increased symptoms of burnout, as these individuals seek both in and out of their institutions for adequate mentorship. We also noted that international medical graduates also had lower odds of having a primary mentor. These findings are consistent with prior work showing the mentorship and sponsorship challenges of URiM trainees and faculty in other fields of academic medicine,[9,21] women in academic medicine,[22] and women in radiation oncology.[23,24] These findings highlight compounded difficulties that individuals with multiple marginalized identities may face in accessing mentorship and sponsorship in oncology subspecialties.

Our data also demonstrate lower application rates for grants/awards among URiM participants. Multiple studies have already shown lower application rates for R01 grants or career development awards in Black and Hispanic investigators compared with their White counterparts,[25,26] where the decreased submission of awards was more pronounced in applicants with intersectional identities, such as Black women.[25] There has also been a significant funding gap, as Black and Hispanic investigators have historically been less likely to receive NIH funding compared with non-Hispanic White investigators.[27] Similar patterns have been observed with regards to national society recognition awards. Among seven major hematology and oncology societies, women and minority groups have been shown to be under-represented among award recipients.[28] This has dramatic implications for the future of academic medicine and oncology, as it can lead to less academic advancement and career satisfaction for URiM hematologists/oncologists. Such effects can subsequently perpetuate the cycle of a homogenous workforce and stifle innovation.

A strength of this study is that it included higher proportion of URiM participants relative to their share in the general practicing oncology workforce. However, the total number of participants who belonged to URiM groups is still small in this study and further highlights the glaring issue that the oncology workforce does not reflect the diversity of the US population. Despite this, to our knowledge, we were able to carry out the largest study to date characterizing the mentorship experiences of trainees and junior faculty in oncology subspecialties.

There are inherent limitations to our cross-sectional study design. Although such a design allowed us to capture data at a single time point, it did not allow us to establish causal or longitudinal relationships. In addition, we were unable to calculate a response rate because of the e-mail and social media recruitment method used in this study and the survey used was not externally validated, which can introduce bias. Furthermore, the study period was amid the COVID-19 pandemic, which may have affected the participants mentorship experiences overall. For instance, in HO, several studies have shown increased self-reported symptoms of burnout, stress, and worry regarding loss of clinical opportunities, grant funding, and variable productivity related to the COVID-19 pandemic, which may have influenced our findings.[29,30]

For the bivariate association analysis, we reported the primary analysis results, where we included missing values as the not reported category. Our sensitivity analyses suggested that several findings from the primary analyses were not stable. Specifically, statistically significant associations of the URiM status with sex, practice location, and primary mentor status did not reach $P < .05$ with the complete case analyses excluding missing values. A caution should be exercised in interpreting the associations of these variables with the URiM status. Finally, the snowball sampling method used also inherently introduces selection bias and differential recruitment, as evidenced by there being only one (n = 1) participant from gynecology/oncology. Despite these limitations, we believe that our study highlights important challenges experienced by oncology subspecialty trainees and early-career faculty from backgrounds historically excluded from medicine.

Understanding the challenges of URiM trainees can help shape training environments in academic medicine. Given the challenges for URiM trainees and early-career faculty in oncology subspecialties, training programs must consider new innovative mentoring programs that prioritize diversity. Prior work has demonstrated mentorship programs can be successful when they are aligned with the institutional goals and resources are established to sustain efforts that foster an environment of inclusion and diversity.[31,32] Various models of mentorship, such as the cascading model,[33] can be used to amplify the reach of senior faculty mentors, by pairing them with early-career faculty, and pairing the early-career faculty with trainees, and so forth. The rapid uptake of online meeting platforms because of the COVID-19 pandemic can also be used to pair mentors from various institutions with URiM trainees and early-career faculty across the country, as remote mentoring has been shown to be an effective avenue to provide mentorship to women in radiation oncology.[24] Finally, the ongoing training of potential mentors to ensure effective mentoring experiences remains crucial.[34] Institutions must provide support and academic incentives to faculty who continue to have more and more demands on their time. Most importantly, mentorship programs should be evaluated regularly to ensure they are meeting their intended goals.

Tackling the challenges of lack of diversity in academic medicine and sparse mentorship of URiM trainees and early-career faculty is often relegated to individuals who share a similar background. However, faculty from URiM backgrounds are grossly underrepresented in oncology subspecialties[35] and in leadership[36] across National Cancer Institute–designated cancer centers. As a result, many are often disproportionally taxed with extra responsibilities in the name of diversity (minority tax).[37]

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Multiple studies have shown that lack of racial/ethnic concordance between mentor and mentee does not adversely affect satisfaction with or success of mentorship programs.[15] Our study confirms these findings, as sharing a similar background to the mentor was seen as the least important characteristic of a mentor by the entire cohort. Therefore, mentorship of individuals from historically excluded groups in medicine remains the responsibility of our entire academic community.


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## AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

**Mentorship Experiences Are Not All the Same: A Survey Study of Oncology Trainees and Early-Career Faculty**

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## APPENDIX

**TABLE A1.** Participants' Experience in Grant/Award Applications and Career Goal Support by Primary Mentor Status

| Variable | Having a Primary Mentor | | *P* |
|---|---|---|---|
| | Yes (n = 231), No. (%) | No (n = 63), No. (%) | |
| Experience in applying for grants and awards | | | |
| Applied for any grant | | | |
| Yes | 102 (44.2) | 19 (30.2) | .068 |
| No | 120 (51.9) | 43 (68.3) | |
| Not reported | 9 (3.9) | 1 (1.6) | |
| Type of grant: T32 | | | |
| Yes | 27 (26.5)[a] | 4 (21.1)[a] | .778 |
| Type of grant: YIA | | | |
| Yes | 54 (52.9)[a] | 7 (36.8)[a] | .221 |
| Type of grant: F31 | | | |
| Yes | 11 (10.8)[a] | 2 (10.5)[a] | 1 |
| Applied for any award | | | |
| Yes | 103 (44.6) | 16 (25.4) | .005 |
| No | 117 (50.6) | 46 (73.0) | |
| Not reported | 11 (4.8) | 1 (1.6) | |
| Type of award: merit | | | |
| Yes | 58 (56.3)[b] | 9 (56.2)[b] | 1 |
| Type of award: travel award | | | |
| Yes | 42 (40.8)[b] | 7 (43.8)[b] | 1 |
| Type of award: institutional | | | |
| Yes | 28 (27.2)[b] | 6 (37.5)[b] | .388 |
| Experience in career goal support | | | |
| Having career goal support by their institution | | | |
| Yes | 190 (82.3) | 36 (57.1) | <.001 |
| No | 26 (11.3) | 22 (34.9) | |
| Not reported | 15 (6.5) | 5 (7.9) | |

Abbreviation: YIA, young investigator award.

[a]The denominator is the number of participants who reported having experience in applying for any grant (n = 102 for yes and n = 19 for no groups).

[b]The denominator is the number of participants who reported having experience in applying for any award (n = 103 for yes and n = 16 for no groups).

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