

# The General Surgery Residency Experience

## A Multicenter Study of Differences in Wellbeing by Race/Ethnicity

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**Objectives:** We explored differences by race/ethnicity in regard to several factors that reflect or impact wellbeing.

**Background:** Physician wellbeing has critical ramifications for the US healthcare system, affecting clinical outcomes, patient experience, and healthcare economics. Within surgery, literature examining the association between race/ethnicity and wellbeing has been limited and inconclusive.

**Methods:** Residents at 16 academic General Surgery training programs completed an online questionnaire. Racial/ethnic identity, gender identity, post-graduate year (PGY) level, and gap years were self-reported. Differences by race/ethnicity in flourishing (global wellbeing) as well as factors reflecting resilience (mindfulness, personal accomplishment, workplace support, workplace control) and risk (depression, emotional exhaustion, depersonalization, stress, anxiety, workplace demand) were assessed.

**Results:** Of 300 respondents (response rate 34%), 179 (60%) were non-male, 123 (41%) were residents of color (ROC), and 53 (18%) were from racial/ethnic groups that are underrepresented in medicine (UIM). Relative to White residents, ROC have significantly lower flourishing and higher anxiety, and these remain significant when adjusting for gender, PGY level, and gap years. Relative to residents overrepresented in medicine (OIM), UIM residents have significantly lower emotional exhaustion and depersonalization after adjusting for gender, PGY level and gap years.

**Conclusions:** Disparities in resident wellbeing based on race/ethnicity and UIM/OIM status exist. However, the experience of ROC is not homogeneous. As part of the transformative process to address systemic racism, eliminate disparities in surgical training, and reconceptualize wellbeing as a fundamental asset for optimal surgeon performance, further understanding the specific contributors and detractors of wellbeing among different individuals and groups is critical.

**Keywords:** differences in wellbeing by race/ethnicity, distress, flourishing, job strain, mindfulness for surgeons, surgical education, surgical resident wellbeing

## BACKGROUND

Physician wellbeing has critical ramifications for the US healthcare system, affecting clinical outcomes, patient experience, and healthcare economics.<sup>1</sup> Wellbeing is a complex state of fulfillment, connectedness, and opportunity that reflects individual affect, human-centered systems, and a culture of equity and justice.<sup>2</sup> We have shown “flourishing” (measured by the Mental

Health Continuum) to be a valid measure of social, emotional, and psychological wellbeing in surgical trainees<sup>3</sup> and a potential measure of wellbeing intervention effectiveness. However, increasing awareness of the relationship between race, gender, and the individual experience underscores the need to explicitly consider these factors in the study of wellbeing and the design of interventions. A growing body of literature has revealed gender differences in surgical training in regard to workplace treatment, work-life influences (such as sexism in familial relationships and family planning considerations<sup>4</sup>), and manifestations of distress in the form of burnout,<sup>5</sup> thoughts of attrition,<sup>6</sup> and suicidality.<sup>7</sup> However, work that examines these issues in regard to race or ethnicity remains far more limited and inconclusive.<sup>8</sup>

To address this gap, we explored differences by race/ethnicity in regard to several factors shown to reflect or impact wellbeing in a national sample of surgical trainees: flourishing (ie, global wellbeing), resilience (ie, “resilience factors,” like mindfulness, personal accomplishment, and workplace social support) and distress (ie, “risk factors,” like burnout, job dissatisfaction, and depression). Importantly, race is a social, not biological, construct established in the 18th century without scientific evidence. Appropriately, there is modern controversy regarding the use of racial terminology when studying biological sciences. This study recognizes modern proof that race is arbitrary biological fiction, yet racial taxons remain widely used in medical teaching, practice, and research,<sup>9</sup> reflecting an underlying structural racism that actively and negatively influences the lives of people with diverse racial/ethnic backgrounds. For instance, the risk of death due to police-related violence is up to 4 times higher for Black American men<sup>10,11</sup>; Asian American hate crimes have increased proliferated with the onset of coronavirus disease

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2019 (COVID-19)<sup>12</sup>, and support for immigration is variable for countries of origin with different racial and religious demographics.<sup>13,14</sup> Growing literature shows that structural racism not only impacts individual health and wellbeing, as above, but also impacts the health and wellbeing of entire racial and ethnic communities, representing a public health crisis within the United States.<sup>15</sup> As such, we examined differences in resident wellbeing by race and ethnicity in acknowledgment of a lived, if not scientifically founded, reality. Our goal was to provide preliminary data to help inform the design, evaluation, and prioritization of future wellbeing initiatives as they may differ based on race/ethnicity.

## METHODS

### Study Design

An online survey instrument was distributed in January 2021 to all General Surgery residents (both clinically active and in research) at 16 Accreditation Council for Graduate Medical Education-accredited academic training programs located in urban and metropolitan locations of Western, Mountain, Central, and Eastern regions of the United States. Participating programs are a mix of University-based and University-affiliated training programs, ranging in size from 21 to 108 residents (preliminary and categorical). Participating programs comprise the General Surgery Research Collaborative on Resident Wellbeing, which evolved during the first surge of COVID-19 due to outreach from University of California, San Francisco (UCSF) Center for Mindfulness in Surgery.

Champions at participating programs disseminated a Research Electronic Data Capture survey to their respective resident bodies (via internal listservs), indicating that the survey is anonymous, all questions are optional, and results will only be viewed in aggregate. Eight-hundred ninety-one residents received the survey, which remained open for 6 weeks, with 1–2 reminders every week. Participants who completed the survey optionally submitted a separate survey (to maintain anonymity) via Google Docs with their name and any email address to claim a \$5 coffee card for their participation. There was no linking information between the 2 surveys. The study was approved by UCSF's institutional review board and informed consent was obtained for all participants through the online survey.

### Survey Instrument

The anonymous survey collected basic demographic information (Table 1) and measured flourishing, a measure of global wellbeing with a 3-factor model reflecting social, emotional, and psychological mental health domains.<sup>16</sup> It further measured the presence of resilience factors (ie, mindfulness, personal accomplishment, workplace control, and workplace support), together characterized by high positive emotions, nonreactivity to stressors, and connectedness as defined by seminal works in the field of resilience science<sup>17,18</sup> and used in prior studies as proxy measures of wellbeing.<sup>19</sup> Finally, it measured distress factors (ie, emotional exhaustion [when emotional demands of the work can exhaust a service provider's capacity to be involved with, and responsive to, the needs of service recipients<sup>20</sup>], depersonalization [an attempt to put distance between oneself and service recipients by actively ignoring the qualities that make them unique and engaging people<sup>20</sup>], stress, anxiety, depressive symptoms, and workplace demand), as defined by multiple works exploring distress in surgery and perceived in the literature to be discordant with wellbeing.<sup>7</sup> Published measures associated with these resilience and risk factors were previously compiled, grounded in Job Demand-Resource and Broaden and Build theories, guided by an expert in surgeon wellbeing and surgical education (C.C.L.), reviewed and discussed by experts in Health

**TABLE 1.**  
Participant Characteristics of 300 Respondents

Characteristic	N (%)
Gender identity	
Female	178 (59.3)
Male	119 (39.7)
Genderqueer/gender nonconforming	1 (0.3)
Transgender man	0 (0.0)
Transgender woman	0 (0.0)
Decline to state	2 (0.7)
Race/ethnicity	
White	171 (57.0)
Asian	70 (23.3)
Asian only	64 (21.3)
Asian + White	6 (2.0)
Latinx	28 (9.3)
Latinx only	16 (5.3)
Latinx + White	12 (4.0)
Black/African American	11 (3.7)
Black/African American only	9 (3.0)
Black/African American only + White	2 (0.7)
Other	11 (3.7)
American Indian/Alaska Native	3 (1.0)
American Indian/Alaska Native only	1 (0.3)
American Indian/Alaska Native + White	2 (0.7)
Native Hawaiian or other Pacific Islander	0 (0)
Unknown/decline to state	6 (2.0)
Training level	
PGY-1	77 (25.7)
PGY-2	42 (14.0)
PGY-3	52 (17.3)
PGY-4	43 (14.3)
PGY-5	32 (10.7)
Research	52 (17.3)
Decline to state	2 (0.7)

Professions Education research, and found to be sensitive and reliable in our prior work evaluating the relationships between workplace factors, risk, and resilience in surgical trainees. Likert scales were scored according to published methods that are described in detail elsewhere (Appendix 1, <http://links.lww.com/AOSO/A137>).<sup>3</sup>

### Racial/Ethnic Groupings

Our survey included a combined race/ethnicity question with options to self-identify as Latinx or as one of 5 race categories (American Indian or Alaska Native, Asian, White, Black or African American, Native Hawaiian or other Pacific Islander) defined by the 1997 Office of Management and Budget standards, which serve as the basis for the US Census Bureau surveys.<sup>21</sup> Consistent with 1997 Office of Management and Budget standards, selection of multiple options was permitted. Subgroup options for these categories were not offered in our survey. Based on recent literature<sup>22</sup> and the Association of American Medical Colleges definition of underrepresented in medicine (UIM) trainees (ie, “those racial and ethnic populations... underrepresented in [medicine] relative to their numbers in the general population”<sup>23</sup>), we combined Black/African American, Latinx, American Indian/Alaska Native, and Native Hawaiian/other Pacific Islander respondents for UIM group analysis. Individuals self-identified as “Other” were also included as UIM, as opposed to White or Asian respondents who are overrepresented in medicine (OIM),<sup>22</sup> and were grouped accordingly. Individuals who indicated 2 races were grouped as residents of color (ROC), reflective of extensive literature documenting the perception and social categorization of biracial individuals as being “non-White.”<sup>24</sup>

## Data Analysis

All measures of interest were examined descriptively based on self-reported race/ethnicity and UIM or OIM groupings. Counts and percentages were reported for nominal data. *T* tests by racial/ethnic grouping and multivariable linear regression models for all wellbeing, resilience, and risk factor scores were performed. Racial/ethnic grouping was the main independent variable, while gender, post-graduate year (PGY) level, and number of gap years were included as covariates in the multivariable models. Complete case analysis was used for the multivariable model. The model subsample was compared with the subsample excluded due to missing data. Participant characteristics, including gender, race/ethnicity, and training level, were compared between the 2 groups using Fisher exact tests. Hypothesis tests were 2-sided, and the significance threshold was set to 0.05. Statistical analyses were performed using SAS version 9.4.

We examined differences in wellbeing elements between racial/ethnic groups categorized in 2 ways. Categorization A compared White residents to ROC. Categorization B compared OIM residents (White and Asian) to UIM residents (all other ROC). This reflects the fact that Asian residents are not UIM (which is presumed to reflect certain advantages) but are people of color (which is known to engender certain disadvantages).

## RESULTS

### Respondents

Three-hundred residents (60% non-male, 41% ROC, 18% UIM) responded to the survey, representing a 34% response rate (Table 1). This compares to demographics of the entire body of US General Surgery residents as follows: 41% female and 38% ROC, 21% UIM.<sup>25</sup>

### Differences in Wellbeing, Resilience, and Risk by Race/Ethnicity Categories

Descriptive statistics, along with normative data for each measure as available, for wellbeing, resilience, and risk factors by race/ethnicity can be seen in Table 2. Among respondents categorized as White versus ROC (categorization A), ROC have significantly higher anxiety and lower flourishing, which remain significant

after adjusting for gender, PGY level, and gap years (Table 3). No other differences are observed between White residents and ROC.

Among respondents characterized as OIM versus UIM (categorization B), UIM residents have significantly lower depersonalization. When adjusting for gender, PGY level and gap years, UIM residents have significantly lower emotional exhaustion and depersonalization. No other differences are observed between OIM and UIM residents.

Comparison of the multivariable model subsample ( $n = 237$ ) and the subsample excluded due to missing data ( $n = 63$ ) did not differ significantly on any of the participant characteristics tested. Consequently, complete case analysis was adequate to produce approximately unbiased estimates.

## DISCUSSION

This national cross-sectional study of mixed-level trainees at 16 academic General Surgery Residency programs highlights differences in trainee wellbeing based on racial/ethnic identity. Specifically, our results reveal 3 key findings. First, ROC report lower global wellbeing than White residents. Second, UIM residents report lower burnout than OIM residents. Third, some outcomes for Asian respondents resemble those of UIM residents while others resemble those of White residents.

Our first finding, that ROC reported lower global wellbeing than White residents, is evidenced by the significant difference in mental health continuum (MHC) scores between these 2 groups. This finding may seem intuitive in light of recognized discrimination within and without surgery, apparent in phenomena like microaggressions<sup>8,33</sup> and minority status stress.<sup>34</sup> However, large national studies have demonstrated higher flourishing among people of color in the general population,<sup>35,36</sup> supporting the notion of racial/ethnic minority resilience, which is believed to reflect highly adaptive mechanisms functioning in the context of adversity.<sup>37</sup> Proposed avenues to resilience specific to the African American community include racial socialization<sup>38</sup> and group identification,<sup>39</sup> both tools predicated on strong social connectedness and posited to enhance the ability to navigate discrimination and refute stereotypes. In the National Survey of American Life, racial group identification and positive ingroup evaluation among African Americans were associated with more positive self-attitudes (higher self-esteem and mastery) and lower depressive

**TABLE 2.**  
Descriptive Statistics of Wellbeing, Resilience, and Risk Factors by Race/Ethnicity Grouping, With Normative Data

Wellbeing Element	Study Population			Normative Data	
	White (N = 171)	Asian (N = 70)	UIM (N = 53)	Mean (SD)	Population (All United States)
Global wellbeing					
MHC-SF	47.6 (45.5–49.6)	44.3 (41.1–47.6)	44.8 (41.6–48.0)	47.46 (NR)	5689 College students <sup>26</sup>
Resilience					
CAMS-R	28.4 (27.6–29.1)	27.4 (26.0–30.0)	27.5 (25.8–29.1)	31.51 (5.65)	212 College students <sup>27,28</sup>
aMBI-PA	13.9 (13.5–14.3)	14.1 (13.4–14.8)	13.4 (12.5–14.3)	—*	
DCSQ-Support	19.4 (18.9–19.9)	19.2 (18.3–20.1)	18.9 (18.1–19.6)	18.34 (2.68)	411 White-collar employees <sup>29</sup>
DCSQ-Control	13.8 (13.5–14.1)	13.8 (13.1–14.5)	13.5 (13.0–14.0)	17.31 (2.84)	411 White-collar employees <sup>29</sup>
Risk					
PHQ	6.4 (5.6–7.2)	6.5 (5.3–7.8)	6.3 (5.1–7.5)	4.5 (5.5)	704 Parents of school-age children, age 31–40 <sup>30</sup>
aMBI-EE	9.9 (9.3–10.5)	10.4 (9.4–11.5)	9.0 (7.7–10.3)	—*	
aMBI-DP	7.0 (6.3–7.7)	7.2 (6.1–8.3)	5.5 (4.2–6.8)	—*	
PSS	17.4 (16.4–18.5)	18.1 (16.6–19.7)	16.9 (15.3–18.6)	17.46 (7.31)	433 Population sample, age 25–34 <sup>31</sup>
STAI	12.2 (11.6–12.7)	13.2 (12.3–14.0)	12.9 (11.7–14.1)	10.7 (NR)	503 Adults <sup>32</sup>
DCSQ-Demand	15.7 (15.3–16.0)	15.8 (15.2–16.4)	15.3 (14.6–16.0)	13.27 (2.43)	411 White-collar employees <sup>29</sup>

\*Normative data not available since instrument was developed and exclusively used for physicians.

aMBI-DP indicates abbreviated Maslach Burnout Inventory-Depersonalization; aMBI-EE, abbreviated Maslach Burnout Inventory-Personal Accomplishment; CAMS-R, Cognitive and Affective Mindfulness Scale-Revised; CI, confidence interval; DCSQ-Control, Demand, Control, Support Questionnaire-Control; DCSQ-Demand, Demand, Control, Support Questionnaire-Demand; DCSQ-Support, Demand, Control, Support Questionnaire-Support; MHC-SF, Mental Health Continuum-Short Form; NR, not reported; PHQ, Patient Health Questionnaire; PSS, Perceived Stress Scale; STAI, State-Trait Anxiety Index.

**TABLE 3.**  
**Wellbeing, Resilience, and Risk Factor Scores by Race/Ethnicity Category**

Wellbeing Element	Race/Ethnicity (Categorization A)			Race/Ethnicity (Categorization B)		
	Mean (SD)		Adjusted P <sup>a</sup>	Mean (SD)		Adjusted P <sup>a</sup>
	White (N = 171)	ROC (N = 123)		OIM (N = 241)	UIM (N = 53)	
Global wellbeing						
MHC-SF	<b>47.6 (13.3)</b>	<b>44.5 (12.5)</b>	<b>0.05</b>	46.7 (13.2)	44.8 (12.2)	0.27
Resilience						
CAMS-R	28.4 (4.8)	27.4 (5.7)	0.20	28.1 (5.0)	27.5 (5.8)	0.46
aMBI-PA	13.9 (2.6)	13.8 (2.8)	0.82	13.9 (2.6)	13.4 (3.0)	0.34
DCSQ-Support	19.4 (3.1)	19.0 (3.2)	0.17	19.4 (3.2)	18.9 (2.9)	0.16
DCSQ-Control	13.8 (2.1)	13.6 (2.3)	0.60	13.8 (2.2)	13.5 (2.0)	0.32
Risk						
PHQ	6.4 (5.0)	6.4 (4.4)	0.66	6.5 (4.9)	6.3 (4.3)	0.69
aMBI-EE	9.9 (3.9)	9.8 (4.3)	0.54	<b>10.0 (3.9)</b>	<b>9.0 (4.5)</b>	<b>0.05</b>
aMBI-DP	7.0 (4.2)	6.4 (4.4)	0.29	<b>7.1 (4.2)</b>	<b>5.5 (4.5)</b>	<b>0.02</b>
PSS	17.4 (6.5)	17.6 (5.8)	0.92	17.6 (6.3)	16.9 (5.6)	0.46
STAI	<b>12.2 (3.5)</b>	<b>13.1 (3.7)</b>	<b>0.04</b>	12.4 (3.5)	12.9 (4.1)	0.29
DCSQ-Demand	15.7 (2.2)	15.6 (2.5)	0.73	15.7 (2.2)	15.3 (2.6)	0.19

<sup>a</sup>Adjusted for gender, PGY level, and number of gap years.

Bold entries represent those that show a significant difference.

aMBI-DP indicates abbreviated Maslach Burnout Inventory-Depersonalization; aMBI-EE, abbreviated Maslach Burnout Inventory-Emotional Exhaustion; aMBI-PA, abbreviated Maslach Burnout Inventory-Personal Accomplishment; CAMS-R, Cognitive and Affective Mindfulness Scale-Revised; DCSQ-Control, Demand, Control, Support Questionnaire-Control; DCSQ-Demand, Demand, Control, Support Questionnaire-Demand; DCSQ-Support, Demand, Control, Support Questionnaire-Support; MHC-SF, Mental Health Continuum-Short Form; PHQ, Patient Health Questionnaire; PSS, Perceived Stress Scale; STAI, State-Trait Anxiety Index.

symptoms.<sup>40</sup> Similarly, specific features of Hispanic culture that reflect strong social connectedness, such as high levels of familism, religiosity, and allocentrism, have been posited to mitigate stress that might otherwise occur as a function of adversity.<sup>41</sup> Thus, our contrary findings may reflect the underdevelopment of group-derived forms of resilience due to the paucity of Black-identifying trainees in surgery. Similarly, residency work hours and barriers to the advance planning of time off may hinder the maintenance of extracurricular (ie, familial, church-based) sources of resilience for Latinx trainees. Further, it is possible that discrimination toward racial/ethnic minorities in surgery is simply worse than in the general population or that the inherent stressors of surgical training negatively synergize with minority status stress to overwhelm resilience reserves. Causality remains to be proven, but the ability of the Mental Health Continuum to discretely measure emotional, social, and psychological wellbeing may help to triangulate areas of particular impact.

Our second finding, that UIM residents report lower burnout than OIM residents, is reflected in UIM respondents having significantly lower emotional exhaustion and depersonalization scores than their OIM (ie, White and Asian) counterparts. Lower burnout tendencies among UIM respondents in our population is consistent with recent literature examining burnout in healthcare by race/ethnicity. In a national study of more than 4000 US physicians, adjusted odds of burnout were lower in Latinx and Black physicians compared with White and Asian physicians.<sup>42</sup> In addition, lower rates of burnout were observed in an aggregate sample of Latino physicians and clinical staff compared with White health care physicians and clinical staff practicing at a Veterans Affairs hospital.<sup>43</sup> These results may appear counterintuitive in light of recognized racial discrimination within medicine, and indeed they are actively debated.<sup>44</sup> Proposed explanations include lower reporting due to stigma,<sup>45</sup> enhanced resiliency and decreased burnout vulnerability due to the inherent adversity of minority life,<sup>46</sup> and/or selection bias of only exceptionally resilient individuals, capable of surmounting the disproportionate challenges faced by minorities pursuing medical training.<sup>47</sup> Other studies of residents have shown no difference in burnout by race/ethnicity,<sup>48</sup> highlighting the lack of clarity in this domain and need for further exploration.

Furthermore, while our second finding seems to contradict our first, it bears noting that wellbeing and burnout are not

opposites. Rather, the former measures a composite of one's affect, connectedness, and resources in life and the latter measures one's experience of work. Moreover, in this study, ROC and UIM are not equatable, as the former group includes Asian trainees, while the latter group does not. Confirming these findings, furthering our understanding of why UIM residents may have lower emotional exhaustion and depersonalization, and assessing the influence on outcomes (including additional measures specific to the experience of racism and discrimination) will need to be pursued in a larger study designed for such a purpose.

Our third finding, that some outcomes for Asian respondents resemble those of UIM while others resemble those of White trainees, is supported by scores derived from analyzing data by 2 different racial/ethnic categorizations. Specifically, when comparing White trainees versus ROC (Asian and UIM), ROC had significantly lower MHC scores and higher anxiety but no difference in emotional exhaustion, depersonalization, or any other factors. Yet, when comparing OIM (White and Asian) versus UIM respondents, UIM respondents had significantly lower emotional exhaustion and depersonalization but no difference in MHC score, anxiety, or any other factors. The difference in findings from grouping together Asian and UIM respondents as opposed to Asian and White respondents is likely driven by the complex, nonhomogeneous, and nuanced experience of individuals identifying as different races/ethnicities. While a better powered study is needed for more granular comparison of these groups, this tentatively suggests that Asian-identifying trainees are more similar to UIM than White trainees in terms of their global wellbeing and anxiety but more similar to White than UIM trainees in terms of their experience of work (ie, emotional exhaustion and depersonalization). While there may be shared experiences among people of color in some domains of medical training and practice, the long-standing tendency to examine race as a binary construct (ie, White vs. "non-White") is both scientifically unfounded and, as our data suggest, risks overlooking key aspects of how wellbeing may be achieved across diverse groups.<sup>43</sup> For example, 1 study of surgical trainees found African American, Asian, and other ROC were collectively less likely than White residents to feel they fit in at their programs and more likely to feel the need for additional specialty training.<sup>49</sup> On the other hand, innumerable studies have documented

differences among individuals and groups comprised of people of color in regard to their perception of stressors,<sup>50</sup> their experience of microaggressions,<sup>8</sup> their beliefs and attitudes regarding mental health,<sup>45</sup> and protective factors that enhance resiliency.<sup>41</sup>

While our study merely suggests the presence of differences, research outside of medicine provides important insights. A study by Cokley et al<sup>50</sup> found that Asian Americans reported higher feelings of imposter syndrome than African American and Latino/a students, which the authors attributed to unique beliefs around high self-expectation<sup>51</sup> and maladaptive perfectionist tendencies<sup>52</sup> found to be associated with higher psychological distress and lower psychological wellbeing.<sup>50</sup> In another study of undergraduate students, Taylor et al<sup>53</sup> found that Asian Americans were buffered against psychological and biological responses to stress more by implicit social support (ie, awareness of the existence of a support network) than by explicit social support (ie, overt expression), which actually exacerbated their stress. In contrast, European (ie, White) Americans benefited both psychologically and biologically from explicit rather than implicit support, with implicit social support actually exacerbating their stress.<sup>53</sup> The authors concluded that the net yield of having support may not be different, but the form of successful support may be associated with critical differences. As such, increasing perceived support in the workplace, a factor associated with increased flourishing in surgical trainees,<sup>3</sup> may require different approaches for different groups even if they share a common need. This further underscores the need for mixed-methods exploration of these issues.

In any modern discussion of racial/ethnic disparity certain fundamental issues bear noting. There is current controversy regarding language choice in this domain of study with concision driving ubiquitous use of abbreviations and categories which risk reinforcing long-standing biases. For instance, by centering descriptors on the majority (eg, “non-White,” “non-male,” “non-heterosexual”), we inherently (if unconsciously) conflate the majority (of surgeons) with the definition (of a surgeon). Research regarding gender equality in science, technology, engineering, and mathematics fields has shown such “normalization” to be exclusionary in its effect.<sup>54</sup> In the present study, the research question and sample size necessitated grouping data based on self-reported race/ethnicity and labeling the groupings clearly and concisely. To the best of our ability, we have selected language to balance published standards, inclusivity, and audience familiarity. Complete exploration of these critical issues is outside the scope of this article.

While our findings show promise in terms of informing tailored and inclusive interventions, our study should be viewed in the context of several limitations. First, our response rate was 34%, which may introduce bias. Similarly, the higher prevalence of non-male residents in our survey may reflect overrepresentation of individuals with uniquely high resilience (able to overcome adversity inherent to underrepresented groups advancing in medicine)<sup>46</sup> or those with uniquely high distress (due to inherent sexual harassment).<sup>7</sup> Second, given the low number of UIM residents in our study (consistent with the national landscape), we were unable to study factors of importance to ROC subgroups. Third, we were underpowered to look at differences by geographic area, which may influence wellbeing and the residency experience due to differences in local context and diversity of the surrounding area. Fourth, while the present study included an array of measures assessing flourishing (global wellbeing) as well as factors reflecting resilience and risk, it did not include measures specific to the experience of racism and discrimination, which have been shown to play an important role in the wellbeing of nonmajority gender/race/ethnicity groups. Finally, the timing of our survey was in the midst of a social movement for racial justice and the COVID-19 pandemic, which may have skewed responses. However, structural racism has predated these historic moments. Our findings should be confirmed in a comprehensive national sample, enhanced

by addressing the aforementioned limitations, and expanded through future qualitative work.

Nonetheless, our findings represent an advancement in our understanding that differences by racial groups exist and the need for heterogeneous interventions to improve trainee wellbeing and eliminate disparity. This may include individual-level interventions such as accessible mental health resources, practical training in how to address discrimination toward ROC from patients and colleagues, cultivating community for UIM groups, and advanced scheduling of time off to foster social support outside work. Implementation and assessment of such strategies, with deliberate interventions designed for ROC and those designed for UIM, represent a critical future direction in this domain. More broadly, our findings underscore the need for cultural change within surgery, necessarily predicated on intellectual humility, shared accountability for dismantling systemic racism, and a willingness to understand White privilege and supremacy,<sup>55</sup> as uncomfortable as this will be.

## CONCLUSIONS

Our results suggest a racial/ethnic disparity in surgical training. Further exploration through a larger mixed-methods study is needed to better understand specific factors that impact this issue. Accounting for differences when designing and implementing interventions, and more broadly adopting a transformative learning process to address systemic racism, is critical to optimize surgical trainee wellbeing and to fully advance surgery into the modern era.

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