

# Workplace Bias Affecting Applicants to Independent Plastic Surgery Residencies

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**Background:** This study explores factors that encourage residents to apply to independent plastic surgery residencies to gain insight into whether they faced bias as a result of this decision.

**Methods:** Resident applicants who applied to two academic independent plastic surgery residencies in 2021 and 2022 were emailed a survey consisting of 25 questions. Responses were collected anonymously and analyzed. Descriptive statistics were performed, and subgroup analyses were conducted with Fisher exact and Pearson  $\chi^2$  testing.

**Results:** Thirty-nine complete responses were included for analysis (response rate 22.7%). Participants were asked what encouraged them to go into plastic surgery during residency. The most common reasons were scrubbing in on plastic surgery cases and interactions with plastic surgery faculty/residents, with each reason cited by 30 respondents (76.8%). Further, 20.5% of residents agreed or strongly agreed that they felt unsupported by their program director in their decision to apply into plastic surgery. Likewise, 64.1% of respondents agreed or strongly agreed to having experienced demeaning comments or jokes by faculty about their choice of plastic surgery. Consequently, 17.9% agreed or strongly agreed that they developed stress or anxiety due to how co-residents and/or faculty treated them regarding their decision to pursue plastic surgery.

**Conclusions:** General surgery residents planning to apply to independent plastic surgery residency may experience workplace biases related to their career decision. An important opportunity exists to support independent applicants and to provide mentorship. (*Plast Reconstr Surg Glob Open* 2023; 11:e5220; doi: 10.1097/GOX.0000000000005220; Published online 22 August 2023.)

## INTRODUCTION

Plastic surgery remains one of the most competitive specialties to match into, whether through the integrated or independent track.<sup>1</sup> Since the implementation of integrated residency programs, the number of independent tract positions available has decreased consistently.<sup>2</sup> Despite a diminishing number of available

spots, the 2022 independent match showed a record number of applications compared with the last 5 years, with 121 paid registrations with 57 of 57 positions filled.<sup>3</sup> Therefore, the independent model has remained very competitive, with a match rate of 56% in 2022—the lowest since 2013.<sup>3</sup>

Interest in surgical subspecialties, especially plastic and reconstructive surgery, has been strongly associated with prior exposure to the field.<sup>4</sup> Although this subject has been studied more in integrated track applicants, this relationship, which offers both exposure and mentoring, has been hypothesized to be a major determinant in the decision for a trainee to apply to plastic surgery. As a result, personality compatibility between plastic surgeon and trainee, as well as attendance of a medical school with greater exposure to the field, have been cited as important career-choice determinants.<sup>4,5</sup> Taken together, the reasons for the increase in independent plastic surgery applications in past years is likely multifactorial. The combination of dedicated mentorship and support throughout residency can play a major role in a general surgery

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residents' path toward a career as a plastic surgeon, for instance.

Previous studies have identified personality traits and attributes needed to match into a plastic surgery residency, as well as objective measurements such as research output and letter of recommendation.<sup>2,6-9</sup> However, little is known about the personal experiences of residents before their application to independent plastic surgery programs. The purpose of this study was to explore the factors that encourage residents to apply to an independent plastic surgery residency and to gain insight into whether they faced biases or negative experiences as a result of this decision.

### METHODS

Surgical resident applicants who applied to two academic independent plastic surgery residencies in 2021 and 2022 were emailed a survey consisting of 25 questions through the REDCap (Research Electronic Data Capture) electronic data capture tool.<sup>10,11</sup> REDCap is a secure, web-based software platform designed to support data capture for research studies. The survey invitation was first sent on August 3, 2022, with two later reminders and subsequently remained open for responses for three weeks. The study protocol (2021P000971, 2022E0420) was approved via institutional review boards at both participating institutions. The survey addressed respondent demographics, their reasons for applying into plastic surgery, and their experiences with plastic surgery faculty during their general surgery training. Additionally, the survey inquired about personal experiences during general surgery residency, including perceived bias regarding their stated choice to pursue a career in plastic surgery. Responses were collected anonymously and analyzed using Microsoft Excel (Microsoft Corp., Redmond, Wash.). Subgroup analysis was performed by Fisher exact and Pearson  $\chi^2$  testing to determine associations between gender and negative experiences.

### RESULTS

A total of 172 residents were contacted, and 44 responded to the survey (response rate 26.2%). Five residents did not fully complete the survey and were excluded, resulting in 39 (22.7%) total complete responses. The average age of the respondents was 32.6 years (SD 2.53) with 59% being men and 41% women. The majority of the respondents had MD degrees (87.2%). Meanwhile, 15.4% completed a preliminary residency year, and 100% participated in a general surgery residency program. Regionally, 35.9% trained in the northeast, 33.3% trained in the south, 15.4% trained in the midwest, and 15.4% trained in the west (Table 1).

Eleven respondents (28.2%) trained in general surgery at an institution that has an integrated plastic surgery residency, eight (23.5%) at an institution with an independent plastic surgery residency, and three (7.7%) trained at an institution with both (Table 1). Also, 45.9% completed research years during residency, and of these applicants, 64.7% focused their research years specifically on plastic surgery. When asked at what point

### Takeaways

**Question:** Do residents who decide to pursue independent plastic surgery residencies face bias within their training programs due to this career choice?

**Findings:** Applicants to independent plastic surgery residencies in 2021–2022 were surveyed. Overall, 72% agreed to have had at least one negative experience related to their decision to pursue careers in plastic surgery. Consequently, 17.9% agreed that they developed stress or anxiety due to how faculty and co-residents treated them.

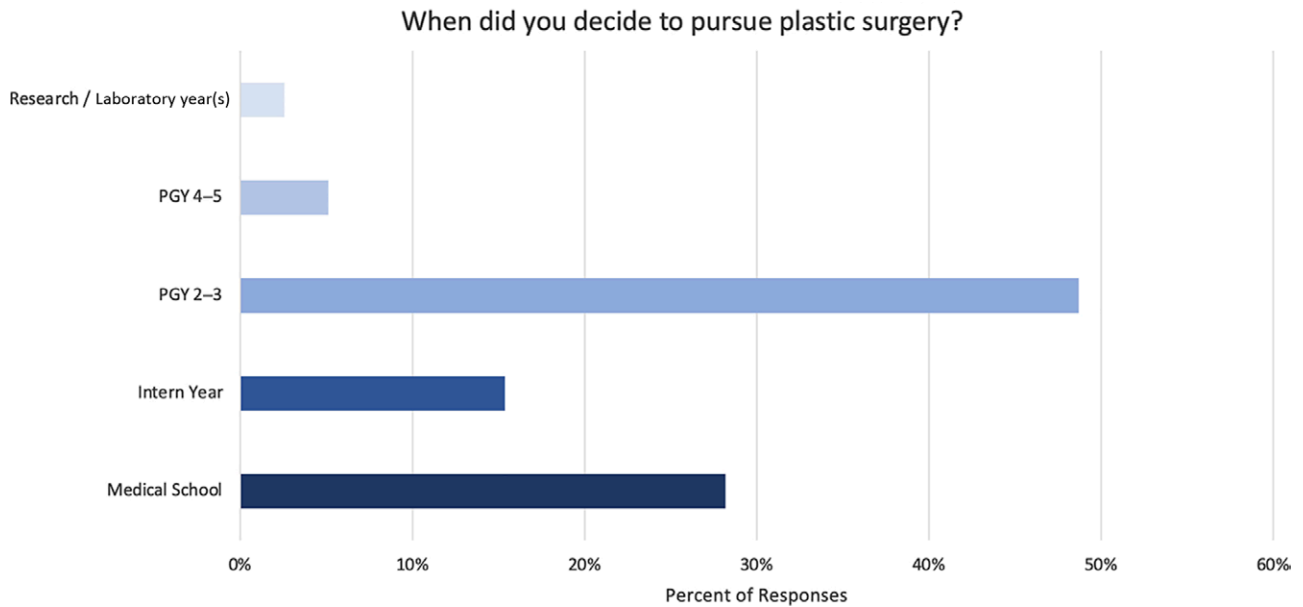
**Meaning:** General surgery residents applying to independent plastic surgery residency may experience workplace biases. An opportunity exists to support independent applicants and provide mentorship.

**Table 1. Respondent Demographic Characteristics**

Respondents	n (%)
Total	39 (22.7%)
Age (mean, SD)	32.6 (2.53)
Gender	
Masculine	23 (59%)
Feminine	16 (41%)
Degree	
MD	34 (87.2%)
DO	5 (12.8%)
MBBS	1 (2.6%)
Residency type	
General surgery	39 (100%)
Region of residency	
Northeast	14 (35.9%)
South	13 (33.3%)
Midwest	6 (15.4%)
West	6 (15.4%)
Home institution	
Independent program	
Yes	8 (20.5%)
No	31 (79.5%)
Integrated program	
Yes	11 (28.2%)
No	28 (71.8%)

they decided to pursue plastic surgery, the majority of respondents stated postgraduate year (PGY) 2–3 of residency (19, 48.7%), followed by medical school (11, 28.2%), intern year (6, 15.4%), PGY 4–5 (2, 5.1%), and research years (1, 2.6%) (Fig. 1). Of those respondents who decided to pursue plastic surgery in medical school, 45.5% (5/11) applied to integrated plastic surgery programs at that time.

With regard to plastic surgery rotations in residency, 15 (38.5%) respondents had a required rotation, with the majority of these mandatory rotations occurring during intern year (52.4%) and PGY 2–3 (38.1%). The average number of months of required rotations was 2.2 months (SD 2.46). Twenty-seven participants (69.2%) completed a nonrequired, elective plastic surgery rotation, most commonly occurring during PGY 4 (53.8%), followed by PGY



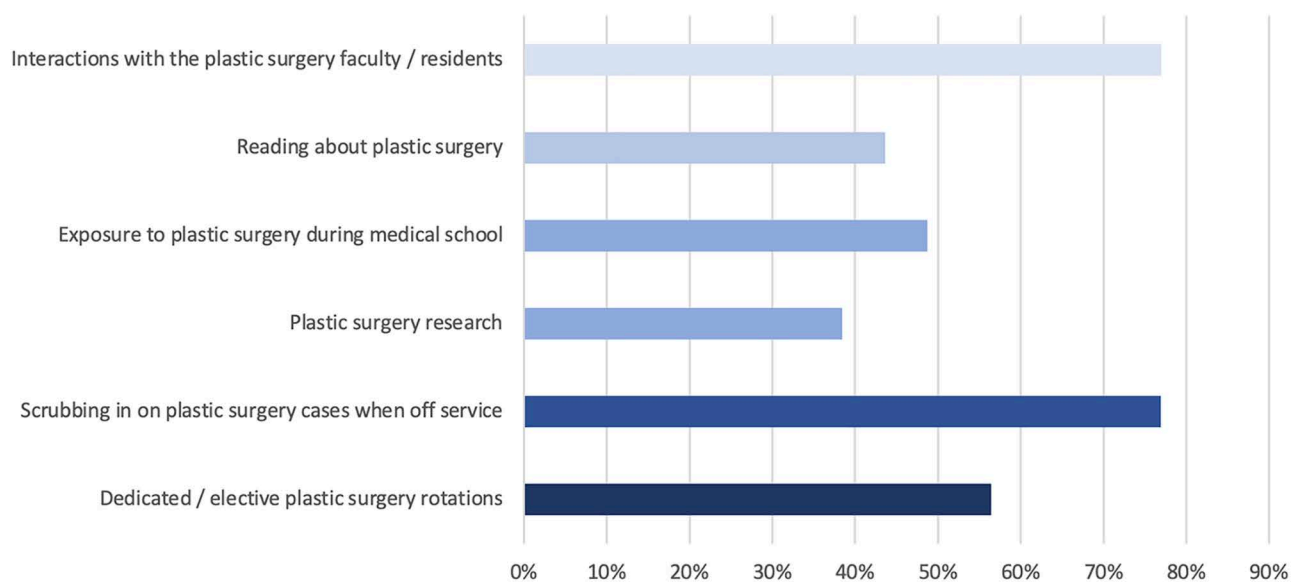
**Fig. 1.** Time of career in which independent plastic surgery applicants decided to pursue plastic surgery.

3 (12.8%) and PGY 5 (12.8%). One third of participants (13, 33.3%) completed an away plastic surgery rotation during residency. Geographically, 53.8% of these rotations were in the Northeast and 15.4% occurred in the South, Midwest, and West. The average amount of time the general surgery residents spent on plastic surgery rotations of any kind, collectively, was 2.19 months (SD 2.06), with four residents responding 0 months.

Participants were asked what encouraged them to go into plastic surgery during residency and were able

to select multiple options. The most common reasons were scrubbing in on plastic surgery cases and interactions with plastic surgery faculty/residents, with each of these reasons being cited by 30 respondents (76.8%). Dedicated and elective plastic surgery rotations was the next most common answer, cited by 22 participants (56.4%), followed by exposure to plastic surgery during medical school, which was cited by 19 participants (48.7%). Additional responses are shown in [Figure 2](#). When asked about the number of plastic surgery cases,

### During residency, what encouraged you to go into plastic surgery?



**Fig. 2.** Reasons independent plastic surgery applicants decided to pursue a career in plastic surgery.

each respondent has participated in during residency (including double-scrubbed), the majority responded 51–100 cases (35.9%). The next most common response was >100 cases (25.6%), followed by 11–25 cases (20.5%) and 26–50 cases (17.9%).

Respondents were asked to rate their opinions toward eight questions on a two-point Likert scale. When asked if they felt their attendings were supportive of their decision to apply to plastic surgery, 23.1% of respondents disagreed. Similarly, 20.5% agreed or strongly agreed that they felt unsupported by their program director in their decision to apply into plastic surgery. Thirteen (33.3%) resident respondents agreed or strongly agreed that they were treated differently than co-residents by faculty because of their decision. Likewise, 64.1% of respondents agreed or strongly agreed to having experienced demeaning comments or jokes by faculty about their choice of plastic surgery (Fig. 3). With regard to their peers, 25.6% of respondents agreed or strongly agreed to having experienced demeaning comments or jokes by their co-residents. As a result, 17.9% agreed or strongly agreed that they developed stress or anxiety due to how co-residents and/or faculty treated them regarding their decision to pursue plastic surgery (Fig. 4).

**Subgroup Analysis: Gender**

Men reported more negative experiences than women in every question, except regarding program director support, in which there was an equal number of negative experiences among male and female respondents. For example, 43.5% of male respondents agreed or strongly agreed that they were treated differently by faculty,

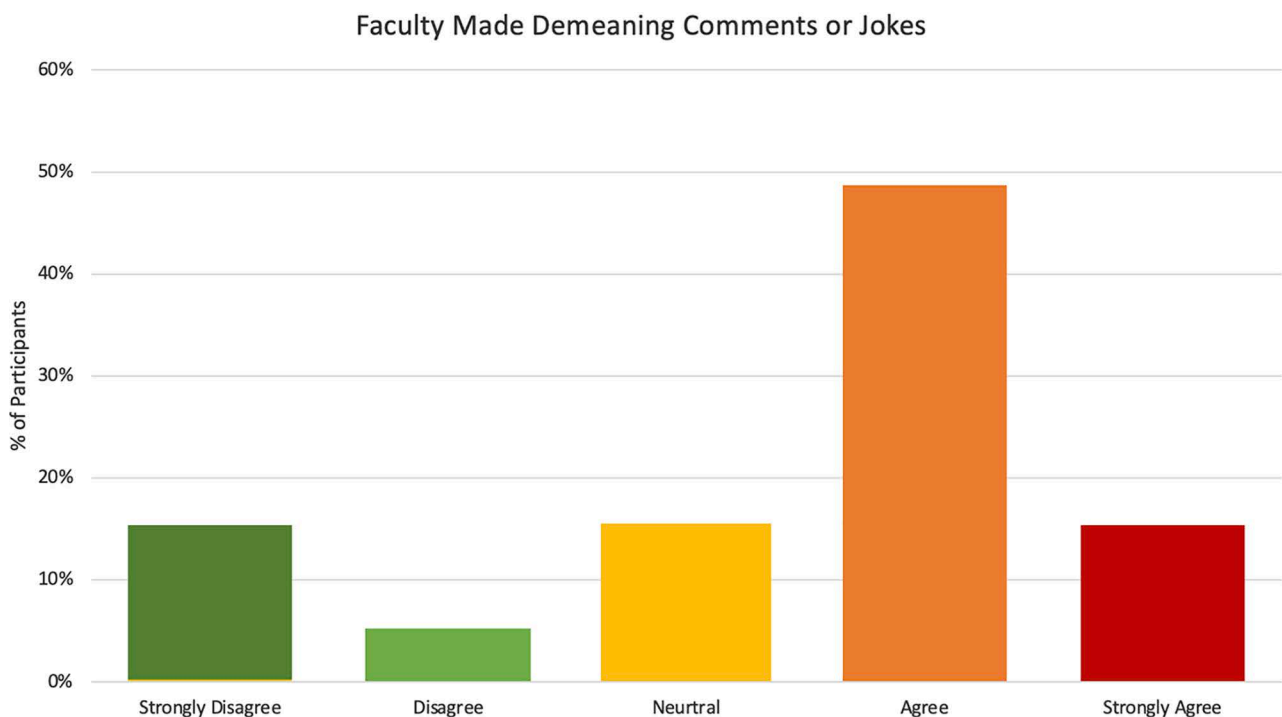
compared with 18.6% of female respondents. However, there was no significant association between gender and negative experiences with regard to this question ( $P = 0.11$ ) or any other ( $P > 0.05$ ).

**Subgroup Analysis: Home Program Plastic Surgery Residencies**

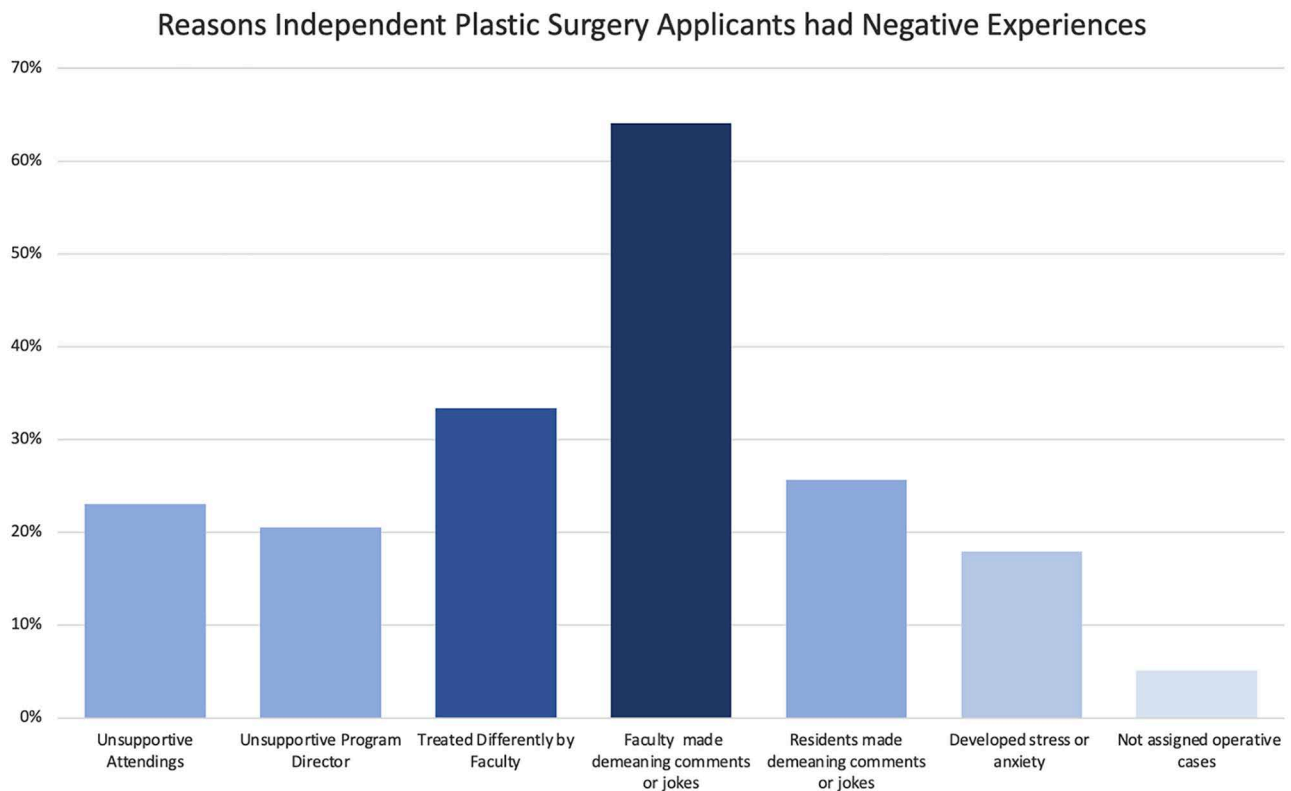
Respondents from institutions with integrated plastic surgery residencies (25.6%) were not less likely to experience a lack of support from faculty than those from institutions without ( $P = 1$ ). They were more likely to experience any type of bias (80%) than respondents from an institution without an integrated plastic surgery residency (65.5%); however, the difference was not statistically significant ( $P = 0.69$ ). Similarly, respondents from institutions with independent plastic surgery residencies (20.5%) were not less likely to experience a lack of support from faculty than those from institutions without ( $P = 0.36$ ). They were also more likely to experience any type of bias (87.5%) than respondents from an institution without an integrated plastic surgery residency (64.5%); however, the difference was not statistically significant ( $P = 0.65$ ; Table 2).

**DISCUSSION**

Choosing to pursue an independent plastic surgery residency is a significant decision made by more than 100 residents each year. This survey analyzed the motivations and consequences behind this decision, with an emphasis on elucidating workplace biases faced by independent plastic surgery applicants. The number of independent track plastic surgery programs has been decreasing



**Fig. 3.** Independent plastic surgery applicants' experiences with faculty making demeaning comments or jokes.



**Fig. 4.** Reasons independent plastic surgery applicants had negative experiences.

**Table 2. Subgroup Analysis of Bias Based on Respondent Home Institution's Training Programs**

	n (%)	Lack of Faculty Support (n, %)	P	Experience Any Type of Bias (n, %)	P
Integrated home program	10 (25.6%)	2 (20.0%)	1	8 (80.0%)	0.6927
No integrated home program	29 (74.4%)	7 (24.1%)		19 (65.5%)	
Independent home program	8 (20.5%)	3 (37.5%)	0.3548	7 (87.5%)	0.6478
No independent home program	31 (79.5%)	6 (19.4%)		20 (64.5%)	

significantly, while a record number of independent track candidates applied in 2022,<sup>3</sup> resulting in a hypercompetitive match. In 2022, the match rate was 56%, presenting worse odds of matching than other surgery fellowships like pediatric (62.3%), colorectal (69.5%), or vascular surgery (82.5%).<sup>3,12</sup>

Every applicant who responded to the survey was a general surgery resident. Although 64.7% of respondents participated in research years specific to plastic surgery, only 25% trained at an institution that had an independent plastic surgery program. The discrepancy between these two values highlights how the lack of an independent pathway at one's institution does not seem to dissuade residents from applying into the field. Many participants in this cohort of general surgery residents still report opportunities for clinical exposure in plastic surgery; however, only around 40% had a required plastic surgery rotation. This is much lower than other subspecialties like transplant surgery, which is required around 90% of the time.<sup>13</sup> Additionally, one-third of respondents completed an away rotation, and nearly 70% participated in a plastic surgery elective.

Before applying to plastic surgery, the average applicant spent a total of 2.19 months in plastic surgery rotations, scrubbing into a mode of 51–100 cases. Although the majority of general surgery residents were able to participate in plastic surgery rotations, 10.2% of the respondents never completed a single plastic surgery rotation before applying and 20% of respondents scrubbed in on just 11–25 plastic surgery cases before making their fellowship/residency decision. Therefore, a subset of general surgery residents make this important decision without much direct recent exposure to the field. Being aware of the variation in plastic surgery exposure amongst residents, general surgery programs may be able to further support residents in this process by allowing for additional elective rotation time.

In this study, 72% of respondents agreed to having had at least one negative experience during their categorical general surgery training related to their decision to pursue a career in plastic surgery. These negative experiences include 23.1% of respondents feeling lack of support from attendings and/or PDs and 64.1% reporting faculty making demeaning comments or jokes about their decision.

Similar evidence of workplace bias throughout general surgery training has been widely reported in the literature. A 2019 survey of 7409 surgical residents reported that 30.3% experienced verbal or physical abuse.<sup>14</sup> Another study of 5277 residents described that 50.4% respondents experienced workplace mistreatment.<sup>15</sup> A 2022 systematic review aggregated these and other studies to conclude that 63% of surgery residents experienced bullying, 43% experienced discrimination, and 29% experienced harassment during residency training.<sup>16</sup> The high prevalence of demeaning comments found in our study aligns with previously published literature on this topic, highlighting how this aspect of bullying may be still prevalent amongst general surgery programs today.

The consequences of such mistreatment and workplace biases regarding residents' decision to pursue plastic surgery include negative impacts on their mental health, as seen in this study with 17.9% of respondents agreeing to having experienced additional stress and anxiety. Hu et al's study addressing discrimination, abuse, and harassment concluded that mistreatment frequently occurs during surgery training, and that residents who are subject to these negative experiences were more likely to experience burnout (OR 2.94) and have suicidal thoughts (OR 3.07).<sup>14</sup> Specific to general surgery residents, high rates of burnout have been reported, including 38.5% of the respondents to Hu et al's survey reporting weekly burnout symptoms.<sup>14</sup> With workplace bias further affecting the mental health of independent plastic surgery residents, there exists an opportunity to prevent burnout among general surgery residents after their discernment of fellowship and career path.

Multiple studies have shown that the prevalence of negative experiences, although very common overall, vary significantly depending on individual general surgery program culture.<sup>14,15,17</sup> For example, Hu et al stratified reports of verbal abuse by individual programs and demonstrated a troubling range of responses. At the minimum, one program had 0% of residents report verbal abuse, whereas at the maximum, another program had 66.7% of its residents report verbal abuse. This variability in program-level workplace bias demonstrates that training in general surgery can occur without bullying.<sup>14</sup> It also provides optimism that efforts of individual programs to create a supportive environment regarding fellowship decisions can be effective and prevent additional stress among trainees.

Within individual programs, this survey found that faculty and superiors were often involved in negative experiences concerning trainees' perceived bias regarding their residency/fellowship decision. More than one-fifth of residents experienced a lack of support from faculty or PDs and reported high rates of demeaning comments or jokes from attendings, especially in comparison with co-residents. Studies addressing bullying in general surgery training have shown similar trends, with faculty often playing a role in the mistreatment; Zhang et al showed that the most common source of offensive remarks to residents was attending surgeons.<sup>17</sup>

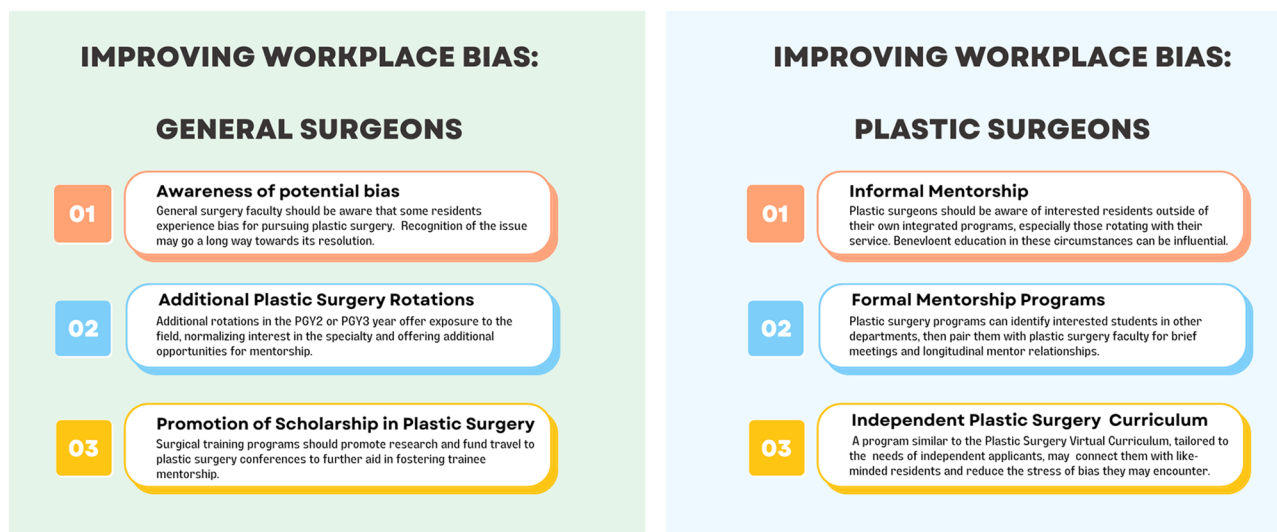
Exacerbating this issue and impeding its correction is the finding that program directors (PDs) are often more

optimistic than residents regarding training conditions at their residency program. Nasca et al found that the proportion of PDs that perceived mistreatment was much lower than the proportion of residents who reported this experience; only 9.3% of PDs perceived mistreatment, whereas 65.9% of residents reported bullying at their programs.<sup>18</sup> One explanation for the differing perceptions of workplace bullying is low rates of formal reporting by the residents themselves. For example, in one study, 47% of respondents reported mistreatment, but only 18% of that cohort made a formal complaint. Of those residents who did, 56% described having a negative reporting experience.<sup>19</sup>

Attending surgeons and PDs must be aware of these trends in mistreatment during training, especially as it relates to the future career paths of their residents. Specific to those residents who choose to pursue independent plastic surgery residency, faculty's actions disproportionately create additional stress and anxiety. However, interaction with attendings was simultaneously the second most common influential factor for choosing to pursue plastic surgery, highlighting the strong influence that attending physicians and PDs have on the future choices of these residents. Better understanding their trainees' decisions and opportunities for maximally effective support can help attending surgeons to rectify current standards of workplace bias.

As for the underlying cause of this workplace bias, an exact etiology is unclear. Although general surgery and plastic surgery are inextricably linked, the rise of integrated training programs may have widened the divide between the two fields in the minds of some surgeons. Therefore, trainees pursuing plastic surgery may be seen as pivoting or leaving the field of general surgery, rather than extending or expanding on prior training. Therefore, such surgeons might rather invest time into training residents who are interested in pursuing careers in general surgery subspecialties like colorectal surgery. This is likely exacerbated by the fact that around 90% of plastic surgeon trainees go into private practice instead of academic positions. Furthermore, some general surgeons may have a poor perception of plastic surgery overall. Plastic surgery, especially aesthetic surgery, has been the subject of societal stigma for generations. Although this has improved dramatically in recent years, it is possible that physicians in other fields maintain such biases against the field as a whole, which are transferred upon interested trainees.

There are steps we can take to address workplace bias against independent plastic surgery applicants (Fig. 5). General surgery PDs and faculty should be aware of these findings representing the opinions of their residents. Their biases may be implicit and their actions unintended, in which case recognition of the issue may go a long way toward its resolution. Additional required plastic surgery rotations in the general surgery training curriculum can reduce bias by providing additional exposure to the field, normalizing interest in the specialty, and presenting additional opportunities for mentorship. These rotations should be added outside of intern year and within the PGY2 or PGY3 years, as this



**Fig. 5.** Recommendations for increasing resident support and decreasing workplace bias.

time was identified by respondents as particularly influential in their career decision. Lastly, surgical training programs should promote and fund research and travel to plastic surgery conferences to further aid in fostering trainee mentorship.

For plastic surgery PDs and faculty, the most important step is to increase mentorship.<sup>20,21</sup> Plastic surgeons should be aware of interested residents outside their own integrated programs, and simple programs can be created to promote mentorship relationships with these nonplastic surgery residents. Plastic surgery programs can identify and then pair interested residents with plastic surgery for brief meetings and longitudinal mentorship, with no financial cost to the department. On a broader scale, the American Society of Plastic Surgeons, offers the PROPEL mentorship program to aspiring plastic surgeons, including general surgery residents, and should be recommended to aspiring independent applicants.<sup>22</sup> Similarly, the establishment of a national, organized program tailored to residents interested in independent plastic surgery residencies would be of great benefit. The Plastic Surgery Virtual Curriculum, which is currently suited for medical students, has been successful in increasing confidence, preparedness, and feeling connected to the greater community of integrated plastic surgery applicants.<sup>23</sup> Such a program, tailored to the specific needs of independent applicants, may similarly connect them with like-minded residents passionate about plastic surgery and reduce the stress of bias they may encounter.

### Limitations

The main limitation to this study is the response rate. Applicants were contacted at the email address they provided when applying to independent plastic surgery residencies, many of which are inactive now. Therefore, it is likely that a number of the email addresses that received the survey were no longer in use, artificially lowering the response rate. Despite this limitation, the percentage of

the applicant cohort that responded was potentially sufficient to draw conclusions about the larger group.

Additionally, implicit response bias may have affected the results, as residents with negative experiences may have been more compelled to share their opinions. Likewise, all respondents were general surgery residents. Applicants to independent plastic surgery programs from other fields were therefore not included in the results and may have had different experiences than those summarized in this study. This is especially true of fields like otolaryngology, which overlap in scope with plastic surgery, which could either foster additional prejudice or increased solidarity.

## CONCLUSIONS

Applying to an independent plastic surgery residency is very competitive. Applicants apply with varying backgrounds, including a wide range of clinical experience in plastic surgery. General surgery residents planning to apply to independent plastic surgery frequently experience lack of support from faculty/PDs, as well as endure demeaning comments or jokes related to their decision. These experiences can negatively impact residents' mental health by causing additional stress and anxiety. An important opportunity exists to support independent applicants and provide mentorship during this critical period of career discernment.

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**DISCLOSURES**

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